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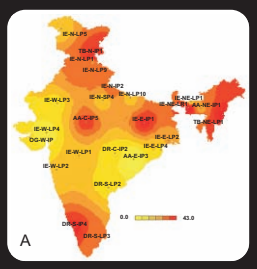
वार्षिक प्रतिवेदन
Annual Report
2011-12



CSIR-Central Drug Research Institute, Lucknow

वै.औ.अ.प. केन्द्रीय औषधि अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

CSIR-CENTRAL DRUG RESEARCH INSTITUTE

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Chattar Manzil Palace, Mahatma Gandhi Marg, Lucknow – 226 001

New CDRI: B.S. 10/1, Sector 10, Janakipuram Extn, Sitapur Road, Lucknow – 226 021

THRUST AREAS OF RESEARCH

1. Malaria and other Parasitic Diseases

- Development of new drugs/drug combinations as therapeutic interventions for malaria, leishmaniasis and filariasis;
- Establish novel target based drug assay protocols for identification of new leads;
- Knowledge generation on parasite biology and host parasite interactions.

2. Reproductive Health Research, Diabetes & Energy Metabolism

- Development of novel agents for fertility regulation (male/female) and management of endocrine disorders through modern drug design, scientific validation of traditional remedies and generation of new knowledge

3. Tuberculosis and Microbial Infections

- Simplification and shortening of treatment for drug-sensitive tuberculosis and search of new treatments for MDR-TB
- Development of new drugs for bacterial, fungal and viral (HIV and JEV) infections and tuberculosis.

4. CVS, CNS and Related Disorders

- Development of new target based drugs to alleviate CVS, CNS and related disorders;
- Carry out excellent basic research to delineate the molecular mechanisms of these pathologies so as to identify suitable targets for drug discovery, as well as to analyze the possible mechanism(s) of action of the candidate drugs.

5. Cancer and Related Areas

- Creation of appropriate platform for interdisciplinary collaborative research;
- Creation of knowledge base in cancer biology;
- Lead identification/optimization to obtain drug-like molecules.

6. Safety & Clinical Development

- Pre-clinical, clinical development and commercialization of new generation affordable drugs for diseases of national importance and international relevance;
- Creation of center of excellence in the field of Clinical trials, Regulatory toxicology, Safety pharmacology, Pharmaceutics and Pharmacokinetics & metabolism and catering to the needs of pharmaceutical industries.

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HIGHLIGHTS OF ACHIEVEMENTS

◆ Publications in SCI Journals (2011)	:	302
- Average Impact Factor (2011)	:	2.88
- Publications with > 5 Impact Factor (2011)	:	22
◆ Book Chapters (2011)	:	04
◆ Instruction Manual (2011)	:	01
◆ Patents (2011)		
- Filed Abroad	:	07
- Filed in India	:	10
- Granted Abroad	:	09
- Granted in India	:	02
◆ Ph.D. Thesis Submitted (2011)	:	56
◆ Technologies Demonstrated to Industries (2011)	:	1 (Improved process for Centchroman)
◆ Contract Research Undertaken (2011)	:	03
◆ Grant-in-Aid Projects Initiated (2011)	:	19
◆ Total External Budgetary Resources (April 2011 - January 2012)	:	₹ 11.76 Crore

Provisional data as on 01/02/2012

The Charter

- Development of new drugs and diagnostics;
- Cellular and molecular studies to understand disease processes and reproductive physiology;
- Development of contraceptive agents and devices;
- Systematic evaluation of medicinal properties of natural products;
- Development of technology for drugs, intermediates and biologicals;
- Dissemination of information in the field of drug research, development and production;
- Consultancy and development of technical manpower.

Organizational Structure

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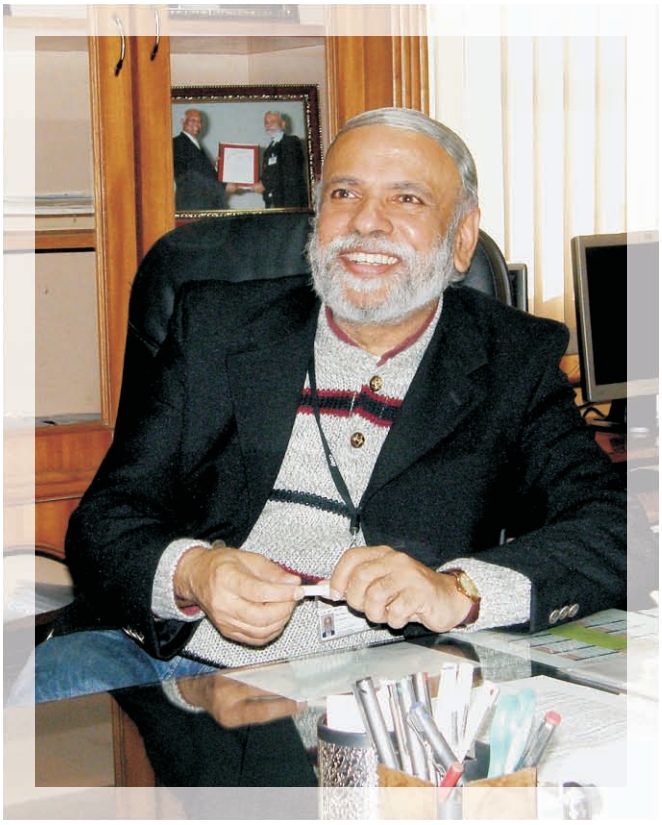
निदेशक की कलम से



सीएसआईआर–सीडीआरआई का वर्ष 2011–12 का वार्षिक प्रतिवेदन आपके समक्ष प्रस्तुत करते हुए मुझे हार्दिक प्रसन्नता हो रही है। आज हमारा संस्थान अपने नवीन अत्याधुनिक सर्वसुविधाजनक परिसर में स्थानांतरण की दहलीज़ पर है। मैं उन सब लोगों के प्रति आभारी हूँ जिन्होंने इस स्वप्न को साकार करने में सहयोग एवं कठिन परिश्रम किया। स्थानांतरण की प्रक्रिया को शीघ्रता से पूर्ण करने के लिए आवश्यक प्रशासनिक स्वीकृतियाँ प्रक्रियाधीन है। एक कार्यशील प्रयोगशाला को नये परिसर में स्थानान्तरित करके उसके कार्य निष्पादन की दर को बनाए रखना एक कठिन और चुनौतीपूर्ण कार्य है। इसके उपरांत भी उचित प्रबंधन करके बहुमूल्य समय को बचाकर संस्थान के सदस्य अपने नवीन कार्यस्थल को शीघ्र अति शीघ्र सुव्यवस्थित करने की ओर अग्रसर हैं। मुझे विश्वास है, कि संस्थान को प्रत्येक प्रतिबद्धसदस्य अपना सम्पूर्ण योगदान देकर इस महती कार्य को सफल बनाएगा।

मुझे यह सूचित करते हुए भी हर्ष हो रहा है, कि वर्तमान वर्ष भी संस्थान के सर्वाधिक उपलब्धिपूर्ण वर्षो में से एक रहा है। इस दौरान हमारे सतत् प्रयास विकास के क्षेत्र में नए आयाम स्थापित करने में सफल साबित हुए हैं। इस क्रम में मलेरियारोधी यौगिक 97/98 के लिए स्वस्थ स्वैच्छिक कार्यकर्ताओं पर प्रथम चरण के औषधि प्रभाव गति अध्ययन आरम्भ किये जा चुके हैं। औषधि नियंत्रक, भारत सरकार द्वारा एण्टी हाइपरग्लास्मिक औषधि (डायबिटीज़ की दवा) सीडीआर 134/F194 के प्रथम चरण के क्लीनिकल परीक्षणों की अनुमति प्रदान कर दी गई है, इसी प्रकार मलेरिया (यौगिक 99/411) आरियोप्रोसिस (यौगिक 99-373, S007-1500] CDR 1020 F147) थ्रॉम्बोसिस (S007-867,S002-333) डायबिटीज़ (CDR-267 F018) आदि औषधियों के क्षेत्र में भी सकारात्मक प्रगति हो रही है। बावजूद इसके कुछ महत्वपूर्ण औषधियों के विकास में तेजी लाने की आवश्यकता है, जिससे कि वो 12वीं योजना की समयावधि में ही विक्रय हेतु बाज़ार में उपलब्ध हो सकें।

अनंतिम आंकड़ों के अनुसार वर्ष 2011 में 302 से अधिक शोध पत्र प्रकाशित किये गये, जिनका इम्पैक्ट फैक्टर 2.88 रहा है। भारत में 10 पेटेन्ट और विदेशो में 7 पेटेन्ट आवेदित किये गये तथा इसी वर्ष 2 भारतीय पेटेन्ट और 9 विदेशी पेटेन्ट स्वीकृत किये गए। वर्ष 2011 में लगभग 56 शोधकर्ताओं ने पीएचडी थीसिस प्रस्तुत की। वर्ष 2011 में रूपये 4.5 करोड़ के बजट सहित 19 सहायता अनुदान परियोजनाएं और 3 प्रायोजित परियोजनाएं प्रारंभ की गई। सीएसआईआर–सीडीआरआई के अत्यन्त सफल और लोकप्रिय उत्पाद सेन्टक्रोमान की परिष्कृत प्रक्रिया प्रौद्योगिकी को एचएलएल लाइफ केयर लिमिटेड, तिरूवनन्तपुरम के प्रतिनिधियों के समक्ष सफलतापूर्वक प्रदर्शित किया गया और प्रौद्योगिकी हस्तान्तरण दस्तावेज उनको सौपें गये। इस वर्ष हमारे विभिन्न वैज्ञानिकों और शोध छात्रों को राष्ट्रीय और अन्तर्राष्ट्रीय एजेन्सियों द्वारा प्रतिष्ठित पुरस्कार और सम्मान से विभूषित किया गया, जिनमें आईसीएमआर पुरस्कार, युवा वैज्ञानिक पुरस्कार, राष्ट्रीय जैव विज्ञान पुरस्कार, एकेडमी की फेलोशिप और अन्य पुरस्कार सम्मिलित है। मैं सब को हार्दिक शुभकामनाएं देता हूँ तथा भविष्य में और अधिक सफलता की कामना करता हूँ।

सीएसआईआर–सीडीआरआई ओपन सोर्स ड्रग डिस्कवरी (ओएसडीडी) का एक अंग बनने पर गौरवान्वित है, यह अद्वितीय अभियान सीएसआईआर के महानिदेशक प्रो. समीर के. ब्रह्मचारी द्वारा प्रारंभ किया गया है साथ ही हमें इस बात का भी गर्व है कि हमको ओएसडीडी कार्यक्रम के दो महत्वपूर्ण घटक–ओएसडीडी केमिस्ट्री आउटरीच (ओएसडीडीकेम) और ओएसडीडी मलेरिया कार्यक्रम (ओएसडीडीएम) के नेतृत्व का दायित्व सौंपा गया है। ओएसडीडीकेम के अंतर्गत विभिन्न विश्वविद्यालयों, आईआईटी, आईआईएसईआर और देश के प्रत्येक भाग में शैक्षणिक संस्थानों के बड़ी संख्या में एमएससी केमिस्ट्री के छात्रों को प्रयोगात्मक प्रशिक्षण प्रदान किया जायेगा, जिससे वर्षो पुरानी कार्बनिक रसायन की प्रायोगिक पद्धतियों को नवीन आयाम मिलेगा। मुझे पूर्ण विश्वास है, कि यह कार्यक्रम छात्रों को अनुसंधान में लगे रहकर अपना करियर बनाने के लिये प्रोत्साहित करेगा और विश्वविद्यालयों तथा कॉलेजो में अनुसंधान/पाठ्यक्रमों की वर्तमान संरचना को परिवर्धित करने के लिये क्रान्तिकारी सिद्वहोगा। मुझे यह सूचित करते हुए प्रसन्नता है, कि उपर्युक्त कार्यक्रम के अंतर्गत 8 परियोजनाएं स्वीकृत हो चुकी हैं और कम्पाउंड लाइब्रेरी में 300 कम्पाउंड्स जमा किये जा चुके हैं। ओएसडीडीएम, मलेरिया हेतु औषधि खोज के लिये एक ओपन सोर्स प्लेटफॉर्म है जिसमें परिकलन और प्रयोगात्मक दोनों ही दृष्टिकोण सम्मिलित है। ओएसडीडी मलेरिया का उद्वेश्य राष्ट्रीय एवं अन्तर्राष्ट्रीय सहभागियों के साथ मिलकर विभिन्न प्रकार के अनुभवों और हितों को एक साथ रखकर एक संकुल के रूप में नई औषधियों की खोज को गति प्रदान करना है। यह अन्वेषण से औषधि लक्ष्य तक की परिधि की केन्द्रित परियोजनाओं को कार्यान्वित करने, संश्लेषित अणुओं और प्राकृतिक उत्पादों से लीड के मूल्यांकन और कैन्डीडेट औषधियों के विकास के लिये तैयार किया गया है। हम घरेलू और अन्तर्राष्ट्रीय मोर्चे पर उन सभी शोधकर्ताओं को, जो इसमें रूचि रखते हैं, ओएसडीडी कार्यक्रम के अंतर्गत भाग लेने के लिये आमंत्रित करते है। आइये, हम विश्व के लाखों सुविधाहीन लोगों को उनकी आर्थिक पहुँच के अन्दर स्वास्थ्य सुविधाएं प्रदान करने के तरीके और साधनों का पता लगाने के लिये एकजुट होकर कार्य करें।

उच्च कोटि के अनुसंधान कार्य को प्रोत्साहन देने, शोधकर्ताओं के मध्य विचारों के आदान प्रदान को बढ़ाने हेतु जनवरी 2012 से विशिष्ट व्याख्यान श्रृंखला का प्रारंभ किया गया। इस पहल के अंतर्गत प्रति माह किसी न किसी भारतीय अथवा विदेशी वैज्ञानिक को सीएसआईआर–सीडीआरआई आकर संस्थान के शोधकर्ताओं से बातचीत करने और व्याख्यान देने के लिये आमंत्रित किया जाता है। मैं निश्चित रूप से कह सकता हूँ, कि आने वाले वर्षों में विशिष्ट व्याख्यान श्रृंखला एवं संस्थान के वैज्ञानिकों द्वारा पूर्व से ही संचालित "बुधवार व्याख्यान माला" का यह कदम संस्थान में शैक्षणिक वातावरण के साथ–साथ शोध कार्यो में भी वृद्वि करेगा। इस वर्ष एसीएसआइआर के छात्रों के प्रथम बैच ने सीएसआईआर–सीडीआरआई में अपने अनुसंधान कार्य प्रारंभ किये।

हम संस्थान की ग्यारहवीं योजना के समापन की ओर अग्रसर हैं। प्रो. ब्रह्मचारी की अध्यक्षता में आयोजित बायोलॉजिकल क्लस्टर की समीक्षा बैठक यह प्रदर्शित करती है कि बेसिक रिसर्च कम्पोनेन्ट में हमने महत्वपूर्ण प्रगति की है। अधिकांश परियोजनाओं में हमने लक्ष्य से अधिक संख्या में प्रकाशनों, पेटेन्ट और पीएचडी की उपाधियाँ प्रदान की हैं। यद्यपि आगे और अधिक उत्कृष्टता के अवसर भी हैं। विश्लेषण से हमको अनुसंधान कार्यक्रमों पर आत्मनिरीक्षण का अवसर प्राप्त हुआ है। 12वीं योजना अवधि में हमने मानव स्वास्थ्य के महत्वपूर्ण प्रश्नों, विशेष रूप से संक्रामक बीमारियों, जीवन शैली से उत्पन्न स्वास्थ्य समस्याएं, प्रजनन स्वास्थ्य और जैव चिकित्सा विज्ञान के महत्वपूर्ण प्रश्नों पर ध्यान केन्द्रित रखा। सीएसआईआर बायोलॉजिकल साइन्सेज क्लस्टर मिशन के अनुरूप हम वैज्ञानिक जनशक्ति की अगली पीढ़ी को शिक्षित और प्रशिक्षित करने के लिये प्रतिबद्व है। हम 5 नेटवर्क परियोजनाओं का नेतृत्व करने जा रहे हैं और जैविक, रासायनिक, भौतिक, इंजीनियरिंग और सूचना विज्ञान समूह के लगभग 15 नेटवर्क परियोजनाओं में सहभागी प्रयोगशाला के रूप में योगदान दे रहे हैं। सीएसआईआर के राष्ट्रसेवा मिशन में सीएसआईआर–सीडीआरआई द्वारा अंतरविषयी समूह की विशाल श्रृंखला में सहभागिता, हमारी शक्ति और महत्व का परिचायक है। मैं सभी नोडल ऑफिसर्स और वैज्ञानिकों के प्रति आभार व्यक्त करता हूँ, जिन्होंने 12वीं योजना की योजना प्रक्रिया में सक्रिय रूप से भाग लिया और पर्याप्त समय दिया। यद्यपि इस बार योजना प्रक्रिया लम्बी है किन्तु मैं निश्चित रूप से कह सकता हूँ कि समुचित योजना नियोजन से परियोजनाओं की सफलता दर में वृद्वि होगी।

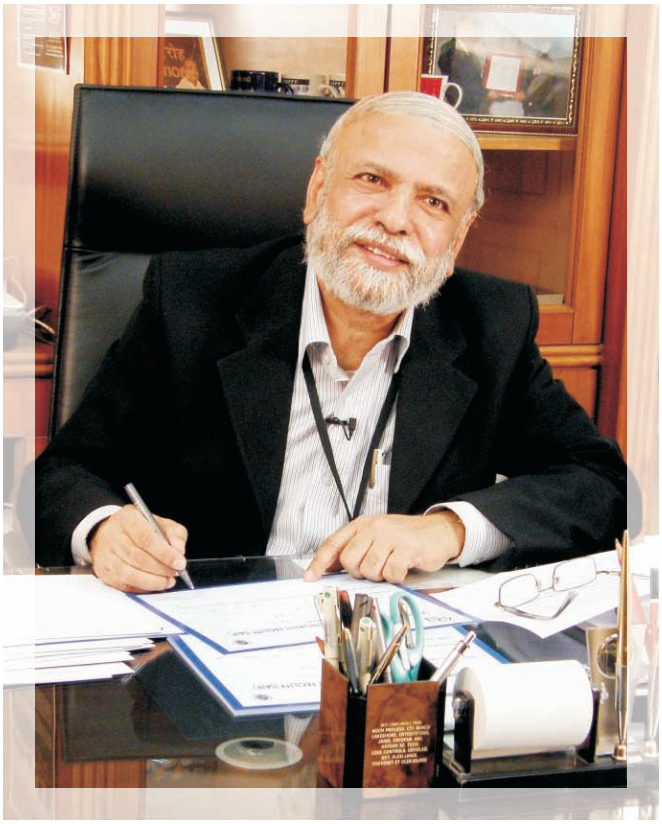
मैं अपने समस्त स्टाफ और उनके परिवार को धन्यवाद देता हूँ, जिन्होंने अपने सहयोग द्वारा इस वर्ष को अत्यन्त सफल बनाने में अमूल्य सहयोग दिया और आने वाले वर्षो के लिये भी यही कामना करता हूँ।

तुषार चक्रवर्ती

फरवरी 17, 2012

(तुषार कान्ति चक्रवर्ती)

FROM THE DIRECTOR'S DESK



It gives me immense pleasure to present before you the Annual Report 2011-12 of CSIR-Central Drug Research Institute which is at the threshold of shifting to its new campus equipped with state-of-the-art facilities. I am grateful to all those who strived hard in realizing this dream. Necessary administrative and statutory clearances are under process to expedite the shifting process. Shifting of functional lab to a new place and maintaining the pace of performance is a Herculean task. However, proper planning and execution can save lot of valuable time so that staff can make their workplaces operational at the earliest. I am confident that each and every member of my staff would continue to extend the fullest cooperation in this important endeavour.

I am happy to report that the current year has been one of the productive years of the Institute. Sustained progress has been made in the development of candidate drugs and new lead molecules. Phase I pharmacokinetic study in healthy volunteers has been initiated for the candidate drug for malaria Compound 97-78; DCG(I) permission has been received for Phase I Clinical Trial of the antihyperglycemic candidate drug CDR134F194. Significant progress has been made in the further development of other candidate drugs and new leads in the area of malaria (Compound 99-411), osteoporosis (Compound 99-373, S007-1500, CDR1020F147), thrombosis (S007-867, S002-333), diabetes (CDR267F018) and others. Nevertheless, there is a need to intensify the pace of progress in the further development of candidate drugs to see some of them in market by the end of 12th plan period.

As per the provisional data, we have published more than 302 research papers in 2011 with an average impact factor of 2.88, filed 10 patents in India and 7 patents abroad. Further, 2 of the Indian patents and 9 foreign patents were granted in the year 2011. About 56 researchers submitted PhD theses during 2011. Institute scientists continued to attract national and international funding agencies to sponsor research projects. In the year 2011, a total of 19 Grant-in-Aid projects and 3 Sponsored projects have been initiated with a total budgetary outlay of Rs. 4.5 Crore. Technology for improved process for the Centchroman, a flagship blockbuster contraceptive product of CSIR-CDRI has been successfully demonstrated to representatives from HLL Life Care Ltd, Thiruvananthapuram and Technology Transfer Document handed over to them. During the year, several of our scientists and research fellows received prestigious honours and awards from national and international agencies including ICMR Award, Young Scientist Award, National Bioscience Award, Fellowship of National Academy of Sciences and several other awards. I extend my hearty congratulations to all and wish for more in coming years.

CSIR–CDRI feels proud to be part of Open Source Drug Discovery (OSDD) – a unique movement initiated by Prof. Samir K. Brahmachari, Director General, Council of Scientific & Industrial Research and to have been

entrusted with the responsibility of spearheading two important components of the OSDD Program – the OSDD Chemistry Outreach (OSDDChem), OSDD Malaria Program (OSDD*m*). OSDDChem is intended to impart practical training to a large number of M Sc chemistry students in various universities, IITs, IISERs and other academic institutes across the length and breadth of the country; give a new dimension to the age-old organic practical classes; and create an Open Chemical Library of diverse organic compounds synthesized by the students. I am sure that the program will encourage students to pursue their career in research and bring radical changes to the present set-up of research/courses in universities and colleges. I am glad to inform that already 8 projects have been sanctioned and more than 300 compounds have been submitted to compound library under above program. OSDD*m* is an open source platform for drug discovery programmes for malaria involving both computational and experimental approaches. OSDD*m* aims to bring together diverse experience and interests to expedite the search for new drugs by working as a consortium with national and international partners. It is designed to implement focused projects ranging from investigation of drug targets, evaluation of leads from synthetic molecules and natural products, and development of candidate drugs. We invite all interested researchers on domestic and international fronts to participate in the above programs under OSDD umbrella. Let us join hands and work together to find ways and means to provide affordable healthcare to millions of underprivileged people in the world.

In the pursuit of fostering high quality research, to provide a platform for exchange of ideas among researchers and to create an interactive learning environment for research students, a Distinguished Lecture Series has been initiated from January 2012. Under this initiative, a distinguished Indian or foreign scientist is being invited every month to visit CSIR-CDRI to interact with institute researchers and deliver a lecture. I am sure that in coming years, this initiative along with Wednesday Lecture Series by Institute Scientists will further augment research as well as academic environment in the Institute. The year also saw the first batch of AcSIR students commencing their research work at CSIR-CDRI.

We are at the verge of concluding the 11th plan projects of the Institute. Recently held review meeting under the chairmanship of Prof. Brahmachari showed that we have made significant progress in basic research component. We have delivered more than the targeted number of publications, patents and PhDs in most of the projects. However, still there was a scope for further excellence. The analysis gave us an opportunity to introspect our research programs. In the 12th plan period, we shall continue to focus on important questions relevant to human health, specifically in the area of infectious diseases, lifestyle induced health adversities, reproductive health and catalyze advances in biomedical sciences towards enabling affordable and locally relevant healthcare. In line with the CSIR Biological Sciences Cluster Mission, we are committed to educate and train the next generation of scientific manpower. We are going to be the flag bearers for 5 network projects and contributing in more than 15 other network projects of Biological, Chemical, Physical, Engineering and Information science clusters as a participating laboratory. Participation of CSIR-CDRI in such wide range of interdisciplinary clusters is an indication of our strength and importance for CSIR in its mission to serve the nation. I am grateful to all the nodal officers and scientists who actively participated and spent considerable time in the planning process for the 12th plan period. Though the planning process is lengthy this time, but, I am sure that proper planning will enhance the success rates of the projects.

I cordially thank all my staff and their families who extended their valuable support and making the year very fruitful and anticipate same in coming years.

February 17, 2012

(T.K. Chakraborty)

Performance Report


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत
CSIR INDIA

Performance Report : Overview

The current year has been one of the productive years of the Institute. Sustained progress can be seen on all fronts. Significant progress has been made in the development of candidate drugs and new lead molecules. Phase I pharmacokinetic study in healthy volunteers has been initiated for the candidate drug for malaria compound 97-78; DCG(I) permission has been received for Phase 1 Clinical Trial of the antihyperglycemic candidate drug CDR134F194. Progress has been made in the development of other candidate drugs and lead molecules. As per the provisional data for the year 2011, more than 302 research papers have been published with an average impact factor of 2.88. For the first time more than 113 publications have been published in the Journals with IF >3. Further, more than 168 research papers were presented in national and international conferences. Filed 10 patents in India and 7 patents abroad, 2 of the Indian patents and 9 foreign patents were granted in the year 2011. About 56 researchers submitted PhD thesis during 2011 and a total of 168 Post-graduate students from 35 universities and their affiliated colleges from all over the country were selected on merit basis and imparted training in various disciplines of drugs and pharmaceutical research for 4-10 months duration. CSIR-CDRI being a mentor institute for the NIPER, Raebareli, imparted one year project training in biomedical research to 30 M.S.(Pharm) Pharmaceutics & Medicinal Chemistry specialization students. The year also saw the first batch of AcSIR students commencing their research work at CSIR-CDRI. Through international training under bilateral cooperation, Institute Imparted training to 3 fellows from abroad. A total of 19 Grant-in-Aid projects and 3 Sponsored projects have been initiated with a total budgetary outlay of Rs. 4.5 Crore. Technology for improved process for the Centchroman, a blockbuster contraceptive product of CSIR-CDRI has been successfully demonstrated to representatives from HLL Life Care Ltd, Thiruvananthapuram and Technology Transfer Document handed over to them. During the year, several of our scientists and research fellows received prestigious honours and awards from national and international agencies including ICMR Award, Young Scientist Award, National Bioscience Award, Fellowship of Academy and several other awards. Several important programs have been initiated during the year including OSDD Chemistry Outreach Program, OSDD Malaria, Distinguished Lecture Series, Wednesday Lecture Series, AcSIR, etc. The year was equally eventful also and visited by the distinguished personalities. Shri Pawan Kumar Bansal, Hon'ble Minister for Parliamentary Affairs, Science & Technology and Earth Sciences was the Chief Guest on the occasion of CSIR-CDRI Diamond Jubilee Annual Day 2011. Prof. Samir Brahmachari, Secretary, DSIR and DG, CSIR visited to review the 11th plan program and to deliver Mellanby Memorial Lecture. Prof. C.N.R. Rao delivered lecture as a part of International Year of Chemistry Celebrations. Prof. Richard R. Ernst, Nobel Laureate, Honorary Doctor, Swiss Academy of Science, Switzerland presented his deliberations during a symposium on Magnetic Resonance. Institute continued to modernize its facility by establishing state of the art equipments and facilities. During the year, new animal models viz. SHR rat (Specific Hypertensive Rat) and C57BL/6 mice were established. Animal Genetic Monitoring Lab and Health Monitoring Lab were upgraded. Four new major equipments procured and installed which includes Atmospheric pressure tandem quadrupole mass spectrometer TQD with UPLC; 4000 Q Trap LCMS/MS (ABSciex); 4800 MALDI TOF/TOF; Automated system for crystallization and visualization of protein crystals. Establishment of New CSIR-CDRI is near to its completion and shifting will start very shortly. A brief summary of performance report of the Institute is presented in following pages followed by the details of the achievements in following sections.

CSIR-CDRI Tableau at Republic day

It was a red letter day for CSIR-CDRI when the tableau of CSIR on the healthcare theme - from generic drugs to genomics was presented before the nation at Republic day 2011 parade. The CDRI products like Saheli, Memory Sure and E-Mal were shown highlighting the drugs available to the common man at affordable price.

Progress in the Development of Candidate Drugs and New Leads

I Candidate Drugs under Advance Stages of Development

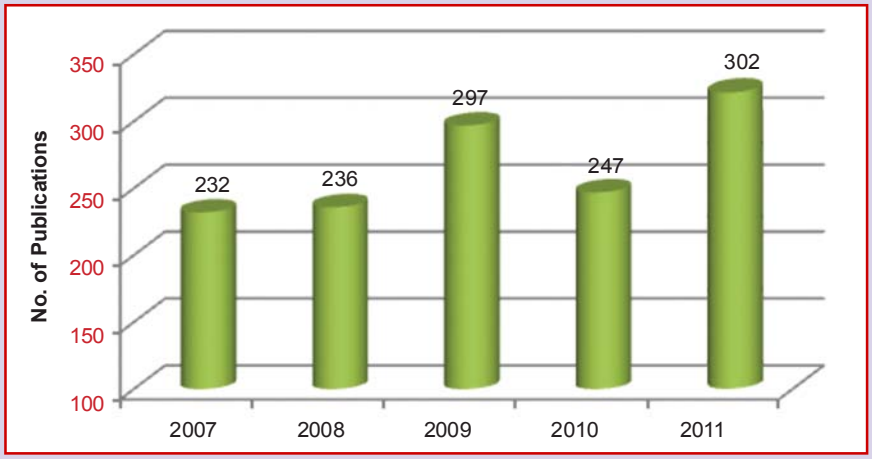
Diseases / Disorders	Candidate Drug & Efficacy	Clinical Status	Licensees & Collaborators
Malaria	**97-78** (Antimalarial)	Phase-I single dose clinical study completed. Single dose pharmacokinetic study in healthy volunteers initiated. So far study has been completed on 9 healthy volunteers	IPCA Labs., Mumbai
	99-411 (Antimalarial)	Pre-clinical data is under compilation for IND submission	IPCA Labs., Mumbai
Diabetes	**CDR134D123** (Antihyperglycemic)	Phase-I Single & Multiple Dose studies completed. Quality Monograph of the plant *Xylocarpus granatum* prepared as per Ayurvedic Pharmacopeia of India specifications and submitted to DGCCRAS on 23 August 2011 to avail marketing permission. Additional data, as desired by DGCCRAS, is under compilation	TVC Sky Shop Ltd., Mumbai
Diabetes & Dyslipidemia	**CDR134F194** (Antihyperglycemic)	DCG(I) permission to conduct Phase I Clinical Trial received in May 2011. Necessary action initiated and trial would commence soon	TVC Sky Shop Ltd., Mumbai
Dyslipidemia	**80-574** (Hypolipidemic)	Clinical studies of compound 80-574 completed. Analysis of the data for repositioning of the product is in progress	Cadila Pharmaceuticals Ltd. Ahmedabad
Osteoporosis	**99-373** (Anti-osteoporotic)	Plan and Protocol of phase I clinical trial has been approved by DCG(I). Investigators Brochure has been compiled	Under negotiation
	OsteoJuvenate (1020F147) (Anti-osteoporotic)	Regulatory studies completed. Product is being further developed as neutraceutical and dietary supplement for optimum bone health	Natural Remedies, Bangalore
Liver Disorder	**Picroliv** (Hepatoprotective)	Phase III clinical trial completed at CSSMU, Lucknow and Seth GS Medical College & KEM Hospital Mumbai	DIL, Mumbai
Stroke	**Herbal Medicament** (Neuroprotective)	Draft IND prepared by Themis Medicare has been reviewed and comments forwarded to Themis for preparation of final IND application	Themis Medicare Ltd., Mumbai

II Potential New Leads

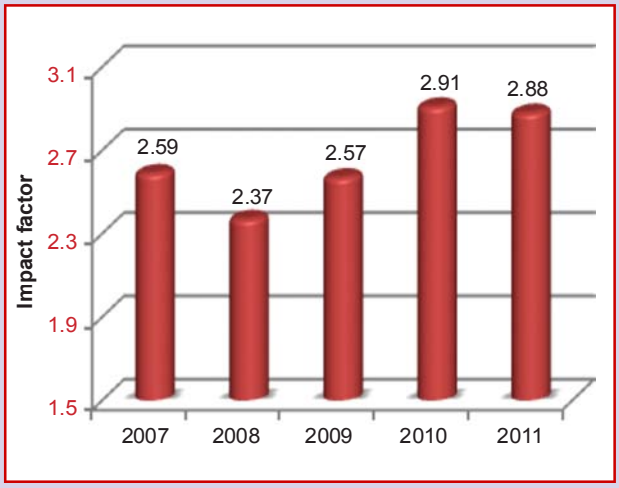
Diseases / Disorders	Lead Product & Efficacy	Status	Licensees & Collaborators
Osteoporosis	**S007-1500** (Rapid fracture healing)	Compound found safe in single dose toxicity study by oral route in rat and mice and by IM route in rat. One year stability study completed	Open for licensing
	CDR914K058 (Osteogenic)	Efficacy established in animal models. Synthesis of compound in progress	Under negotiation
	CDR4744F004 (Osteoprotective and bone anabolic)	Standardized fraction from the renewable part of the plant has been found to have bone anabolic effect in osteopenic rats; Principal component analysis of bioactive markers completed	Under negotiation
Thrombosis	**S007-867** (Antithrombotic)	Compound found safe in single dose toxicity study by oral route in rat and mice and by IM route in rat; No adverse effect on CVS, CNS & respiratory parameters.	Open for licensing
	S002-333 (Antithrombotic)	Compound found safe in single dose toxicity study by oral route in rat; Patent Granted	Open for licensing
Diabetes & Dyslipidemia	**CDR267F018** (Antidyslipidemic)	Compound found safe in 28 day repeat dose toxicity study in Rh monkey	Open for licensing
Lipid lowering	**CDR4655K09** (Antidyslipidemic)	Efficacy established as a new class of HMG-CoA reductase and as potential lipid lowering agent	Open for licensing
Contraception	**S010-1255** (Spermicidal & Antitrichomonal)	Potent spermicidal and anti-trichomonal (against both metronidazole susceptible and resistant strains) activity established with much higher safety index compared with Nonox-9	Open for licensing
Cancer	**S009-131** (Anticancer)	*In vivo* studies carried out in ACTREC, Mumbai in SCID mice bearing cervical cancer (HeLa) showed that activity of S009-131 is better than that of standard drug Adriamycin	Open for licensing
Tuberculosis	**S006-830** (Antituberculosis)	Efficacy established *in vitro* & *ex vivo*. Large scale synthesis completed. QC analysis of pure compound in progress	Being developed under OSDD

*Data as January 2012

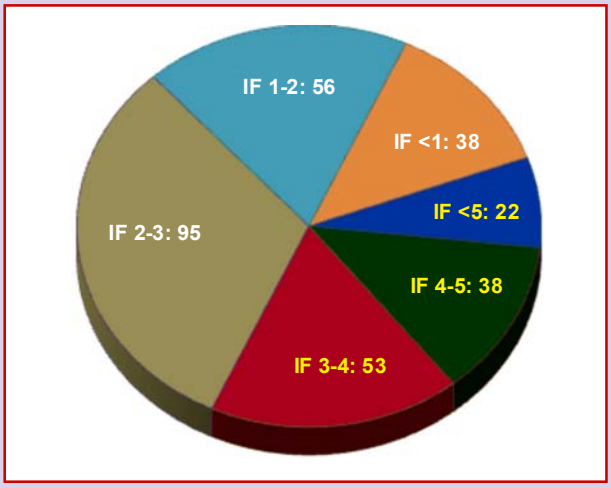
PUBLICATIONS



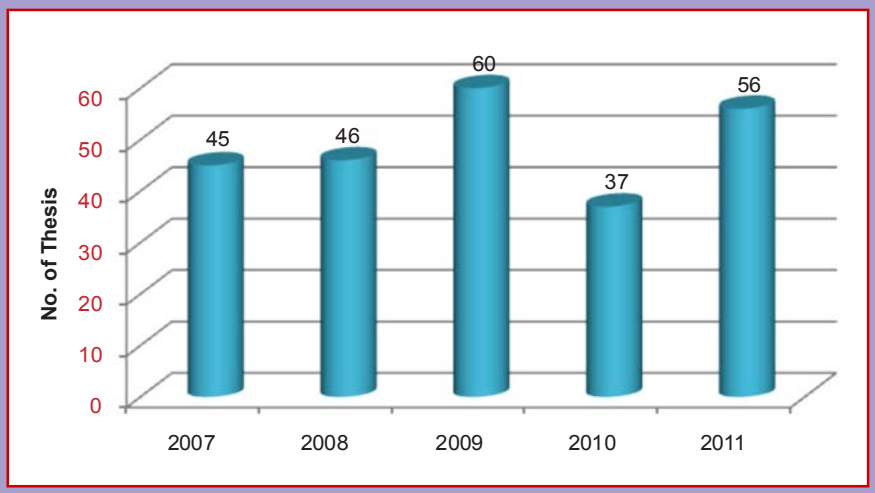
Average Impact Factor



Impact Factor-wise No. of Publications 2011



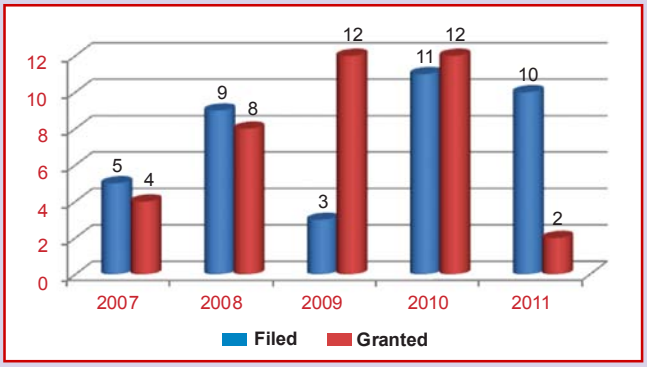
Ph.D. THESIS SUBMITTED



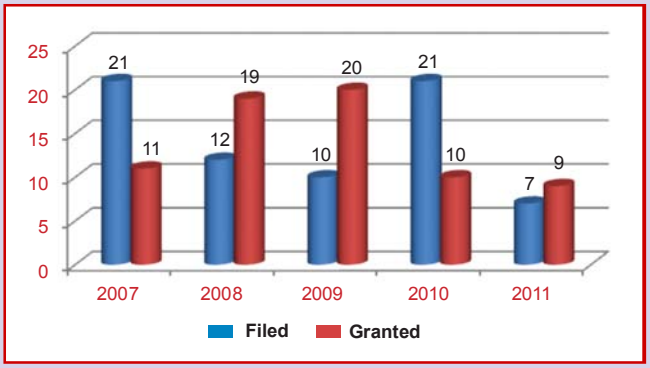
*Provisional data as on 31-01-2012

Patents

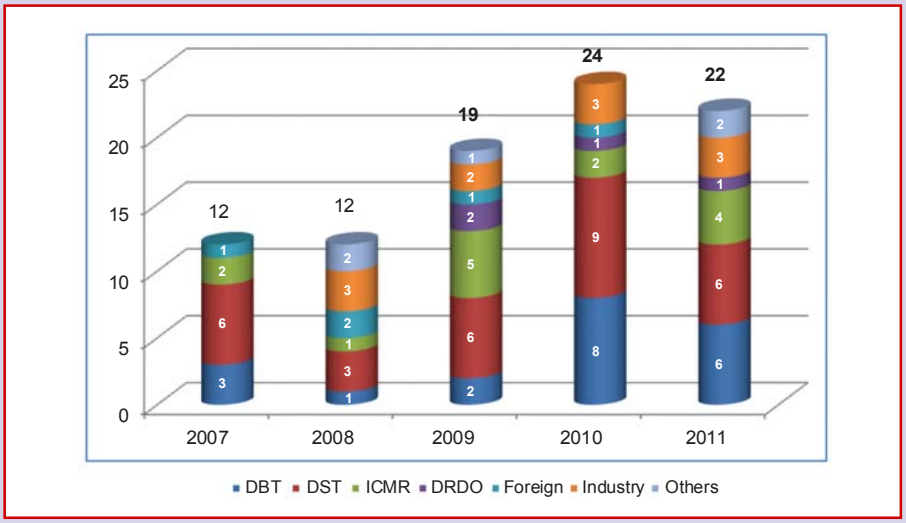
Indian Patents



Foreign Patents



New Inter-Agency Projects Initiated



Provisional Data as on 31/01/2012

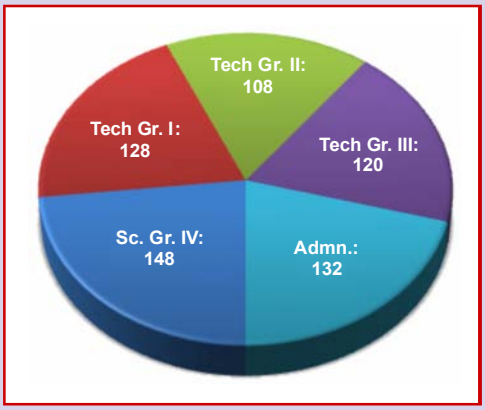
Technology Demonstration

Demonstration of know-how of Ormeloxifene (Centchroman) to HLL Lifecare Ltd., Thiruvanthapuram

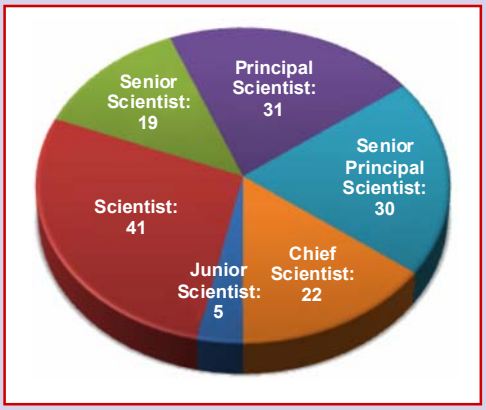
In pursuance of the license agreement between CSIR-CDRI and HLL Lifecare Ltd., Thiruvanthapuram, executed on 2-12-2009 for the commercial exploitation of Centchroman, the improved process know-how of its preparation has been successfully demonstrated and handed over the Technology Transfer Document (TTD).

MANPOWER

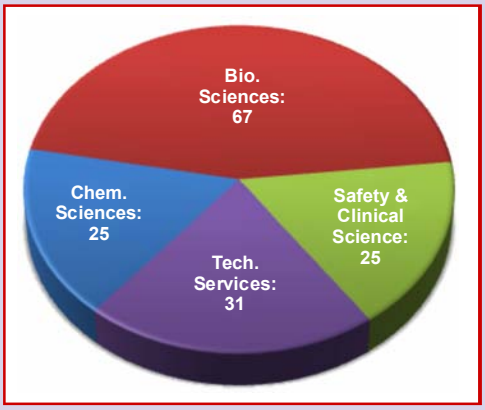
Total Staff



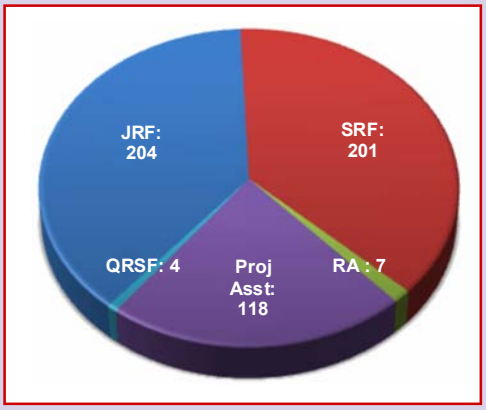
Designation-wise Number of Scientists



Area-wise Strength of Scientists



Research Fellows and Project Assistants



WE WELCOME NEWLY RECRUITED SCIENTISTS

Dr. Syed Musthapa M
Senior Scientist
Endocrinology Division

Dr. Namrata Rastogi
Scientist
Medicinal & Process Chemistry Division

Dr. Dipak Datta
Senior Scientist
Drug Target & Discovery Division

Dr. Dibyendu Banerjee
Scientist
Molecular & Structural Biology Division

Dr. Jiaur Rehmaan Gayen
Scientist
Pharmacokinetics & Metabolism Division

*Data as on 31-01-2012

OSDD Chemistry Outreach Program (OSDDChem)

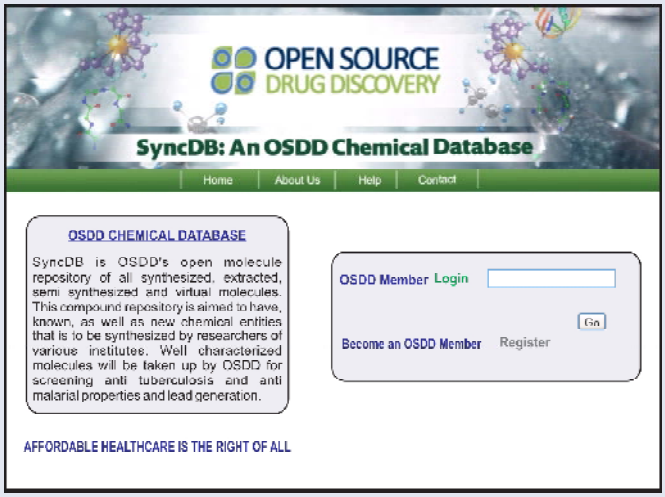
(CSIR-CDRI as Coordinating Laboratory)

On the occasion of the International Year of Chemistry 2011, CSIR, under the aegis of its OSDD initiative, has launched a Chemistry Outreach Program through CSIR-CDRI as the nodal laboratory. The major objectives of the program are:

- Create an Open Chemical Library of diverse organic compounds synthesized mainly by the M.Sc. and Ph.D. students working at Universities/ colleges/ institutes across the length and breadth of the country;
- To impart practical training to M.Sc. students specializing in organic chemistry toward synthesis and spectroscopic characterization of organic compounds;
- To set up OSDD Outreach Centres at different CSIR labs including CSIR-CDRI (Lucknow), CSIR-NIEST (Jorhat), CSIR-IICB (Kolkata), CSIR-NIIST (Thiruvanthapuram), CSIR-IICT (Hyderabad) and CSIR-IIIM (Jammu) where students from nearby places can carry out short duration projects;
- To investigate the bioactivity of the compounds in antitubercular and antimalarial assays;
- To archive the compounds in state of the art storage facility for other biological assays and future usage;

Strategical Details:

- All compound submissions through the website (http://crdd.osdd.net/osddchem/);
- Registration at Sysborg 2.0 (http://www.osdd.net/)
- Any registered member of OSDD can access the website;
- All compounds to be registered by Principal Investigator (a regular faculty of university/ college/ institute);
- A project corresponding to the registered molecules to be submitted by PI;
- Project should have Name and complete address of the Investigator (include father's name), Title of the project, Preamble, Objectives, Work plan, Synthetic Scheme, Timelines, Budget, Approval from competent authority of the institution;
- Any registered member can comment, evaluate and suggest modifications on any project;
- Compounds can be submitted against the approved projects;
- SOPs available on the portal;
- The results of the biological screening will be uploaded on the portal within 3-4 weeks time;



For further details, please visit: http://crdd.osdd.net/osddchem or write to Dr. Sanjay Batra at s_batra@cdri.res.in

Incentives:

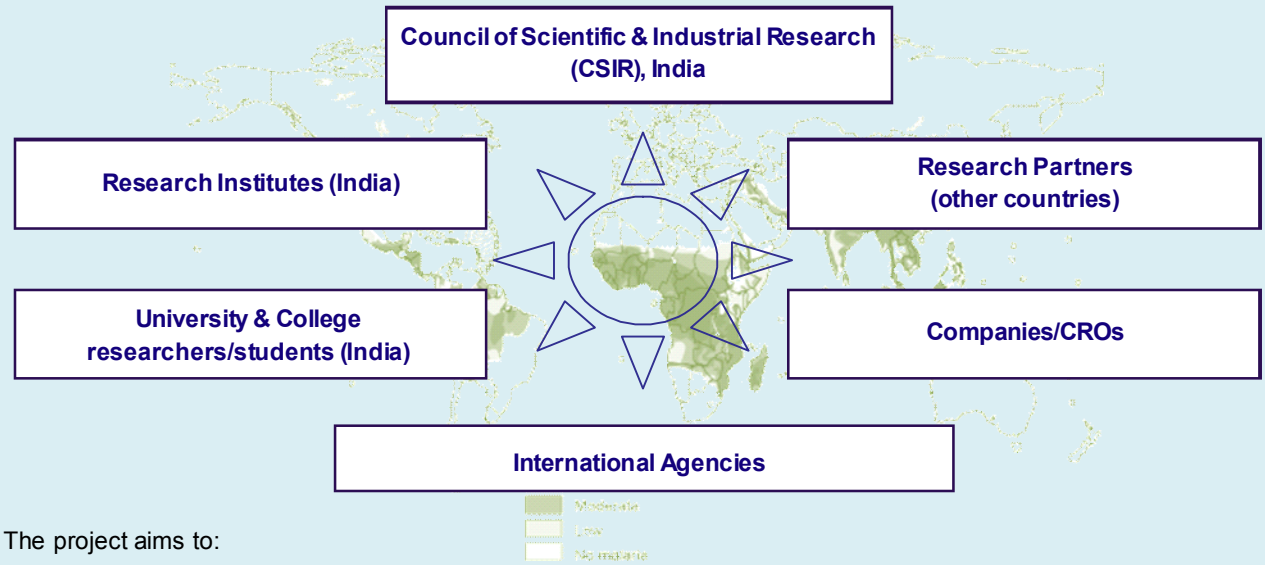
- An initial amount of Rs. 1 lakh for consumable cost, and Rs. 5 - 10 lakhs for minor equipments cost if needed, will be transferred by cheque/bank transfer to the respective institute or laboratory by CSIR-CDRI (no funding to CSIR labs);
- Rs 3000/- to be paid for each compound (debited from the consumable grant);

Progress made so far:

- Projects submitted- 8 / Project sanctioned- 8
- Compounds submitted- 300

Open Source Drug Discovery For Malaria (OSDD*m*)

(CSIR-CDRI as Coordinating Laboratory)

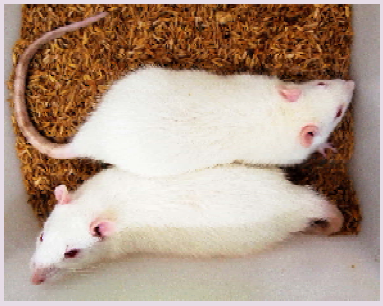


The project aims to:

- Identify pathways and novel targets using bioinformatics and systems approaches.
- Identify chemical entities of interest and use open source for wide participation in chemical synthesis of compounds, lead optimization and cross validation of data.
- Set-up and validate *in vitro* and *in vivo* screening systems, evaluate drug kinetics and drug-drug interaction.
- Search for anti-malarial compounds from plants under traditional use.
- Drug development (toxicity profiling, pharmacokinetics, evaluation in monkeys (*P. cynomolgi*), take candidate drugs through Phase I and early efficacy studies).

  For further details, please visit http://malaria.osdd.net

New Models/Facilities in Animal House



SHR Rat (Specific Hypertensive Rat): Disease specific animal model for use for CVS, antihypertensive and congestive heart failure studies

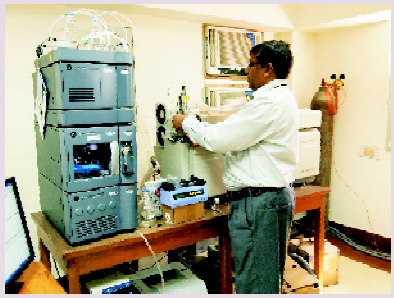
C57BL/6 Mice: Background strain for transgenesis. Used in cardiovascular and audiogenic seizure studies

Animal Genetic Monitoring Lab

Animal Health Monitoring Lab

New Sophisticated Equipments

Atmospheric pressure tandem quadrupole mass spectrometer TQD with UPLC



4000 Q Trap LCMS/MS (ABSciex)

4800 MALDI TOF/TOF

Automated system for crystallization and visualization of protein crystals

Setting up of World-Class Drug Research Institute

The New CDRI Campus, spread across approximately 61 acres of land, houses R&D Laboratories, support services (Animal House, SAIF, Lab Engineering, Administration, etc.). The campus will also provide housing accommodation to its employees, hostel facilities to research fellows and other amenities. The project is in advanced stage of completion and it is expected that shifting activities will begin very soon.

BUDGET

2011-2012 (Sanctioned Estimates)

(Rs. in lakh)

	Heads	CSIR Grant
(A)	**Recurring**	
	Pay and Allowances	3922.928
	Contingencies	349.860
	HRD	4.000
	Lab Maintenance	195.000
	Staff Quarter Maintenance	12.000
	Chemicals and Consumables	970.910
	Sub-Total	**5454.698**
(B)	**Capital**	
	Works and Services	125.000
	Apparatus and Equipments	3486.500
	Office Equipments, Furniture and Fittings	7.000
	Library Books and Journals	225.000
	Staff Quarter (Construction)	50.000
	Sub-Total	**3893.500**
	Total (A+B)	**9348.198**
(C)	**SIP/NWP/IAP/FAC/CMM Projects**	**2060.492**
	***Grand* Total (A+B+C)**	**11408.690**

*Provisional Data as on 31-01-2012

2010-2011 (Actual Expenditure)

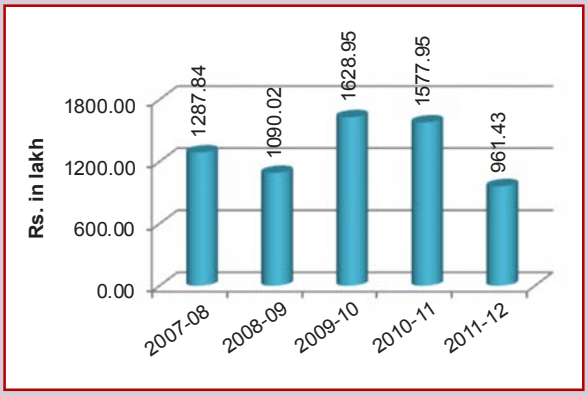
(Rs. in lakh)

	Heads	CSIR Grant	L.R.F.
(A)	**Recurring**		
	Pay and Allowances	3816.934	4.088
	Contingencies	350.007	43.430
	HRD	4.000	0.535
	Lab Maintenance	200.000	28.347
	Staff Quarter Maintenance	16.000	3.843
	Chemicals and Consumables	601.112	
	Sub-Total	***4988.053***	***80.243***
(B)	**Capital**		
	Works and Services/ Electrical Installations	45.000	3.370
	Apparatus and Equipments/ Computer Equipments	1550.000	
	Office Equipments, Furniture and Fittings	7.031	
	Library Books and Journals	275.000	
	Staff Quarter (Construction)	61.000	
	Sub-Total	**1938.031**	**3.370**
	Total (A+B)	**6926.084**	**83.613**
(C)	**SIP/NWP/IAP/FAC/CMM Projects**	**10814.160**	
	Grand Total (A+B+C)	**17740.244**	**83.613**

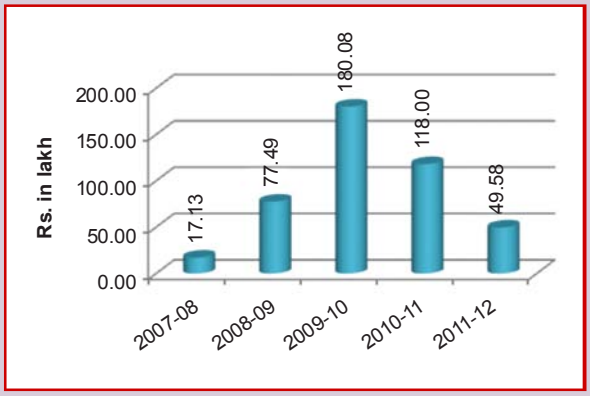
#Data as on 31-01-2012

External Budgetary Resources and CSIR Grant

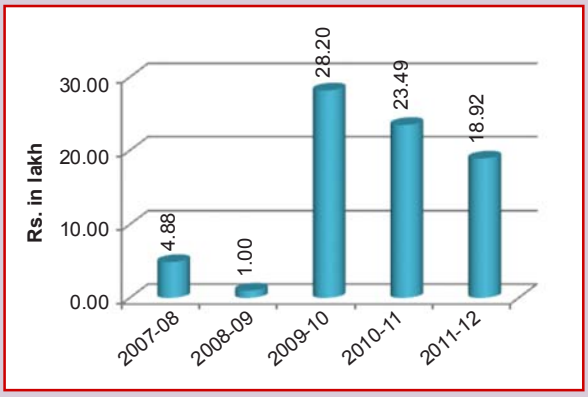
External Cash Flow from Government Agencies



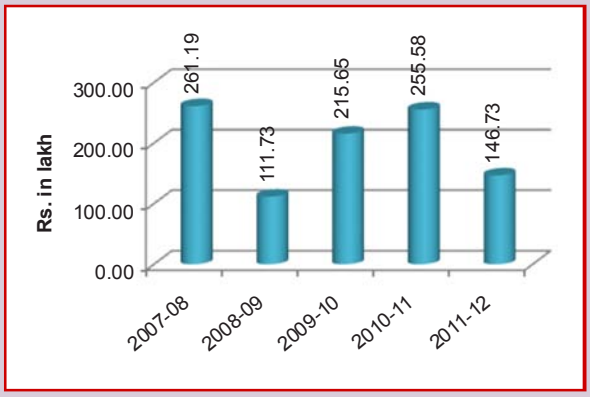
External Cash Flow from Foreign Agencies



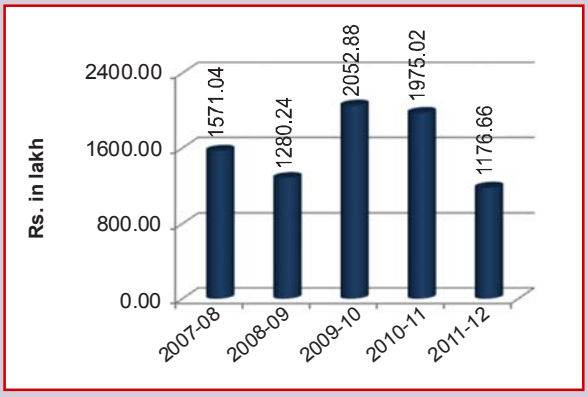
External Cash Flow from Industries



Lab Reserve Fund Generated

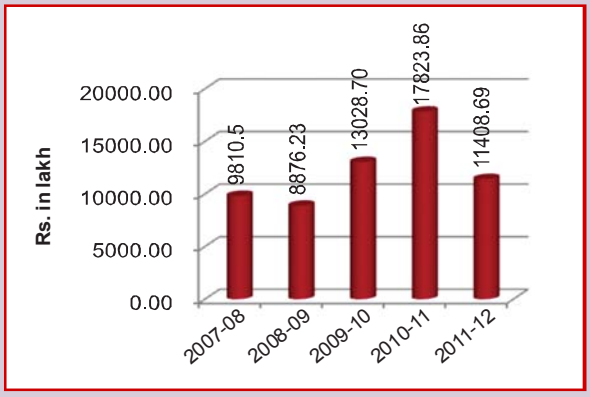


Total External Budgetary Resources*



*Includes ECF and LRF

Total Budget (CSIR Grant)*



*Includes Regular Budget and Plan Projects (CMM/SMM/SIP/NWP/IAP/HCP/OLP/MLP)
For the year 2011-12 amount corresponds to sanctioned Estimates

*Provisional data as on 31-01-2012

Research Council

(April 2010 – March 2013)

Chairman

Prof. N.K. Ganguly
Former Director-General, ICMR, Distinguished Biotechnology Fellow & Advisor,
Translational Health Science & Technology Institute
C/o National Institute of Immunology
Aruna Asaf Ali Marg
New Delhi – 110 067

Member

Dr. A. Surolia
Director
National Institute of Immunology
Aruna Asaf Ali Marg
New Delhi - 110 067

Dr. K. Nagarajan
Corporate Advisor
Hikal Ltd., R & D Centre
Kalena Agrahara Bannerghatta Road
Bangalore – 560 076

Dr. Shekhar C. Mande
Staff Scientist
Centre for DNA Fingerprinting and Diagnostics
ECIL Road, Nacharam
Hyderabad- 500 076

Prof. K.N. Ganesh
Director
Indian Institute of Science Education and Research
900, NCL Innovation Park, Dr. Homi Bhabha Road
Pune- 411 008

Dr. R. Nagaraj
Scientist
CSIR-Centre for Cellular and Molecular Biology
Hyderabad- 500 007

Dr. Bhaskar Saha
Scientist
National Centre for Cell Science
Ganeshkhind
Pune- 411 007

Dr. M.D. Nair
A-11 Sagarika No. 15,
3rd Seaward Road, Valmiki Nagar,
Chennai - 600 041

Agency Representative

Dr. (Ms.) Deepali Mukherjee
Chief ECD
Indian Council of Medical Research
Post Box No. 4911, Ansari Nagar
New Delhi- 110 029

DG Nominee

Dr. Rajesh S. Gokhale
Director
CSIR-Institute of Genomics and Integrative Biology
University Campus, Mall Road
Delhi- 110 007

Sister Laboratory

Dr. Ram Rajsekharan
Director
CSIR-Central Institute of Medicinal and Aromatic Plants
P.O. CIMAP
Lucknow – 225 015

Cluster Director

Prof. Siddhartha Roy
Director
CSIR-Indian Institute of Chemical Biology
4, Raja SC Mullick Road, Jadavpur
Kolkata- 700 032

Director

Dr. Tushar Kanti Chakraborty
Director
CSIR-Central Drug Research Institute
Lucknow – 226 001

Permanent Invitee

Head or his Nominee
Planning & Performance Division
Council of Scientific & Industrial Research
Anusandhan Bhawan, 2, Rafi Marg
New Delhi - 110 001

Secretary

Dr. S.B. Katti
Scientist
Medicinal & Process Chemistry Division
CSIR-Central Drug Research Institute
Lucknow – 226 001

Management Council

(January 2012 – December 2013)

Chairman

Dr. TK Chakraborty
Director,
CSIR-Central Drug Research Institute,
Lucknow 226001

Members

Dr. KC Gupta
Director
CSIR-Indian Institute of Toxicological Research
Lucknow 226 001

Dr. Rajendra Prasad
Chief Scientist
Business Development Division
CSIR-Central Drug Research Institute,
Lucknow 226001

Dr. PMS Chauhan
Senior Principal Scientist
Medicinal & Process Chemistry Division
CSIR-Central Drug Research Institute,
Lucknow 226001

Dr. Neena Goyal
Principal Scientist
Biochemistry Division
CSIR-Central Drug Research Institute,
Lucknow 226001

Dr. KV Sashidhara
Senior Scientist
Medicinal & Process Chemistry Division
CSIR-Central Drug Research Institute,
Lucknow 226001

Dr. Dipankar Koley
Scientist
Medicinal & Process Chemistry Division
CSIR-Central Drug Research Institute,
Lucknow 226001

Mr. Guniyal HM
Principal Technical Officer
Sophisticated Analytical Instrument Facility
CSIR-Central Drug Research Institute,
Lucknow 226001

Mr. AK Dwivedi
Controller of Finance & Accounts
CSIR-Central Drug Research Institute,
Lucknow 226001

Member Secretary

Mr. LR Arya
Controller of Administration
CSIR-Central Drug Research Institute,
Lucknow 226001

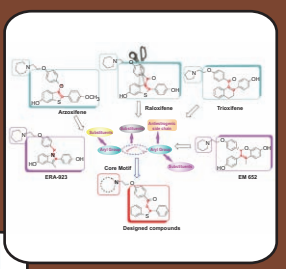
Announcement

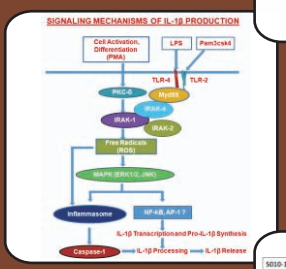
CSIR-CDRI Award 2012

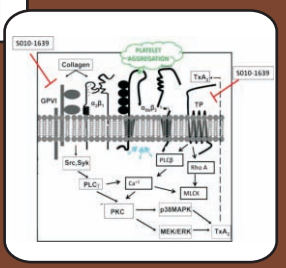
The prestigious CSIR-CDRI Award for Excellence in Drug Research for the year 2012 in Life Sciences has been awarded to **Prof. Subramanian Ganesh**, IIT, Kanpur for his work on "Characterizing the molecular players in neurodegenerative disorders, especially in epileptic Lafora disease and in Chemical Sciences the award has gone to **Dr. Rajkumar Banerjee**, IICT, Hyderabad for his work on "Synthesis of ligands for the nuclear hormone receptors for the development of anticancer therapeutics".

Our heartiest congratulations to both the awardees. The felicitation ceremony will be held on 26th September 2012.

Notes







Progress in Research Projects


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्, भारत
CSIR INDIA

1 Malaria and other Parasitic Diseases

Area Coordinator:
Dr. S.K. Puri

Assistant Coordinator:
Dr. Saman Habib

Area Leaders:
Dr. S.K. Puri
Dr. Shailja Bhattacharya
Dr. Anuradha Dubey

Parasitic infections cause tremendous burden of disease in tropics and subtropics as well as in more temperate climates. Malaria, Leishmaniasis and Filariasis are the three main parasitic disease areas being vigorously pursued at the Institute. With prevalence in more than 100 countries and more than 4 billion people worldwide at combined risk, diseases caused by these three parasites represent a major biomedical challenge. Researchers at the Institute address issues pertaining to design and development of novel drug molecules as well as optimization and preclinical development of lead molecules and combination therapy regimens, besides investigation of novel drug delivery systems. A significant basic research component of the program focuses on identification and characterization of novel drug targets, understanding mechanisms of drug action and drug resistance, investigation of aspects of parasite biology and host-parasite interaction, immunoprophylaxis and immuno-diagnosis. The contribution of host genetic factors in malaria susceptibility in Indian populations is also under investigation. The structural biology component of the program aids in molecular modeling and X-ray structure determination.

1.1 Malaria
1.2 Leishmaniasis
1.3 Filariasis

1.1 Malaria

1.1.1 Synthesis and screening

1.1.1.1 Synthesis

Diverse chemical moieties numbering around 700 and representing several prototypes viz. quinoline derivatives, quinoline methanol derivatives, 4 aminoquinoline-schiff base derivatives, amino acid conjugated 4-amino-quinolines, 4-aminoquinoline–chalcone hybrids, 4-aminoquinoline amides, 4-aminoquinoline-rodamine hybrids, 4-aminoquinoline–isatine hybrids, quinoline quinoxalibe derivatives, pyrimidine - β Caboline derivatives, α carboline derivatives, δ carboline derivatives, β Caboline-tetrazole hybrids, quinoline-tetrazole hybrids, pentamidine-pyrimidine hybrids, febrifugine dimers, imidathiazoles, triazoles, chalcones, pyrimidines, triclosan derivatives, acetamide derivatives, amide derivatives, chromenochalcone derivatives, oxazole derivatives, quinazoline glycoconjugates, quinazoline etc. were synthesized during the year to identify new lead molecules against malaria. These samples underwent evaluation against the *in vitro* and *in vivo* models for antimalarial drug assay.

1.1.1.2 Screening against *Plasmodium falciparum in vitro*

More than 700 new synthetic compounds were screened against *P. falciparum* (strain 3D7) *in vitro*. Several novel series including amino acid conjugated 4-amino-quinolines, 4 aminoquinoline-schiff base derivatives, Quinoline-tetrazole hybrids, pentamidine-pyrimidine hybrids, pyrimidine-β caboline derivatives, 4-aminoquinoline – chalcone hybrids, quinazoline, chromenochalcone derivatives, and triclosan derivatives, have been identified with IC_{50} values below 100 ng/ml. Some of the identified series were also screened against chloroquine resistant *P. falciparum* K1 parasites and have shown promising response. In addition, more than 400 samples of natural origin comprising extracts from terrestrial plants or marine fauna were also evaluated against *in vitro* model under the network programmes and a few leads were identified for follow up studies.

1.1.1.3 Screening against *Plasmodium yoelii* (N-67) – Swiss mice model

Nearly sixty synthetic compounds selected on the basis of activity response against *P. falciparum in vitro*, were evaluated against chloroquine resistant *P. yoelii* (N-67) –

Swiss mice model. Several novel moieties from amongst amino acid conjugated aminoquionolines, and quinoline tetrazole derivativs showed above 95% parasite clearance after 4-day treatment regimen. Further studies are in progress.

1.1.1.4 Screening against *Plasmodium yoelii* (MDR) – Swiss mice model

Ten promising compounds including quinazolines and chalcone were screened against *P. yoelii nigeriensis* MDR in Swiss mice. Compound S011-137 exhibited 63.7% parasite growth inhibition on day 4 at 100mg/kg dose.

1.1.1.5 Follow up studies with S007-1263

S007-1263 had shown antimalarial activity against *P. yoelii nigeriensis* in Swiss mice. The compound has now been tested in rhesus monkeys against *P. cynomolgi B*. Doses of 40 and 50mg/kg have been found to be curative and no recrudescence was observed in treated monkeys up to 60 days of observation period.

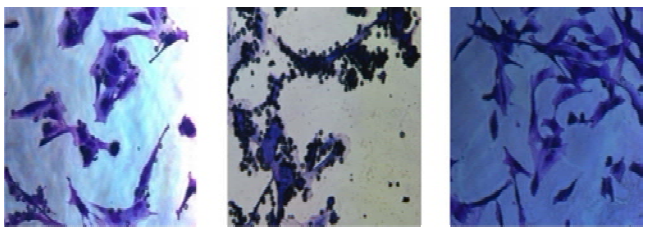
1.1.1.6 Drug combination studies

Compound S010-1299, an acridine derivative, showed a synergistic response in combination with artemether against *P. falciparum in vitro*. Therapeutic combination studies with pharmacodynamic approach (parasite clearance time and parasite reduction ratio) was carried out for S010-1299 with artemether and this combination was found to have potent antimalarial potential against *P. yoelii nigeriensis* (MDR) with no recrudescence till day 28 with a dose of 200mg/kg S010-1299 and 60 mg/kg artemether (approx.3:1) for 4 days. In combination group parasite clearance time was 48hrs. Individually same dose of compound and artemether showed recrudescence on day 7.

1.1.2. Basic studies

1.1.2.1 Cytoadherence studies with *P. falciparum* employing human brain endothelial cells *(BB19)*

Cytoadherence of PRBC to endothelial cells is considered an escape mechanism for *P. falciparum* to evade clearance of PRBC by phagocytosis of macrophages in secondary lymphoid tissues like spleen. Agents that block parasite binding to endothelial cells and hence interrupt cytoadherence are therefore potential adjunct therapies for severe malaria. For cytoadherence assays, a co culture model of BB19 cells and *Plasmodium falciparum* was used. *Pf* 3D7KAHRP and *Pf*K1infected red blood cells bound to theBB19 cells depicting cytoadherence (Fig. 1.1).



A B C

***Fig. 1.1: A) Pf* K1-infected red blood cells bound to BB19 cells, *B) Pf* 3D7 KAHRP (+His) GFP infected red blood cells bound to BB19 cells, C) None of the uninfected red blood cells bound to the BB19 cells.**

1.1.2.2 mRNA expression of cytokines after infection with lethal and non-lethal *P. vinckei* parasites (Parasitol. Res. DOI 10.1007/S00436-011-2656-1)

Analysis of mRNA expression of cytokines in spleen from infected mice revealed that the principal difference was an early depletion in pro-inflammatory cytokine's mRNA expression in mice infected with lethal *P. vinckei* (PvAS) parasites. In addition, an increase in anti-inflammatory cytokines particularly IL-10 mRNA expression levels was found in the same group of mice. In contrast, the significant rise in pro-inflammatory cytokine's m-RNA expression levels was recorded at day 1 onwards after infection with non-lethal *P. vinckei* (PvAR). The maximum fold change was recorded for IFN-γ and IL-10, when compared to base line value. TGF-β did not seem to play any major role in *P. vinckei* infection.

1.1.2.3 Translation factors in the *Plasmodium* apicoplast and the organellar SUF pathway of [Fe-S] complexation

The plastid of *Plasmodium falciparum,* the apicoplast, performs metabolic functions essential to the parasite. Protein translation in the apicoplast is inhibited by antibiotics that target prokaryotic translation factors, some of whose homologs are predicted to be localized to the parasite organelle (***TRENDS Parasitol.*, 2011, 27: 467**). The interaction between apicoplast-encoded EF-Tu and apicoplast-targeted EF-Ts in order to understand differences with bacterial factors and consequent inhibition with selected antibiotics (***Int. J. Parasitol.*, 2011, 41: 417**). The process of ribosomal recycling in the organelle was revealed by localization of a ribosome recycling factor (RRF) to the apicoplast and characterization of its recycling function in conjunction with apicoplast EF-G.

Various reactions in the apicoplast require the assembly of [Fe-S] prosthetic groups on participating proteins. The [Fe-S] assembly pathway involving SUF proteins has been predicted to function in the apicoplast with one component (*Pf*SufB) encoded by the plastid genome itself. ATPase activity of recombinant *P. falciparum* nuclear-encoded SufC and its localization in the apicoplast has been demonstrated. Further, an internal region of apicoplast SufB was used to detect *Pf*SufB-*Pf*SufC interaction *in vitro*, and *in vivo* interaction of the two proteins was confirmed by co-elution (***Int. J. Parasitol.*, 2011, 41:991**) (Fig. 1.2). As a departure from bacterial SufB and similar to reported plant

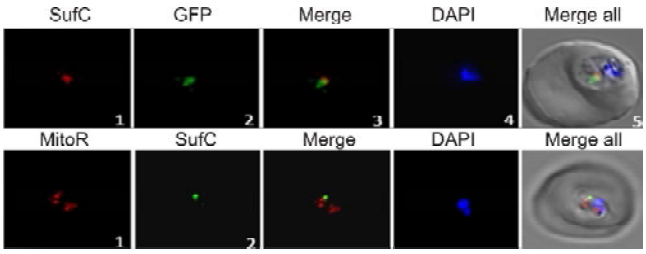


Fig. 1.2: Nuclear-encoded SufC localizes to the *Plasmodium* apicoplast

plastid SufB, apicoplast SufB exhibited ATPase activity suggesting the evolution of specialised functions in the plastid counterparts. These results provide experimental evidence for an active SUF pathway in the *Plasmodium* apicoplast.

1.1.2.4 The human APOBEC3B deletion and susceptibility to falciparum malaria in India

The complex interplay of human blood disorders (***Evolution* 2011, 65: 3625**) and other genetic variations influences the manifestation of malaria infection. *APOBEC3B*, a gene involved in innate response, exhibits insertion-deletion polymorphism across world populations and its insertion allele was observed to be nearly fixed in malaria endemic regions of Sub-Saharan Africa as well as populations with high malaria incidence in the past. The distribution of the *APOBEC3B* deletion was studied in 25 diverse Indian populations and severe or non-severe *Plasmodium falciparum* patients and ethnically-matched uninfected individuals from a *P. falciparum* endemic and a non-endemic region of India. *APOBEC3B* deletion

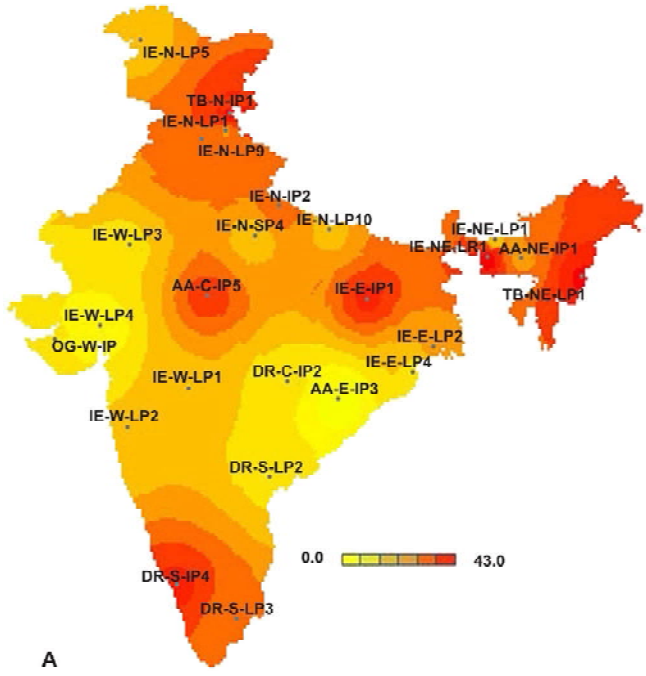


Fig. 1.3: Spatial distribution of the *APOBEC3B* deletion in Indian populations

frequencies ranged from 0 to 43% in the Indian populationsand the frequency of the insertion allele strikingly correlated with the endemicity map of *P. falciparum* malaria in India (***Infection, Genetics and Evolution*, in press**) (Fig. 1.3). A strong association of the deletion allele with susceptibility to falciparum malaria in the endemic region (non-severe vs. control, Odds Ratio= 4.96, p value = $9.5E^{-06}$; severe vs. control, OR= 4.36, p value = $5.76E^{-05}$) was observed. Although the frequency of deletion allele was higher in the non-endemic region, there was a significant association of the homozygous deletion genotype with malaria (OR=3.17, 95% CI=1.10 to 10.32, p value =0.0177). This presents a case for malaria as a positive selection force for the *APOBEC3B* insertion and suggests a major role for this gene in innate immunity against malaria.

1.2 Leishmaniasis

1.2.1 Synthesis and screening

1.2.1.1 Synthesis

Novel synthetic moieties representing several prototypes viz. chalcones, quinolines, β-carbolines, β-amido carbonyls, β-carboline- tetrazole hybrids, triazoles, quinozoline- triazines, Isatin- quinolines, quinoline- DHPM, perspicamide, amino alcohols, oxazoles, hydrazides derivatives, sugar chalcones, quinazolones, piperazides and terpenyl derivatives were synthesized for bioevaluation against experimental models.

1.2.1.2 Screening against *in vitro* model

One hundred and ninety synthetic compounds, 210 marine extracts and 5 plant extracts were evaluated against *in vitro* macrophage-amastigote model for lead identification. A total of 93 compounds showing significant activity were reevaluated for their IC_{50} and CC_{50} responses to determine the selectivity index and 31 compounds were identified for *in vivo* efficacy evaluation. Similarly 26 marine extracts/ fractions were also identified for *in vivo* trials against visceral leishmaniasis in hamster model. In addition, 285 synthetic compounds received under DNDi sponsored project representing four prototypes namely thiazoles, thiazole-amines, thiazole-sulfonamides and nitroimidazoles were evaluated *in vitro* for lead generation. Sixty-five out of 117 thiazoles and 135 out of 168 Nitroimidazoles exhibited promising activity.

1.2.1.3 Screening against *in vivo* model

Thirty-one synthetic compounds identified from *in vitro* screening were evaluated against *L. donovani* - hamster model. Eleven synthetic compounds representing aryl chalcones, terpenyl chalcones, triazoles, β-amido carbonyls, quinazolines and hydrazides derivatives showed 70 to 85% inhibition of parasite multiplication. A nitroimidazole derivative

DNDi-VL-2001 was identified under the DNDi sponsored project exhibiting 90% efficacy at 50 mg/kg x 5d; PO, against *L. donovani* - hamster model. Since this compound was a racemic mixture, during the follow up studies, key activity of the (R) and (S) enantiomers i.e. DNDi-VL-2098 and DNDi-VL-2099 respectively, has been determined at different dose regimens. The R-isomer DNDi- VL-2098 has shown promising activity at the oral dose of 50 mg/kg x 5d regimen against different grades of infection and selected as a potential candidate for pre-clinical development. S-enantiomer (DNDi-VL-2099) had shown very marginal efficacy of 30% at this dose. Apart from this, one amidothiazole, DNDi-VL-0501 was also tested at 50 mg/kg x 5d po dose and was not found promising.

1.2.1.4 Combination therapy using miltefosine with immunomodulators

A) Improved treatment of visceral leishmaniasis (kala-azar) by using combination of ketoconazole, miltefosine with an immunomodulator—Picroliv (Acta Tropica, 2011, 119: 188–193)

Immunomodulatory effect of picroliv in combination with ketoconazole and miltefosine was monitored against *L. donovani* - hamster model. Animals treated with combination of ketoconazole (50 mg/kg, 5 days, p.o.) + miltefosine (5 mg/kg, 5 days, po) showed augmentation in efficacy against leishmania parasite (72%) in comparison to those treated with ketoconazole (54.67%) and miltefosine (54.77%) separately. Co-administration of picroliv (10 mg/kg, 12 days, po) has further enhanced antileishmanial efficacy from 72% to 82% (Fig. 1.4). Significant rise in cell mediated immunity witnessed in this group reveals the role played by the immunomodulator, picroliv and justifies the significance of enhanced cell mediated immunity in the therapy.

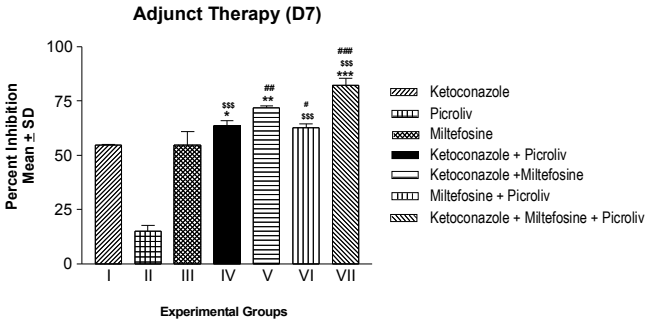


Fig. 1.4: Combination therapy of miltefosine, ketoconazole and picroliv

B) Effect of Pam3Cys induced protection on the therapeutic efficacy of miltefosine against experimental Visceral Leishmaniasis (Peptides 2011, 32, 2131-2133)

Prophylactic potential of synthetic bacterial lipopeptide and a TLR2 agonist, Pam3Cys was evaluated against experimental visceral leishmaniasis *in vitro* as well as *in vivo* in mouse model. *In vitro* prophylactic studies showed that the macrophages activated with Pam3Cys, acquired considerable resistance to Leishmania parasites, as only 71.42 ± 3.3 % of the macrophages contracted infection as compared to the untreated controls (92.80 ± 8.6 %) (Fig. 1.5). *In vivo* results of prophylactic potential of Pam3Cys (100µg/animal/single dose/ip) and its effect on the therapeutic efficacy of miltefosine have also shown encouraging results. Pam3Cys showed 74.64 % inhibition in parasitic establishment when administered by ip route at a dose of 100 µg/animal spaced at two weeks i.e. on day -7 and +7 of challenge with *L. donovani* amastigotes. However, when aforesaid dose of Pam3Cys was given with sub-curative dose of miltefosine (2.5 mg/kg for 5 days) its efficacy enhanced from 49.80 % to 92.25% (Fig. 1.6). These findings revealed that this lipopeptide has potential protective efficacy which significantly enhanced the therapeutic efficacy of miltefosine used at low dose against Leishmania infection and warrants detailed investigations on its possible immunopotentiatory actions.

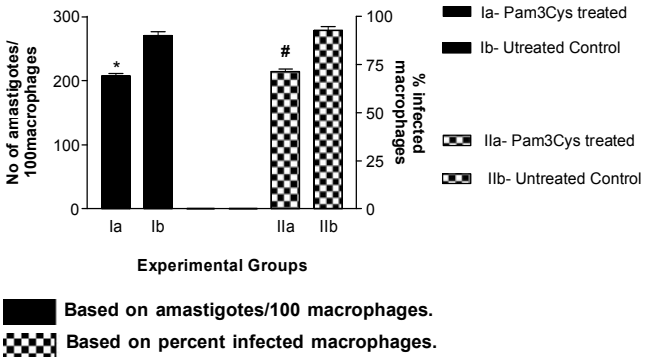


Fig. 1.5: *In vitro* prophylactic efficacy of Pam3Cys

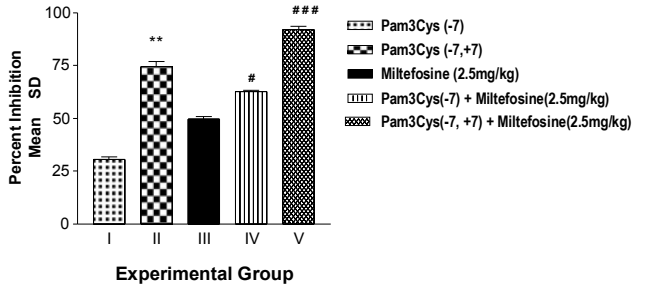


Fig. 1.6: Prophylactic efficacy of Pam3Cys alone and in combination with miltefosine in mouse model

1.2.2 Elucidation of drug resistance mechanism

1.2.2.1 Cloning and sequencing of differentially expressed drug resistance genes

By utilizing a DNA microarray expression profiling approach, a gene encoding mitogen-activated protein kinase

1 (MAPK1) for the kinetoplast protozoan *L. donovani* (LdMAPK1) has been identified that was consistently down-regulated in antimony-resistant field isolates. The expression level of the gene was validated by real time polymerase chain reaction). Furthermore, decreased expression of LdMAPK1 was also confirmed at the protein level in resistant isolates. Primary structure analysis of LdMAPK1 revealed the presence of all characteristic features of MAPK1. Southern analysis suggested that the gene was present as single copy in parasite genome. When expressed in *E. coli*, the recombinant enzyme showed kinase activity with myelin basic protein as substrate and was inhibited by staurosporine. Interestingly, over expression of this gene resulted in increase in sensitivity of the transfectants towards Sb (III), suggesting its role in antimony resistance **(Antimicrob Agents Chemother. 2012; 56(1):518-25).**

Another gene which exhibited upregulation in resistant isolates was identified as NLI gene (Nuclear LIM Interactor Interacting Factor). Complete ORF was PCR amplified, cloned and sequenced. The complete NLI ORF was 870 bp long that encodes for a protein of 290 aminoacids with molecular weight of 33.3 kD and theoretical pI 8.37. In phylogenitic analysis, the NLI gene of *L. donovani* branched with *T. Cruzi*. The recombinant NLI protein was expressed in *E. coli*. Efforts are in progress to purify the recombinant protein and develop antibodies against it.

1.2.3 Identification, characterization and validation of Triosephosphate isomerase (LdTIM) as novel drug target (Appl Biochem Biotechnol. 2011, 164(7):1207-14)

The triosephosphate isomerase of *L. donovani* (LdTIM) was expressed at high level in *Escherichia coli* and purified by Ni-NTA chromatography. In the present study, the effect of bovine serum albumin on the reactivation of TIM was investigated. Furthermore, 8-anilino-1-naphthalene sulfonic acid was used to detect the structural changes induced by bovine serum albumin (BSA). Here, it is concluded that BSA assists in the refolding and regain of LdTIM enzyme activity by providing framework for structure formation. This study indicates that numerous protein–protein contacts are constantly occurring inside the cell that leads to the formation of native protein.

1.2.4 Immunological studies

1.2.4.1 Follow up studies with Th1 stimulatory proteins identified through proteomics for their immunoprophylactic potential

In visceral leishmaniasis, Th1 types of immune responses correlate with recovery from and resistance to disease, and resolution of infection results in lifelong immunity against the disease. Leishmanial Ags that elicit proliferative and cytokine responses in PBMCs from cured/ exposed/Leishmania patients have been characterized through proteomic approaches in both promastigotes and amastigotes.

In context of promastigotes, 18 proteins were identified as potent immunostimulatory proteins and 15 of these proteins were developed and their molecular and immunobiochemical characterization was carried out. When these rproteins were re-assessed for their immunogenicity all except two – (Calreticulin and Trypanothione reductase) exhibited significant cellular response (as compared to SLD) with lymphocytes from cured Leishmania infected hamsters as well as PBMC's from cured patients.

Elongation Factor-2 which has demonstrated to generate strong IFN-g and IL-12 response in cured Leishmania-Infected Patients/Hamsters was taken up first for evaluation of its prophylactic efficacy.

The recombinant Elongation Factor-2 (rLelF-2) was able to provide considerable prophylactic efficacy (65%) to hamsters against *L. donovani* challenge (Fig. 1.7). The efficacy was supported by the increased inducible NO synthase mRNA transcript and Th1-type cytokines IFN-γ, IL-12, and TNF-α and downregulation of IL-4, IL-10, and TGF-β. Hence, it is inferred that rLelF-2 elicits a Th1 type of immune response exclusively and confers considerable protection against experimental visceral leishmaniasis **(J Immunol, 2011, 187: 6417–6427).**

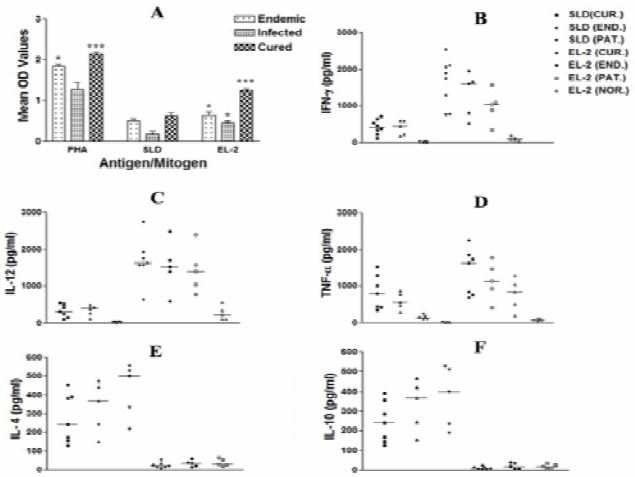


Fig. 1.7: Th1 and Th2 cytokine production of PBMCs from individuals of cured VL patients and endemic controls in response to rLelf-2 and SLD antigens, each data point represents one individual. Values are given as concentration in pg/ml.

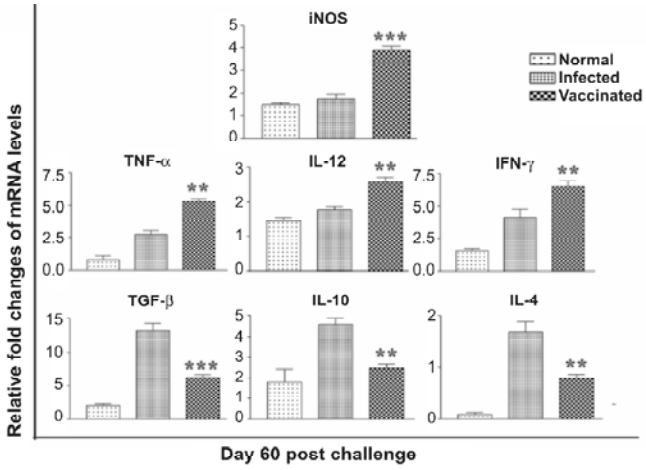


Fig. 1.8: Splenic iNOS and cytokine mRNA expression profile analysis of normal and immunized hamsters on day 60 p.i. by quantitative real-time RT-PCR.

As for amastigote stage, studies have been hampered due to the cumbersome process of its purified isolation. Hence as a first step, isolation and purification of splenic amastigotes of *L. donovani* was carried out following the traditional protocol with slight modification which yielded in purified population of amastigotes. These were fractionated into five membranous and soluble subfractions each i.e MAF1-5 and SAF1-5 and were subjected for evaluation of their ability to induce cellular responses. Out of five sub-fractions from each of membrane and soluble, only four viz. MAF2, MAF3, SAF2 and SAF3 were observed to stimulate remarkable lymphoproliferative, IFN-γ, IL-12 responses and Nitric Oxide production, in Leishmania-infected cured/exposed patients and hamsters. Results suggest the presence of Th-1 type immunostimulatory molecules in these sub-fractions which may further be exploited for developing a successful subunit vaccine from the less explored pathogenic stage against VL. Proteomic and MALDI analysis of potent fraction and sub fraction of amastigotes revealed that 47 spots out of 70 were identified and of these 14 were Th1 stimulatory proteins, 3 drug targets and rest were putative ones. Interestingly, almost none except one (Heat shock Protein 83) matched with the TH1 stimulatory proteins of promastigotes. **(PLOS One 2011, in press)** (Fig. 1.9).

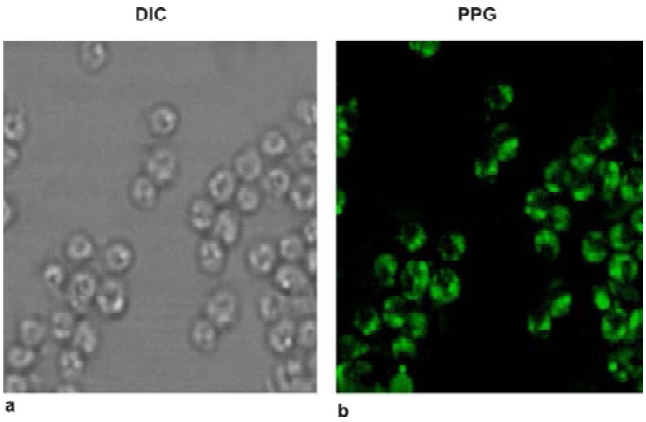


Fig. 1.9: Immunolocalization of PPG in pure amastigotes derived from splenic tissue by confocal laser scanning microscopy. (a) DIC image (Differential interference contrast image) of purified amastigotes in confocal microscopy which is similar to that obtained by phase contrast microscopy but without the bright diffraction halo (b) Fluorescent image of purified amastigotes using anti-PPG antibody with secondary anti-rabbit FITC labeled IgG.

1.2.5 Cell Biology Studies

1.2.5.1 Functional characterization of actin-network proteins in Leishmania parasites

Leishmania parasites contain a highly diverged actin cytoskeleton the biochemical properties of which have recently been shown unconventional and therefore it possesses high therapeutic value. The actin-network proteins currently being characterized include, ADF/cofilin, Twinfilin and Actin related protein-1 (ARP-1).

ADF/cofilin

Leishmania ADF/cofilin has been mutated at its N-terminal serine-4 residue by replacing it with aspartate residue, which imitates phosphorylated serine. Biochemical characterization of this mutant revealed complete inhibition of F-actin depolymerizing activity but it retained affinity with actin monomers. This mutant however, inhibited nucleotide exchange on the actin monomers thereby affecting actin turnover in the network. Overexpression of this mutant in wild type Leishmania promastigotes resulted in non-motile cells having short flagella and no paraflagellar rod ultrastructure. These observations confirmed an important role of actin-dynamics in the flagellar compartment (Fig. 1.10) **(Eukaryotic Cell, in press)**.

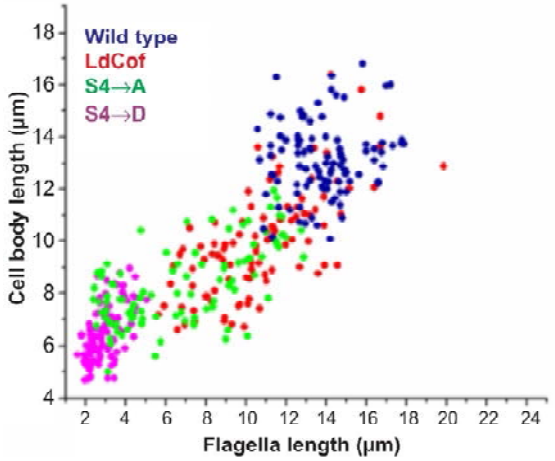


Fig. 1.10: Distribution of flagella and cell body lengths in ADC/Cofilin mutants.

1.3 Filariasis

1.3.1. Screening

1.3.1.1 Synthetic compounds

Two synthetic oxygen heterocyclic compounds S010-522 and S010-519 although showed moderate adulticidal activity against primary *in vivo B. malayi*-jird model , however, did not exhibit significant efficacy in the secondary *B. malayi - M. coucha* model upto 200 mg/kg, x 5 days.

1.3.1.2 Marine extracts

A total of 284 marine samples including crude extracts, fractions, sub fractions and 3 pure compounds were screened *in vitro* against *B. malayi* adult worms and microfilaria. Of these, AU2-498-B001 demonstrated antifilarial activity on both adult and microfilaria with low IC_{50} of 0.12 and 0.10 µg/ml respectively. Of the nine fractions of another extract IIC-917-A001, only one (F003) was active on adult *B. malayi* with IC_{50} of 5.92 µg/ml.

1.3.1.3 Plant Products

In vitro: Twenty two plant samples were tested *in vitro* against adult female *B. malayi* and microfilaria. 1920-N010-0005 and 4400-A001-F006 were active only on mf showing IC_{50} values of <5 ug/ml. One of the pure compounds (4400F006K24) was effective in killing both adult and mf stage (IC_{50} adult 1.24, mf 9.42). Fraction F015 of 4464 and its various derivatives N009-0006, N010-001, N010-003, 4464-Fr 33-34 (D1) were effective in killing adult worms of *B. malayi*. One of the six plant derived compounds (JMJ/PDY/11/04) received from VCRC, Pondicherry, demonstrated *in vitro* activity on adult *B. malayi* (IC_{50} 10.15 µg/ml). None of the 79 plant preparations evaluated under CSIR Network project exhibited antifilarial action on *B. malayi* at 62.5 µg/ml.

In vivo: Primary screening in adult *B. malayi* transplanted jird model with S-010-1956 and 1920-N010-0005 at 100 mg/kg x 5 days by subcutaneous route, showed 56% and 55.5% adulticidal response respectively. Four of the pure compounds (K-24, K-17, K-26 and K-27) isolated from plant 4400-A001-F006 when administered intraperitoneally to implanted jirds at 50 mg/kg x 5days revealed moderate adulticidal action (46-57%). Primary *in vivo* evaluation of VCRC test sample JMJ/PDY/11/01 is underway at 100 mg/kg s.c.x5 days.

Follow-up studies with the identified plant products

Plant 4362: The leaf-extract of plant 4362 killed both adult worms and mf *in vitro* while n-Butanol insoluble fraction affected only microfilariae. In *B. malayi - M. coucha* model the extract at 1g/kg, p.o. x 5 days exerted ~60% macrofilaricidal and ~65% sterilizing effect on female worms. HPLC profile revealed 9 components, of these two were major in the n-butanol insoluble fraction. NMR spectra of the fraction also displayed characteristic peaks of anthocyanin-glycosides **(Med. Chem. Res. 2011, 20, 1594-1602).**

IHB 1429 P14: Sub fraction SF-2 (IC_{50}: 5 µg/ml) of F001 was active *in vitro*. Of the three pure compounds isolated, K003 was *in vitro* active. In primary screen (*B. malayi* –jird), this compound had moderate (41%) adulticidal action at 100 mg/kg, s.c. x 5 days. Single molecule (SF-AN3) isolated from another test sample MAP 2443 P01 was inactive *in vivo* in the primary screening at 100 mg/kg, s/c x 5 days.

RJM0069P03: *In vitro* activity in the crude alcoholic extract of the two varieties of plant collected from Lucknow was confirmed and toluene fraction of the alcoholic extract was found to be most effective. One of the single molecules (N-011-0009) isolated from this plant could kill microfilariae *in vitro* (IC_{50}: 44.1 µg/ml) and *in vivo* follow up is underway.

1.3.3. Immunological studies

1. 3.3.1 Exploration of immunoadjuvanticity of biodegradable polymeric lamellar substrate particles (PLSP) of poly l-lactide for filarial immunogenic proteins (Int. J. Pharma., 2011, 420, 101-110)

Filarial antigens require repeated administration to ensure development of adequate humoral and cell mediated immune responses. To minimize the number of administrations required, the utility of PLSP (PL) as adjuvant was investigated. *B. malayi* adult worm extract (Ad) and its SDS-PAGE resolved immunogenic and protective fraction F6 (54–68 kDa) were adsorbed on PLSP. Animals received a single injection of PL-F6/Ad, FCA-F6/Ad and two doses of the plain antigens. Specific immunological responses (IgG and its subclasses, and IgE levels in serum, IFN-γ, TNF-α and nitric oxide) of the immunized animals were investigated. Single injection of PL-F6 or PL-Ad produced better immune

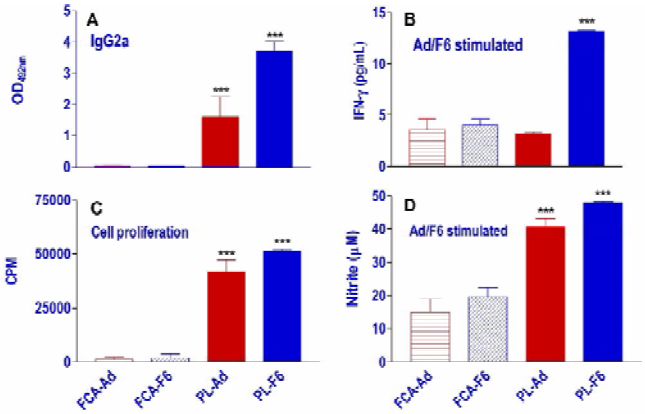


Fig. 1.11: Specific IgG2a level (A), IFN-γ (B) release, cellular proliferation (C) and NO (D) release in response to Ad/F6 stimulation *in vitro* of mice immunized with one dose of adult *B. malayi* antigen (Ad) or F6 adsorbed on PLSP (PL) or emulsified with FCA. Values are Mean±SD. ***P<0.001 (FCA-Ad/FCA-F6 vs PL-Ad/PL-F6).

responses compared to one injection of FCA-F6/Ad (Fig. 1.11A-D) or two injections of plain F6 or Ad. The data demonstrate that PLSP is a superior immunoadjuvant for enhancing the immune response of the host to the filarial antigens and obviates the need for multiple injections.

1.3.3.2 Characterization of anti-inflammatory fraction BmAFI: Immunoreactivity of molecules of L3 with anti-BmAFI antibodies (Acta Trop., 2011, 120, 191-205)

Filarial parasites survive by inducing tolerance in host but the antigens and mechanisms involved are not clear. Earlier it had been showed that BmAFI, a Sephadex G-200 eluted fraction of *B. malayi* adult worm extract, stimulates IL-10 release and sensitization with the fraction permitted survival of 3rd stage larva (L3) and their development to adult stage in the hostile peritoneal cavity (p.c.) of *M. coucha* by evoking a modified Th2 type of response and anti-inflammatory IL-10 cytokine milieu. It was aimed to investigate, if there are common antigens between adult and L3 and find out if this influences subcutaneously given L3 infection in BmAFI sensitized animals. For detecting common antigens L3 antigens were probed with BmAFI antisera. BmAFI sensitized animals were exposed to L3 subcutaneously and the parasite burden was assessed. The results show that pre-sensitization with BmAFI enhanced the microfilaraemia and adult worm recovery. Most of the SDS-PAGE resolved molecules were found common between L3 and BmAFI and reactive with IgG and IgG1 in sera of BmAFI sensitized animals and the intensity of reactivity increased in sensitized animals infected with L3 (Fig. 1.12 A,B). In conclusion, the present and earlier findings together suggest that molecules of BmAFI have the potential to stimulate Th2 associated responses and that might enhance the parasite burden not only in the permissive host *M. coucha* but also facilitate parasite survival and development even in non-permissive p.c. environment of the host.

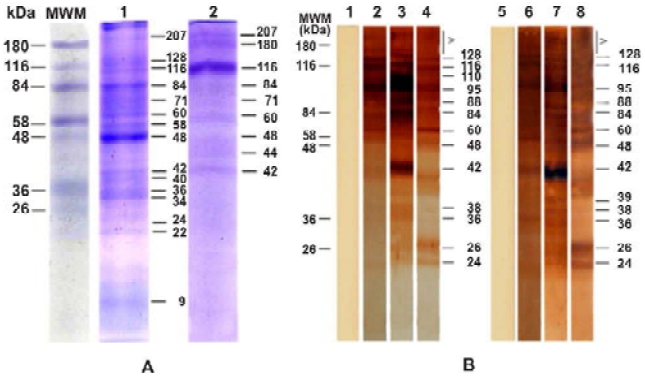


Fig. 1.12: (A) Coomassie blue stained SDS-PAGE profile of L3 extract and BmAFI of *B. malayi*. (B) Immunoblot reactivity of resolved fractions of L3 with serum IgG and IgG1 of BmAFI sensitized and non-sensitized animals with or without L3 initiated infection. Lanes 1, 5: Age matched non-infected; lanes 2, 6: BmAFI-sensitized; lanes 3, 7: BmAFI-sensitized+L3; lanes 4, 8: non-sensitized+L3.

2 Reproductive Health Research, Diabetes & Energy Metabolism

Area Coordinator:
Dr. Naibedya Chattopadhyay

Assistant Coordinators:
Dr. Gopal Gupta
Dr. Sabyasachi Sanyal

Area Leader:
Dr. Arvind Srivastava

Objectives of Reproductive Health Research

Design and synthesis of novel molecules/isolate from natural sources and bioevaluate them for generating new leads and to develop them as female or male contraceptives, spermicides with anti-STI properties, agents for the management of post-menopausal osteoporosis and other endocrine disorders; evaluate traditional remedies for fertility regulation and endocrine disorders; understand mode of action of promising agents and undertake basic research to generate new knowledge on female and male reproductive endocrinology relevant to fertility regulation.

Objectives of Diabetes and Energy Metabolism Research

I) Discovering of targeted therapeutic leads in type II diabetes mellitus (T2DM) and hyperlipidemic condition for potential preclinical development and II) Understanding pharmacological basis of actions of existing and potential therapeutics in type II diabetes and hyperlipidemic condition

1. Reproductive Health Research
2. Diabetes and Energy Metabolism Research

2.1 Reproductive health research

2.1.1 Anti-implantation or early post-implantation pregnancy interceptive agents

2.1.1.1 Anti-implantation activity of synthetic compounds/ natural products

Twenty five extracts of natural origin (plant/ marine extracts) were evaluated for anti-implantation-cum-early post implantation interceptive activity in adult female rats when administered on days 1-7 post- coitum. None of the samples showed 100% efficacy.

2.1.2 Male reproduction: Contraception, infertility and basic studies

2.1.2.1 A dually protective vaginal contraceptive film formulation

Creams and gels that are generally employed for vaginal delivery of the active ingredient suffer from the drawback of being messy and/or greasy, and require an applicator for metering the necessary dose. Mucoadhesive, quick-dissolving, vaginal-film formulations offer a user-friendly solution to this problem. Films were prepared using the earlier reported novel, non-surfactant spermicidal and anti-trichomonas compound pyrrolidinium pyrrolidine-1-carbodithioate and evaluated for various biological activities and physical parameters. The *in vitro* drug release profile was estimated by a validated HPLC method and the *in vitro* efficacy studies were carried out by Sander Cramer test using human semen. The films presented an efficient and user-friendly delivery system for intravaginal release of metered doses of active spermicidal ingredient before coitus for twin protection. The new spermicide in two film formulations was more efficacious than N-9 and Metronidazole *in vitro*, while the films possessed the physical properties and aesthetic appeal of an ideal, dually-shielding vaginal contraceptive (Fig. 2.1).

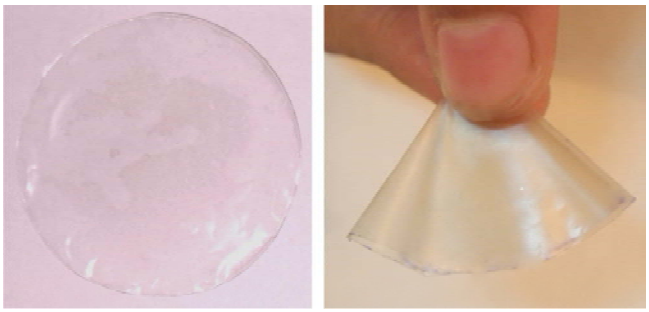


Fig. 2.1: A new vaginal contraceptive film

2.1.2.2 Novel 3-(azol-1-yl)phenylpropanes as microbicidal spermicides for prophylactic contraception (BMCL 21:176-181, 2011)

A series of 25 3-(azol-1-yl)phenylpropanes was designed, which yielded 10 compounds that irreversibly immobilized 100% human sperm at 1% (w/v) concentration in 60s; 12 compounds that showed potent microbicidal activity at 12.5-50 ìg/mL against *Trichomonas vaginalis*; and 17 compounds that exhibited potent anticandida activity with minimum inhibitory concentration (MIC) of 12.5-50 µg/mL. Almost all the compounds exhibited high level of safety towards normal vaginal flora (*Lactobacillus*) and human cervical (HeLa) cells in comparison to the marketed spermicide nonoxynol-9 (N-9). All the biological activities were evaluated *in vitro*. Two compounds with good safety profile exhibited multiple (spermicidal, antitrichomonas and anticandida) activities, warranting further lead optimization for furnishing a prophylactic vaginal contraceptive.

2.1.2.3 Male infertility treatment using Indian herbs

The seed powder of *M. pruriens* reported previously was found to be promising for infertility treatment. Further experiments to understand its mechanism of action successfully showed that the seed powder effectively combats oxidative stress and cell death to improve spermatogenesis and semen quality (Fig. 2.2).

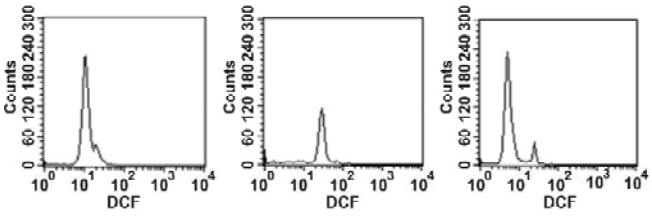


Figure 2.2: Intracellular sperm ROS value in the healthy control animal, sub-fertile and sub-fertile animal after treatment with seed powder.

2.1.2.4 Strong association of 677 C>T substitution in the MTHFR gene with male infertility - A study on an Indian population and a meta-analysis (PLoS One, 2011; 6(7):e22277)

The objective of this study was to analyze Methylenetetrahydrofolate reductase (MTHFR) gene 677C>T polymorphism in infertile male individuals from North India, followed by a meta-analysis on data of present and published studies. Genotyping on a total of 837 individuals including well characterized infertile (N=522) and confirmed fertile (N=315) individuals was undertaken. The SNP was typed by direct DNA sequencing. Chi square test was done for statistical analysis. Published studies were searched using appropriate keywords. Source of data collection for meta-analysis included 'Pubmed', 'Ovid' and 'Google Scholar'. Those studies analyzing 677C>T polymorphism in male infertility and presenting all relevant data were included in meta-analysis. The genotype data for infertile subjects and fertile controls was extracted from each study. Chi square test was done to obtain odds ratio (OR) and p-value(Fig 2.3).

Meta-analysis was performed using Comprehensive Meta-analysis software (Version 2). The frequency of mutant (T) allele (p=0.0025) and genotypes (CT+TT) (p=0.187) was significantly higher in infertile individuals in comparison to fertile controls in our case-control study. The overall summary estimate (OR) for allele and genotype meta-analysis were 1.304 (p=0.000), 1.310 (p=0.000), respectively, establishing significant association of 677C>T polymorphism with male infertility.

In conclusion, 677C>T substitution associated strongly with male infertility in Indian population. Allele and genotype meta-analysis also supported its strong correlation with male infertility, thus establishing it as a risk factor.

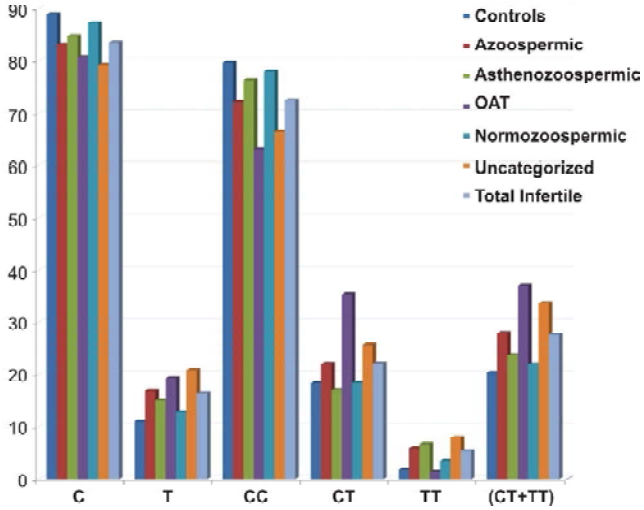


Fig. 2.3: Bar diagram showing distribution of allele and genotypes in control and different groups of infertile individuals.

2.1.2.5 Secular changes in the semen quality in India during past 33 years (J. Androl. 2011 DOI:10.2164/Jandrol. 111.015057)

Several studies have suggested a change in semen quality over last 60 years in many regions of the world, but such studies are lacking for Indian population. The present study was aimed at investigating if semen quality has changed during last three decades in normal healthy Indians. Data was retrieved on semen quality for Indian men without a history of infertility from published studies and analyzed it for trend in individual semen quality parameters using regression modeling. Semen parameters of 19,734 normal healthy men from studies published over past 33 years (from 1978 onwards) were used for this purpose. Linear regression analysis weighted by sample size and controlling for age of the subjects revealed a significant decline in sperm motility and a significant increase in sperm concentration. Other semen parameters did not change significantly over this period (Table 1).

Table 1. Weighted least square regression analyses to understand trend in sperm concentration (1), sperm motility (2), sperm morphology (3), semen volume (4), total sperm count (5) and total motile sperm count (6) with year of the study. All the analyses were weighted by number of subjects.

		Standardized coefficients (± s.e.)	*t*	*p*
1	Intercept		15.604	0.000
	Year	0.079 (0.000)	0.550	0.585
	R^2 = 0.006, adjusted R^2 = -0.014, F(1,48) = 0.302, p = 0.585			
2	Intercept		5.325	0.000
	Year	-0.532 (0.001)	-3.605	0.001
	R^2 = .283, adjusted R^2 = .261, F(1,33) = 12.997, p = 0.001			
3	Intercept		-0.023	0.982
	Year	0.013 (0.965)	0.059	0.954
	R^2 = .000, adjusted R^2 = -0.050, F(1,20) = 0.003, p = 0.954			
4	Intercept		0.731	0.475
	Year	-0.169 (0.035)	-0.686	0.502
	R^2 = .029, adjusted R^2 = -.032, F(1,16) = 0.471, p = 0.502			
5	Intercept		-0.839	0.414
	Year	0.218	0.864	0.401
	R^2 = .047, adjusted R^2 = -.016, F(1,15) = 0.747, p = 0.401			
6	Intercept		0.676	0.512
	Latitude	-0.184	-0.649	0.528
	R^2 = .034, adjusted R^2 = -0.047, F(1,12) = 0.422, p = 528			

In conclusion, there has been a genuine decline in sperm motility and an increase in sperm concentration, which is corroborated by a recent study on Indian subjects.

2.1.3 Experimental chemotherapeutics in malignancies of reproductive system

2.1.3.1 Design, synthesis and identification of new 1,3-biarylsulfanyl derivatives as anti-breast cancer compound (BMC, 2011, 19, 5409-19)

A new series of 1,3-biarylsulfanyl derivatives (homodibenzyl core motif) have been designed and synthesized as new estrogen receptor ligands by chopping benzothiophene core of raloxifene to engender secoraloxifene scaffold (Fig. 2.4). The principal idea for the designing of 1,3-biarylsulfanyl derivatives comes from estradiol, noncyclic structure diethyl stilbestrol and similar structures

All the synthesized compounds were screened for anti-proliferative, anti-osteoporotic, and anti-implantation activity. Compounds BD1 and BD2 having basic amino anti-estrogenic side chain were exhibiting potential anti-proliferative activity in MCF-7 and MDA-MB-231 cell lines comparable standard drug Tamoxifen. The lead compounds cause selective inhibition of ER+ve MCF-7 in comparison to ER-ve MDA-MB-231 possibly by acting as ER antagonist. This also supported by significant relative binding affinity towards estrogen receptor.

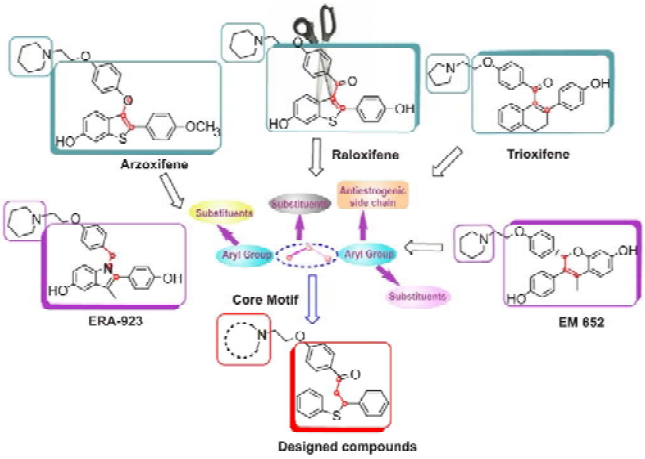


Fig. 2.4: Design of 1,3-biarylsulfanyl derivatives

2.1.3.2 Diterpenes isolated from a standardized fruit extract of *Cupressus sempervirens* suppress benign prostatic hyperplasia in rat and *in vitro* human models

The ethanolic extract of *Cupressus sempervirens* (CS) fruit inhibited proliferation of human BPH-stromal cells and the activity was localized to its chloroform-soluble, diterpene-rich fraction. Eight major diterpenes isolated from this fraction exhibited moderate to potent activity, and the most active diterpene (communic acid) exhibited an IC_{50} of 37.5 µM and significantly inhibited phosphorylation of Stat-3 in BPH-stromal cells. Massive epithelial hyperplasia with significantly increased stromal component developed in prostates of aged rats given oral citral treatment were prevented by simultaneous administration of CS ethanolic fruit extract, and more effectively, by its diterpene rich chloroform fraction. Prostates of citral+CS treated rats exhibited distinct TUNEL-labeling of stromal cells and had lower expression of IGF-I, TGF-ß, PCNA and bcl-2/bax ratio in comparison to prostates of rats given only citral. Human BPH tissues incubated in either CS ethanolic extract or its diterpene-rich chloroform fraction or communic acid for seven days had precise lowering of stromal component and well differentiated stromal and epithelial areas in comparison to vehicle treated tissues that had inconspicuous epithelial component and were predominantly packed with stromal cells. Thus CS diterpenes suppress BPH through inhibition of stromal proliferation and communic acid presents a unique lead structure for further optimization of anti-BPH activity.

2.1.3.3 Novel arylpiperazines for management of benign prostatic hyperplasia (J. Med. Chem. 2011, 54 : 302-311)

A series of 27 aryl/heteroaryl/aralkyl/aroyl piperazines were synthesized, and most of these compounds reduced prostate weight of mature rats by 15-47%. Three compounds had better activity profile than the standard drug flutamide.

QSAR suggested structures with more cyclic and branched moieties, increased topological separation of O and N therein, and reduced solvation connectivity index for better activity. Pharmacokinetic study with the most promising compound at an oral dose of 10.0 mg/kg indicated good absorption, negligible extrahepatic elimination, and rapid distribution to the target organ (prostate) but restricted entry through the blood-brain barrier (Fig 2.5). A 10-fold decrease in PSA and 15-fold increase in ER-β gene expressions of human prostate cancer cells (LNCaP) by the compound *in vitro* indicated AR and ER-β mediated actions. The findings may stimulate further explorations of identified lead for the management of benign prostatic hyperplasia.

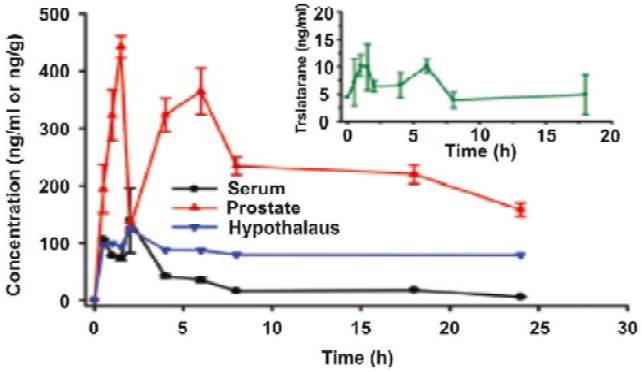


Fig. 2.5. Pharmacokinetic profile of the most promising compound in rats

2.1.4 Bone biology and bone anabolic agents

2.1.4.1 Daidzein prevents the increase in CD4+CD28null T cells and B lymphopoesis in ovariectomized mice: A key mechanism for anti-osteoclastogenic effect (PLoS One. 2011; 6(6): e21216)

This study explores the effect of daidzein (Daid) on the proliferation of TNF-α producing T cells, premature senescent T cells and B cell lymphopoesis under estrogen deficient conditions. Study showed that Ovx mice treated with Daid for six weeks show reduction in Ovx induced expansion of CD4+ T cells in bone marrow and spleen when analysed by flow cytometry. Estrogen deficiency led to increased prevalence of TNF-α secreting CD4+CD28null T cells, however, treatment with Daid increased the percentage of CD4+CD28+ T cells. Co-culture of CD4+CD28null T cells and bone marrow resulted in enhanced osteoclastogenesis as evident by increased tartarate resistant acid phosphatase (TRAP) expression, an osteoclast marker. However, treatment with Daid resulted in reduced osteoclastogenesis in CD4+CD28null T cells and bone marrow cell co-culture. Daid also regulated B lymphopoesis and decreased mRNA levels of RANKL in B220+ cells. Taken together, it is proposed that one of the mechanisms by which Daid prevents bone loss is by reversing the detrimental immune changes as a result of estrogen deficiency.

2.1.4.2 A rare naringenin analog from an Indian medicinal plant has potent bone anabolic effect by acting as an osteoblast estrogen mimic (Br. J. Pharmacol. 2011 DOI : 10.1111/J.1476-5381.2011.01637)

During search for more potent analogs of NAR with positive skeletal effects, various naturally occurring analogs of NAR were screened in an assay for osteoblast differentiation. This assay led to the identification of NAR-C-glucoside (NCG), isolated from an Indian medicinal plant, *Ulmus wallichiana* (Himalayan Elm), as the most potent member of the NAR analogs in inducing osteoblast differentiation. Because the bioavailability is vital for any compound to exert biological effects, so oral bioavailability of NCG and NAR was determined. The effects of NCG on bone properties of OVx mice and in primary osteoblast cultures were studied and compared with NAR. Orally dosed estrogen (E2) or intermittent injection of parathyroid hormone (iPTH) was used as reference hormones for evaluating bone anabolic action in preventive or therapeutic protocol. Involvement of estrogen receptor (ER) in mediating the osteogenic actions by NCG was investigated *in vivo* and *in vitro*.

NCG, more potently than NAR stimulated osteoblast differentiation whilst other NAR analogs including isosakuranetin, poncirin or phloretin had no effect. NCG had better oral bioavailability than NAR. NCG resulted in a greater increase than NAR in the mRNA levels of ERs and bone morphogenetic protein (an ER responsive gene) *in vivo*. In OVx mice, NCG treatment in the preventive protocol increased bone formation rate and improved trabecular microarchitecture better than NAR or E2 treatment. In osteopenic mice, NCG but not NAR treatment in the therapeutic protocol increased bone formation rate and improved trabecular microarchitecture comparable to PTH treatment. The stimulatory effects of NCG on osteoblasts were abolished by ER antagonist. NCG transactivated ERβ but not ERα. NCG exhibited no uterine estrogenicity but NAR did. From these data it is concluded that NCG is a potent analog of NAR that has bone anabolic action through the activation of osteoblast ER, and possesses substantial oral bioavailability. Based on these findings, NCG is suggested as a potential alternative therapy against post-menopausal osteoporosis.

2.1.4.3 A novel quercetin analog from an Indian medicinal plant exerts strong bone anabolic effect: The role of aryl hydrocarbon receptor as a mediator of osteogenic action (Bonc Miner. Res. 2011, 26, 2096-111)

During search for more potent Q analog(s) with osteogenic effects, bioactive compounds rich in flavonols was isolated from a standardized butanolic fraction (BF) derived from the stem-bark of *Ulmus wallichiana* (Himalayan Elm). The stem-bark extract of *U. wallichiana* is known in Indian traditional medicine to hasten fracture repair. In a previous study, it was demonstrated that BF increased periosteal bone formation in growing female rats,

suggesting an osteogenic effect of BF. Initial screening of the extract yielded four compounds that promoted osteoblast differentiation *in vitro*. One of these is 2S,3S-2,3 dihydroquercetin-C-glucoside [IUPAC: 6-C-b-D-glucopyranosyl-(2S,3S)-(+)-3',4',5,7- tetrahydroxyflavonol (GTDF)], which is a novel analog of Q. In OVx rats, it has been recently reported that GTDF improved bone biomechanical quality through positive modifications of BMD and bone microarchitecture without having a hyperplastic effect on the uterus. However, the bone anabolic effect of GTDF and its mode of action was not systematically assessed. Accordingly, the present study was designed first to evaluate the osteogenic effects of GTDF *in vitro* and its molecular mechanism of action. Next, the anabolic effect of GTDF was evaluated in growing rats (modeling-directed growth), bone healing in a rodent model of bone and bone marrow injury, and osteoporotic bones by using dynamic- and static histomorphometries, and biomechanical strength measurements.

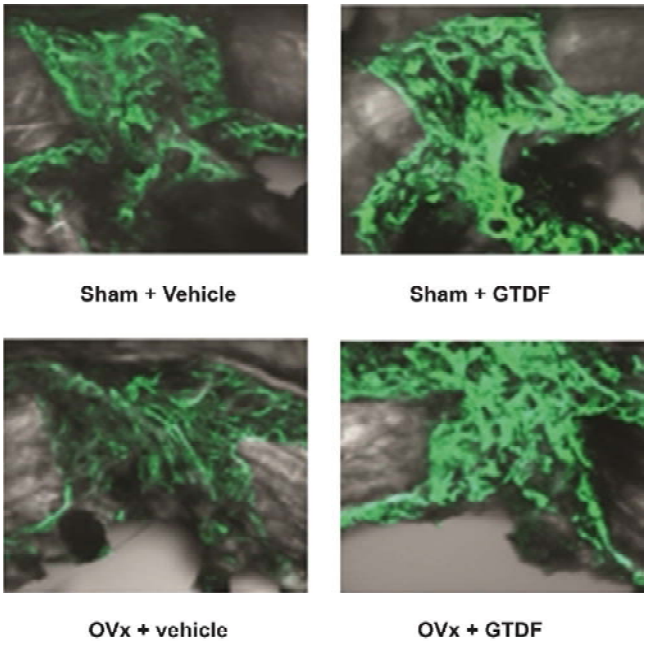


Fig. 2.6: GTDF (5mg/kg/day oral dose) promotes bone regeneration in the drill-hole (femur diaphysis) in sham-operated (ovary intact) and OVx rats. Shown are representative confocal images (100×) of calcein labeling in the drill-hole of various groups 2 weeks after injury. GTDF stimulated new bone formation by 40% in the drill hole.

GTDF stimulated osteoblast proliferation, survival and differentiation, but had no effect on osteoclastic or adipocytic differentiation. In cultured osteoblasts, GTDF transactivated AhR. Activation of AhR mediated the stimulatory effect of GTDF on osteoblast proliferation and differentiation. Furthermore, GTDF augmented cAMP production, which mediated osteogenic gene expression. GTDF treatments given to 1- to 2-day-old rats or adult rats increased the mRNA levels of AhR target genes in calvaria or bone marrow stromal cells. In growing female rats, GTDF facilitated parameters of peak bone accrual in the appendicular skeleton including increased longitudinal growth, bone mineral density, bone formation rate (BFR), cortical deposition and bone strength. GTDF augmented the process of filling up the newly generating bone into a drill-hole of the femur in both estrogen sufficient- and deficient rats. In osteopenic ovariectomized (OVx) rats, GTDF increased BFR and robustly restored trabecular bone compared to the ovary intact group (Fig 2.6). Together, data suggest that GTDF stimulates osteoblast growth and differentiation via AhR, and promotes modeling-directed bone accrual, accelerates bone healing after injury and exerts osteogenic effects on osteopenic rats by likely direct stimulatory effect on osteoprogenitors. Based on these preclinical data, clinical evaluation of GTDF as potential bone anabolic and orally active fracture repair agent is warranted.

2.1.4.4 New synthetic lead compounds of pterocarpan class

Recently it was demonstrated that (±)-medicarpin, a pterocarpan, inhibits osteoclastogenesis and has nonestrogenic bone conserving effect in ovariectomized mice. A pterocarpan analogue of medicarpin, S007-1500 was also found to have *in vitro* and *in vivo* bone forming activity. These results prompted to identify new pterocarpan class compounds possessing interesting osteogenic activity **(Goel et al. WO/2010/052734 dated 14 May 2010)**. Eight compounds were screened for *in vitro* osteogenic activity by determination of ALP activity. Preliminary screening found six compounds to be active.

2.2 Diabetes and energy metabolism research

2.2.1 Target-based synthetic approach

Antioxidants, β-3 agonists, PPARγ activation with the additional lipid modifying activity of the other PPAR subtypes, PTP1b, DPP-IV and aldose reductase inhibitory type mechanisms play important role in the treatment of diabetic and hyperlipidemic conditions. Two approaches have been used in the design and synthesis of new class of PTP1b inhibitors. P-Tyr mimetic as PTP1b inhibitors is one of the new approaches to design antidiabetic agents and uncharged p-Tyrosine mimetic have been considered. Many of the five member heterocyclic thiadiazolidines (TDZ) and isothiazolidines with aryl group as p-Tyr mimentic have been designed globally. Based on these non charged p-Tyr mimetic having six membered thio tetrahydro quinazoline (TTQ) having naphthalene ring in place of phenyl and biphenyls have been designed and evaluated for PTP1b inhibitory activity. One of the best compounds synthesized in this class was found to be S-008-688 which showed inhibition on recombinant PTP1b with IC_{50} around 5.41 μM. It also enhanced glucose uptake by L-6 myo tubes and showed antihyperglycaemic activity on STZ-induced diabetic rats.

The second approach was the molecular design of PTP1b inhibitors through docking. Based on known pharmacophores, the donor acceptors i.e. naphthofurans and dibenzofurans which have shown crucial interactions

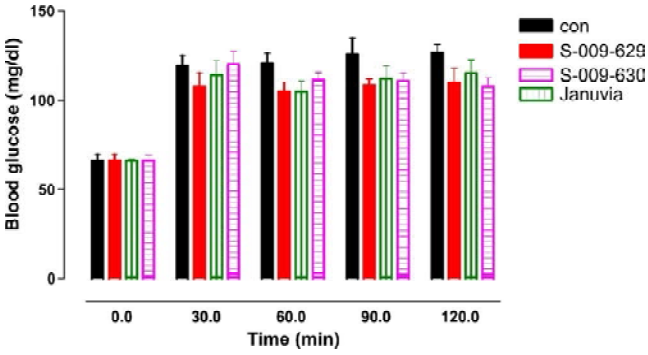


Fig. 2.7: Effect of the synthetic compounds (at 100 mg/kg) and standard drug Januvia (at 50 mg/kg) on the blood glucose levels of the sucrose loaded normoglycaemic rats at various time intervals.

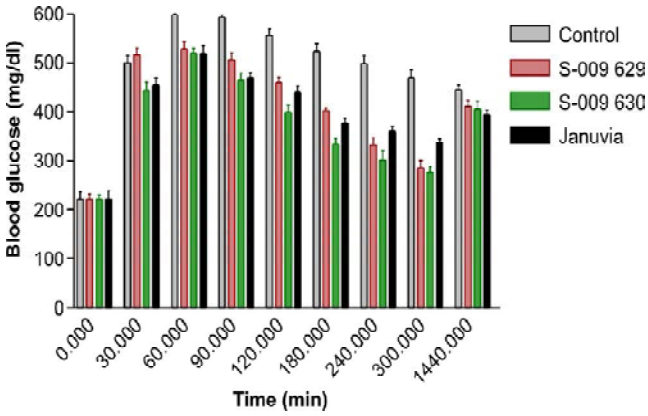


Fig. 2.8: Effect of the synthetic compounds (at 100 mg/kg) and standard drug Januvia (at 50 mg/kg) on the blood glucose levels of the sucrose challenged STZ induced diabetic rats at various time intervals.

with the active site of PTP1b involving residues arginine 221, serine 125 and asparagines 181 were designed. These scaffolds were further optimized and few new benzo (e) indazole derivatives were identified as PTP1b inhibitors **(Goel et al. PCT patent filed**)**. Two best among these molecules were S-009-629 and S-009-630 that have shown inhibition on recombinant human PTP1b. IC_{50} values were calculated to be around 7.12 and 8.12 µM, respectively. These two compounds showed significant antihyperglycaemic effect on STZ-induced diabetic rats (Fig. 2.8, 2.9) and db/db mice, while they showed no hypoglycemic effect in normoglycemic rats (Fig. 2.7).

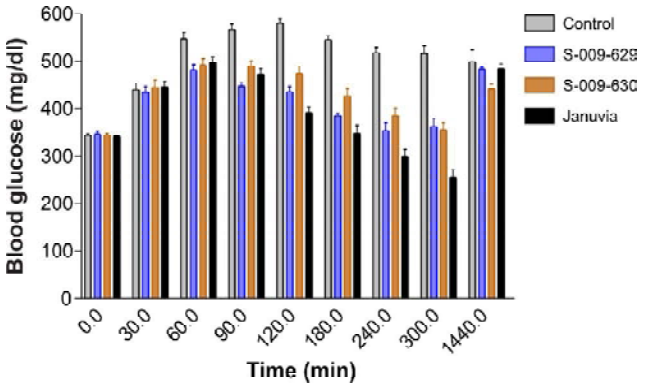


Fig. 2.9: Effect of the synthetic compounds (at 100 mg/kg) and standard drug Januvia (at 50 mg/kg) on the blood glucose levels of the Low dosed STZ induced diabetic rats at various time intervals.

2.2.2 Discovering leads from natural product (Eur J. Pharmacol. 2011. 670(1) 22-8 & 98-104 Mo. Cell Endocrinol. 2011, 339(1) 98-104)

Two antihyperglycaemic fura flavonoid compounds i.e. Pongamal and Karanjin isolated from the fruits of terrretrial plant *Pongamia pinnata* were further explored for their mechanism(s) of action. In L-6 myotubes treatment with pongamol significantly promoted both basal as well as insulin stimulated glucose transport in a concentration dependent whereas karanjin enhanced only basal glucose uptake. However this effect was associated with increased translocation of insulin sensitive glucose transporter protein (GLUT-4) from intracellular surface to plasma membrane, without changing the total amount of GLUT-4 protein and GLUT-4 mRNA in each of the case. GLUT-4 translocation in skeletal muscle can be regulated either via insulin-dependent or insulin-independent signaling pathways. The stimulation of GLUT-4 translocation by insulin requires the insulin mediated tyrosine phosphorylation of insulin receptor substrate (IRS) proteins and subsequent activation of PI-3 kinase and AKT phosphorylation (Ser-473), whereas AMPK pathway regulates GLUT-4 translocation via insulin-independent mechanism. Effect of pongamol or karanjin on PI3-K/AKT pathway was examined by measuring the phosphorylation status of AKT (Ser-473) by western blotting using specific antibody. Pongamol alone had no significant effect on phosphorylation of AKT, but caused significant increase in the insulin-mediated AKT phosphorylation. To validate equal loading in each lane and normalize the blot for protein levels, Actinin-1 was used as internal loading control. Pongamol had no effect on the cellular level of Actinin-I. On the other hand karanjin treatment had no effect on AKT (ser-473) phosphorylation in either basal or insulin-stimulated conditions. To further investigate the biological effect of karanjin, its effect was examined on another signaling pathway known to stimulate GLUT-4 translocation i.e. AMP-K pathway. Effect of karanjin on AMP-K pathway was investigated by measuring the effect on phosphorylation at Threonine-172 by western blotting. Karanin significantly increased the phosphorylation (Thr-172) of AMPK-alpha in a time dependent manner. Karanjin treatment had no significant effect on total AMPK alpha, suggesting its activation by karanjin.

3 Tuberculosis and Microbial Infections

Area Coordinator:
Dr. K.K. Srivastava

Assistant Coordinator:
Dr. B.N. Singh

Area Leader:
Dr. Sudhir Sinha

Aims and objectives of the research area Microbial Infections focus on Tuberculosis, Fungal and Viral infections. Using different screening formats *viz*. *in vitro*, *ex vivo*, *in vivo* and BACTEC, we screen natural products and synthetic compounds for antitubercular, antifungal, antibacterial and antiviral activities and work towards the identification and validation of novel drug targets, developing rationale based screen system, resolving the structure of candidate mycobacterial proteins, analysing host-pathogen kinase interaction and sigma factors regulon to understand the molecular mechanisms of mycobacterial pathogenesis.

3.1 Tuberculosis
3.2 Bacterial and fungal infections
3.3 Viral infections

3.1 Tuberculosis

3.1.1 Screening

More than thousand samples, including in-house synthesized molecules, fractions of terrestrial or marine extract, and OSDD molecules, were screened for anti-TB activity using the standard *in vitro, ex vivo* and *in vivo* assays. Nearly hundred compounds were also screened against mycobacterial FAS-II pathway and against *M. tuberculosis* serine threonine protein kinases (STPks) but none were found active. In the *in vitro* assays, 30 synthetic molecules, showing an MIC of = 6.25 µM against *M. tuberculosis* H37Rv, were considered active. Eight of the actives showed no cytotoxicity towards VERO cells or mouse bone-marrow derived macrophages. The 8 *in vitro* active molecules were evaluated *ex vivo* using the mouse bone-marrow derived macrophage model. In this model, a compound was considered active when it showed > 50% reduction in intracellular colony forming units (CFU) of *M. tuberculosis* H37Rv. Standard TB drugs isoniazid and rifampicin were used as positive controls. By these criteria, 6 compounds were found active.

Three synthetic molecules were evaluated *in vivo* in the mouse model. Compound S010-912 (MIC = 0.39 µM) showed a significant protection against challenge with *M. tuberculosis* H37Rv, as reflected by 2 log reduction in the lung CFU when administered orally at a dose of 50 mg/kg daily for 4 weeks. The same molecule showed 3 log reduction in lung CFU at 100 mg/kg daily oral dose.

S006-830, identified from earlier screening, had previously shown *ex vivo* efficacy comparable with rifampicin and isoniazid, and *in vivo* (in mouse) efficacy comparable with ethambutol and pyrazinamide. The molecule is bactericidal and is also active against drug-resistant *M. tuberculosis*. However the compound is viscous in nature which could impede its pharmaceutical development. Hence the base compound and its three 'free-flowing' salt forms (tartarate, citrate and fumarate) were prepared with > 98% purity and evaluated for anti-TB activity. In the *in vitro* as well as *ex vivo* assays, the 3 salts and the base compound showed comparable efficacy against *M tuberculosis*. In the *ex vivo* experiments, we also noted a synergy between bactericidal action of S006-830 and that of rifampicin and isoniazid was also noted.

3.1.2 Development of screening system for Malate synthase G of *M. tuberculosis* H37Rv.

Malate synthase G (*glcB* or Rv1837c) of *Mycobacterium tuberculosis* H37Rv was cloned in *E. coli* based pET expression vector and the overexpressed protein was purified to homogeneity. The glcB activity assay was developed and validated using purified protein. The enzyme activity inhibition studies revealed that enzyme was inhibited by bromopyruvate. The *in vitro* enzyme assay shall be utilized to screen potential inhibitors of this mycobacterial enzyme.

3.1.3 Basic research

3.1.3.1 Natural product inspired diversity oriented synthesis of Tetrahydroquinoline scaffolds as antitubercular agent (*ACS Comb. Sci.*, 2011, *13* (1), 65–71)

An efficient natural product inspired diversity oriented synthesis of tetrahydroquinoline analogues has been developed using the natural carbohydrate derived solid acid catalyst via multicomponent aza-Diels-Alder reaction of imine (generated *in situ* from aromatic amine and aldehyde) with dienophile in acetonitrile in a diastereoselective manner. The use of water as solvent reverses the diastereoselectivity toward the cis isomer. Interestingly, tricyclic pyrano/furano benzopyran with cis diastereoselectivity is obtained when salicylaldehyde is used as an alternative of aromatic aldehyde under the same condition. These synthesized quinolines and benzopyrans analogues have been evaluated for their Antitubercular activity against *M. tuberculosis* $H_{37}Ra$, and *M. tuberculosis* $H_{37}Rv$, and some of the analogues shows better activity profile than their natural product analogues. The protocol is not only mild, efficient, ecofriendly, but also involves reusable and biodegradable catalyst and provides route for both the diastereoisomer.

3.1.3.2 Novel aryloxy azolyl chalcones with potent activity against *Mycobacterium tuberculosis* H37Rv. (European Journal of Medicinal Chemistry 46(9), 4302-10)

A series of twenty seven novel aryloxy azolyl chalcones were synthesized and evaluated *in vitro* for the growth inhibition of *Mycobacterium tuberculosis* H37Rv. Ten compounds from this series exhibited good activity with MIC in the range of 3.12-0.78 µg/mL and six of them were found non-toxic against VERO cells and MBMDMøs (mouse bone-marrow derived macrophages), were further evaluated *ex-vivo* for their potential to kill intracellular bacilli. Two compounds 4 and 19 showed 99% and 71% killing respectively, of intracellular bacilli in MBMDMøs infection model. Further, compound 19, an imidazolyl chalcone with a 2,4-difluorobenzyloxy moiety also exhibited moderate *in vivo* activity in mice against virulent *M. tuberculosis*, thus providing a new structural lead towards TB drug development.

3.1.3.3 2,3-Dideoxy hex-2-enopyranosid-4-uloses as promising new anti-tubercular agents (European Journal of Medicinal Chemistry 46(6), 2217-2223)

The alarming resurgence of tuberculosis (TB) underlines the urgent need for development of new and potent anti-TB drugs. Towards this goal we herein report the design and synthesis of 2,3-dideoxy hex-2-enopyranosid-4-uloses as promising new anti-tubercular agents. These easily accessible, small molecules were found to exhibit *in vitro* activity against *Mycobacterium tuberculosis* H37Rv in a MIC range of 0.78 µg/mL to 25 µg/mL. A detailed SAR study on these hex-2-enopyranosid-4-uloses led to the identification of compound 5g (S007-724) which on the basis of low MIC (0.78 µg/mL-*M. tuberculosis* H37Rv; 1.56 µg/mL-MDR, SDR strains of *M. tuberculosis*; 0.78 µg/mL-inhibition of intracellular replication of *M. tuberculosis*) and SI value of 13.5 has been identified as a promising lead molecule.

3.1.3.4 Comparative analysis of malate synthase G from *Mycobacterium tuberculosis* and *E. coli* (Int J Biol Macromol. 2011 Dec 1;49(5):917-22)

Metabolic plasticity of Mycobacterium renders high degree of adaptive advantages in the persistence through the upregulation of glyoxylate shunt. The malate synthase (MS), an important enzyme of the shunt belongs to the G isoform and expressed predominantly as monomer. Here we did a comparative unfolding studies of two homologous MS from *Mycobacterium tuberculosis* (MtbMS) and *Escherichia coli* (ecMS) using various biophysical techniques. Despite having high sequence identities, they show different structural, stability and functional properties. The study suggests that the differences in the stability and unfolding of the two enzymes are by virtue of differential electrostatic modulation unique to their respective molecular assembly.

3.1.3.5 Molecular characterization of secretory proteins Rv3619c and Rv3620c from *Mycobacterium tuberculosis* H37Rv (FEBS Journal, 2011, 278(2), 341–353)

Rv3619c and Rv3620c are the secretory, antigenic proteins of the ESAT-6/CFP-10 family of *Mycobacterium tuberculosis* H37Rv. In this article, we show that Rv3619c interacts with Rv3620c to form a 1 : 1 heterodimeric complex with a dissociation constant (K_d) of 4.8×10^{-7} M. The thermal unfolding of the heterodimer was completely reversible, with a T_m of 48 °C. The comparative thermodynamics and thermal unfolding analysis of the Rv3619c–Rv3620c dimer, the ESAT-6–CFP-10 dimer and another ESAT family heterodimer, Rv0287–Rv0288, revealed that the binding strength and stability of Rv3619c–Rv3620c are relatively lower than those of the other two pairs. Molecular modeling and docking studies predict the structure of Rv3619c–Rv3620c to be similar to that of ESAT-6–CFP-10. Spectroscopic studies revealed that, in an acidic environment, Rv3619c and Rv3620c lose their secondary structure and interact weakly to form a complex with a lower helical content, indicating that Rv3619c–Rv3620c is destabilized at low pH. These results, combined with those of previous studies, suggest that unfolding of the proteins is required for dissociation of the complex and membrane binding. In the presence of membrane mimetics, the α-helical contents of Rv3619c and Rv3620 increased by 42% and 35%, respectively. In mice,

the immune response against Rv3619c protein is characterized by increased levels of interferon-γ, interleukin-12 and IgG_{2a}, indicating a dominant Th1 response, which is mandatory for protection against mycobacterial infection. This study therefore emphasizes the potential of Rv3619c as a subunit vaccine candidate.

3.1.3.6 Overexpression of rv3097c in *Mycobacterium bovis* bcg abolished the efficacy of BCG vaccine to protect against *Mycobacterium tuberculosis* infection in mice (Vaccine 29(29-30), 4754–4760)

Rv3097c of *Mycobacterium tuberculosis* encoding lipase (LipY) was overexpressed in *Mycobacterium bovis* BCG. Efficacy of recombinant BCG to protect against infection of *M. tuberculosis* was evaluated in mice. Whereas the parent BCG vaccine protected the mice against infection, recombinant BCG overexpressing LipY offered no protection as judged by viable counts of tubercule bacilli in lungs, weight of infected mice, pathology of lungs and survival of challenged mice. Downregulation of overexpression of LipY by antisense approach considerably restored protection of infected mice as observed with parent BCG vaccine. Overexpression of lipase in BCG caused extensive hydrolysis of triacylglycerol (TG) as identified by TLC, HPLC and NMR spectroscopy. A good correlation could be inferred between hydrolysis of TG and decrease in Th1 secreted IFNγ and IL-2, proinflammatory cytokines and survival of infected mice. Mice immunized with purified LipY antigen were protected and both proinflammatory and Th1 specific cytokines were augmented. TG was found to be a poor vaccine providing no protection, which appears to be due to attenuation of Th1 and proinflammatory immune responses. In conclusion this is the first experimental report to show that immunogenicity of BCG vaccine was impaired by LipY-induced hydrolysis of specific lipids leading to suppression of host immune responses.

3.1.3.7 Deciphering *cis*-regulatory architecture of *kas* operon in mycobacteria

Mycolic acid biosynthesis in mycobacteria involves two fatty acid synthases; fatty acid synthase type I (FAS-I) and fatty acid synthase type II (FAS-II). FAS-I encodes for a single polypeptide with multiple catalytic activities that generates shorter Co-A esters as precursors for elongation. FAS-II consists of disparate enzymes and elongates palmitoyl-ACP to unusually long carbon chain fatty acids. Elongation pathway is accomplished by the concerted action of *kas* operon containing a set of five genes, *fabD*, *acpM*, *kasA*, *kasB* and *accD6*, all encoding for elongation enzymes. The enzymology of these FAS-II enzymes has been worked out in detail, but the transcriptional regulation of these genes is meagerly studied and awaits an in-depth analysis of cis-regulatory network that governs the expression of these genes.Transcriptionally, *kas* operon genes were shown to be induced after treatment with different antimycobacterial drugs, like isoniazid, ethionamide and thiolactomycin and in response to different stress conditions, like changing environmental conditions, low pH, oxidative stress, heat shock, starvation, hypoxia and macrophage infection. Since *kas* operon genes are largely involved in the biosynthesis of fatty acids, their varying transcriptional response to diverse environmental signals implies that the lipid metabolism in mycobacteria is a tightly regulated process and is intricately linked to even minor changes in the homeostasis

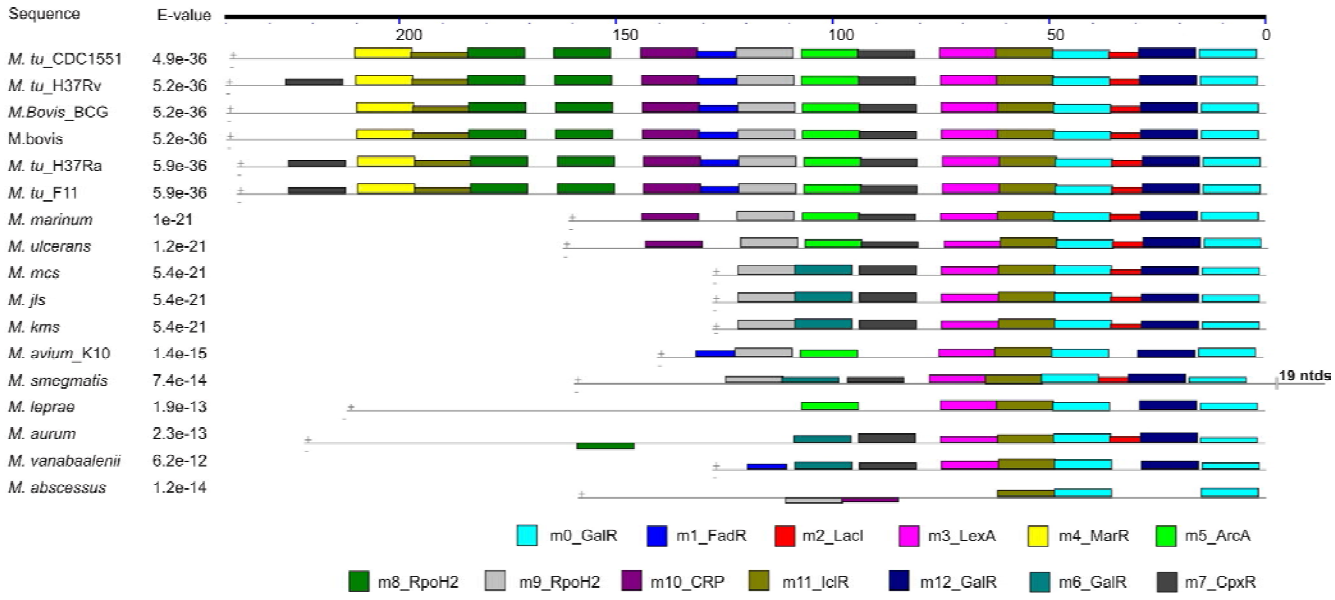


Fig. 3.1: Occurrence of different motifs in the upstream regions of mycobacterial *kas* operons: A highly conserved assemblage of motifs is present at the 3'end of intergenic region in all mycobacterial species.

mechanism of the cell. Recently, MabR, a transcriptional regulator highly conserved in mycobacterial species, was shown to control the expression of the *kas* operon genes by binding to a 21bp palindrome in *kas* operon promoter. Given the diversity of conditions to which *kas* operon genes transcriptionally respond, it is likely that their cis-regulatory region employs more than one transcriptional regulator, and possibly, a network of regulatory proteins to regulate the expression of these genes in response to changing biochemical and physiological states of the microbe. In present study, *in silico* identification of sequence motifs that are commonly present in the *kas* operon upstream regions of different mycobacterial species was performed, and motifs with higher significance value were experimentally validated using series of recombinant strains carrying promoter deletion constructs (Fig. 3.1).

3.1.3.8 Understanding the basis of low cytotoxicity in frog antimicrobial peptide, magainin 2 (Biochemical Journal, 2011, 436 (3) 609-20)

Cytotoxicity is a major obstacle in therapeutic application of antimicrobial peptides. Therefore, it is crucial to know about the factors that control the cytotoxicity of antimicrobial peptides. Frog antimicrobial peptide, magainin 2 shows significantly lower cytotoxicity than many naturally occurring antimicrobial peptides and lacks any leucine zipper like sequences which have been implicated in cytotoxicity of several naturally occurring antimicrobial peptides (Fig. 3.2). To investigate the effect of introducing a leucine zipper like sequence in magainin 2, a novel analogue (Mag-mut) was designed by rearranging only the positions of its hydrophobic amino acids to include this structural element. Our results demonstrate that mere introduction of a leucine zipper like sequence into a non-toxic peptide, without altering the amino acid composition, can render cytotoxicity and thus provide a direct evidence in favour of the involvement of this structural element in controlling toxicity of an antimicrobial peptide.

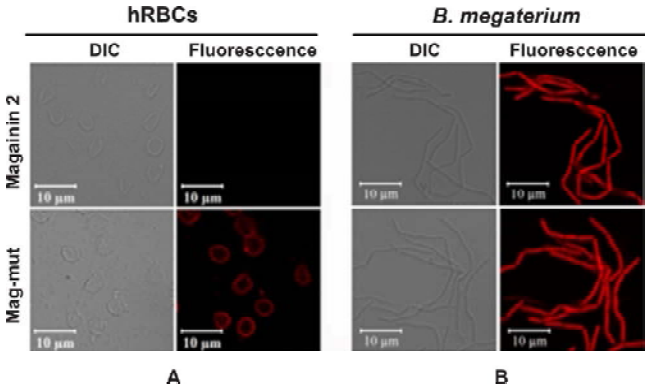


Fig. 3.2: Detection of localization of the Rho labeled magainin 2 and Rho labeled Mag-mut onto hRBCs (A) and *B. megaterium* (B) by confocal microscopy

3.1.3.9 Understanding Ion channel activity of a synthetic S6 segment derived from KvAP channel of archaeon *Aeropyrum pernix* (J Biol Chem. 2011 Jul 15;286(28): 24828-41).

Results suggest that a 22-residue peptide derived from the S6 segment of KvAP channel possesses the primary amino acid sequence to bind to phospholipid vesicles with appreciable affinity and to self-assemble and form pores therein. More interestingly, the S6 peptide also formed weakly voltage-dependent ion channels in BLM, which could be related to the potential contribution of this individual segment in folding of the corresponding full-length integral membrane protein. Significant effects of alterations of amino acid sequence of S6 on its secondary structure, localization, and membrane-permeabilizing and ion channel activity were observed (Fig. 3.3). Altogether, the present results show the characterization of the ion channel property of the synthetic S6 segment and the importance of the voltage sensor domain in maintaining the voltage sensitivity of a voltage-gated ion channel.

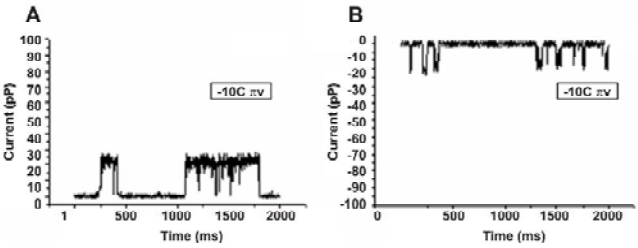


Fig. 3.3: Continuous current traces of ion channel formed by S6 peptide on BLM at the voltages. A. +100 mV & B. -100mV.

3.2 Bacterial and fungal infections

3.2.1 Screening

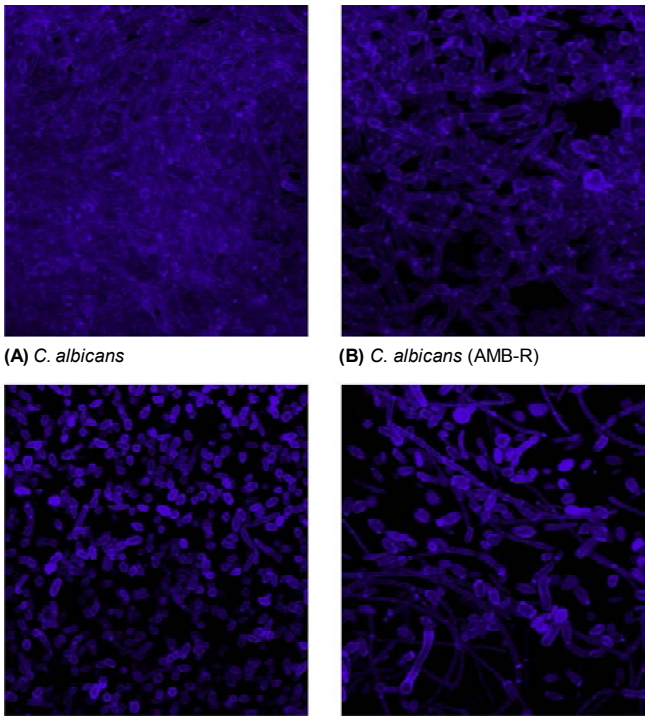
A total of 1294 (synthetic 664 marine 612, and plants 18) compounds/extracts were evaluated for *in vitro* antifungal and antibacterial activity by microbroth dilution method against five pathogenic bacteria and six pathogenic fungi. Synthetic compounds S007-736, -1502, -1506, S009-1918, -1919, S0010- -1564, -1565, 1566, -1568, S0011-100, -111, -115,-186, -188, -397, -509, -578, 1502, -1504, -2026 (MIC range 0.005 12.5 mg/ml against bacteria and fungi), marine extract CAS-0189-A002m NIT-441-A001, NIT-428, CSM-506-C006 and AU2-518-A001 (MIC 15.5-62.5 mg/ml against fungi) were found to be active in preliminary antimicrobial screening. One extract NMITLI 101R (tannin free) was evaluated for immunoprophylactic activity against systemic challenge of *Candida albicans* in mouse where around 63% efficacy was observed at a dose of 3mg/kg. When tested in combination with subinhibitory dose of ketoconazole it exhibited good efficacy. Repeat experiment is under progress to confirm the activity. Synthetic compounds SA-24, SA-27,

SA-37, S011-188 and S011-2026 that exhibited very good antifungal activity against *Candida albicans* in repeated experiments have been followed for *in vivo* evaluation in mouse model of systemic candidiasis.

3.2.2 Effect of arachidonic acid and subinhibitory concentration of antifungals on biofilm formation in species of *Candida* and its amphotericin B resistant strain

C. albicans has property to form biofilm on medical devices which is the main cause of their failure and dysfunction in infected person. During the infection arachidonic acid is released from infected host cells and serves as carbon source for yeast growth and precursor of PGE_2 formation. PGE_2 has a role in immunomodulation and control of morphogenesis in *C. albicans*. PGE_2 also induces the germ tube and biofilm formation during infection. Biofilm of *C. albicans* behave differently compared to the yeast form in respect to antifungal resistance that is more in biofilm. The level of PGE_2 and biofilm formation (Fig. 3.4) of *Candida* and AmB-R (*C. albicans*) was examined in the presence of arachidonic acid (AA) and subinhibtory concentration of two antifungals where a greater biofilm formation in the presence of arachidonic acid was observed as compared to that without AA (Fig. 3.5).

Further the extent of biofilm formation and PGE_2 level were greater in *C. albicans* as compared to other species of



(A) *C. albicans* **(B)** *C. albicans* (AMB-R)

(C) *C. parapsilosis* **(D)** *C. tropicalis*

Fig. 3.4: Confocal laser scanning microscopy (CLSM) of Different *Candida* biofilms grown in the YNB and AA.

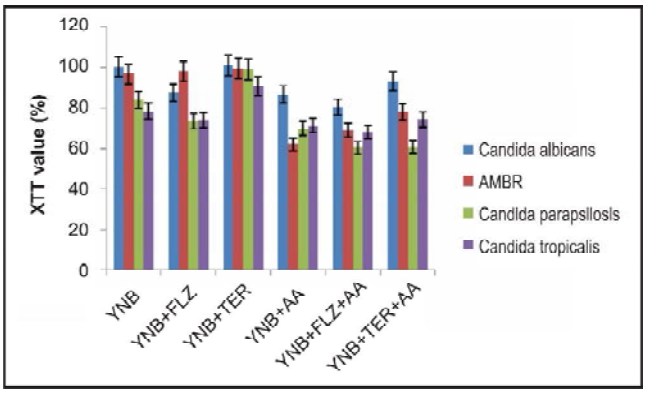


Fig. 3.5: Percent XTT reduction

Candida used in the present study. The subinhibitory concentration of antifungals resulted in still greater amount of biofilm formation and PGE_2 in AmB-R (*C. albicans*). Likewise the effect of antifungals and AA was also studied and the results suggested that increased PGE_2 level increases the biofilm formation and resistance development in the presence of arachidonic and subinhibitory concentration of antifungals (Fig. 3.6).

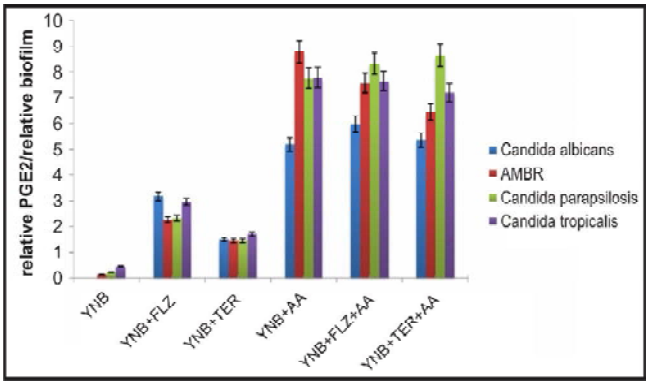


Fig. 3.6: Graphical representation of relative concentration of PGE2

3.3 Viral Infections

3.3.1 *In vitro* evaluation of anti-HIV-1 RT activity

HIV RT has two important sites where two different classes of inhibitors can successfully bind and inhibit RT activity. The HIV-RT inhibitors are: nucleoside reverse transcriptase inhibitors that bind competitively and covalently to the active site of the enzyme, and inhibit polymerisation, while non-nucleoside reverse transcriptase inhibitors, which bind non-competitively and non-covalently at allosteric site on the enzyme and different from its active site. The inhibitors against RT enzyme can be identified by *in vitro* HIV-1 RT assay. This assay is fast, sensitive and specific to HIV-1RT. Screening of anti-HIV-RT compounds is being pursued and screened more than 100 compounds from natural and synthetic origin.

4 CVS, CNS and Related Disorders

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The research activities in CVS-CNS and related disorders pertain to the design, synthesis and development of new drugs from synthetic, plant or marine sources to treat pathologies related to:

- **Cardiovascular system** *(Hypertension, Dyslipidemia, Atherosclerosis, Thrombosis and Myocardial Infarction)*
- **Central nervous system** *(Anxiety, Depression, Psychosis, Dementia and Stroke)*
- **Other disorders** *(Stress, Gastric ulcers and Inflammation).*

In addition, suitable animal models and *in vitro* tests (isolated cells, cell lines and enzymes assays) mimicking the pathologies of CVS-CNS and related disorders were also developed. Molecular mechanisms involved in the pathologies of the above mentioned disorders were explored to identify new therapeutic targets, and to understand the mechanism(s) of action of the candidate drugs.

4.1 Screening and development of NCE's
4.2 Experimental models of CVS/CNS disorders
4.3 Basic studies

4.1 Discovery and development of NCE's

Synthetic compounds (173), plant (143) and marine extracts/fractions (276) were tested for following bio-activities:

4.1.1 Cardiovascular disorders

4.1.1.1 Antihypertensive

160 Plant/marine extracts were evaluated for anti-hypertensive activity in spontaneously hypertensive rats. However, none was found active.

4.1.1.2 Anti-thrombotic

During the reporting period, 59 synthetic compounds were tested for anti-thrombotic efficacy against collagen and adrenaline induced thrombosis in mice as well as for their effect on bleeding time. Some of the tested compounds exhibited better or aspirin like effect, however none was better than the existing active CDRI compounds.

A) Mechanism of action of anti-thrombotic compound S010-1639

A great deal of insight has been gained into the contribution of collagen, thromboxane A_2 (TxA_2), their respective receptors and signaling mechanism in promoting platelet adhesion, activation and subsequent thrombus formation. Hence, targeting against the synergy between collagen and TxA_2 mediated platelet activation pathway could prove to be novel and very useful in terms of improving the

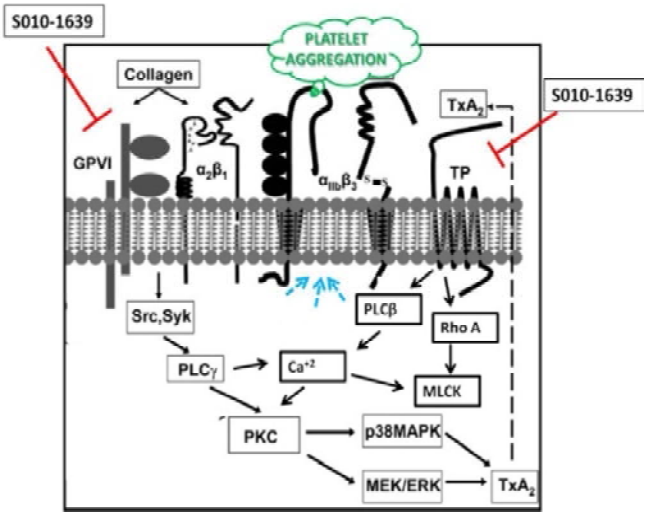


Fig. 4.1: The site of action of compound S010-1639, which inhibits collagen and U46619 induced human platelet activation.

outcome of high intensity antithrombotic therapy. In agreement with this, the CDRI compound S010-1639 was observed to inhibit both collagen as well as U46619 (thromboxane receptor agonist) induced platelet aggregation (Fig 4.1). S010-1639 exhibited better efficacy against collagen than U46619 induced platelet aggregation. It also inhibited human platelet adhesion over collagen coated surface (*in vitro*) in a concentration dependent manner.

Moreover, the action of compound S010-1639 was platelet specific and it did not affect thrombin time, prothrombin time and activated partial thromboplastin time in human plasma. In comparison to aspirin, S010-1639 had only a mild effect on bleeding time in mice. Thus the compound seems to possess dual mechanism of action, requiring further optimization and evaluation.

4.1.2 Central nervous system disorders

4.1.2.1 Neuroprotective effect of a thiazolidinone derivatives

A number of compounds containing modified thiazolidine moiety were evaluated for the neuroprotective activity in the rat stroke model. Compounds S009-728 and S009-747, administered six hours post reperfusion injury at 100 mg/kg (po), offered 80% and 70% reduction in the infarct size. In a follow-up study, compound S010-188 offered significant neuroprotection in rats treated, one hour prior to the middle cerebral artery occlusion. Further, if it was administered 6 hours post ischemia/reperfusion (I/R), it offered 60% reduction in the infarct size and over 30% improvement in the neurological deficits. Malondialdehyde (MDA) level in the blood was also decreased by 52% and glutathione (GSH) level was augmented by 33%. The neuroprotective activity of compound S009-728 was noticeable even at 12.5 mg /kg, (po) dose, which offered 31% reduction in the infarct size with significant changes in above mentioned parameters. Significant prevention in the alteration of these parameters is suggestive of its neuroprotective potential even if administered 6 hr after I/R insult.

4.1.2.2 Acetylcholine esterase (AChE) inhibitory activity

36 synthetic compounds were tested *in vitro* for AChE inhibitory activity in the mice brain homogenates. S011-406, S011-414 and S011-417 exhibited promising AChE inhibitory activity with IC_{50} values 2.90, 0.91 and 0.68 µM respectively. Rivastigmine (IC_{50} = 1.11 µM) and tacrine IC_{50} = 0.13 µM) were used as standard drug.

4.1.2.3 Scopolamine induced amnesia in mice

Effect of S011-406, S011-414 and S011-417 was tested (50 µM/kg, po), against scopolamine induced dementia in mice. Compound S011-414 showed significant protection against scopolamine induced memory impairment, while other two compounds were not equally effective at the tested dose.

4.1.2.4 Anti-anxiety activity

Test compounds that increased more than 30% of the total time spent by mice in open arm of elevated plus maze were considered active. Standard drug diazepam enhanced more than 40% in the time spent in open arm of elevated plus maze in comparison to the control vehicle treated group. Total five compounds were evaluated for their anti-anxiety activity and four compounds were found active.

4.1.2.5 Anti-depressant activity

Anti-depressant activity of 16 compounds was assessed using tail suspension test and forced swim test in mice. None was however found active in both the tests, in comparison to the anti-depressant drug, fluoxitene.

4.1.3 Other related disorders

4.1.3.1 Anti- ulcer activity

Anti-ulcer activity of 29 compounds was evaluated in various models of ulcers and omeprazole was used as a standard drug. Compounds offering more than 50% protection against cold restrain induced ulcers (CRU) were considered active. Six compounds (S009-1213, S011-0463, S011-0468, S011-0471, S011-0472 and S011-0475) offered protection against acute gastric ulcer model in rats, while two compounds (S009-1211 and S009-1212) protected rats from CRU and aspirin induced ulcers. S010-1490 and S010-1491 were found to be protective against CRU, aspirin as well as alcohol induced ulcers.

4.1.3.2 Anti-inflammatory activity

Anti-inflammatory activity of 29 compounds was evaluated in Carrageenan induced paw edema in rats, using ibuprofen as standard drug. Ten compounds showed mild anti-inflammatory effect.

4.1.3.3 TNFα inhibitory activity in THP-1 cells

TNFα inhibitory activity of 14 compounds was screened in THP cells. Four compounds showed mild TNFα inhibitory activity and their effect was compared with standard drug Enbrel (50-500 ng).

4.1.3.4 Effect of 93/478 against Myocardial Ischemia Reperfusion (MI-RP) injury in rats

Myocardial ischemic disease is the leading cause of morbidity and mortality worldwide. In an earlier study, CDRI compound 93/478 exhibited potential cardioprotection against global ischemia in Langendroff isolated rat heart preparations. It was therefore against myocardial ischemia reperfusion (MI-RP) injury model in the rat. CDRI compound 93/478 was administered prior to reperfusion and offered

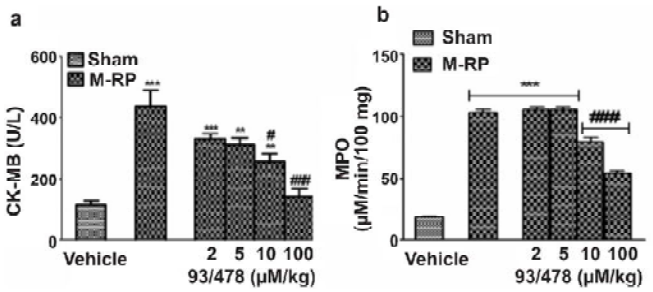


Fig. 4.2: Effect of CDRI-93/478 against rat myocardial ischemia reperfusion injury. a) Serum CK-MB activity and b) Myeloperoxidase activity in heart tissue following MI-RP.

significant protection against MI-RP injury. TTC staining of coronary artery ligated and reperfused heart was used to assess the infarct area, non-infarct area and infarct size. Infarct size following MI-RP was 21%±2% in control group, which was reduced to 10±1% (10 μM/kg) and 7±1% (100 μM/kg) with CDRI-93/478 respectively. Ischemia-reperfusion mediated cell death was assessed by measuring creatine kinase-MB (CK-MB) activity in the serum. A significant increase in serum CK-MB activity was observed after MI-RP, however administration of CDRI-93/478 (10 and 100 μM/kg) prevented rise in CK-MB activity. The accumulation of polymorphonuclear leucocytes (PMNs) was monitored by measuring myeloperoxidase (MPO) activity in the infarcted zone, which was significantly more as compared to the sham-operated group, while CDRI-93/478 (10 and 100 μM/kg) treatment blunted the increase in MPO activity (Fig 4.2). CDRI-93/478 at lower doses 2 μM/kg and 5 μM/kg was however ineffective against MI-RP injury. CDRI-93/478 (10 and 100 μM/kg) thus protected ischemic heart against reperfusion injury in rats.

4.1.3.5 Neuroprotective effect of standardized Curcuma oil

The standardized Curcuma oil at 100 mg/kg body weight was subjected to assessment of anti-stroke activity in focal cerebral ischemia model in rats. The fresh sample was quite active post six hours of reperfusion injury. It was effective in reducing cerebral infarct and neurological deficits by over 68%, with significant reduction in blood MDA content and elevation in GSH level. Thus the new sample is about five times more potent than old sample. Interestingly, it has shown significant anti- apoptotic activity as determined by FACS analysis.

4.1.3.6 Curative neuroprotective effect of standardized 118R (T+ & T-)

Efforts were also made to assess the curative potential of NMITLI extracts following oral administration at 3 and 6 hours of I/R injury in rats. Two extracts (T+ & T-) showed potent neuroprotective effect against all the parameters explored. T+ at 3 hour post treatment with 100mg/kg (po) afforded 56% protection, which was increased to 84% by extract (T-). Further there was no significant difference in ND scores; being 57% and 55% with T+ and T- respectively. The relative reduction in blood MDA was 42% and 29% respectively by extracts T+ and T-. Further extracts T+ and T- when administered at 6 hour post reperfusion injury tended to offer even 56%, 73% infarct reduction, whereas the ND deficit was reduced by 56%, 62% respectively. Interestingly oral dose at 25 mg/kg PO also produced significant neuroprotective effect following 2/24 hr I/R injury.

4.2 Experimental models of CVS-CNS disorders

During the reporting period, following models were standardized / validated, which will be used for the secondary or tertiary screening to further delineate the mode of action of active molecules.

4.2.1 Rabbit model of accelerated atherosclerosis

Effect of ezetimibe, a standard hypolipidemic agent, was evaluated in the accelerated atherosclerosis model. Male New Zealand white rabbits (2-3 kg) were kept on high cholesterol high fat diet (HCHF) consisting of 1% cholesterol and 6% peanut oil. Ezetimibe [3mg/kg, po] was administered once daily following the start of high fat diet feeding, while the control group received only vehicle. After seven days, animals were subjected to balloon angioplasty in the iliac artery using Fogarty embolectomy catheter. These rabbits were maintained on the high cholesterol diet for the next 4 weeks. At the end of study period (5 weeks), the animals were euthanized and the sections of arteries were assessed for various parametes including plaque area. Ezetimibe treatment significantly reduced total cholesterol, triglyceride and low density lipoproteins. Iliac arteries showed that ezetimibe treatment led to decrease in lipid laden content, significant decrease in I/M thickness ratio, plaque area, percentage cross sectional narrowing and increase in the lumen area (Fig. 4.3), indicating towards a total reduction in atherosclerotic burden.

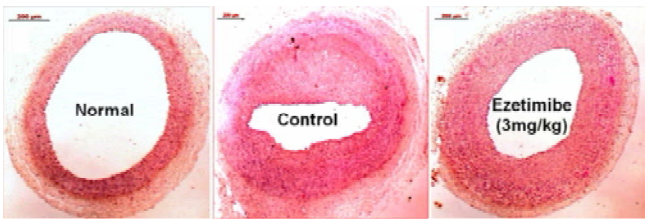


Fig. 4.3: Cross-section of iliac arteries under light microcope, sections were stained with hematoxylin and eosin (magnification 50x). Normal animals received unmodified diet. Control animal were kept on modified diet along with vehicle. Ezetimibe group received modified diet and ezetimibe for 5 weeks (bar=200μm).

4.2.2 Mouse model for Parkinson's disease

1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), a mitochondrial complex inhibitor, was found to cause irreversible parkinsonism in humans. Adult male C57BL/6J mice, 8-10 weeks of age were treated with one injection of MPTP (18mg/kg in saline) every 2 hour for a total of 4 doses over an 8 hour period in one day. Muscle in-coordination was monitored by rotarod test on 3, 5 and 7th day. Acute administration of MPTP resulted in no remarkable change in muscle in-coordination. 7 days after last injection, mice were sacrificed and brains were removed and dopamine level was estimated in striatum region by HPLC equipped with an ECD detector. Dopamine levels were significantly depleted in the MPTP exposed group as compared to the control group. This model will be useful for identifying molecules which could prevent depletion in dopamine or elevate dopamine levels and subsequently provide protection against MPTP induced progressive neurodegeneration.

4.2.3 AF64A (ICV) induced memory impairment in rats: A suitable experimental model to study anti-dementia drugs

Cholinergic deficiency is a major cause of dementia in Alzheimer's disease (AD) and inhibition of acetylcholinesterase (AChE) is the most successful approach to cure AD. Intracerebroventricular (ICV) administration of selective cholinergic neurotoxin ethylcholine mustard aziridinium ion (AF64A) to rats destroyed the central cholinergic system and effect of AChE inhibitors, tacrine and donepezil, was monitored on spatial memory as assessed by Morris water maze test, spontaneous locomotor activity (SLA), biochemical markers of oxidative stress such as glutathione (GSH) and malondialdehyde (MDA). ICV injection of AF64A at 2 nmole dose caused significant deficits in memory function, tested on 5th day after AF64A administration and SLA was checked just prior to water maze test. AF64A administration also caused significant decrease in GSH, increase in MDA and significant reduction in AChE activity in striatum and hippocampus. Tacrine and donepezil treatment at a dose of 5 mg/kg (po) significantly improved AF64A induced memory deficit, SLA and oxidative stress and further inhibition of AChE activity. The persistent neurotoxic effect of AF64A on the cholinergic neurons thus seemed to be a promising chemical agent to develop an experimental model of AD.

4.2.4 Primary endothelial cell culture model

Vascular endothelium plays a pivotal role in the development of vessels and pathogenesis of numerous thrombotic, inflammatory, cardiovascular diseases and cancer. Primary endothelial cell culture from mice and rat was established. Several angiogenic models like 3D endothelial cells, Hind-limb ischemia, Matrigel plug assay, chorio-allantoic assay for eventual screening of several CDRI compounds will also be established. Initial studies on Curcuma oil (C. oil), a highly lipophilic component of *Curcuma longa* has been shown to have salutary effects against several diseases like arthritis, ulcers, cerebral ischemia-reperfusion injury. C. oil conferred protection against post MI-RP rat heart by reducing the expression of various genes (LoX1, vWF, PDGF and Annexin V) in endothelial cells.

4.2.5 Screening for novel ligands of GPCRs

During this period, a new activity has been initiated for novel modulators of GPCRs implicated in CNS and CVS disorders. Further, we aim to incorporate about 30 known GPCR targets and 30 orphan GPCRs in the screening campaign for discovering new lead compounds that can be further developed for treatment of various CVS and CNS diseases. Following is an example where we have validated our screening assay system for Dopamine D1 and Kappa opioid receptor (Fig. 4.4).

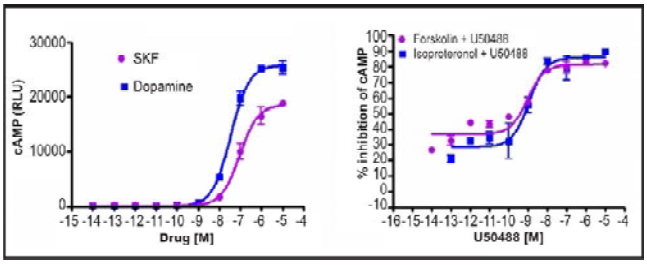


Fig. 4.4: High-throughput screening for novel modulators of GPCRs, and cAMP biosensor assay validation for the Dopamine D1 receptor and Kappa opioid receptor. Receptor Plasmids and a cAMP-sensitive reporter (pGlo22F, Promega) were transiently transfected in HEK293T cells. After 24 hrs, cells were stimulated with compounds for 15 min, followed by the measurement of cAMP-dependent luminescence.

4.3 Basic Studies

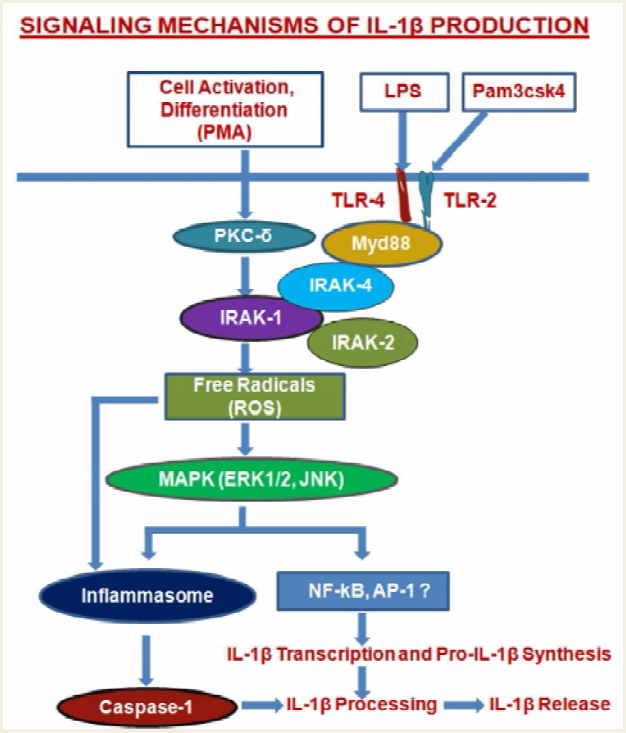
4.3.1 Cardiovascular system

4.3.1.1 Pro-inflammatory potential of neutrophil extracellular traps (Cytometry A 2011, PMID22170804)

Pro-inflammatory nature of neutrophil extracellular traps (NETs) was explored in this study by incubating the PMNs with DETA-NONOate or PMA for 3 hours to induce the NETs formation. After removing the supernatant NETs were incubated with platelet or THP-1 cells for 2 hours, which led to the release of pro-inflammatory cytokines from platelets (IL-1β and IL-8) and THP cells (IL-1β, TNFα and IL-8) as assessed using ELISA kits (Fig. 4.5), demonstrating the pro-inflammatory potential of NETs released from human neutrophils.

IL-1R-associated kinase-1 mediates protein kinase Cδ-induced IL-1β production in monocytes.

The role of IL-1R-associated kinase (IRAK)1 and its interaction with protein kinase C (PKC) δ in monocytes to regulate IL-1β production has not been reported so far. The present study thus investigates such mechanisms in the THP1 cell line and human monocytes. PMA treatment to THP1 cells induced CD11b, TLR2, TLR4, CD36, IRAK1, IRAK3, and IRAK4 expression, IRAK1 kinase activity, PKCδ and JNK phosphorylation, AP-1 and NF-κB activation, and secretory IL-1β production. Moreover, PMA-induced IL-1β production was significantly reduced in the presence of TLR2, TLR4, and CD11b Abs. Rottlerin, a PKCδ-specific inhibitor, significantly reduced PMA-induced IL-1β production as well as CD11b, TLR2 expression, and IRAK1-JNK activation. In PKCδ wild-type over expressing THP1 cells, IRAK1 kinase activity and IL-1β production were significantly augmented, whereas recombinant inactive PKCδ and PKCδ small interfering RNA significantly inhibited basal and PMA-induced IRAK1 activation and IL-1β production. Endogenous PKCδ-IRAK1 interaction was observed in quiescent cells, and this interaction was regulated by PMA. IRAK1/4 inhibitors, their small interfering RNAs, and JNK inhibitor also attenuated PMA-induced IL-1β production. NF-κB activation inhibitor and SN50 peptide inhibitor, however, failed to affect PMA-induced IL-1β production. A similar role of IRAK1 in IL-1β production and its regulation by PKCδ was evident in the primary human monocytes, thus signifying the importance of our finding. To our knowledge, the results obtained demonstrate for the first time that IRAK1 and PKCδ



functionally interact to regulate IL-1β production in monocytic cells. A novel mechanism of IL-1β production that involves TLR2, CD11b, and the PKCδ/IRAK1/JNK/AP-1 axis is thus being proposed.**J Immunol. 2011 Sep 1; 187(5):2632-45.**

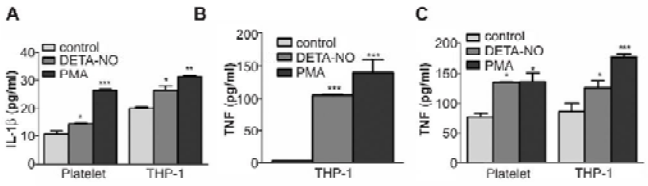


Figure 4.5: NETs induced IL-1β, TNF, IL-8 release. NETs released from activated PMNs were incubated with platelets or THP-1 cells, supernatant was collected and (A) IL-1 β, (B) TNF and (C) IL-8 concentration were measured by ELISA (*p<0.05, **p<0.01, ***p<0.001 vs control).

4.3.1.2 Role of protein kinase signaling and pattern recognition receptors in macrophage foam cell formation

Various scavenger receptors and protein kinases mediate accumulation of oxidized LDL (Ox-LDL) in arterial macrophages to form foam cells. The present study was undertaken to evaluate the role of c-jun N-terminal kinase (JNK) pathway, protein kinase C (PKC), and pattern recognition receptors in Ox-LDL induced lipid accumulation in THP-1 cells. Study revealed that Ox-LDL treatment induced significant accumulation of total cholesterol and esterified cholesterol content ($p<0.001$) in THP-1 cells. The esterified cholesterol content in THP-1 cells reduced significantly following treatment with IRAK1/4 inhibitor ($p<0.01$), general PKC inhibitor ($p<0.05$), PKC-δ inhibitor ($p<0.05$), JNK inhibitor ($p<0.01$) and p38MAPK inhibitor ($p<0.01$). Ox-LDL treatment also induced the surface expression of CD-36, TLR-2 and TLR-4 (~2 fold) while pretreatment with IRAK1/4 inhibitor significantly prevented this induction. Treatment with CD-36 siRNA ($p<0.05$) significantly reduced the cholesterol accumulation while no change was observed with TLR-2 SiRNA and TLR-4 siRNA. IRAK, JNK, PKC- δ, p38MAPK and CD-36 mediate Ox-LDL induced macrophage foam cell formation in THP-1 cells.

4.3.2 Central Nervous System

4.3.2.1 Studies on Cerebral Stroke

A) Elucidation of role of HIF-1α in cerebral Stroke

In the present study, 7 days pre-treatment with CoCl2 (20 mg/kg, po), a prolyl hydroxylase inhibitor offered

neuroprotection against ischemic injury as evidenced by significant reduction in infract volume and improved neurological deficit. Further the oxidative stress marker such as MDA was down regulated and GSH level was augmented. A marked increase in the expression of VEGF, a gene responsible for new blood vessel formation was also observed, suggesting towards new strategies to protect cells from sudden ischemic insult by activating endogenous protective mechanisms following up regulation of HIF-1.

4.3.2.2 Studies on Learning and Memory

A) Role of Angiotensin converting enzyme in cholinergic dysfunction in learning and memory (Psycho pharmacology DOI 10:1007/S00213-2012-2639-7)

Role of central angiotensin converting enzyme (ACE) was evaluated in the regulation of central cholinergic neurotransmission, brain energy metabolism and cerebral blood flow (CBF) in scopolamine induced memory impairment model. Perindopril ameliorated scopolamine induced amnesia. Further, perindopril prevented elevated AChE and MDA level in mice brain. There was a significant increase in CBF and ACh level in perindopril treated mice. Perindopril significantly decreased ACE activity in brain without affecting its mRNA expression. The study clearly demonstrated that ACE plays a pivotal role in the scopolamine induced memory impairment and beneficial effect of perindopril can be attributed to improvement in central cholinergic neurotransmission and CBF.

B) Role of Renin-angiotensin system in memory function (Psycho pharmacology DOI 10:1007/ S00213-2012-2639-7)

This study investigated influence of AT1 and AT2 receptors on cerebral blood flow (CBF), cholinergic neurotransmission and cerebral energy metabolism in scopolamine induced amnesic mice. Scopolamine caused memory impairment, reduced CBF, acetylcholine (ACh) level, elevated acetylcholinesterase (AChE) activity and malondialdehyde (MDA) levels. Administration of vehicle had no significant effect on any parameter in comparison to control. Candesartan prevented scopolamine induced amnesia, restored CBF and ACh level, decreased AChE activity and MDA level. In contrast, PD123, 319 was not effective. However, the effect of AT1 receptor blocker on memory, CBF, ACh level and oxidative stress was blunted by concomitant blockade of AT2 receptor. AChE activity, ATP level and mRNA expression of AT1, AT2 and ACE remained unaltered. The study suggests that activation of AT1 receptors appears to be involved in the scopolamine induced amnesia and that AT2 receptors contribute to the beneficial effects of candesartan (Fig. 4.6). These finding corroborated with number of clinical studies that RAS inhibition in hypertensive patients could be neuroprotective.

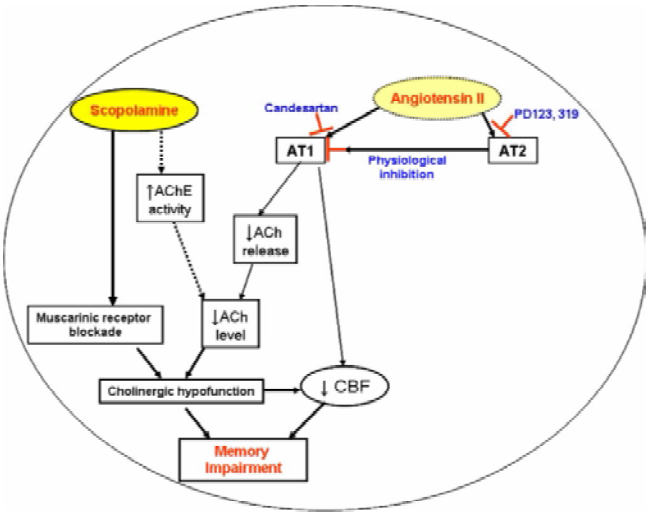


Fig. 4.6: Schematic Diagram showing possible links between central angiotensin receptors and various components associated with scopolamine induced memory impairment.

C) Mitochondrial dysfunction and energy metabolism: A crucial event in Okadaic acid (ICV) induced memory impairment and apoptotic cell death in rat brain (Pharmacology Biochemistry & Behaviour 2011, 100(2), 311-319)

In this study, after 13th day of ICV injection of okadaic acid (OKA) (200ng), memory function was evaluated by Morris Water Maze test. Following completion of behavioral studies on 16th day, mitochondrial membrane potential, Ca^{2+} concentration and reactive oxygen species (ROS) were evaluated in mitochondrial preparation of cortex, hippocampus, striatum and cerebellum of rat brain. ATP, mitochondrial activity, lipid peroxidation and nitrite were also investigated in synaptosomal preparation of rat brain areas. The activities and mRNA expression of apoptotic factors, csapase-3 and capase-9, were studied in different rat brain regions and neuronal damage was confirmed by histopathological study (Fig. 4.7).

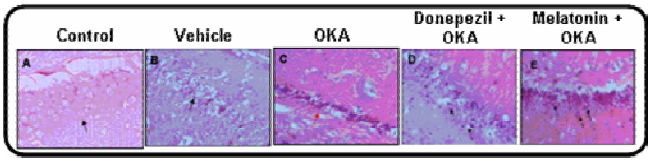


Fig. 4.7: Micrograph (100x) showing effect of OKA on neurons of the hippocampus: Control and vehicle did not reveal difference in cell numbers in the neurons of hippocampus region.

OKA treated rats showed memory impairment including increased Ca^{2+} concentration and ROS and decreased mitochondrial membrane potential, ATP and mitochondrial activity in mitochondrial preparation. There was a significant increase in lipid peroxidation and nitrite in synaptosomal preparations.

Preventive treatment daily for 13 days with antidementic drugs, donepezil and memantine, significantly attenuated OKA induced mitochondrial dysfunction, apoptotic cell death, memory impairment and histological changes. Mitochondrial dysfunction appeared to be a key factor in OKA induced memory impairment and apoptotic cell death, indicating that clinically used antidementic drugs are effective against OKA induced adverse changes at behavioral, cellular, histological level and mitochondrial dysfunction.

Effect of curcumin on ATP level, marker of energy metabolism and CBF, a marker of cerebral circulation in OKA-induced model of memory impairment in mice has been studied. Curcumin treatment significantly improved memory function in OKA injected mice as indicated by significant decrease in escape latency time in MWM and increased retention latencies in PA tests. It also ameliorated the deleterious effect of OKA on CBF, ATP level, oxidative-nitrosative stress suggesting that improvement in brain energy metabolism and CBF contributes to the neuroprotective effect of curcumin.

4.3.2.3 Antipsychotic potential of *Panax quinquefolium*

In this study, effect of *Panax quinquefolium* (PQ), having significant neuroactive properties was evaluated for its antipsychotic potential. A graded dose study with PQ at 12.5–200 mg/kg, (po) showed differential effects against the ketamine induced hyperactivity in the Digiscan animal activity monitor. Nevertheless at 100 mg/kg, PQ blocked ketamine induced memory impairment in the passive avoidance paradigm. In the chronic studies, PQ reduced the ketamine induced enhanced immobility in the forced swim test and did not show extra-pyramidal side effects in bar test and wood block test of catalepsy. These behavioural effects were compared with standard drugs haloperidol and clozapine. Further PQ reduced DA and 5-HT content after chronic treatment, but not after acute administration. In addition, PQ extract reduced acetylcholinesterase activity and nitrite levels, however increased glutamate levels in hippocampus, suggesting towards antipsychotic properties of PQ.

4.3.2.4 Piracetam attenuates lipopolysacchride induced DNA damage in leukocytes and macrophages (Mutation Research, 2011, 726, 66-74)

Piracetam, nootropic drug protects neurons in neuropathological and age-related diseases. Neuropathological conditions involve activation and modulation of peripheral blood cells in patients. Study was conducted *in vivo* in Sprague Dawley rats, *ex vivo* using rat blood leukocytes, and *in vitro* using rat macrophage cell line J774A.1 test systems to investigate the effect of piracetam on leukocytes and macrophages. *In vivo* experiments revealed that piracetam pretreatment significantly protected rats against LPS-induced increases in ROS levels and DNA damage. *Ex vivo* isolated leukocytes and J774A.1 cells treated with LPS exhibited augmented ROS levels and DNA damage, which were attenuated by piracetam treatment. Results obtained revealed the salutary effect of piracetam against LPS-induced oxidative stress and DNA damage in leukocytes and macrophages (Fig. 4.8).

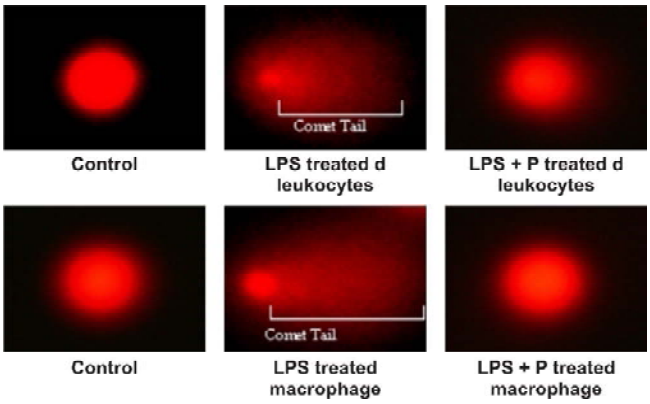


Fig. 4.8: Schematic representation of piracetam induced DNA protection, assessed by single cell gel electrophoresis

4.3.3 Other Related Disorders

4.3.3.1 Gastric ulcers

A) Effect of Melatonin against experimental reflux oesophagitis

In the present study contribution of COX/PG system in the RE-induced inflammation and melatonin functions was examined. COX-2 activation during acute oesophagitis in rats contributed to oesophageal damage by producing high PGE_2 levels, which facilitated inflammatory reactions during oesophagitis. Moreover, melatonin successfully reversed reflux oesophagitis-induced increase in COX-2 expression, PGE_2 content and MPO activity and hence imparted protection.

B) Gastroprotective effect of anti-cancer compound rohitukine: Possible role of gastrin antagonism and H^+ K^+-ATPase inhibition

The anti-ulcerogenic properties of an alkaloid chromane, rohitukine from *Dysoxylum binecteriferum* was assessed in CRU, pyloric ligation and ethanol induced ulcers in rats. Rohitukine was also tested *in vitro* for H^+ K^+-ATPase inhibitory activity in gastric microsomes. Effect of rohitukine on Ca^{2+} in parietal cell enriched cell suspension was also assessed, and cytoprotective activity was evaluated by measuring PGE_2 levels. Rohitukine in a dose-related manner attenuated ulcers in CRU model. Moreover, it significantly lowered the free acidity and pepsin activity in pyloric ligated rats while improved the depleted level of mucin. Rohitukine also significantly reversed the cold restrained-induced increase in gastrin level. *In vitro* study revealed that rohitukine moderately inhibited the microsomal H^+ K^+-ATPase activity. Furthermore, rohitukine potently antagonized the gastrin-elicited increase in cytosolic Ca^{2+} level in parietal cell enriched suspension. In ethanol induced gastric lesions in rats, rohitukine significantly inhibited the formation of erosions and increased PGE_2 content showing more potency than reference drug sucralfate. Results obtained thus suggest that rohitukine possess significant anti-ulcer and anti-gastrin activity in rats. It is likely that gastro-protective influences of rohitukine were dependent on the acid-lowering potential and on cytoprotective action.

5 Cancer and Related Areas

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Assistant Coordinator:
Dr. D.P. Mishra

Area Leader:
Dr. Rakesh Maurya

- Creation of appropriate platform for interdisciplinary collaborative research;
- Creation of knowledge base in cancer biology;
- Lead identification/optimization to obtain drug-like molecules.

5.1 Design, synthesis and biological evaluation of compounds

5.2 Model system

5.3 Basic research in cancer biology

5.1 Design, synthesis and biological evaluation of compounds

5.1.1 Novel histone deacetylase inhibitors

Research program has been initiated for designing and synthesizing cyclic peptidomimetic compounds to inhibit Histone deacetylases (HDACs) enzymes. As the catalytic domain of all HDAC isoforms is highly conserved, the different functional varieties of cyclic peptidomimetic fragment will be employed to target the periphery of the channel leading to the catalytic center. Library of cyclic compounds have been prepared and they have been submitted for the activity against various cancer cell lines. The current effort is to synthesize more cyclic peptides with various ring sizes. The work is under process.

5.1.2 Screening

Various cancer cell lines deployed for screening are: MCF7 (breast cancer), C33A (cervical cancer), KB (oral cancer), A549 (lung cancer) and NIH3T3 (non-cancer control), K562 (Chronic Myeloid Leukemia), HL60 (Acute Promyelocytic Leukemia), U937 (Acute myeloid leukemia).

During reporting period, 360 in-house synthetic compounds of CSIR-CDRI were screened for anti-cancer activity using the sulphorhodamine B (SRB) dye-based assay for cell growth/multiplication. The molecules were evaluated against 5 cell lines: MCF7 (breast cancer), C33A (cervical cancer), KB (oral cancer), A549 (lung cancer) and NIH3T3 (non-cancer control). Molecules showing $\geq$ 80% cell growth inhibition (of one or more of the cancer cell lines), at 50 µM concentrations, were re-screened using serial dilutions so as to determine the IC_{50} values. Molecules with IC_{50} of = 10 µM were considered as 'hits' and categorized according to their selective cytotoxicity. The anti-cancer drugs: Paclitaxel, Nocodazole, Doxorubicine, Centchroman, 5-Fluorouracil, Camptothecine and Staurosporine were used as 'controls' in this assay. By these criteria, 43 compounds were selected as 'hits'. In addition, 266 extracts from marine flora and fauna (obtained through MoES project) were also screened for anti-cancer activity, described as above. Eight of these samples were selected as hits (IC_{50} < 20 µg/mL).

In the follow-up from previous report, compound S-009-131, which had shown selective *in vitro* activity against cervical and prostate cancers, was synthesized in large quantity (with >98% purity) and submitted to ACTREC (Mumbai) for determination of *in vivo* activity. Experiments were performed using human tumor xenografts in SCID mice. In mice bearing cervical cancer (HeLa), the Relative Tumour Volume (RTV) and Tumour Growth Inhibition Index (TGI) values showed that oral administration of S 009-0131 caused a significant reduction of tumor volumes (relative to the vehicle control). In this respect, the activity of S 009-0131 was somewhat better than that of the standard drug adriamycin. Further, S009-0131 was apparently non-toxic to the animals as they did show any loss of weight during the period of the study. The compound, however, did not show protection against experimental prostate cancer (developed by inoculating HCT15 cells in SCID mice).

5.1.3 Antiproliferative action of *Xylopia aethiopica* fruit extract on human cervical cancer cells (Phytother Res. 2011 Oct; 25(10):1558-63)

The anticancer potential of *Xylopia aethiopica* fruit extract (XAFE), and the mechanism of cell death it elicits, was investigated in various cell lines. Treatment with XAFE led to a dose-dependent growth inhibition in most cell lines, with selective cytotoxicity towards cancer cells and particularly the human cervical cancer cell line C-33A. In this study, apoptosis was confirmed by nuclear fragmentation and sub-

G(0)/G(1) phase accumulation. The cell cycle was arrested at the G(2)/M phase with a decreased G(0)/G(1) population. A semi-quantitative gene expression study revealed dose-dependent up-regulation of p53 and p21 genes, and an increase in the Bax/Bcl-2 ratio. These results indicate that XAFE could be a potential therapeutic agent against cancer since it inhibits cell proliferation, and induces apoptosis and cell cycle arrest in C-33A cells.

5.1.4 Efficacy of in house compound S-0007-1235 (MND) as an anti leukemic agent

In the present study, the *in vitro* growth inhibitory and apoptotic effects of synthetic compound series was investigated against human myeloid leukemia cells (K562) known to be resistant to a number of apoptotic stimuli. It was found that compound S-0007-1235 (MND) is selectively active against chronic myelogenous leukemia (K562). MND has IC_{50} of 1.75mM at 72h treatment and also induces megakaryocytic differentiation.

Data shows that the apoptosis induced by this compound is mitochondria-mediated and it also arrests growth of K562 cell at G1 (Fig. 5.1).

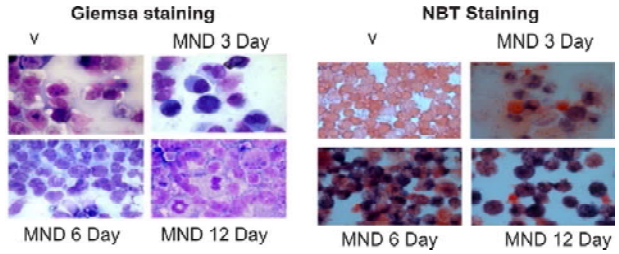

Fig. 5.1: MND causes megakaryocytic differentiation in K562 cells. Cells were treated with vehicle (V) or 1μM MND for indicated time periods followed which cells were immobilized on coverslips using cytotrap and stained as indicated.

Further investigations confirmed that this compound inhibits BCR-ABL phosphorylation and downregulates the relevant downstream pathway as evidenced by dephosphorylation of STAT5, cRAF, MEK1/2 and ERK1/2. Comparison with the marketed drug Imatinib showed that 1235 dephosphorylates BCR-ABL at earlier time points and overall shows significantly higher efficacy than Imatininb. Further, it also dephosphorylates SRC kinase whose phosphorylation leads to Imatinib-resistance. Thus 1235 can be a good therapeutic candidate for Chronic myelogenous leukemia (Fig. 5.2).

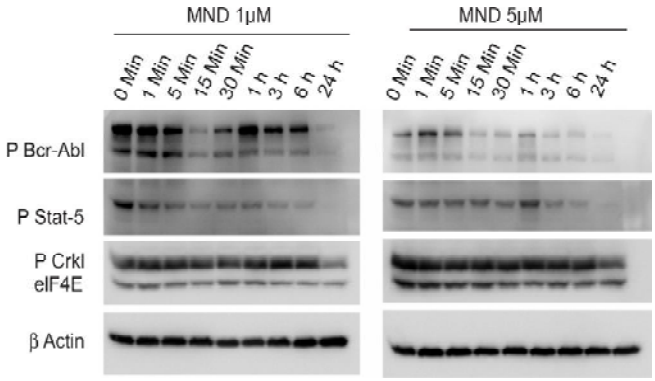

Fig. 5.2: MND causes BCR-ABL dephosphorylation in dose and time-dependent manner. K562 cells were treated with indicated doses of MND for indicated time periods and were evaluated by western blot analysis.

5.1.5 K012 exhibits anti-prostate cancer activity

Quercetin, a plant flavonoid compound has a broad range of pharmacological properties that include selective anti-proliferative effects and cell death, predominantly through an apoptotic mechanism in cancer cells but not in normal cells (*Life Sci.* 1997; 60(24):2157–2163). K012 is a cis-glycoside of quercetin is recently synthesized under CDRI anti-osteoporosis drug development program and reported for osteoblast growth promoting activity (J Bone Miner Res 2011; 26(9): 2096-111). Cell growth inhibitory effect of K012 was examined against androgen-independent metastatic prostate cancer cell line, PC-3 and observed promising activity of K012 against prostate cancer. Further studies on detailed mechanism of action of K012 against prostate cancer cell are going on (Fig. 5.3).

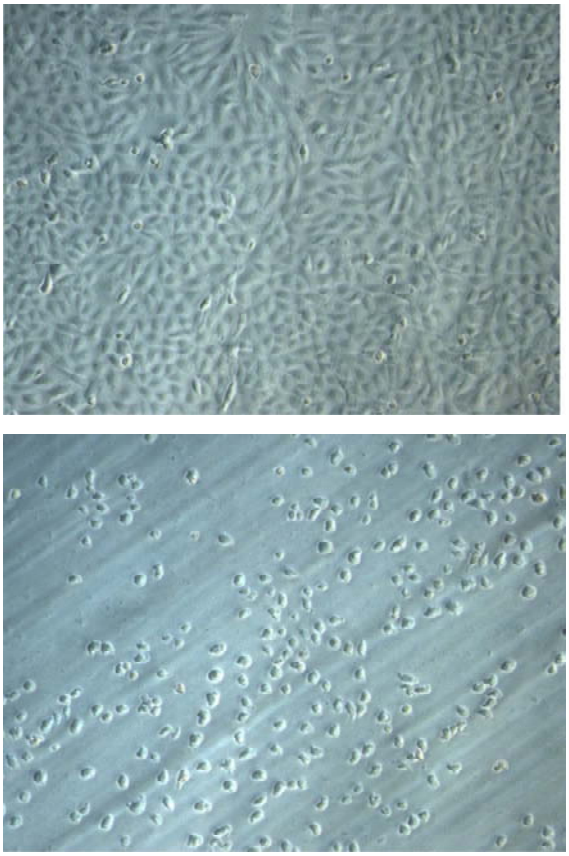

Fig. 5.3: Effect of K012 in PC-3 cells: Left panel shows untreated control PC-3 cells and right panel shows PC-3 cells treated with 10μM of K012 for 48 hours

Further, in order to achieve synergistic effects of two or more different bioactive molecules with different pharmacophoric functions, a series of substituted xanthene core structure with chalcone were recently synthesized for developing pharmacological agents against breast cancer. Initial preliminary screening studies in estrogen receptor-positive, MCF-7 cells and estrogen receptor-negative, MDA-MB-231 cell line, identified a new lead for anti-cancer agents, compound S010-940 it exhibited selective and significant inhibition of 28.2μM against MDA-MB-231 cell line. Further, synthesis of a series of new derivatives using S010-940 scaffold, identified optimized lead with more potent activity in the range of 3μM against MCF-7 and MDA-MB-231 cells. The detailed mechanistic studies and synthesis of new xanthenes-chalcones hybrids by changing the substituents on the chalcone core and xanthene nucleus to enhance the specific anti-breast cancer activity is currently underway.

5.1.6 Integration-mediated prediction enrichment of quantitative model for Hsp90 inhibitors as anti-cancer agents: 3D-QSAR study (Mol Divers. 2011; 15(2):477-89)

The present study describes a systematic 3D-QSAR study consisting of pharmacophore modeling, docking, and integration of ligand-based and structure-based drug design approaches, applied on a dataset of 72 Hsp90 inhibitors as anti-cancer agents. The best pharmacophore model, with one H-bond donor (HBD), one H-bond acceptor (HBA), one hydrophobic_aromatic (Hy_Ar), and two hydrophobic_ aliphatic (Hy_Al) features, was developed using the Catalyst/ HypoGen algorithm on a training set of 35 compounds. The model was further validated using test set, external set, Fisher's randomization method, and ability of the pharmacophoric features to complement the active site amino acids. Docking analysis was performed using Hsp90 chaperone (PDB-Id: 1uyf) along with water molecules reported to be crucial for binding and catalysis (Sgobba et al. ChemMedChem 4:1399-1409, 2009). Furthermore, an integration of the ligand-based as well as structure-based drug design approaches was done leading to the integrated model, which was found to be superior over the best pharmacophore model in terms of its predictive ability on internal [integrated model 2: R ((train)) = 0.954, R ((test)) = 0.888; Hypo-01: R ((train)) = 0.912 and R ((test)) = 0.819] as well as on external data set [integrated model 2: R ((ext.set)) = 0.801; Hypo-01: R ((ext.set)) = 0.604].

5.2 Model system for screening/drug target identification

5.2.1 Fission yeast *S. pombe* as a model system

DNA topoisomerases are specialized nuclear enzymes that perform topological modifications on double stranded DNA and hence are essential for DNA metabolism such as replication, transcription, recombination, condensation and segregation. In a genetic screen, a novel mutant allele of DNA topoisomerase 2 has been identified that delays the mitotic progression and also activates DNA damage checkpoint kinase Chk1 in mitosis dependent manner (Fig. 5.4). Another mutant allele of wat1/pop3 genes has been identified that was sensitive to microtubule destabilizing agent benomyl and exhibit conditional synthetic lethality with chk1 knockout strain. Some in-house compounds have also been screened for their role in checkpoint control and cell cycle regulation in fission yeast.

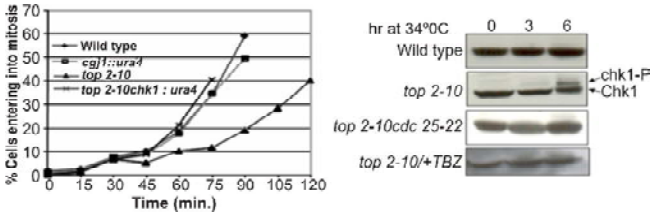

Fig. 5.4: Topoisomearse 2 mutant cells mildly delay the mitotic progression and activates checkpoint kinase chk1 in mitosis dependent mannar

5.2.2 Inhibitor screening against human DNA ligases as potential anti-cancer agents

In rapidly dividing cancer cells, specific inhibition of hLig I can lead to replication block. This may prove to be very useful in anticancer therapy in combination with radiation therapy that induces DNA breaks. *In silico* screening for inhibitors against the human ligase I DNA binding domain (DBD) is being undertaken since the structure of hLig I-bound to nicked DNA is already known. Pharmacophore modeling and computer-aided drug design (CADD) will further be used to identify compounds in databases of commercially available low molecular weight chemicals, predicted to bind to a DNA-binding pocket within the DNA-binding domain of human DNA ligase I, thereby inhibiting DNA joining. The *in silico* screen for putative DNA ligase inhibitors may lead to the selection of compounds for biochemical assays.

5.3 Basic Research

5.3.1 Resveratrol as an adjunct therapy in cyclophosphamide-treated MCF-7 cells and breast tumor explants (*Cancer Sci* 2011; 102: 1059–1067)

Cyclophosphamide (CPA) has efficacy as a breast cancer therapy. However, toxicity to CPA limits its clinical applications. Hence there is a need to develop compounds that may be combined with it to improve the efficacy and overcome toxicity. Previously it has been shown that Resveratrol (RES), a chemopreventive agent, increased the

growth inhibitory effect of CPA-treated MCF-7 cells. Here we have explored the molecular basis of 5 mM CPA and 50 iM RES as a combination on cell-cycle progression, apoptosis and oxidative stress in MCF-7 breast cancer cells. Efficacy of the combination was also evaluated in a serum-free tumor explant culture model. The combination elicited enhanced anti-proliferative action coupled with differential expression of cell-cycle, apoptosis and stress factors. Furthermore, co-treatment superiority in histologically validated ER positive breast cancer explants suggests that this combination may be a worthy future clinical anti-neoplastic regimen.

5.3.2 Resveratrol regulation of antiproliferative activity of Centchroman vis-à-vis CYP 1B1 in MCF-7 Human breast cancer cells

Polyphenols as “sensitizers” together with cytotoxic drugs [Centchroman (CC)] as “inducers” cooperate to trigger apoptosis in various cancer cells. Hence, the combination of sensitizer and inducer having similar mode of mechanism may be a novel approach to enhance the efficacy of inducers. It was hypothesized that polyphenols [Resveratrol (RES)] pretreatment may sensitize MCF-7 (Human Breast Cancer Cells) to Centchroman (CC, antineoplastic agent). Study showed that low dose polyphenol sensitized CC treated cells demonstrated enhanced apoptosis through Annexin/PI than either drug alone. This correlated well with mitochondrial membrane potential disruption, ROS burst, decreased/ unaltered antioxidant enzymes, enhanced JNK, p38 dependent p53 phosphorylation, enhanced proapoptotic factors (increase in Bax/ Bcl-2 ratio) and involvement of caspases. Contrarily, through high dose sensitization in CC treated cells the factors remained unaltered as in polyphenol alone.

This led to conclusion that sensitization of cancer cells with low dose polyphenol augments apoptotic efficacy of CC in MCF-7 cells. This may offer a novel approach to achieve enhanced action of CC with concomitant reduction of side effects enabling improved management of hormone-dependent breast cancer.

5.3.3 2D gel electrophoresis-based proteomic analysis reveals that ormeloxifene induces G0–G1 growth arrest and ERK mediated apoptosis in chronic myeloid leukemia cells K562 (Pal et. al, Proteomics 2011, 11, 1517–1529)

Ormeloxifene, a nonsteroidal selective estrogen receptor modulator (SERM) has been shown to possess

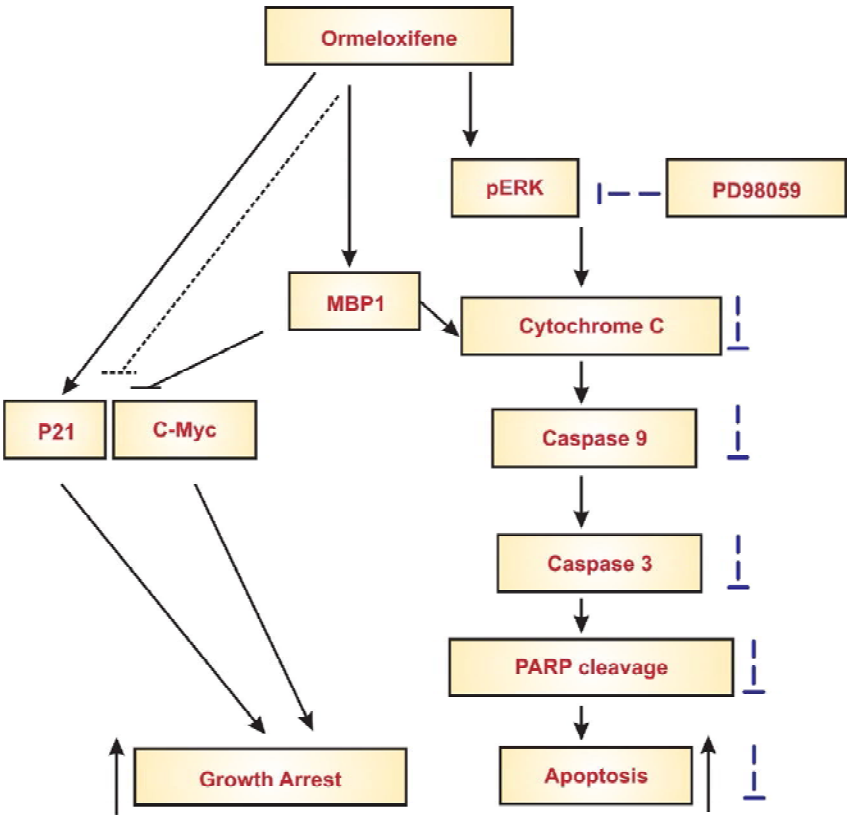

Fig. 5.5: A hypothetical model for mode of ormeloxifene in chronic myeloid leukemia

anticancer activities in breast and uterine cancer. In the present study, it is shown that ormeloxifene induces apoptosis in dose-dependent manner in a variety of leukemia cells, more strikingly in K562. In the present study, 2-DE-gel electrophoresis of K562 cells induced with ormeloxifene showed that 57 and 30% of proteins belong to apoptosis and cell-cycle pathways, respectively. Data demonstrate that ormeloxifene-induced apoptosis in K562 cells involves activation of extracellular signal-regulated kinases (ERKs) and subsequent cytochrome c release, leading to mitochondria-mediated caspase-3 activation. Ormeloxifene-induced apoptosis via ERK activation was drastically inhibited by prior treatment of K562 cells with ERK inhibitor PD98059 (Fig. 5.5).

Ormeloxifene also inhibits proliferation of K562 cells by blocking them in G0–G1 phase by inhibiting c-myc promoter via ormeloxifene-induced MBP-1 (c-myc promoter-binding protein) and upregulation of p21 expression. It is further shown that ormeloxifene-induced apoptosis in K562 is translatable to mononuclear cells isolated from chronic myeloid leukemia (CML) patients. Thus, ormeloxifene induces apoptosis in K562 cells via phosphorylation of ERK and arrests them in G0–G1 phase by reciprocal regulation of p21 and c-myc. Therefore, inclusion of ormeloxifene in the therapy of chronic myeloid leukemia can be of potential utility.

5.3.4 TEM studies on Resveratrol treated breast cancer explants (Cancer Sci. 2011; 102(5):1059-67. IF=3.84)

It is known that cytotoxic therapies combined with dietary compounds may exert enhanced anti-tumour effect through synergistic actions offering significant advantages. The chemotherapeutic potential of dietary compound Resveratrol (RES) in adjunct therapy (with cyclophosphamide) of breast cancer was evaluated using Transmission Electron Microscopy (TEM). Experiments were performed on serum-free primary explant culture system derived from human breast tissue. Comparison after ultra-structural analysis (discussed in the Fig. 5.6 A-C) of control versus 100 µM of RES (IC_{50} dose) clearly indicated massive apoptosis in the latter, thereby justifying its use adjunct with CPA for combination therapy.

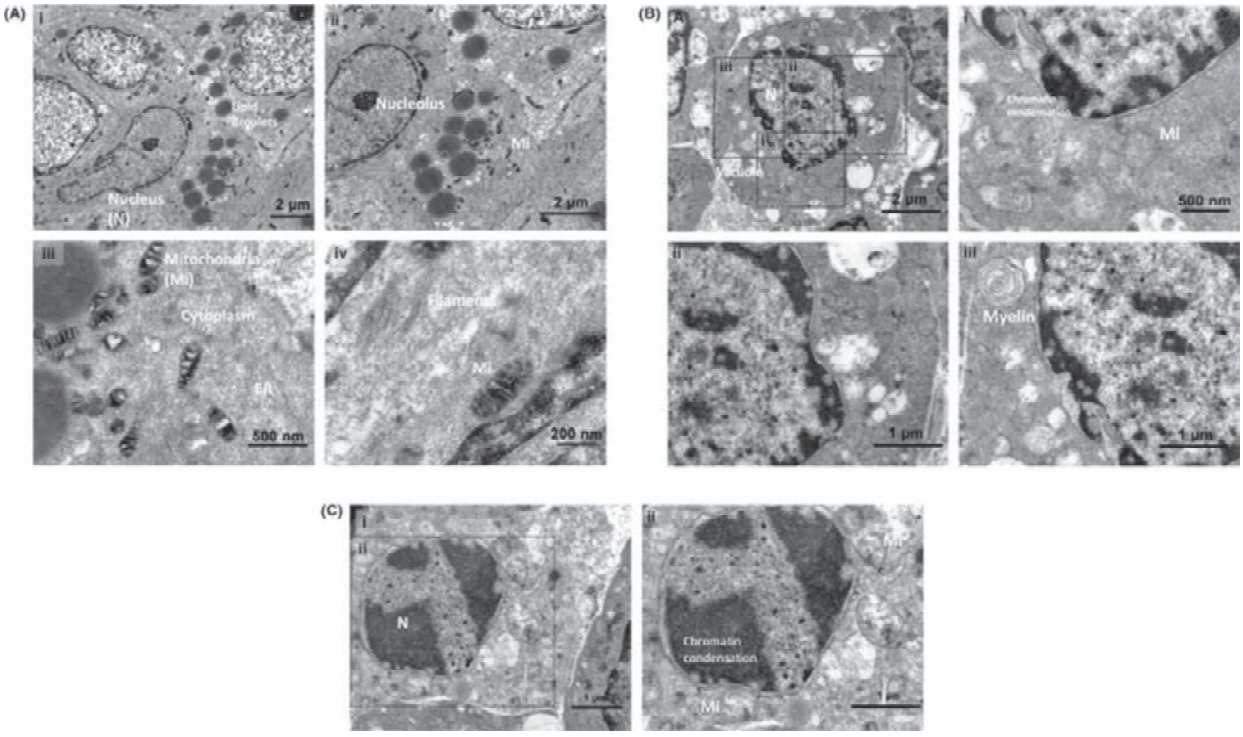

Fig. 5.6: Transmission electron micrographs of human breast explant tissue cultured in serum-free medium. (A) Ultra-structural analysis of the 4 day control showing stromal fibroblasts with distinct nucleoli and intra-cytoplasmic lipid droplets. Abundant cytoplasm consisting of intact Golgi vesicles, rough ER, mitochondria with well defined cristae and electron-dense matrix can also be observed. Stacks of intermediate filaments were also visible in the cytoplasm. However, cellular damage was evident in a few areas. (Bi–iii,C) RES (100 uM) treated explants revealed mostly rounded apoptotic cells, lost intercellular contacts, large inter-cellular spaces, chromatin condensation, pkynotic nuclei and loss of nucleoli. Mitochondrial swelling, loss of cristae and disruption in structural integrity, apoptotic bodies and membrane blebbing was also evidenced. Vacuolation of the cytoplasm, myelin whorls and intermediate filament bundles were the other noticeable features. At least 10 grids prepared from four different blocks were analyzed for each sample.

6 Safety and Clinical Development

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The major objective of this area is to conduct regulatory studies of candidate drugs for clinical development. The studies include:

Pharmaceutical Information	:	Active ingredients, physio-chemical data validations, stability, formulation
Pharmacokinetics	:	Absorption, distribution, metabolism, excretion
Safety Pharmacology	:	Essential safety pharmacology studies
Toxicity Studies	:	Systemic toxicity, special toxicity studies
Clinical Studies	:	Clinical trials

6.1 Pharmaceutics
6.2 Pharmacokinetics & Metabolism
6.3 Safety Pharmacology
6.4 Regulatory Toxicology
6.5 Clinical & Experimental Medicine

6.1 Pharmaceutics

6.1.1 Quality control and stability studies

New HPLC methods for CSIR-CDRI compounds S009-1355, S009-1526, S010-0399, S010-0912, S010-0361, S010-0658, S010-1104, S009-1588, S010-1639, S011-861 and S011-862 with proper resolution of the starting materials have been developed. Two marker compounds from modified Herbal Medicament (HM) preparation and Compound S-006-830 (1.1 g) have been purified by preparative HPLC. Stability studies on CDR134F194, Ormeloxifene-HCL, Saheli, Herbal Medicament (HM), RJM-0035/P10/K002A and compounds 99-373, S007-867, 99/411, S002-333, S001-469, S007-1500 are continuing. Stability and formulation development studies of Ormeloxifene-HCL for Brazil and WHO as per AVISA guidelines completed.

6.1.2 Nanoparticles targeting infected erythrocytes in malaria

Nanoparticles targeting infected erythrocytes with malaria demonstrated that nanoparticles incorporating CDRI 97/63 or quinine possessed antimalarial efficacy at a lower dose as compared to the drugs themselves (Fig. 6.1).

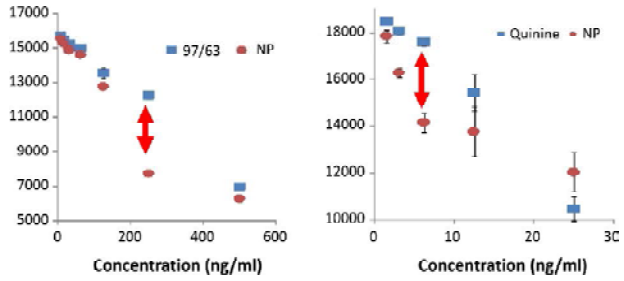


Fig. 6.1: Nanoparticles show significantly greater inhibition of parasitemia in comparison to free drugs (arrows) in an assay on *Plasmodium falciparum* grown in cultured red blood cells.

6.1.3 Inhalable particles containing anti-tuberculosis agents

The Nationally-evolved NMITLI project to fund this public-private-partnership (PPP) culminated in the submission of detailed proof of concept justifying the proposed intervention as adjunct therapy for management of pulmonary tuberculosis. All data necessary for filing an Investigational New Drug Application (IND) was collected, compiled and discussed. It is proposed to seek funding from CSIR-OSDD for further development of this product in the coming financial year.

6.1.4 *In situ* development of Amphotericin B liposomes for industrial applications

A modified ethanol-injection method was developed for the preparation of low-cost Amphotericin B (AmB) liposome formulations for treatment of fungal infections and leishmaniasis. The *in vitro* release study showed an insignificant difference ($P = 0.05$) for 24-hour release between marketed AmB liposomes (AmBisome) and F-1a and F-2a. Proliposome concentrate, used for the preparation of *in situ* liposomes, was physically stable for more than 3 months in experimental conditions. IC_{50} of Ambisome (0.18 µg/mL) was comparable to F-1a (0.17 µg/mL) and F-2a (0.16 µg/mL) against intramacrophagic amastigotes.

6.1.5 Templated ultrathin polyelectrolyte microreservoir for delivery of Bovine Serum Albumin (BSA)

An ultrathin polyelectrolyte microreservoir (UPM) was developed using combinations of synthetic [*poly*(allylamine hydrochloride), (PAH), sodium *poly*(styrenesulfonate), (PS)] and natural (sodium alginate) polyelectrolytes over spherical porous $CaCO_3$ core particles. The prepared UPM was characterized for surface morphology, layer-by-layer growth, payload efficiency, integrity of BSA, as well as effects on viability and adhesion of murine J 774 macrophages. *In vitro* release study revealed that UPMs were able to provide sufficient diffusion barrier to release protein at controlled rates at physiological pH. It has been observed that combinations of synthetic and natural UPM are fully biocompatible. A UPM composed of only synthetic polymers was surface-modified with pluronic F-68 to achieve biocompatibility. It is proposed that the UPM system may successfully be used for the delivery of proteins, and can be tailored to impart desired properties.

6.1.6 Investigations on alternate approach to target mannose receptors on macrophages using 4-Sulfated N-Acetyl Galactosamine more efficiently as compared to mannose decorated liposomes: An application in drug delivery

The purpose of this study was to investigate the suitability and the targeting potential of 4-sulfated N-acetyl galasctosamine (4-SO_4GalNAc) decorated Amphotericin B (AmB) liposome (Sulf-Lip) to tissue-resident macrophages, which represent the natural niche for many pathogens such as *Leishmania*, *Mycobacterium tuberculosis* etc. Flow cytometric data revealed 2.0 and 2.5 times enhanced uptake of Sulf-Lip in J774 and RAW macrophage cell lines compared to Man-Lip. Ligand functionalized modifications dramatically improved the drainage pace of the AmB liposomes from the site of administration (IV injection) into the lymphatic system, which resulted in modest increase and retention of encapsulated drug in targeted organs (i.e. liver and spleen). Histopathological study coupled with fluorescent microscopy authenticates the enhanced localization of 4-SO_4GalNAc layered liposomes in spleen and liver. By this study it can be concluded that 4-SO_4GalNAc targeting moiety can provide new insight for efficient drug delivery to macrophages.

6.1.7 Development of LBL based nanoreservior for delivery of insulin

A prototype LBL based ultrathin polyelectrolyte nanoreservoir developed earlier for oral delivery of insulin were subjected for testing in rats for intestinal absorption using fluorescent-labeled formulation. Examination of intestinal sections by fluorescence microscopy revealed numerous villi in intestinal mucosa whose apical part was facing the intestinal lumen. At 3h, the formulation appeared at the basolateral region of the intestinal wall and subsequently dissemination towards the lymphatic drainage. Bright fluorescence appeared in the domes of the Peyer's patches after 5h and distinct fluorescence was observed in the lacteals of villi, indicating further diffusion of the formulation into the lymphatic system. This opens up the prospect for various absorption mechanisms involved in the intestinal uptake of macromolecules loaded UPC formulations. The developed formulation was non toxic to intestinal membranes compared to controls.

6.1.8 Nanoparticles assisted chemotherapy of cancer using gemcitabine and its stearoyl prodrug

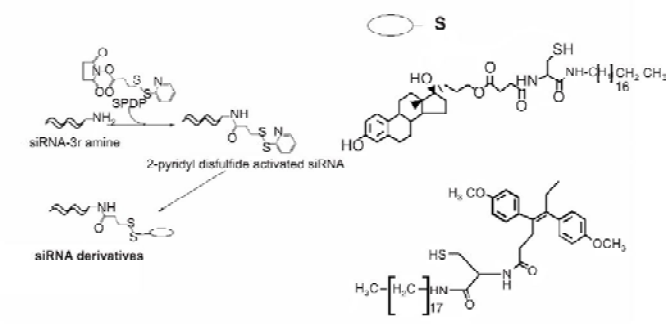
Gemcitabine (dFdC), an anticancer drug crosses cell membranes with difficulty and is rapidly metabolized. A lipophilic stearoyl derivative of dFdC (C18dFdC) was synthesized and characterized by spectroscopy. The parent drug and its stearoyl conjugate were built-in into polymeric poly(d,l-lactide-co-glycolide) nanoparticles (PLGA-NPs) using poly-vinyl alcohol/bovine serum albumin as stabilizers and compared for aspects including size and size distribution, zeta potential, surface morphology, encapsulation efficiency and *in vitro* drug release. Cytotoxicity of these delivery systems towards MCF-7 cancer cells revealed advantages of the C18dFdC-NPs over pure dFdC and dFdC-NPs in both time- and concentration-dependent manner. Flow cytometric analysis revealed greater cellular internalization of lipophilic derivative compared to hydrophilic dFdC. Stearoyl gemcitabine encapsulated in PLGA nanoparticles was much less haemolytic compared to plain gemcitabine, its stearoyl derivative and gemcitabine encapsulated nanoparticles.

6.1.9 Nanoparticulate system targeting cancer and leishmanial parasites

Preparation and evaluation of PLGA nanoparticles coated with chitosan and bearing the chemotherapeutic agent docetaxel was carried out. The project involves preparation of nanoparticulate system and evaluation for various attributes including size, zeta potential, entrapment, *in vitro* release, cell uptake and MTT assay. Apart from this nanoemulsion formulations incorporating Amphotericin B have also been prepared and explored for antileishmanial activity. The formulations are showing prominent leishmanicidal activity compared to free Amphotericin B.

6.1.10 Development of Estrogen Receptor Targeting siRNA drugs to eradicate Human breast cancer (CSIR-EMPOWER project)

To generate anti cancer siRNA mediated novel target specific and synergistic therapies for the management of breast cancer via estrogen receptor targeted drug conjugated siRNA drugs, the Estrogen receptor(ER) ligand (17β-estradiol and Diethylstilbestrol) covalently conjugated siRNA were synthesised. The cellular uptake of targeting ligand conjugated Fluorescent-siRNA in estrogen receptor over-expressing human breast cancer cells, MCF-7 and ER negative, drug resistant breast cancer cells MDA-MB-231 were evaluated using flow-cytometry and compared with non conjugated Fluorescent-siRNA. Further studies are in progress.



Scheme 1 represents the synthesis of ER ligand siRNA conjugates.

6.2 Pharmacokinetics and Metabolism

6.2.1 Pharmacokinetics and metabolism studies of anti-diabetic compounds

6.2.1.1 S007-1261

Method Development: A sensitive, selective, accurate and precise LC-MS/MS over the range 1.56-200 ng/ml, for the quantification of S007-1261 in rat plasma was developed and validated.

Stability Studies: The S007-1261 was found to be stable during three Freeze-Thaw cycle, Bench top, Dry residue and Long term conditions. The compound showed low stability in simulated gastric fluid (SGF) while good stability in simulated intestinal fluid (SIF).

Pharmacokinetics Study: The S007-1261 showed slow absorption with an elimination half-life of > 14 hrs; the MRT value of 25.29 ±1.99 h after an intravenous dose and 23.23 ± 1.31 h after oral dose, which indicates that S007-1261 is retained in the system for longer duration. The compound shows high volume of distribution (738.69 ± 87.13 L) that suggests good distribution outside vascular compartment. The systemic bioavailability of the compound was 33.61% after oral administration. The large clearance of the compound indicates a high extraction ratio across the eliminating organs. After oral dosing with S007-1261, it appears that the absorption was slow as plasma concentrations peaked at ≥ 10 hr post-dose (Fig. 6.2 & 6.3).

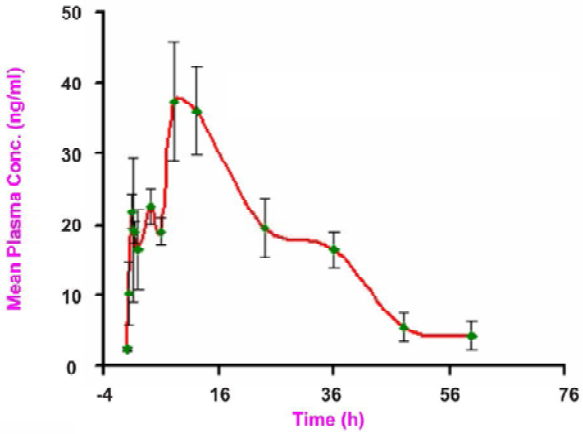


Fig. 6.2: Oral dose in male rats

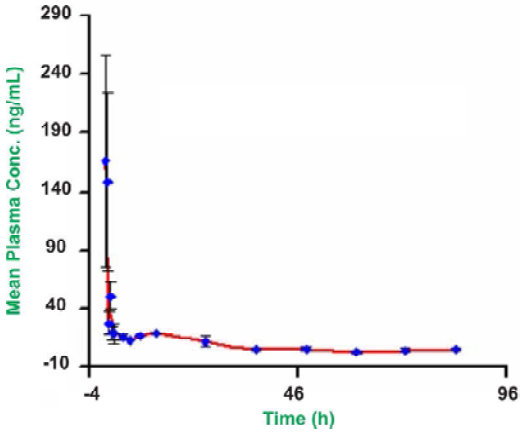


Fig. 6.3: IV dose in male rats

Protein Binding Study: The plasma protein binding of S007-1261 was found to be 49.23±0.74% at concentration of 1 µg/ml. The protein binding was moderate indicating higher unbound drug concentration that favors tissue redistribution or clearance of drug from the body.

6.2.2 Anti-malarial

6.2.2.1 97/78: Drug interaction studies with Lamotrigine, an anti-epileptic drug

Co-administration of Lamotrigine (LTG) (42 mg/kg) with 97/78 (40 mg/kg) did not significantly alter the Tmax and Cmax of 97.63 in male rats and tmax in female rats. Other PK parameters were significantly different both in male and female rats ($p < 0.05$) (Fig. 6.4 and 6.5).

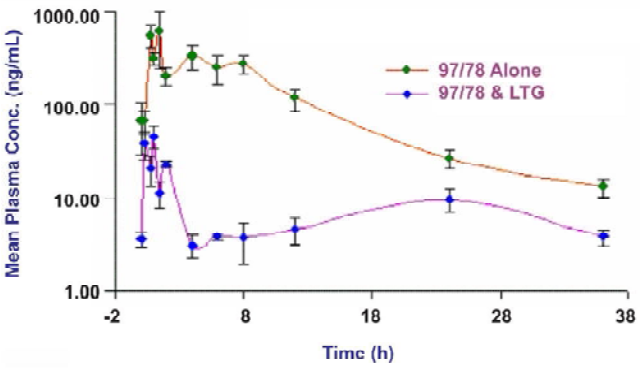


Fig. 6.4: Drug Interaction in Male SD rats

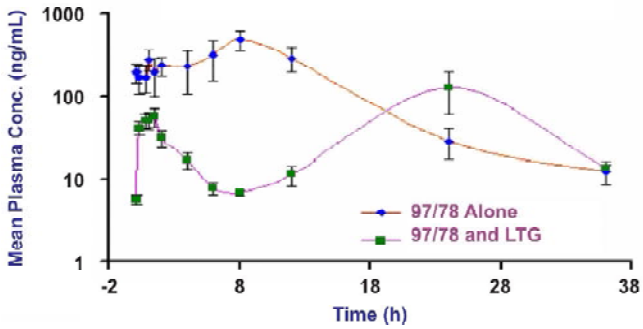


Fig. 6.5: Drug Interaction in Female SD rats

6.2.2.2 Simultaneous quantification of active metabolite of 97/78 and Piperaquine in rat plasma

A sensitive, selective and rapid assay procedure has been developed for the simultaneous quantification of 97/63, an active metabolite of 97/78, and piperaquine in rat plasma. LLOQ of the method was found to be 3.9 ng/ml while the calibration curve was linear in the range of 3.9 to 250 ng/ml. The precision and accuracy were within the permissible limits of deviation. The method is useful to investigate pharmacokinetic interactions between 97/78 and piperaquine in rats which will pave way for the development of suitable combinations of trioxanes with long acting anti-malarials in order to combat the problem of emerging resistance against endoperoxides.

6.2.2.3 99/411: Drug interaction studies with phenytoin, an antiepileptic (Proc. 3rd Int. Symp. in Drugs Metabolism & Pharmacokinetics, 11-13 Feb. 2011)

Co-administration of Phenytoin (PHY) (42 mg/kg) with 99/411 (12 mg/kg) did not significantly alter half life (T½), Tmax, Cmax, AUC0-∞ and MRT of 99/411 ($p > 0.05$) (Fig. 6.6).

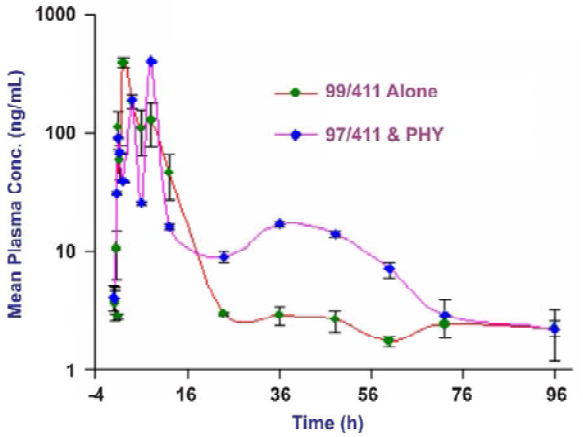


Fig. 6.6: Drug Interaction in Male SD rats

6.2.2.4 Simultaneous quantification of 99/411 & Lumefantrine and 99/411 & Piperaquine in rat plasma (Proc: XLIV Annual Conf. of Indian Pharma. 19-21 Dec. 2011)

A sensitive, selective and rapid assay procedure has been developed for the simultaneous quantification of 99/411 & lumefantrine and 99/411 & Piperaquine combinations separately in rat plasma. LLOQ of the method was found to be 3.9 ng/ml in both assays while the calibration curve was linear in the range of 3.9 to 500 ng/ml for 99/411-Lumefantrine and 3.9 to 250 ng/ml for 99/411-piperaquine. The precision and accuracy were within the permissible limits of deviation. The method is useful to investigate pharmacokinetic interactions of 99/411 with lumefantrine and piperaquine in rats which will pave way for the development of suitable combinations of trioxanes with long acting anti-malarials in order to combat the problem of emerging resistance against endoperoxides.

6.2.3 Anti-thrombotics: S002-333/S004-1032/ S007-1558

6.2.3.1 Metabolic stability using liver microsomes of different animal species and their respective genders and detection of putative metabolites

Validated HPLC-UV method with improved sensitivity, selectivity and shorter run time has been developed with LLOQ of 0.31µM which was applied in evaluating *in vitro* metabolic stability of S002-333 and its isomers.

Data for all species (rat, rabbit, and dog) and their respective genders show that S002-333 and S004-1032

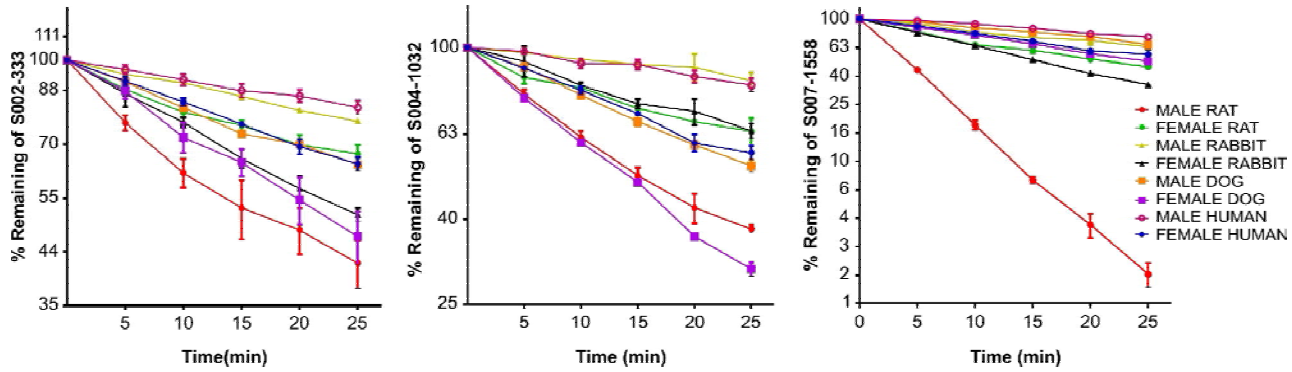


Fig. 6.7: Depletion profile of S002-333 and isomers in pooled microsomes of different species and their respective genders

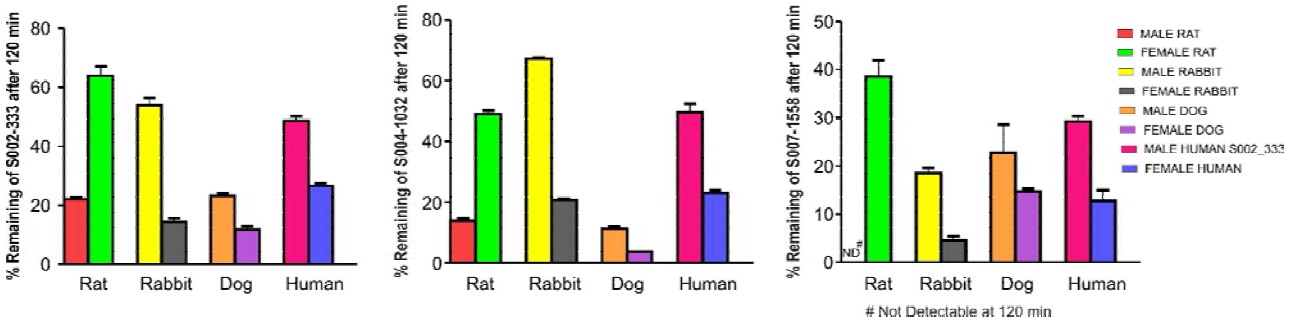


Fig. 6.8: Stability of S002-333 and its isomers in microsomal incubation milieu

degrade faster in female dog microsomes whereas S007-1558 was not detectable after 25 min in male rat liver microsomes. After comparing with humans, with respect to metabolites formed, these species may be used for further studies of metabolites and their ADME behavior. Mono oxidation, di-oxidation, N-hydroxylation, N-acetylation and dehydrogenation was observed as Phase-I biotransformation in S002-333 and in both the enantiomers S004-1032 and S007-1558. These bio-transformations were putatively defined on the basis of LC-MS/MS fragmentation (Fig. 6.7 and 6.8).

6.2.3.2 Stereoselective bioanalysis and pharmacokinetics of S004-1032 and S007-1558, two enantiomers of S002-333

A sensitive and stereoselective LC-MS/MS method was developed for the quantification of both the enantiomers of S002-333 (Fig. 6.9). Oral pharmacokinetic of isomers S004-1032 and S007-1558 upon administration of recemic mixture S002-333 was estimated in NZ rabbit at 20 mg/kg dose. Absolute bioavailability of S004-1032 and S007-1558 was found to be 18.43 ± 1.61 and 16.00 ± 2.19 respectively.

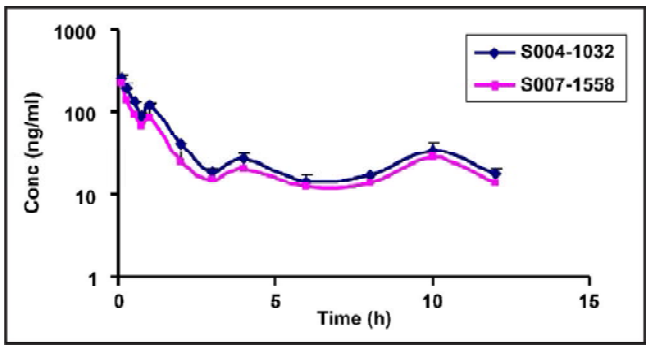
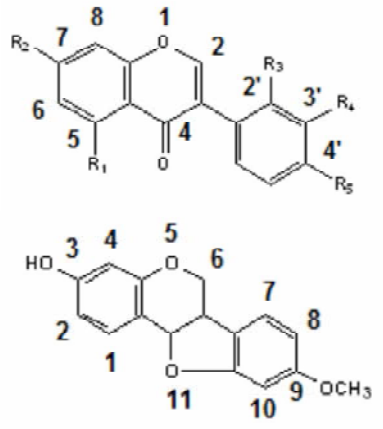


Fig. 6.9: Solubility of S004-1032 and S007-1558

6.2.4 Anti-osteoporotic, osteogenic and osteo-protective agents

6.2.4.1 Plant 1020F147

LC MS/MS/MS based pattern profiling/ chromatographic finger printing of osteogenic fraction F147 and simultaneous determination of 22 flavonoids was



K095

established. Presence of eight osteogenic isoflavones (K040, K051, K052, K053, K054, K080, K095 and K098) was confirmed by comparison with pure reference standards. Simultaneous procedure was applied to determine their absolute concentration in F147 (Table 1). Remaining 14 flavonoids were relatively quantified and were putatively characterized using ion trap MS/MS/MS and "Information Dependent Acquisition of Mass spectral data.

Table 1. Chemical structure of markers of F147

Markers	Chemical name	R1	R2	R3	R4	R5
Daidzein (K040)	7,4'-dihydroxy isoflavone	H	OH	H	H	OH
Cajanin (K051)	5,2',4'-trihydroxy,7-methoxy isoflavone	OH	OCH3	OH	H	OH
Isoformononetin (K052)	7-methoxy, 4'-hydroxy isoflavone	H	OCH3	H	H	OH
Genistein (K053)	5,7,4'-trihydroxy isoflavone	OH	OH	H	H	OH
Cladrin (K054)	7-hydroxy, 3',4'-dimethoxy isoflavone	H	OH	H	OCH3	OCH3
Formononetin (K080)	7-hydroxy,4'-methoxy isoflavone	H	OH	H	H	OCH3
Prunetin (K098)	5,4'-dihydroxy,7'-methoxy isoflavone	OH	OCH3	H	H	OH

6.2.4.2 Plant 914 n-Butanol fraction

An improved HPLC based pattern profiling/ chromatographic finger printing of osteogenic n-butanol fraction was established for the absolute quantification of four osteogenic markers K012, K058, K068 and K100. This analytical method was translated to semi-prep separation for the purification of most active marker K058.

6.2.4.3 Protein binding of osteogenic markers K054, K095 of plant 1020 and S006-1709

The protein binding study for K095, K054 and S006-1709 by charcoal adsorption method showed that the percentage of protein binding was low for all three compounds. There was no significant difference in protein binding of K095 (12.17±1.71%) and its synthetic analogue S006-1709 (16.28±3.73%), while the protein binding of K054 (3.37± 0.15 %) was lower than these two compounds.

6.2.4.4 Metabolic stability of osteogenic markers Cladrin (K054), Medicarpin (K095) of CDRI Plant 1020 and CDRI S006-1709

The metabolic stability of K054, K095 and S006-1709 rat liver microsomes revealed that the dimethoxy substituted compound K054 ($t_{1/2}$ 69.72 ± 3.54 min) was more stable than K095 ($t_{1/2}$ 23.42 ± 3.19 min). The synthetic compound S006-1709 ($t_{1/2}$ 35.71 ± 4.70 min) was found to more stable than its natural analogue K095 and may be a potential lead for further optimization of osteogenic and osteo-protective agents.

6.2.4.5 Effect of osteoprotective flavonoids Kaempferol (KMF), Formononetin (FMN) and Biochanin-A (BCA) on CYP450 metabolizing enzymes CYP1A2, CYP2C9, CYP2C19, CYP2D6, CYP2E1 and CYP3A

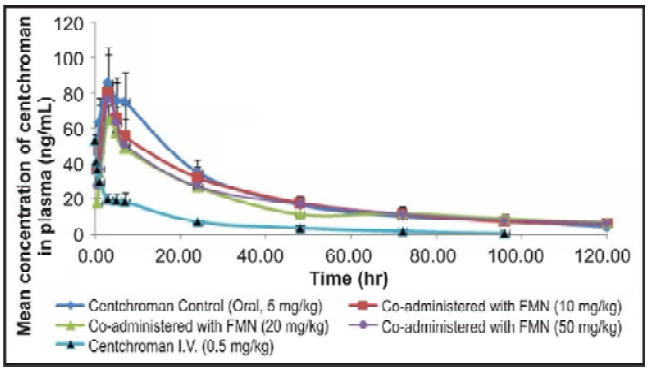
KMF was found to be the moderate inhibitor of CYP2C9, CYP2C19, CYP2E1 and CYP3A4 with IC_{50} value of 17.75 µM, 26.34 µM, 13.32 µM and 12.72 µM, respectively. It was found to be the weak inhibitor of CYP1A2 with IC_{50} value of 48.82 µM. It did not exhibit significant inhibitory effect on CYP2D6 with IC_{50} value exceeding 100 µM. FMN and BCA appear to be relatively safe with IC_{50} values for most of the CYPs greater than 50 and 100 µM, respectively, particularly with respect to CYP3A4 where IC50 value of BCA is 66.82 µM and 52.18 µM using nifedipine and testosterone as substrate, respectively.

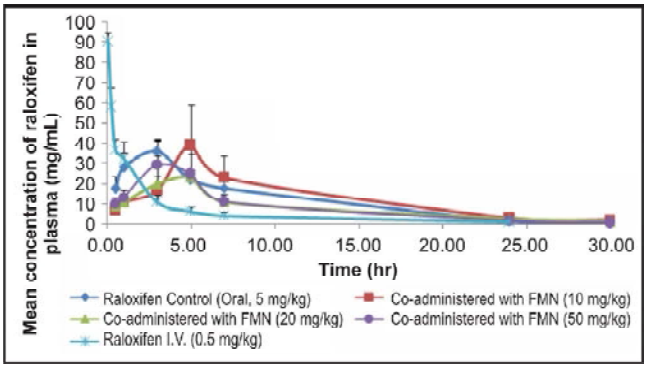
These flavanoids are unlikely to cause hepatic CYP-mediated drug-drug interactions since it is less likely to attain such a high concentration of these flavanoids in blood because of low bioavailability of these flavonoids. However, since hepatic and intestinal CYPs cDNA are identical, the proteins expressed in these organs are probably the same. Therefore, it may be interesting to evaluate effect on intestinal CYPs where it is more likely to attain high concentrations of flavanoids.

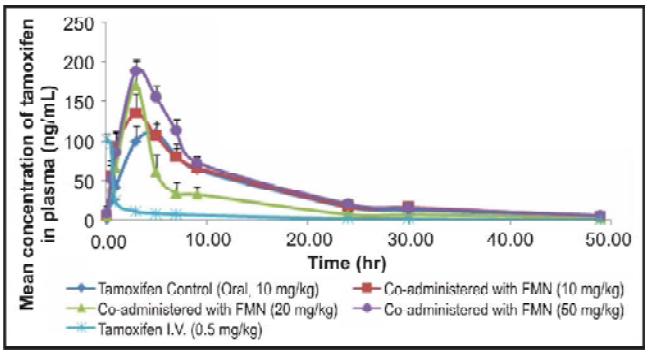
6.2.4.6 Effect of Formononetin co-administration on pharmacokinetics of Centchroman, Raloxifen and Tamoxifen

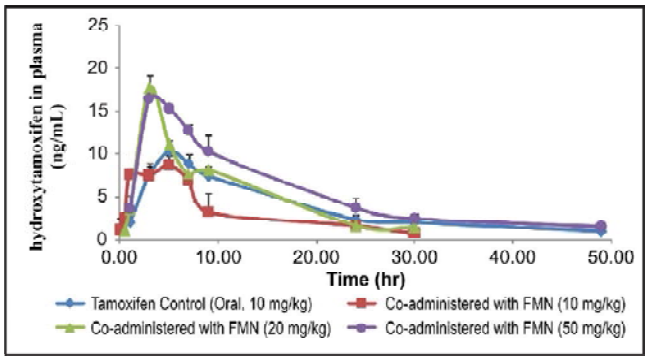
Formononetin (FMN) co-administration exhibited insignificant changes in pharmacokinetic parameters of centchroman and raloxifen suggesting that FMN and FMN containing dietary/herbal supplements may be administered safely with centchroman and raloxifen without altering their pharmacodynamic response on concomitant use.

However, in case of tamoxifen, there was insignificant effect of FMN co-administration at 10 and 20 mg/kg dose, but FMN at 50 mg/kg, significantly ($p<0.05$) increased the AUC0-8 and Cmax of 4-hydroxytamoxifen in comparison to control group. The Relative Bioavailability % of 4-hydroxytamoxifen in the presence of FMN at 50 mg/kg was remarkably increased compared to the control.









The metabolite ratio (MR: AUC0-∞ of 4-hydroxytamoxifen to tamoxifen) was increased in the presence of FMN suggesting that FMN has effect on formation of 4-hydroxytamoxifen. It was observed that the co-administration of FMN or the FMN containing dietary supplements can significantly increase the bioavailability of tamoxifen and 4-hydroxytamoxifen. If the results obtained from the rat's model are confirmed in the clinical trials, the tamoxifen dose should be adjusted for potential drug interactions when tamoxifen is used with FMN or the FMN-containing dietary supplements.

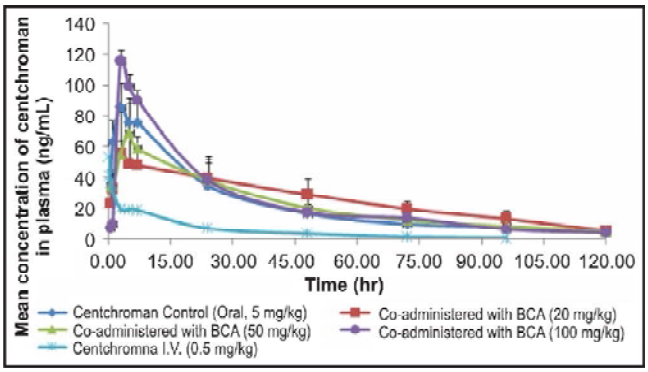
6.2.4.7 Intravenous pharmacokinetics and oral bioavailability of biochanin-A in female rats

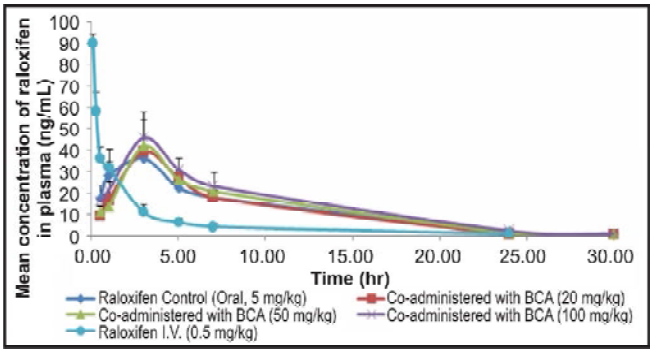
Biochanin A (BCA) is a methoxylated isoflavone which is the major constituent in red clover and in commercially available extracts of this plant. In female SD rats, the bioavailability of BCA was found to be approximately 4.6% with a high clearance and a large apparent volume of distribution. The BCA was extensively bio-transformed to its metabolite genistein and corresponding glucuronide and sulfate conjugates which appeared in the systemic circulation from the first sample point onwards. This is the first report on pharmacokinetics and metabolism of BCA in female rats. Evaluation of the pharmacokinetics of BCA will be useful in assessing its PK-PD relationships for the potential therapeutic applications of BCA.

6.2.4.8 Effect of Biochanin-A (BCA) co-administration on pharmacokinetics of Centchroman and Raloxifen

BCA co-administration has induced no significant changes in pharmacokinetic parameters of centchroman suggesting that BCA and BCA containing dietary/herbal supplements can be used safely with centchroman without altering its pharmacodynamic response on concomitant use.

Interestingly concomitant administration of BCA at 20 and 50 mg/kg dose had insignificant effect on PK parameters of raloxifen (5 mg/kg). But, BCA at 100 mg/kg, significantly ($p<0.05$) increased the AUC0-∞ (36.50 %) in comparison to



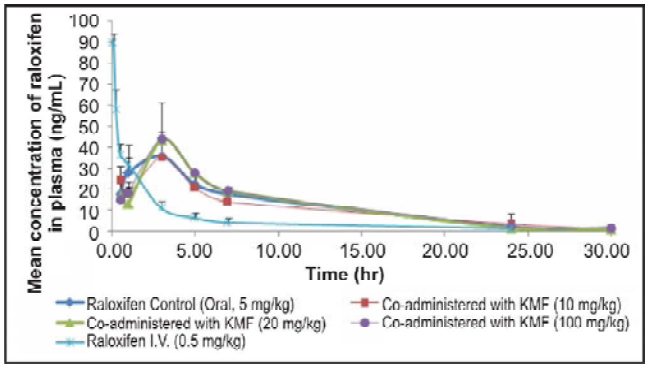


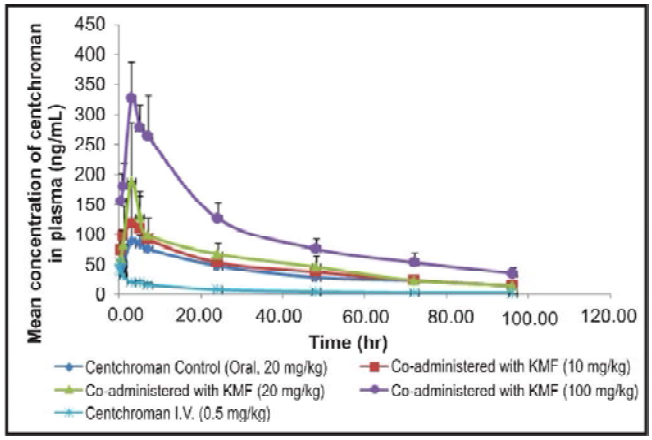
control. Consequently, the absolute bioavailability of raloxifen in the presence of BCA was remarkably increased compared to the control which could be due to the inhibition of Phase-II metabolism of raloxifen by BCA. The Cmax and terminal half life of raloxifen were not significantly altered upon co-administration of BCA.

6.2.4.9 Effect of Kaempferol co-administration on pharmacokinetics of Raloxifene and Centchroman

Kaempferol (KMF) co-administration induced no significant changes in pharmacokinetic parameters of raloxifen suggesting that KMF and KMF containing dietary/ herbal supplements can be administered safely with raloxifen without altering its pharmacodynamic response on concomitant use.

In case of centchroman, the concomitant administration of KMF significantly increased the peak concentrations and area under the plasma concentration-time curve of centchroman. The terminal half-life of centchroman after oral administration in the absence or presence of KMF was not affected, indicating that any effect on the centchroman pharmacokinetic parameters can be attributable to processes that occur in the gut rather than to a modification of its systemic clearance. It was concluded that, co-administration BCA and BCA containing dietary/ herbal supplements can modulate the bioavailability of centchroman. However, further studies using clinical trials will be needed to determine if the results obtained in this study can be extrapolated to humans. If the results obtained from the rats' model is confirmed in the clinical trials, the centchroman dose should be adjusted for potential drug interactions when centchroman is used with KMF or the KMF-containing dietary supplements.





6.2.5 Anti-tuberculosis: Pharmacokinetic study of anti-tuberculer leads in rats

The pharmacokinetics of CDRI leads S008-1167, S008-1635, S009-895 and S010-0399 was studied after 10 mg/kg oral dose in male Sprague Dawley rats. The concentration-time profile of the compounds was determined using HPLC-UV method. The compounds were quickly absorbed, distributed and eliminated from the serum. However, S009-895 and S010-0399 have better systemic availability than S008-1167 and S008-1635.

6.2.6 Model development

6.2.6.1 PAMPA permeability assay: Assessment of centchroman, tamoxifene, and osteoprotective flavonoids

The PAMPA permeability assay was standardized using USFDA approved high and low permeability markers. The standards furosemide and ranitidine were found to be within acceptable range for low permeability compounds (value less than 1.0 x 10-6 cm/s) while permeability of carbamazepine and naproxen was found to be within acceptable range for high permeability compounds (value higher than 1.0 x 10-6 cm/s). These values prove the reliability of the PAMPA permeability assay. The test compounds centchroman, tamoxifene, formononetin, isoformononetin, genistein biochanin-A, prunetin, glycitein, equol and nobiletin exhibited high permeability at 4.0 and 7.4 pH when compared with FDA approved low, medium and high permeability markers.

The assay was found to be high throughput, low cost, stable, reliable and reproducible. PAMPA is potentially useful tool in evaluating the transcellular membrane permeability of a compound hence can be used to study permeability of NCEs or marketed drugs.

6.2.6.2 *In situ* single pass intestinal perfusion (SPIP) model for permeability assessment: Nine-in-One simultaneous quantitation of physicochemically diverse molecules on RP-HPLC in drug discovery and development: Application to SPIP study in rats upon cassette administration

A simple, sensitive and specific RPHPLC method for simultaneous determination of Paracetamol, Caffeine, Cephalexin, Ketoprofen, Propranolol, Metropolol, Atenolol, Hydrochlothiazide and Phenol red was developed with a view

to assess intestinal permeability of hits, leads and candidate drugs in a high through put manner using *in situ* single pass intestinal perfusion (SPIP) technique. The permeability values of the reference compounds were in close proximity to their reported values. Using the above model permeability of another four known compounds (Naproxen, Antipyrine, Carbamezepine, Furosemide) was assessed and also found to be close to the reported values.

Based on a strong correlation obtained between rat and human data, it was inferred that the SPIP could be utilized with precision to predict the human intestinal permeability and fraction dose absorbed of NCEs or any marketed drug in humans. Therefore, the judicious applications of these techniques can help in identify drug candidates that will be well absorbed in humans.

6.3 Safety Pharmacology

Essential Safety pharmacology studies of anti-dementic preparation of AP20am-16 and anti thrombotic compound S007-867 as per scheduled 'Y' have been completed. No adverse effects on CNS, CVS and respiratory profile were observed after oral administration upto 10 times of ED50 dose.

Essential Safety pharmacology studies of anti thrombotic compound S002-333 as per scheduled 'Y' are in progress.

6.4 Regulatory Toxicity

6.4.1 Toxicity studies of in-house compounds

6.4.1.1 S-007-1500 (Fracture healing): Single dose toxicity study in rat by i.m. route completed. Compound was administered in doses 6, 12.5 and 25 mg/kg, and found safe up to 25 mg/kg.

6.4.1.2 S-007-867 (Anti-thrombotic): Single dose toxicity study in rat by i.m route completed. Compound was administered in doses 30, 60 and 120 mg/kg, and found safe up to 120 mg/kg.

6.4.1.3 S-007-867 (Anti-thrombotic): Single dose toxicity study in mice by Oral route completed. Compound was administered in doses 325, 650 and 1300 mg/kg, and found safe up to 1300 mg/kg.

6.4.1.4 CDR-267-F018 (Hypoglycemic): 28 day repeat dose toxicity study in Rhesus monkey study completed.CDR-267-F018 was administered orally in doses of 62.5, 125 and 250 mg/kg daily and found safe up to 250 mg/kg.

6.4.2 Toxicity studies of external compounds

6.4.2.1 MA0305 (Herbal preparations of Maharshi Ayurveda for sleep and behavioral disorders): Single dose toxicity study in Swiss mice by oral route completed. The preparation was administered in doses 250, 500, 1000 and 2000 mg/kg, and found safe up to 2000 mg/kg.

6.4.2.2 CPL-2009-0030 and **CPL-2009-0031 (Anti-diabetic GLP1 antagonists):** Mutagenicity evaluation was done by using 4 tester strains(TA-97a, TA-98,TA-100& TA-102) of *Salmonella typhimurium* and 3 tester strains { WP2, WP2uvrA^{-}, WP2uvrA^{-}(pkM101)} *E. coli*. The compounds are found to be non mutagenic.

6.4.2.3 AP20am15 (Memory Enhancer): Male fertility study in rats completed and found safe at 250, 500 & 1000 mg/kg body wt. dose levels.

6.4.3 Experimental toxicology (Basic studies)

6.4.3.1 A novel dimer-tetramer transition captured by the crystal structure of the HIV-1 Nef (PLOS ONE 2011; 6(ii) ez6629.doi.10.13.71)

Crystallographic study of the full-length HIV-1 Nef revealed that the protein adopts the elusive closed tetrameric association in the structure. The transition from a dimer to a tetramer involves large changes to the dimeric association to form a tetramer with 4-fold symmetry. The molecular details of the dimer-tetramer transitions explain how the protein can distinguish between different sets of protein partners when it is in the membrane-associated and cytoplasmic stages respectively.

6.4.3.2 Apigenin protects against lithocholic acid-induced liver injury and oxidative stress in mice (ATLA 2011; 39(1) 96)

Lithocholic acid (LCA) is a hydrophobic secondary bile acid and is known to cause intrahepatic cholestasis. This model was used to explicate the protective effect of Apigenin against LCA-induced hepatotoxicity. Serum liver

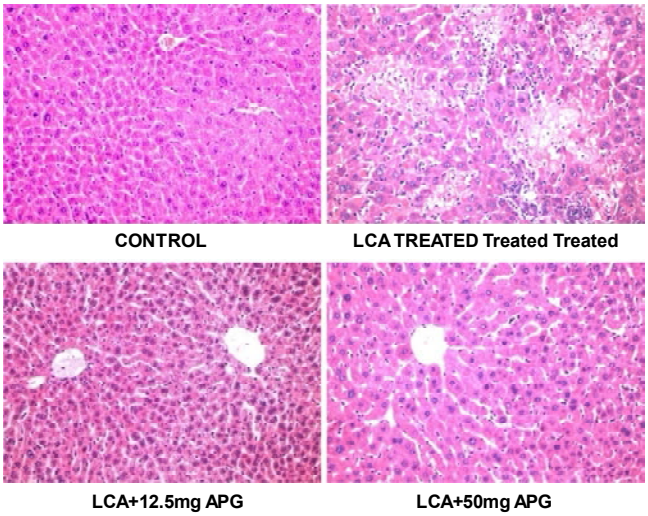


Fig. 6.10: Effect of Apigenin against LCA-induced hepatotoxicity

function parameters, oxidative stress parameters, and qRT PCR analysis clearly showed the hepatoprotective effect of Apigenin against LCA induced toxicity and oxidative stress in mice.

6.4.3.3 Model system *C. elegans* employed for studying toxicity of nano particulate iron (18th Int. Conf. C. elegans, UCLA, USA P298B)

Model system *C. elegans* was employed to study the toxicity of nano particulate iron. It was observed that nano iron induces significant effect on longevity of the nematodes as the life span was reduced by 17% in case of worms treated with 2mM nanoparticle Fe_2O_3; worms treated with equal concentration of bulk Fe_2O_3 did not exhibit a reduced longevity as compared to control subjects. Similarly, nano iron exhibited a significant effect on generation of reactive oxygen species thus increasing the amount of oxidative stress within the worms. It is concluded that: 1) *C. elegans* could successfully be employed in studying toxicity of nanoparticles; 2) nano iron did exhibit whole-organismal toxic effects at 2mM concentration in nematode *C. elegans*; and 3) nanoparticulate form of iron, at tested concentrations, induces comparatively more whole-organismal toxicity than that of the bulk form.

6.4.3.4 *In vitro* studies: Rotenone induced neurotxicity in Neuro2A cells

Study was conducted to investigate the involvement of nitrosative and ER stress in rotenone treated Neuro-2a cell. Results showed that rotenone treatment caused concentration dependent significant decrease in cell viability, increase in nitrite level and expression of ER stress markers (GRP78 and GADD) in cytosolic fractions. Furthermore, rotenone induced DNA damage was assessed by single cell gel electrophoresis in neuro-2A cells. Significant DNA damage in neuronal cells was observed following rotenone treatment. Findings suggested that rotenone treatment caused significant cell death, augmented nitrite level ER stress and consequent DNA damage in neuroblastoma cells.

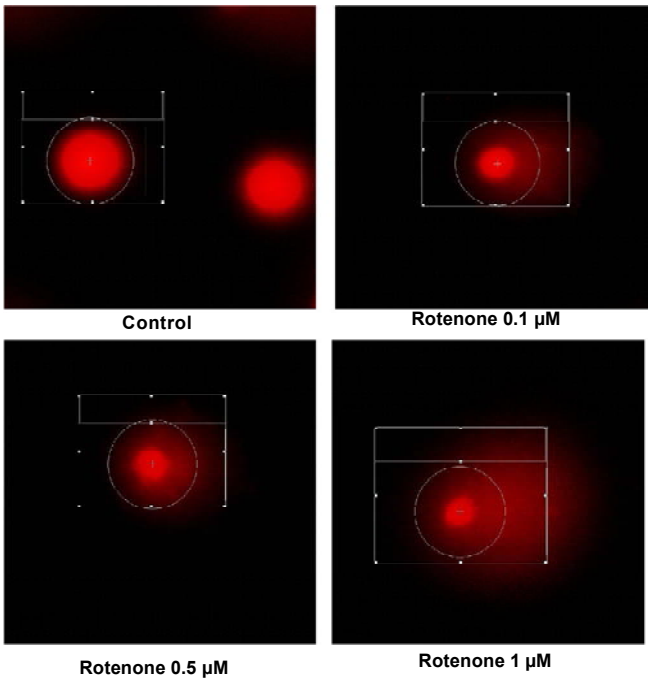


Fig. 6.11: Images showed increase in DNA damage assessed by Single cell gel electrophoresis in Neuro2A cells.

6.4.3.5 Protective effect of melatonin on rotenone induced DNA damage and apoptosis in astroglial and neuronal cells

The effect of melatonin, a clinically used antioxidant was explored against rotenone induced cell death in rat astrocytoma cell line (C6) and mouse neuroblastoma cell line (Neuro 2a). Co-exposure of melatonin (300µM) significantly suppressed rotenone induced free radical generation in both the cell lines. Melatonin effectively protected against rotenone induced DNA damage, nuclear morphological changes and caspase-3 expression in C6 cells. However, melatonin was found ineffective in counteracting altered cell intactness, nuclear morphology, DNA damage and caspase-3 expression in Neuro 2a cells. This conferred that melatonin is effective in glial cell toxicity as an antioxidant but not in neuronal cell death as an anti-apoptotic agent (Proceedings of XXIX Annual conference of Indian Academy of Neurosciences, 2011 p-116)

6.5 Clinical Trials

6.5.1 Compound 97/78 (Anti-malarial agent)

Phase I single dose pharmacokinetic study in healthy volunteers as per revised protocol approved by DCG(I) has been initiated at PGIMER, Chandigarh. So far, study has been completed on 9 healthy volunteers. Recruitment process for remaining 7 volunteers is going on.

6.5.2 CDR134 D123 (Anti-diabetic compound)

The clinical trial data of CDR1345D123 compiled and submitted to AYUSH and has been referred to Extra Ayurvedic Pharmacopia Committee for inclusion. The Committee in May 2011 requested for a Quality Monograph to be prepared as per Ayurvedic Pharmacopia of India specifications including TLC and HPLC Fingerprinting using Phyto-chemical Reference Standards (PRS). The Quality Monograph of the plant *Xylocarpus granatum* was prepared as per Ayurvedic Pharmacopeia of India specifications including TLC and HPLC Fingerprinting using Phyto-chemical Reference Standards (PRS) and submitted to DGCCRAS on 23rd August 2011. Again a letter was received

on 17th October, 2011 requesting for additional Botanical & Chemical information. These data are being generated and will be submitted soon.

6.5.3 CDR134F194 (Anti-hyperglycaemic agent)

The Permission for Phase-I Clinical Trial studies of CDR134F194 was accorded by Drugs Controller General of India on 18 May 2011. The preparations for the drug formulation to be used in Phase-I Single Dose and Multiple Dose Clinical Trial studies and funding for the trial are in progress and the clinical trial would commence soon

6.5.4 Compound 99/373 (Anti-osteoporotic agent)

Plan and protocol of phase I Clinical Trial has been approved by DCG(I) and IEC PGIMER, Chandigarh. Investigators Brochure has been compiled and negotiations with Global Health Private Limited (GHPL) / Medanta – The Medicity, Gurgoan and HLLLifecare Ltd. Mumbai are underway for identifying collaborating partners for Phase I/ POC Trials.

6.5.5 Picroliv (Hepatoprotective agent)

Phase III Clinical Trial in patients of tuberculosis on multi drug therapy has been completed at two centers. Clinical Trial Reports of both centers compiled i.e. 260 patients (Placebo - 124 and Picroliv - 136) at CSM Medical University, Lucknow and 113 patients (Placebo - 57 and Picroliv - 56) at Seth G. S. Medical College and KEM Hospitals, Mumbai. Correspondence with Duphar India Ltd., Mumbai ongoing for deciding future course of action.

6.5.6 Herbal Medicament (Anti-stroke agent)

IND document being prepared by Themis Medicare Ltd., Mumbai in collaboration with Safety and Clinical Development Group, CSIR-CDRI. Draft IND, prepared by Themis, has been reviewed by respective Divisions of CSIR-CDRI and comments forwarded to Themis for preparation of final IND application.

6.5.7 Arteether (Anti-malarial agent)

The dossier on arteether in pediatric patients of *P falciparum* malaria, submitted to the Drugs Controller General of India, was reviewed by expert committee of DCG(I). Further action is to be taken by Themis Medicare as required by DCG(I).

6.5.8 Compound 99/411 (Anti-malarial agent)

Compilation of the preclinical data continued for IND submission in collaboration with IPCA, Mumbai.

6.5.9 Compound 80/574 (Anti-hyperlipidemic agent)

The Dossier for submission to DCG(I) for permission to carry out the Phase III Clinical Trial of CDRI Comp. 80/574 in combination with Atorvastatin versus Atorvastatin alone has been prepared by Cadila Pharma and was submitted to DCG(I). Some documents have been received from Cadila Pharma and some more documents are awaited for independent analyses and possible Repositioning of the promising Hypolipidemic product is in progress.

6.5.10 Puffer Fish Oil (Anti-hyperlipidaemic agent)

The experiments regarding preclinical data especially identification and standardization of Biomarkers of PFO are being generated by Prof Jharna Ray, Calcutta University in response to the comments of IND Committee of DCG(I). The experiments and additional data generation is in progress.

6.5.11 Effect of sulphadoxin–pyrimethmine co-administration on pharmacokinetics of á,â Arteether, an anti–malarial agent, in healthy male volunteers

Protocol approved by IEC CSM Medical University, Lucknow and trial has been initiated. So far 7 volunteers have been recruited in the trial.

CSIR-Central Drug Research Institute, Lucknow

Technical Services & Facilities


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत
CSIR INDIA

Technical Services & Facilities

1 Business Development Activities

The institute continued to explore the business development opportunities for new leads by collaborating with industries, academia, government organizations, funding agencies and foreign bodies to have public-private partnership at an early stage of the development. The major new contract/assignment signed/undertaken by the CSIR-CDRI during reporting period is as follows:

	Title	Industry/Institute	Signing Date
Sponsored Project Agreements			
1.	To investigate the toxicological profile of MA 305 formulation using single dose 14 days toxicity study in mice by oral route.	Maharishi Ayurveda Products Pvt. Ltd., Noida.	24.06.2011
2.	Single dose clinical pharmacokinetic study of CDRI 97/78 in healthy human volunteers following oral administration at 200 mg dose.	Ipca Labortories Ltd., Mumbai.	08.11.2011
3.	14 days systemic toxicity study of Ferrocept in rats.	IIT, Kharagpur.	12.11.2011
4.	14 days systemic toxicity study RISUGadv in rats.	IIT, Kharagpur.	21.11.2011
Consultancy Agreement			
1.	To create a facility for polypeptide synthesis at R&D Centre.	Ranbaxy Laboratories Ltd., Gurgaon.	11.10.2011
Memorandum of Understanding for joint R&D			
1.	Inhalable DNA vaccine for tuberculosis.	Integral University, Lucknow.	12.01.2011
2.	Pharmacological evaluation of homoeopathic medicine under drug standardization programme of CCRH.	Central Council for Research in Homeopathy, New Delhi.	02.02.2011
3.	Nanoreservoirs carrying *Brugia malayi* recombinant proteins as potential vaccine against experimental lymphatic filariasis.	Integral University, Lucknow.	10.02.2011
4.	Synthesis of biologically potent bisphosphonates.	Sri Venkateshwara University, Tirupati.	23.03.2011
5.	Effect of sulphadoxine – pyrimethamine co-administration on pharmacokinetics of α/β – Arteether, an antimalarial agent in healthy male volunteers.	Chhatrapati Shahuji Maharaj Medical University, Lucknow.	19.04.2011
6.	Isolation and characterization of antidiabetic secondary metabolites from two selected medicinal plants.	Chhatrapati Shahuji Maharaj Medical University, Lucknow.	07.07.2011
7.	The assessment of prenatal exposure of newer antidepressant drug.	Allahabad University, Allahabad.	11.07.2011
8.	For the establishment of an international collaboration in research and education.	University of California at San Diego, School of Medicine, USA.	23.09.2011
9.	An innovation in distraction osteogenesis for mandibular regeneration using a refined transport distractor.	C.S.M. Medical University, Lucknow.	13.10.2011
Memorandum of Agreement			
1.	Structural analysis of bacterial peptidyl-tRNA hydrolase enzymes and design of high affinity binders.	DBT, New Delhi.	13.12.2011
Secrecy Agreement			
1.	Phytoextract from Plant 4744 showing osteoprotective activity.	Arjuna Natural Extracts Limited, Kochi, Kerala.	10.05.2011
2.	Compound 93/478 showing anti-ischemic-cardio protective and anti-hypertensive activity.	Laila Pharmaceuticals Pvt. Ltd., Tamil Nadu.	25.07.2011
3.	A fracture healing bone anabolic agent.	Kemxtree LLC, NJ, USA.	02.09.2011
4.	Plant- 4744/F004 showing osteoprotective activity.	Supreem Pharmaceuticals, Mysore.	28.09.2011

5.	An anti-osteoporosis (antiresorptive) compound designated as 99/373 for the management of estrogen deficiency including post menopausal osteoporosis.	HLL Lifecare Ltd., Thiruvananthapuram	14.12.2011
Material Transfer Agreement			
1.	Inhibitors of the essential protein Dam methylase from endosymbiotic bacteria *Wolbachia.*	National Cancer Institute, National Institutes of Health, USA.	25.01.2011
2.	Material clone MyavA.01155.a. A1.	Seattle Biomedical Research Institute, Seattle.	17.03.2011
3.	Material – Antisera recognizing N-6 methyladenine.	New England BioLabs, MA 01938-2723.	10.06.2011
4.	Material- AR423 strain.	National University Corporation Kumamoto University, Japan.	05.07.2011
5.	Material – Green fluorescent protein GFP - *Leishmania donovani* Dd8 strain.	HongKong Polytechnic University.	09.08.2011

2. S&T Management Activities

The Division of S&T Management was involved in multifarious activities viz.:

PME Activities

- Preparation of 12th Five Year Plan Projects;
- Preparation of R&D Highlights document & Director's R.C. presentation;
- Planning, monitoring and reporting of budget for in-house, network and external projects;
- Organized quarterly/six monthly/annual project monitoring meetings for network and in-house project areas.
- Coordinated with the CSIR/CAG Audit towards the performance Audit of 10th plan projects, in-house and externally funded projects;
- Centralized Management of all kinds of project folders;
- Developed and launched online project management software;
- Processing of indents and their display every month on CDRI's Intranet;
- Preparation of monthly reports;
- Co-ordination of OSDD related projects.

IPR Management

- Protection of innovations;
- Coordination for filing and grant of Indian and foreign applications/patents;
- Recommendations for renewal of patents/ commercialization status;
- Maintenance of information on IP system/surveillance;
- Response to queries on IP related issues.

HR Activities

- Organization of orientation program for newly recruited staff of the Institute;
- Updation of guidelines structured for training programs at CDRI;
- Framing new guidelines for participation of research fellows of CDRI in conferences/symposia/seminars/workshops held in India and abroad;
- Organizing CSIR Program on Youth for Leadership in Science-2011;
- Processing of staff nominations for honours & awards, fellowships and training programs;
- Processing of requests of staff and research fellows for participation in various fora.

Institutional Publications

- CSIR-CDRI Annual Report 2011-12;
- CSIR-CDRI Newsletters (two issues).

ISTAG

- Coordination of Institute scientists' deputation abroad under different programs;
- Coordination of distinguished foreign visitors to CDRI;
- Coordination of foreign students under various international fellowships.

Societal Activities

- Coordination of a CSIR sponsored program on "Faculty Training, Motivation and Adoption of Schools & Colleges in 2011;
- Implemented health education programme for rural schools.

Database Management

- CDRI chemical library, synthetic compounds and natural products;
- Projects, patents, staff, research fellows, budget, ECF, projects, awards, conferences / symposia / seminars/ workshops, etc.

Dissemination of Technical Information

- Technical and non-technical information on institute's programs and activities;
- Release of advertisements for souvenirs;
- Responding to parliament queries;
- Response to queries from various corners (Govt./non-Govt. agencies);
- Coordination of Biological screening services provided to the external users.

RTI

- Response to queries on scientific and technical matters.

3. Sophisticated Analytical Instrument Facility

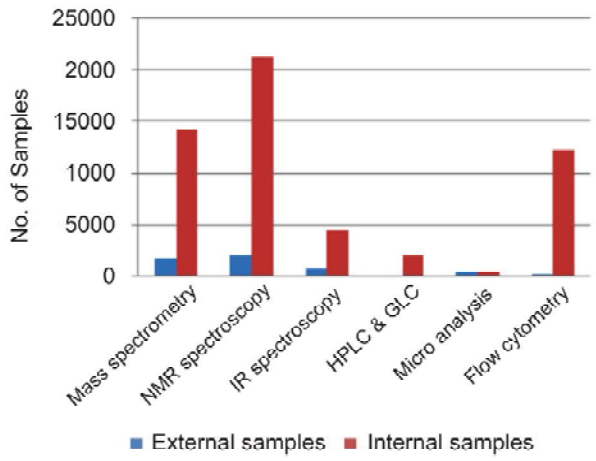
Objective of the facility /services:

Sophisticated Analytical Instrument facility at Central Drug Research Institute, Lucknow is more than 30 years old and is one of the first four such facilities set up by the Department of Science & Technology (DST), Government of India to fulfill the following objectives.

- Provide facilities of sophisticated analytical instruments to scientists and other users from academic institutes, R&D laboratories and industries to enable them to carry out measurements for R&D work;
- Acquire and develop capability for preventive maintenance and repair of sophisticated instruments;
- Organize short term courses/workshops on the use and application of various instruments and analytical techniques;
- Train technicians for maintenance and operation of sophisticated instruments;
- Development of new measurement/analytical techniques: Apart from providing routine analytical techniques/methods of analysis available on the instruments, efforts are made by the SAIF to develop new techniques/methods of analysis to put the instruments to their full use and offer them to the scientists for exploring new dimensions in research in various areas of science and technology.

S&T services provided during reporting period:

During the period (Dec. 2010 to Nov. 2011) the centre carried out analyses of 4658 external and 42755 internal samples. Users were from University/ Colleges, National Labs./Govt. Organization and industries.



4. Electron Microscopy

Electron microscopy unit is equipped with scanning and transmission electro microscopes and confocal microscope. Analytical services provided during the year of report are as follows:

Instrument	Internal samples	External samples	Total No.
Electron Microscopy	690	151	841
Confocal Microscopy	978	0	978

5. National Laboratory Animal Centre

The National Laboratory Animal Centre at the institute undertakes breeding, propagation and maintenance of various laboratory animal species for scientific usage in biomedical research and drug evaluation programmes. During the period, the centre ensured regular and timely supply of healthy and defined animals to different in-house and sponsored research projects. It also maintained the experimental *rhesus macaques* obtained from government recognized animal supplier. These macaques were duly quarantined and tested for any microbial or parasitic infections prior to experimentation. The centre also harbours an eco-friendly run for post experimental rehabilitation of monkeys based on the prescribed guidelines. In addition, the centre extended supply of tissue, organ, blood and sera samples of laboratory animals for research purposes. The qualified and experienced staff also completed proper health monitoring of all laboratory animals through microbiological, parasitological, pathological screening, radiological monitoring of monkeys, nutritional monitoring of laboratory animal feed, feed trial studies, production of special research diets like high sucrose, fat and/or cholesterol diets for more precise studies. The animal facility was also involved in HRD programme in laboratory animal science through conducting various training courses including care, breeding and management, health monitoring and quality control, nutritional monitoring, diagnosis and management of laboratory animal diseases.

a) Breeding and maintenance of following laboratory animals (9 species and their >25 strains):

Species & Strains	Status
Mouse	
Swiss	Out-bred
Park's strain (PS)	-do-
BALB/C	Inbred
AKR	-do-
NZB	-do-
AJ	-do-
C57BL/6	-do-
NOD	-do-
db/db	-do-
Apo e	-do-
DBA/1J	-do-
Rat	
Sprague Dowley (SD)	Out-bred
Druckrey (DR)	-do-
Charles Foster (CF)	-do-
Wistar	Inbred
SHR	-do-
F344	-do-
Hamster	
Golden hamster	Both, Out-bred & In-bred
White hamster (Mutant of Golden Hamster)	Inbred
Golden hamster	-do-
Gerbil	
Mongolian strain	Out-bred

Mastomys Rat	
Coucha strain	-do-
Guinea Pig	
English albino	-do-
Rabbit	
New Zealand White	-do-
Belgian	-do-
Sheep	
Indian breed	Farm-bred
Monkey	
Rhesus species	Wild caught

b) Supply of experimental animals for research purposes:

A total of 44428 animals were supplied for research studies, out of which 5912 animals costing Rs 19,41,940/- were supplied to CPCSEA registered outside research and academic institutions including pharmaceutical companies. Break-up is given below.

	Services Details	Total Numbers
a)	Supply of research animals to CDRI in-house projects	18644
b)	Supply of animals to Extramural projects in CDRI	19872
c)	Supply of animals to CPCSEA registered institution	
	Government sector	4187
	Private sector	1725
	Total	**44428**

c) Other technical services rendered:

- Microbiological, hematological and biochemical screening : 937 Nos.
- Parasitological screening : 1016 Nos.
- Nonhuman primates in rehabilitation : 26 Nos.
- Tuberculin testing of monkeys performed : 222 Nos.
- Chest radiography of monkeys undertaken : 60 Nos.
- Pathological Monitoring including PM cases : 336

6. Tissue & Cell Culture Unit

Major objective of the unit is development & upkeep of central tissue culture facility including maintenance, propagation, cryopreservation & revival of cell lines as listed in the table. During the reporting period, T-25 Cell Culture Flasks numbering 117 of various cell lines were made available to the user scientists including outside user e.g. Eastern Medikit Ltd., Gurgaon, Haryana also on payment basis.

a) List of cell lines under maintenance (Name of cell lines)

- MCF-7 Human Breast Cancer ER +ve
- MDA MB 231 Human Breast Cancer ER -ve
- L 929 Mouse Connective tissue fibroblasts
- THP 1 Human Monocyte
- HEK 293 Human Embryo Kidney
- H9c2 Rat myoblasts
- Hep G2 Human Liver carcinoma
- Hep 3B Human Liver carcinoma
- 3T3 L1 Mouse Embryo fibroblasts
- J774 A.1 Mouse Macrophage
- Vero C 1008 African Green Monkey Kidney fibroblasts
- C 6 Rat Glioma
- L 6 Rat Muscle
- SHSY 5Y Human Neuroblastoma
- hGF Human Gingival fibroblast- Primary culture
- Neuro-2A Mouse Neuroblastoma

7. S&T Knowledge Resource Centre

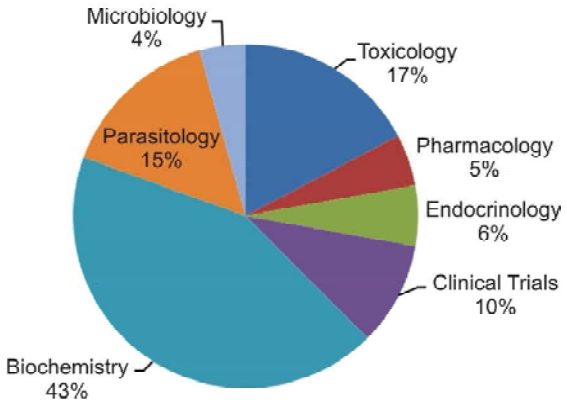
The S&T Knowledge Resource Centre (KRC) has been established with an objective to provide biomedical information services for the scientists in the era of information boom. The centre also caters to the needs of the pharmaceutical industry, entrepeneures, and researchers involved in biomedical research. The center is computerized and conforms to the norms of e-governance.

KRC continued to provide information services to its users and a total of 1255 outside users (Students of M. Pharm, Biotechnology, Biomedical Sciences) utilized these services during the year. Its present collection comprises of 22494 books and 73969 bound volumes of journals. Centre also provides access to various e-journals, open source resources and bibliographic databases viz-Scifinder, Web of Science, R&D Insight etc. The centre also manages, maintains and updates the institute website and institutional repository. The centre published a monthly periodical 'Drugs & Pharmaceuticals Industry Highlights' incorporating periodical 'Drugs & Pharmaceutical R & D Highlights'.

In addition, centre provides services to the scientists of institute and other scientific organizations in photography, power point presentations, exhibitions, display panels, posters, designing of covers and layouts for institutional publications.

8. Biometry & Statistics

The division has an objective of assisting the scientists in planning and designing of experiments, analysing data and drawing inferences. During the year, laboratory data obtained from various R&D divisions were analysed within stipulated time using SYSTAT 12.0 and STATISTICA 7.0 software. The pie diagram depicts the proportional time spent for and works from various divisions during the reported period. During reporting period, a criteria has been developed for selection of glucose profiles and the probability of initial glucose levels to estimate the anti-hyperglycemic activity. Significance of percent activity was obtained for 360 compounds of



SLM studies, 140 compounds of STZ studies and 124 compounds of STZ-S studies.

9. Information Technology Services

Computer Division provided following services during the reporting period:

- Creation of Repository Database for CSIR-CDRI candidate drugs.
- MoES database application software was developed and implemented for online transaction.
- Setting up of a state-of-art LAN/WAN infrastructure for the New CSIR-CDRI Campus, Sitapur Road, Lucknow.
- Projects leveraging NKN (National Knowledge Network) infrastructure and services.
- Comprehensive ERP implementation.
- Designing complete layout on internet cabling system using fiber optic and UTP cables.
- Implemented antivirus software and firewall to avoid any virus threat to our Network.
- Development of R&D databases and portals.
- Implementation and maintenance of GLP Computers.
- Complete video-conferencing and audio-visual coverage in different national and international seminars, conferences and workshops.
- In-house maintenance of Online Stores & Purchase Software.
- Following new software applications developed:
    a. Online Application for Ph.D. registration (For Academic Affairs Unit).
    b. SAIF Web Application (For online management of SAIF division work).
    c. Online Survey application for CSIR-CDRI employees.
    d. Online slot reservation application for UID generation (For CSIR-CDRI Staff Club).
    e. Online Student Management System (For Academic Affairs Unit, CSIR-CDRI).
    f. E-calendar for CSIR-CDRI RC-Meeting .

10. Instrumentation

Instrumentation Division continued to provide efficient, economical and effective repair, maintenance, upkeep of sophisticated analytical, biomedical, electronics and laboratory equipments. Division maintained uninterrupted power supplies of all the divisions of the Institute. In case of non-availability of imported components, equivalent indigenous substitutes were installed to ensure the smooth functioning of equipments. Specifications and technical evaluations were prepared for the procurement of state of the art new equipments.

Certified standards for weight, temperature, time, volume, pH and rpm were maintained. Laboratory equipments of different divisions of Institute were calibrated as per GLP guidelines.

11. Academic Affairs

The unit serves as a centre for the management of research students working in different departments of the institute. The activities carried out during the period include:

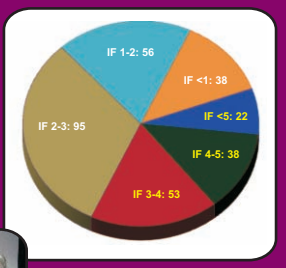
- Compilation of pre-Ph.D. course work under AcSIR for life and chemical sciences.
- Liaised with IICB Kolkata and CLRI Chennai for the approval of AcSIR Pre-Ph.D. course work.
- Liaised with Jawaharlal Nehru University for the reorientation of the Pre-Ph.D course by introducing interdisciplinary course structure, highly subjective in depth optional courses and series of specialized optional courses under life/chemical sciences for basic/applied research.
- Selection of students for registration at AcSIR for Pre-Ph.D program through interview for the batches commencing fall and spring 2011 and for the spring 2012.
- Liaised with AcSIR-HQ for the registration of students working at CSIR-CDRI.
- Initiation of Pre-Ph.D course work under AcSIR for life sciences from Aug 2011.
- Examination and evaluation of the first batch of AcSIR students.
- Initiation of Pre-Ph.D course work for CSIR-CDRI students registered at Jawaharlal Nehru University.
- Coordinated and conducted examination of the pre-Ph.D. course work for CSIR-CDRI students registered at Jawaharlal Nehru University.
- Liaised with Jawaharlal Nehru University for timely registration, synopsis approval, thesis submission, Ph.D. viva at CSIR-CDRI etc.
- Coordinated centralized admission of Junior Research Fellows for the batches commencing July 2011 and Jan 2012.
- Coordinated centralized admission of GATE-JRFs for the session commencing July 2012.
- Coordinated and regularized selection of LS-qualified project assistants under externally funded projects by holding interviews on 24th of every month.
- Screening and endorsement of post-doctoral application forms being submitted by Ph.D. students from outside CSIR-CDRI to Indian funding agencies.
- Developed a new “Human Resource Management System” software dealing with the online registration of research students (JRFs/SRFs/PAs/RAs) with the help of our Computer Division. All activities of students pertaining to leave/salary form/Ph.D. registration/ reimbursement/participation in symposium/up gradation/Thesis submission etc. will be done using this software. The software was launched 1 Jan 2012.

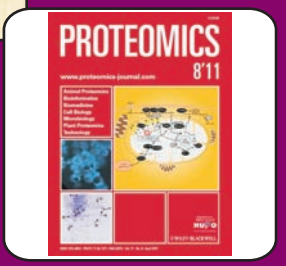
12. Laboratory Engineering Services

The Lab Engineering Services division continued to provide Engineering Services to the Institute to maintain the Infrastructure for R&D work. The major works carried out during reporting period are as follows:

- Progress monitoring & co-ordination of the New CDRI campus being setup at Sitapur Road, Lucknow.
- Establishment of Animal Health Monitoring lab.
- Installation of new tube well at sector ‘K’ Aliganj.
- Renovation of canteen at sector ‘K’ Aliganj.
- Renovation of CSIR-IITR vacated area of Animal House.
- Renovation of Toilets at CSIR Dispensary, Nirala Nagar.
- Roof waterproofing of CSIR Scientist Apartment Aliganj.
- Air conditioning of Breeding and Experimental unit of Animal House.
- Renovation of CSIR Guest House at second floor, sector ‘K’ Aliganj.
- Renovation of 'Infectious block' for make shift arrangement of Accounts and Purchase division after collapse of Porch.
- Maintenance of Labs, lifts, DG sets, AC plants etc.

Notes





Research Output


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत
CSIR INDIA

1 Publications

2010

1. Srivastava AN, Gupta A, Srivastava S, Natu SM, Mittal B, Negi MPS and Prasad R. Cisplatin combination chemotherapy induces oxidative stress in advance non small cell lung cancer patients. **Asian Pacific Journal of Cancer Prevention 11(2), 465-471**
2. Kumar N, Gupta S, Dube A, and Vyas SP. Emerging role of vesicular carriers for therapy of visceral leishmaniasis: Conventional versus novel. **Critical Reviews in Therapeutic Drug Carrier Systems 27(6), 461-507**
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2011

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2. Agarwal A, Awasthi SK and Murthy PK. *In vivo* antifilarial activity of some cyclic and acylic alcohols. **Medicinal Chemistry Research 20, 430-434**
3. Agrawal R, Tyagi E, Shukla R and Nath C. Insulin receptor signaling in rat hippocampus: A study in STZ (ICV) induced memory deficit model. **European Neuropsychopharmacology 21(3), 261-273**
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1. Mir SS, Biswas S and Habib S (2011). Targeting apicoplast pathways in Plasmodium. In ***'Apicomplexan Parasites'***. Eds. Katja Becker and Paul M. Selzer, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. Pages 169-187. ISBN: 978-3-527-32731-7

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4. Bathula SR, Huang L. (2011) Gene therapy with plasmid DNA. In **Burger's Medicinal Chemistry, Drug Discovery, and Development**. Seventh Edition, Ed. Donald J. Abraham and David P. Rotella, DOI: 10.1002/0471266949.bmc073.pub2

Instruction Manual

1. ***Prayogshala Jantu Prabandhan evem Takniki Digdarshika (in Hindi).*** Ed. Upadhyay DS, Sharma R. & Rai K. ISBN: 81-85042-18-7

2 Patents

Patents Granted Abroad in 2011	**:**	**09**
Patents Granted in India in 2011	**:**	**02**
Patents Filed Abroad in 2011	**:**	**07**
Patents Filed in India in 2011	**:**	**10**

Patents Granted Abroad:

2011

1. **Title:** Herbal extracts of *Salicornia* species, process of preparation thereof, use thereof against tuberculosis
Kenyan Patent No. AP/P/2006/003567 **Date of Grant:** 29-July-2011
Inventors: Meena Rajnikanth Rathod, Bhupendra Dhanvantrai Shethia, Jayant Batukrai Pandya, Pushpito Kumar Ghosh, Prakash Jagjivanbhai Dodia, Brahm Shanker Srivastava, Ranjana Srivastava, Anil Srivastava, Chittar Mal Gupta & Vinita Chaturvedi

2. **Title:** Herbal extracts of *Salicornia* species, process of preparation thereof, use thereof against tuberculosis
Sudan Patent No. AP/P/2006/003567 **Date of Grant:** 29-July-2011
Inventors: Meena Rajnikanth Rathod, Bhupendra Dhanvantrai Shethia, Jayant Batukrai Pandya, Pushpito Kumar Ghosh, Prakash Jagjivanbhai Dodia, Brahm Shanker Srivastava, Ranjana Srivastava, Anil Srivastava, Chittar Mal Gupta & Vinita Chaturvedi

3. **Title:** Herbal extracts of *Salicornia* species, process of preparation thereof, use thereof against tuberculosis
Tanzanian Patent No. AP/P/2006/003567 **Date of Grant:** 29-July-2011
Inventors: Meena Rajnikanth Rathod, Bhupendra Dhanvantrai Shethia, Jayant Batukrai Pandya, Pushpito Kumar Ghosh, Prakash Jagjivanbhai Dodia, Brahm Shanker Srivastava, Ranjana Srivastava, Anil Srivastava, Chittar Mal Gupta & Vinita Chaturvedi

4. **Title:** Herbal extracts of *Salicornia* species, process of preparation thereof, use thereof against tuberculosis
Zambia Patent No. AP/P/2006/003567 **Date of Grant:** 29-July-2011
Inventors: Meena Rajnikanth Rathod, Bhupendra Dhanvantrai Shethia, Jayant Batukrai Pandya, Pushpito Kumar Ghosh, Prakash Jagjivanbhai Dodia, Brahm Shanker Srivastava, Ranjana Srivastava, Anil Srivastava, Chittar Mal Gupta & Vinita Chaturvedi

5. **Title:** Herbal extracts of *Salicornia* species, process of preparation thereof, use thereof against tuberculosis
Zimbabwe Patent No. AP/P/2006/003567 **Date of Grant:** 29-July-2011
Inventors: Meena Rajnikanth Rathod, Bhupendra Dhanvantrai Shethia, Jayant Batukrai Pandya, Pushpito Kumar Ghosh, Prakash Jagjivanbhai Dodia, Brahm Shanker Srivastava, Ranjana Srivastava, Anil Srivastava, Chittar Mal Gupta & Vinita Chaturvedi

6. **Title:** New herbal composition for treating gastric ulcer
Canadian Patent No. 2480223 **Date of Grant:** 21-June-2011
Inventors: Janaswamy Madhusudhana Rao, Upparapally Sampathkumar, Boggavarapu Subrahmanya Sastry, Jhillu Singh Yadav, Kondapuram Vijaya Raghavan, Gautam Palit, Deepak Rai, Madhu Dikshit, Panniyampally Madhavankutty Varier, Trikovil Sankaran Muraleedharan & Kollath Muraleedharan
Supporting Staff: Dwarka Nath Bhalla, Tarun Lata Seth & Md. Saleem Ansari

7. **Title:** A process for the isolation of an antidiabetic and antihyperlipidimic fraction from the fruits of *Xylocarpus granatum*, a mangrove plant
United States Patent No. 7959954 **Date of Grant:** 14-June-2011
Inventors: Vijai Lakshmi, Ajet Saxena, Rajesh Kumar, Raghwendra Pal, Satyawan Singh, Arvind Kumar Srivastava, Preeti Tiwari, Deepak Raina, Anil Kumar Rastogi, Sudhir Srivastava, Mahendra Nath Srivastava, Ramesh Chandra, Anju Puri & Ram Raghubir
Supporting Staff: Hriday Ram Mishra, Suresh Chandra, Naveen Prakash Misra, Mukesh Srivastava, Tika Ram & R.R.Gupta

8. **Title:** An improved process for preparation of trans-3,4-diarylchroman
South African Patent No. 2010/04272 **Date of Grant:** 30-March-2011
Inventor: Devi Prasad Sahu
Supporting Staff: Atma Prakash Dwivedi

9. **Title:** Herbal medicaments for treatment of neurocerebrovascular disorders
Japanese Patent No. 4695839 **Date of Grant:** 4-March-2011
Inventors: Madhur Ray, Raghwendra Pal, Satyawan Singh & Nandoo Mal Khanna
Supporting Staff: Jharna Arun & Madhuri Chaudhari

2010

(Not included in the Annual Report 2010-11)

1. **Title:** Herbal medicaments for treatment of neurocerebrovascular disorders
   Korean Patent No. 10-1001815 **Date of Grant:** 9-December-2010
   Inventors: Madhur Ray, Raghwendra Pal, Satyawan Singh & Nandoo Mal Khanna
   Supporting Staff: Jharna Arun & Madhuri Chaudhari

2. **Title:** Herbal medicaments for treatment of neurocerebrovascular disorders
   Estonian Patent No. P200400097 **Date of Grant:** 13-October-2010
   Inventors: Madhur Ray, Raghwendra Pal, Satyawan Singh & Nandoo Mal Khanna
   Supporting Staff: Jharna Arun & Madhuri Chaudhari

Patents Granted in India:

2011

1. **Title:** Oxy-substituted flavones as antihyperglycemic and antidyslipidemic agents
   Patent No. 247797 **Date of Grant:** 20-May-2011
   Inventors: Ram Pratap, Satyanarayana Mavurapu, Chandeshwar Nath, Ram Raghubir, Anju Puri, Ramesh Chander, Priti Tiwari, Brajendra Kumar Tripathi & Arvind Kumar Srivastava

2. **Title:** Novel spermicidal and antifungal agents
   Patent No. 245815 **Date of Grant:** 02-February-2011
   Inventors: Anil Kumar Dwivedi, Vishnulal Sharma, Niharika Kumaria, Kiran Kumar, Gopal Gupta, Jagdamba Prasad Maikhuri Janak Dulari Dhar, Pradeep Kumar, Abdul Haq Ansari, Praveen Kumar Shukla, Manish Kumar, Raja Roy, Kunnath Padmanabhan Madhusudhanan & Ram Chandra Gupta
   Supporting Staff: Bhawani Shankar Joshi, Tara Rawat, Somendra Nath Roy & Seraj Alam Ansari

Patents Filed Abroad:

2011

1. **Title:** Polymeric nanomatrix associated delivery of Kaempferol in rats to improve its osteogenic action
   PCT Application No. 020110111285 **Date of Filing:** 29-August-2011
   Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay & Anil Kumar Dwivedi

2. **Title:** Polymeric nanomatrix associated delivery of Kaempferol in rats to improve its osteogenic action
   PCT Application No. 2010217238 **Date of Filing:** 26-August-2011
   Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay & Anil Kumar Dwivedi

3. **Title:** Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders
   Chinese Application No. 200980152325.9 **Date of Filing:** 23-June-2011
   Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi
   Supporting Staff: Abdul Malik & Avinash Kumar

4. **Title:** Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders
   Korean Application No. 10-2011-7012523 **Date of Filing:** 31-May-2011
   Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi
   Supporting Staff: Abdul Malik & Avinash Kumar

5. **Title:** Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders
   Japnese Application No. 2011-535212 **Date of Filing:** 06-May-2011
   Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi
   Supporting Staff: Abdul Malik & Avinash Kumar

6. **Title:** Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders
   European Application No. 09787590.0 **Date of Filing:** 05-May-2011
   Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi
   Supporting Staff: Abdul Malik & Avinash Kumar

7. **Title:** Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders
US Application No: 13/127913 **Date of Filing:** 05-May-2011
Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi
Supporting Staff: Abdul Malik & Avinash Kumar

2010

(Not included in the Annual Report 2010-11)

1. **Title:** Novel donor-acceptor flurene scaffolds: a process and uses thereof
Chinese Application No. 200980119745.7 **Date of Filing:** 29-November-2010
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & R. S. Anand

2. **Title:** Novel donor-acceptor flurene scaffolds: A process and uses thereof
Democratic Republic of Korea Application No. 20101150004288 **Date of Filing:** 18-November-2010
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & R. S. Anand

3. **Title:** *Ulmus wallichiana* PLANCHON derived extract, designated as "osteoanabol" and its compounds employed in prevention or treatment of osteo-health related disorders
Japenese Application No. 2010-549257 **Date of Filing:** 2-November-2010
Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya & Naibedya Chattopadhyay
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

4. **Title:** A bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for treatment of osteo-health disorders
Chinese Application No. 200980113792.0 **Date of Filing:** 2- October-2010
Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya & Naibedya Chattopadhyay
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

5. **Title:** Novel hydroxy functionalized 1,2,4-trioxanes and their derivatives useful as antimalarial agents and a process for the preparation thereof
Vietnam Application No. 1-2010-02715 **Date of Filing:** 11-October-2010
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri

6. **Title:** Novel hydroxy functionalized 1,2,4-trioxanes and their derivatives useful as antimalarial agents and a process for the preparation thereof
Aripo Application No. AP/P/2010/005405 **Date of Filing:** 08-October-2010
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri

7. **Title:** Novel donor-acceptor flurene scaffolds: A process and uses thereof
US Application No. 12/894428 **Date of Filing:** 30-September-2010
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & R. S. Anand

8. **Title:** Novel hydroxy functionalized 1,2,4-trioxanes and their derivatives useful as antimalarial agents and a process for the preparation thereof
Brazilian Application No. PI0822467-6 **Date of Filing:** 27-September-2010
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri

9. **Title:** Novel hydroxy functionalized 1,2,4-trioxanes and their derivatives useful as antimalarial agents and a process for the preparation thereof
OAPI Application No. 1201000324 **Date of Filing:** 27-September-2010
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri

10. **Title:** A bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for treatment of osteo-health disorders
European Application No. 09718537.5 **Date of Filing:** 03-September-2010
Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya & Naibedya Chattopadhyay
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

11. **Title:** A bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for treatment of osteo-health disorders
US Application No. 12/920927 **Date of Filing:** 03-September-2010
Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya & Naibedya Chattopadhyay
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

Patents Filed in India:

1. **Title:** Triazole substituted terpenyl pyrazolidines and process for preparation thereof
Application No. 3493DEL2011 **Date of Filing:** 05-December-2011
Inventors: Shivaji Narayan Suryawanshi, Suman Gupta, Avinash Tiwari, Shalini Singh, Monika Mittal & Rahul Shivhare
Supporting Staff: Manju

2. **Title:** Terpenyl isoxazole based hybrid compounds and process for preparation thereof
Application No. 3494DEL2011 **Date of Filing:** 05-December-2011
Inventors: Shivaji Narayan Suryawanshi , Suman Gupta, Neena Goyal, Santosh Kumar ,Monika Mittal & Rahul Shivhare
Supporting Staff: Manju

3. **Title:** Heteroterpenoid carboxylic acid and derivatives and a process for preparation thereof
Application No. 3495DEL2011 **Date of Filing:** 05-December-2011
Inventors: Shivaji Narayan Suryawanshi, Suman Gupta, Santosh Kumar, Monika Mittal & Aditya
Supporting Staff: Manju

4. **Title:** Substituted 4-arylthiazole-2-hydrazone derivative for the treatment of tuberculosis
Application No. 1580DEL2011 **Prov. Date of Filing:** 03-June-2011
Inventors: Supriya Singh, Kuldeep Kumar Roy, Sandeep Kumar Sharma, Ranjana Srivastava, Vinita Chaturvedi & Anil kumar Saxena
Supporting Staff: Zahid Ali & Arimardan Singh Kushwaha

5. **Title:** *Dalbergia sisso* derived extract and compounds employed in prevention or treatment of osteo-health related disorders
Application No. 1206DEL2011 **Prov. Date of Filing:** 25-April-2011
Inventors: Rakesh Maurya, Preety Dixit, Ritu Trivedi, Vikram Khedgikar, Jyoti Gautam, Avinash Kumar, Divya Singh, Shelendra Pratap Singh, Wahajuddin, Girish Kumar Jain & Naibedya Chattopadhyay
Supporting Staff: Satish Chandra Tiwari, Bendangla Chagkija & Priyanka Kushwaha

6. **Title:** Oligopeptides and process for preparation thereof
Application No. 0732DEL2011 **Prov. Date of Filing:** 16-March-2011
Inventors: Tushar Kanti Chakraborty, Gajula Praveen Kumar, Dulal Panda & Jayant Asthana

7. **Title:** Substituted 1,2,3,4-tetrahydroquinolin-7-yl carbamates, their preparation, and use thereof as acetylcholinesterase (AChE) inhibitors for the treatment of Alzheimer's and other neurodegenerative disease
Application No. 0363DEL2011 **Prov. Date of Filing:** 14-February-2011
Inventors: Kuldeep Kumar Roy, Santoshkumar Tota, Chandishwar Nath, Rakesh Shukla & Anil Kumar Saxena

8. **Title:** Aryl aryl methylthioarenes (AAMTAs) as antimalarial agents and a process for the preparation thereof
Application No. 0364DEL2011 **Prov. Date of Filing:** 14-February-2011
Inventors: Gautam Panda, Priyanka Singh, Sanjit Kumar Das, Subal Kumar Dinda, Manish Goyal & Uday Bandopadhyay

9. **Title:** Novel 3,3-spiroanellated 5,6-disubstituted -1,2,4-trioxanes as antimalarial agents and a process for the preparation thereof
Application No. 0265DEL2011 **Prov. Date of Filing:** 04-February-2011
Inventors: Prem Prakash Yadav, Sunil Kumar Puri, Ranjani Maurya & Awakash Soni

10. **Title:** Chiral 3-aminomethylpiperidine derivatives as inhibitors of collagen induced platelet activation and adhesion
Application No. 0208DEL2011 **Prov. Date of Filing:** 31-January-2011
Inventors: Dinesh Kumar Dikshit, Madhu Dikshit, Tanveer Irshad Siddiqi, Anil Kumar, Ravi Shankar Bhatta, Girish Kumar Jain, Manoj Kumar Barthwal, Ankita Misra, Vivek Khanna, Prem Prakash, Manish Jain & Vishal Kumar
Supporting Staff: Surendra Singh, C.P. Pande, Kanta Bhutani & M.S. Ansari.

3 Papers Presented in Scientific Conventions

2010

International Symposium on TB Diagnostics: Innovating to Make an Impact, New Delhi (16-17 December)

1. Association of HLA and VDR variants with cytokine profile and bacterial viability in *M. tuberculosis* infected human MDMs following treatment with anti tuberculosis drugs and drug loaded microparticles, Amit K Singh, Rajiv Garg and Amit Misra

2011

National Seminar on Mass Spectrometry 2011, Lucknow (11-12 January)

1. New technique on mass spectrometry of natural product, Vikas Bajpai, Nikhil Kumar and Brijesh Kumar
2. Application of Q-TOF mass spectrometer on *Ulmus Wallichiana* plant, Deepty Sharma, KR Arya and Brijesh Kumar
3. Rapid identification of herbal products using characteristic mass spectrum Fingerprint, Pragya Singh, Sanjeev Kanojiya, Dipak Kumar Mishra, Sanjeev K Shukla and Brijesh Kumar

Keystone Symposium (J3) Tuberculosis: Immunology, Cell Biology and Novel Vaccination Strategies, Vancouver, Canada (15 -20 January)

4. Variations in macrophage responses to infection with *Mycobacterium tuberculosis* and treatment with microparticles affect bacterial survival, Amit K Singh, Rajiv Garg and Amit Misra

3rd National Symposium on Modern Trends in Differential Geometry and Mathematical Modelling in Biosciences, Lucknow (15-16 January)

5. Mathematical approach for studying control of glucose levels in Type I *diabetes mellitus*, Mukesh Srivastava, Richa Srivastava, AK Srivastava and M Abbas

National Symposium on New Paradigms in Laboratory Animal Science in an Era of Advanced Biomedical Research, IVRI, Izatnagar (28-29 January)

6. Role of physical factors on housing environment and welfare of laboratory animals, A base line of biomedical research, AK Srivastava and D Hansda
7. Sterilization procedure of cages, drinking bottles and bedding material for housing of laboratory animals in an animal facility, AK Bhargava, AK Srivastava and D Hansda
8. Certain organs of biomedical importance of laboratory animals, D Hansda, AK Srivastava, K Rai and DS Upadhyay
9. Effect of nutrition on the growth parameters of sprague dawley rat (*Rattus norvegicus*), Pompy Mukhopadhyay, DS Upadhyay, Ravindra Singh and D Hansda
10. Ectoparasiticidal agent used in different concentration for treatment of laboratory rodent at Central Drug Research Institute, Lucknow, D Hansda, AK Srivastava, K Rai and DS Upadhyay
11. Effect of open formula based CDRI feed on body weight gain, visceral organs weight and hematological parameters in SD Rat, Ravindra Singh, D Hansda and DS Upadhyay
12. An overview: The use of mice in obesity research, Archana Mishra, DS Upadhyay, K Rai and BH Manjunatha Prabhu
13. Clinical trial of Azithromycin to control the prevalence of cervical lymphadenitis in Charles foster rat, SNA Rizvi, K Rai and DS Upadhyay
14. Effects of breeding procedures of laboratory animals for better embryo collection, BH Manjunatha Prabhu, K Rai and D S Upadhyay
15. Effects of temperature and photoperiod on reproduction in the female guinea pig (*Cavia porcellus*): K Rai, BH Manjunatha Prabhu and DS Upadhyay.
16. Breeding technique in guinea pigs, K Rai, BH Manjunatha Prabhu and DS Upadhyay
17. Good Laboratory Practice (GLP) in laboratory animal facility, Himangsu Kousik Bora
18. Gaps and needs in laboratory animal science to support current biomedical research, DS Upadhyay
19. Education and training in Laboratory animal science: Indian Scenario, DS Upadhyay

The Ramanbhai Foundation 5th International Symposium on Current Trends in Pharmaceutical Sciences, Ahmedabad (1-4 February)

20. Effects of acute versus chronic treatment of ketamine in mice: Behavioral and neurochemical abnormalities, Manavi Chatterjee and Gautam Palit

Advances in Translational Research & Medicine, Ahmedabad (1-4 February)

21. Rosiglitazone mediated neuroprotection in MCAO model is not mediated by Glutamate transporter 1, Rajkumar Verma, Vikas Mishra, Dinakar Sasmal and Ram Raghubir
22. Emerging molecular targets for novel therapeutic strategies in stroke, Ram Raghubir
23. Flurbiprofen neuroprotective effect in focal cerebral ischemia, Vikas Mishra, Rajkumar Verma and Ram Raghubir

15th ISCBC International Conference, Rajkot (4-7 February)

24. Chiron approach synthesis of natural products and natural product like molecules from carbohydrate-based building blocks, Arun K Shaw

25. Design and synthesis of the hybrid quinazolinonetriazine as antileishmanial agents, Moni Sharma, K Chauhan, Suman Gupta and PMS Chauhan

26. Synthesis and biological evaluation of indolyl gluoxylamides as a new class of antileishmanial agents, Chauhan Shikha S, Gupta Leena, Chauhan PMS, Mittal Monika, Vishwakarma Preeti and Gupta Suman

27. Characterization of *Brugia malayi* thymidylate kinase, a putative drug target, Pawan Kumar Doharey, Anita, Manish Kumar Suthar, Shiv Vardan Singh and JK Saxena

28. *Plasmodium yoelii* – Expression & purification of purine nucleoside phosphorylase, Manish Kumar Suthar, Anita, Pawan Kumar Doharey, Shiv Vardan Singh and JK Saxena

29. Artemisinin and its derivatives as inhibitors of antioxidant system of *Plasmodium yoelii,* Shiv Vardan Singh, Anita, Manish Kumar Suthar, Pawan Kumar Doharey and JK Saxena

30. Tissue uptake of an Arylpiperazine derived SARM for Benign Prostatic Hyperplasia Management, J Lal, A Sarswat and SK Pandey

31. Design and synthesis of new chalcone derivatives containing triazine moiety with potent antitubercular activity, Anand Kumar Pandey, Kuldeep Chauhan, Vinita Chaturvedi, Sandeep K Sharma, Ranjana Shrivastava and PMS Chauhan

32. Synthesis and anti-microbial activity evaluation of novel Dithiocarbamate-aminoquinoline/pyridine Conjugates, Kuldeep Chauhan, Moni Sharma, Anand Kumar Pandey, Atindra Kumar Pandey, PK Shukla and Prem MS Chauhan

33. Design and synthesis of the hybrid quinazolinone-triazine as antileishmanial agents, Moni Sharma, Kuldeep Chauhan, Suman Gupta and Prem MS Chauhan

34. Synthesis of new 4-aminoquinoline-schiff base derivatives as potent antimalarial agents, Rashmi Sharma, Moni Sharma, Kumkum Srivastva and Prem MS Chauhan

35. A Versatile synthesis of tetrazole tethered â-carbolines via ugi- 4CC reactions, Shahnawaz Khan, Vikas Tyagi, Shashi Pandey, Harsh M Gauniyal and Prem MS Chauhan

36. Synthesis of Amadiaquine - Aplysinopsin hybrids as novel antimalarial agents, Shashi Pandey, Shahnawaz Khan, Kumkum Srivastva, Harsh M Gauniyal and Prem MS Chauhan

37. Synthesis and biological evaluation of Indolyl Glyoxylamides as a new class of antileishmanial agents, Shikha S Chauhan, Leena Gupta, Prem MS Chauhan, Monika Mittal, Preeti Vishwakarma and Suman Gupta

38. A microwave assisted synthesis of fused lactam[1,2-a][1,4]benzodiaz- apine derivative by sequential ugi/coupling reaction, Vikas Tyagi, Shahnawaz Khan and Prem M S Chauhan

39. Design and synthesis of 3-(azol-1-yl)phenylpropanes as microbicidal spermicides for prophylactic contraception, Lalit Kumar, Amit Sarswat, Nand Lal, Ashish Jain, Sumit Kumar, STVS Kiran Kumar, Jagdamba P Maikhuri, Atindra K Pandey, Praveen K Shukla, Gopal Gupta and Vishnu L Sharma

40. Arylpiperazines for management of Benign Prostatic Hyperplasia-Design, synthesis and biological evaluation, Amit Sarswat, Lalit Kumar, Nand Lal, Rajeev Kumar, Jagdamba P Maikhuri, Diwakar Dalela, Kirti, Gopal Gupta and Vishnu L Sharma

41. Piperazine derived antispermatogenic agents as oral contraceptive for men: Design, synthesis and *in vitro* evaluation, Nand Lal, Lalit Kumar, Amit Sarswat, Vikas Verma, JP Maikhuri, Gopal Gupta and Vishnu L Sharma

30th Annual Convention of Indian Association for Cancer Research (IACR) & International Symposium on "Signaling Network and Cancer", IICB, Kolkata (06-09 February)

42. IL-6 and IL-10 Gene Polymorphisms and Breast Cancer Risk in Northern Indian population Pooja Singh, Lakshma V. Nayak, Hemant Kumar Bid, Sandeep Kumar and Rituraj Konwar

14th Punjab Science Congress, Longowal (07-09 February)

43. New chemotherapeutics agents against microbial and parasitic infection involving efficient synthetic strategies, RP Tripathi

44. Synthesis and bio-evaluation of alkylaminoaryl phenyl cyclopropyl methanones as antitubercular and antimalarial agents, Arya Ajay, Vandana Singh, BN Singh, V Chaturvedi, R Tripathi and RP Tripathi

37th Annual Conference of Indian Immunology Society, Jammu (7-10 February)

45. Expression, purification and characterization of trehalose-6-phsphate phosphatase from human lymphatic parasite *Brugia malayi,* Susheela Kushwaha, Prashant K Singh, Ajay K Rana and Shailja Misra Bhattacharya

46. N-methyl-6,7-dimethoxyisoquinonone isolated from *Annona squamosa* bark up-regulate the T and b cell population and macrophages function in Balb/c mice, Vishal K Soni, Nasreen Bano, Manisha Pathak, Dinesh Kumar Yadav, Rakesh Maurya, Swatantra Kumar Jain and Shailja Misra Bhattacharya

47. Functional characterization of ATPase RNA helicase of human lymphatic filarial parasite *Brugia malayi* using RNA interference, Meghna Singh, Prashant K Singh and Shailja Misra Bhattacharya

48. Dam methylase of endosymbiotic *Wolbachia* from lymphatic filaria *Brugia malayi*, an ideal drug target causes immune suppression in mice, Ajay Rana, Vishal K Soni, Susheela Kushwaha, Prashant K singh and Shailja Misra Bhattacharya

49. Cocktail vaccination with *Brugia malayi* recombinant protein confer effective protection against infective larval challenge in *Mastomys coucha,* Nidhi Srivastava, Jeetendra K Nag, Susheela Kushwaha, Prashant K Singh and Shailja Misra Bhattacharya

50. Gedunin and phytogedunin of *Xylocarpus granatum* demonstrate macrofilaricidal activity against *Brugia malayi* in experimental rodent host, Sweta Misra, Meenakshi Verma, Jyoti Gupta, Vijay Laxmi and Shailja Misra Bhattacharya

51. The marine sponge *Haliclona oculata* possesses antifilarial activity against experimental human lymphatic filarial parasite *Brugia malayi* in rodent model, Jyoti Gupta, Sweta Misra, Vijay Lakshmi and Shailja Misra Bhattacharya

3rd International Symposium on Drug Metabolism and Pharmacokinetics, Applications toward Drug Discovery and Development, Mohali (11-13 February)

52. Effect of Phenytoin- An antiepileptic on pharmacokinetics profile of an antimalarial trioxane in rats, HN Kushwaha, N Gautam, A Misra, B Singh and SK Singh

53. Pharmacokinetics of S007-967, An arylpiperazine derived SARM, for Benign Prostatic Hyperplasia Management, B Heeralal, P Tripathi, SK Pandey, A Sarswat and J Lal

National Conference on Data Mining, Pune (19-20 February)

54. Advanced techniques for regression and classification in mining of biomedical data, Abbas M, Mukesh Srivastava and Mohd. Imran Siddiqi

3rd NIPER (RBL)-CDRI Symposium on Medicinal Chemistry and Pharmaceutical Science, Lucknow (3-5 March)

55. CpG-ODN 2006 and Miltefosine: A potential combination for treatment of experimental Visceral Leishmaniasis, Suman Gupta, Shraddha A Sane, Nishi Shakya, Preeti Vishwakarma and W Haq

56. Potential use of Pam3Cys, in immunochemotherapy of Visceral Leishmaniasis, Nishi Shakya, Preeti Vishwakarma and Suman Gupta

57. Pharmacokinetics of S007-967, an Arylpiperazine Derived SARM, for BPH Management in Rats, B Heeralal, P Tripathi, SK Pandey, A Sarswat and J Lal

58. Synthesis of galactopyranosyl amino alcohols: Lead molecules for tuberculosis, Udai Prakash Tripathi, Anindra Sharma, Rama P Tripathi

59. Design, synthesis and antitubercular evaluation of hybrid molecules, Priyanka, Namrata Anand, BN Singh, Vinita Chaturvedi and RP Tripathi

60. Application of butenoyl–C-glycoside in the synthesis of glucopyranosylmethyl pyrazolines, pyrimidines and biphenyls, Seerat Fatima, Vivek P Pandey, SS Bisht and RP Tripathi

61. Synthesis, characterization & biological evaluation of novel antispermatogenic *agents as male contraceptives,* Veenubala, Santosh Jangir, Lalit Kumar, Amit Sarasvat, Nandlal, Saurabh Maheswari, Gopal Gupta and Vishnu L Sharma

62. Design & synthesis of novel alkyl phosphate analogues as possible spermicides, Santosh Jangir, Veenubala, Lalit Kumar, Amit Sarasvat, Nandlal, Gopal Gupta and Vishnu L Sharma

63. Synthesis and Biological Studies of Diaryl Benzopyrans : Apoptosis Induction and Inhibition of Hyperplasia Formation in Rat Uterus, Sanghani Y., Mohd. K. Hussain, Chandra V., Fatima I., Saxena R., Kitchlu S., Hajela K. and Dwivedi A.

Annual Meeting of the Indian Society of Human Genetics, Manipal (February)

64. Polymorphisms in the MTHFR gene are a risk factor for male infertility in India Nishi Gupta and Rajender Singh

17th Conference of National Magnetic Resonance Society, Amritsar (1-4 March)

65. Solution structure of ADF/cofilin from *Leishmania donovani* and *Toxoplasma gondii,* Prem P Pathak, Vaibhav K Shukla, Anupam Jain, Sarita Tripathi and Ashish Arora

66. Structural analysis of bacterial Peptidyl t-RNA Hydrolase, Ashok Kumar, Rahul Yadav and Ashish Arora

5th Semmering Vaccine Symposium 2011 "Vaccine –the Key Paradigm for the 21st Century's Health Care Strategies", Baden, Austria (28 April-1 May)

67. To compare the release of nitric-oxide after administration of HbsAg loaded polymeric lamellar substrate particles=PLSPs [PLGA(75:25)] and microspheres=Ms [PLGA(50:50)] in mice, V Saini, PK Murthy and DV Kohli

2nd International Annual Conference on Models of Human Diseases Better Models for Better Drugs, University of Toronto, Toronto, Canada (28 June)

68. Immune cells and skeletal muscle connect inflammation with insulin resistance, Pillon N, Fink LN, Schertzer JD, Tamrakar AK, Kelwalramani G, Samaan C, Arane K, Bilan PJ and Klip A

Annual Conference of the Genetics Society of Austral-Asia, Melbourne, Australia (10-13 July)

69. Effect of dietary epigenetic interventions on parkinsonism in *Caenorhabditis elegans*, Pooja Jadiya, Shreesh Raj Sammi, Supinder Kaur and Aamir Nazir

International Conference on Genomics and Proteomics, Calicut (14-16 July)

70. Apigenin protects against Lithocholic acid-induced liver injury and oxidative stress in mice, Singh P, Singh PK, Srivastava AK, Maurya SK, Sharma S and Rath SK

71. Diagnostic ability of X-linked inhibitor of apoptosis (XIAP) in Urinary bladder cancer, Srivastava AK, Singh PK, Singh P, Nayak S, Dalela D, Goel MM, Rath SK and Bhatt MLB

All India Council for Technical Education (AICTE) Seminar on Industry Expectations from Pharmacy College, Ghaziabad (6-8 August)

72. Comparative pharmacokinetic drug interaction between Gabapentin, an antiepileptic and CDRI-97/78, an antimalarial in male and female rats, HN Kushwaha, HH Siddiqui and SK Singh

National Seminar on Cheminformatics, Coimbatore (26 August)

73. Theoretical drug design in drug research paradigm, YS Prabhakar

Micro Solar Energy Generation and Utilization, Kanpur (3-4 September)

74. Synthesis of donor-acceptor fluoranthene: Application in organic light emitting diodes, Gaurav Taneja, Vijay Kumar, RS Anand and Atul Goel

75. Synthesis of non-aggregating donor-acceptor pyrenylarenes for blue organic light emitting devices, Pankaj Nag, Vijay Kumar, RS Anand and Atul Goel

2nd Asia Pacific Osteoporosis and Bone Meeting Gold Coast, Australia (04-08 September)

76. Age and skeletal site affect responsiveness of bone marrow stromal cells from different trabecular compartments in different physiological conditions: effect of Estrogen and Vitamin D Ritu Trivedi and Avinash Kumar

Second International Conference on Holistic Medicine, Kottayam (11-13 September)

77. Natural molecules with GLUT4 translocation stimulatory effect for the treatment of insulin resistance, Tamrakar AK, Jaiswal N, Maurya CK, Maurya R and Srivastava AK

70th Annual Meeting of the Japanese Cancer Association, Nagoya, Japan (3-5 October)

78. Polymorphisms in certain TP53 target genes associate risks of upper aero digestive tract carcinomas in North Indians, Sarvendra Vikram Singh, Amit Kumar Mitra, Vivek Kumar Garg, Rashmi Chaturvedi, Mandira Sharma and Srikanta Kumar Rath

IOF Regionals 1st Middle East and Africa Osteoporosis Meeting, Dubai (19-22 October)

79. Pteroheal has potential as an osteoprotective and fracture repair agent Divya Singh, Rashmi Pandey, Amit Kumar, Atul Goel, Naibedya Chattopadhyay

India Academy of Neurosciences, New Delhi (28-29 October)

80. Involvement of endoplasmic reticulum stress and nitrosative stress in rotenone induced neurotoxicity: A study on *in vivo* and *in vitro* test systems, Goswami P, Singh S, Swarnkar S, Gupta S and Nath C

52nd Annual Conference of AMI, International Conference on Microbial Biotechnology for Sustainable Development, Chandigarh (3-6 November)

81. Serine threonine protein kinase of *Mycobacterium tuberculosis* down regulates the expression of host kinase, Ruma Kumari, Susmita K Singh, Diwakar K Singh, Pramod K Singh and Kishore K Srivastava

82. Post translational modification in virulence factors contribute to pathogenesis of mycobacteria, Pramod K Singh, Ruma Kumari, Susmita K Singh, Diwakar K Singh, Sameer Tiwari and Kishore K Srivastava

83. Efficacy of BCG vaccine against *Mycobacterium tuberculosis* in experimental tuberculosis by over expression of Rv3097c in *Mycobacterium bovis* BCG, Vipul Kumar Singh and Arunava Dasgupta

84. Rapid *in vivo* assessment of drug and vaccine candidates against non tuberculous mycobacteria, Vivek Kumar Kashyap and Arunava Dasgupta

85. Production of steriospecific lactic acid by *Rhizopus arrhizus,* M Singh, S Mehrotra, AK Pandey and CKM Tripathi

80th Annual Meeting of the Society of Biological Chemists (India), Lucknow (12-15 November)

86. PE proteins are differentially expressed by *Mycobacterium tuberculosis* during infection inside the host, Susmita K Singh, Ruma Kumari, Diwakar K Singh, Sameer Tiwari and Kishore K Srivastava

87. Structure based discovery of potent S-Adenosyl-L-Homocysteine Hydrolase inhibitors as potential antileishmanial agents, Prashant Khare, Amit K Gupta, Praveen K Gajula, Krishna Y Sunkari, Anil K Jaiswal, Sanchita Das, Preeti Bajpai, TK Chakraborty, Anuradha Dube, and Anil K Saxena

88. Efficacy of nanoemulsion of Amphotericin B against *Leishmania donovani* infection, Anil K Jaiswal and Anuradha Dube

89. Molecular characterization of a novel hypothetical protein of *Leishmania donovani* as a potential vaccine/drug target, Rajendra Kumar Baharia, Rati Tandon, Pramod, K Kushawaha, Reema Gupta, Sanchita Das and Anuradha Dube

90. Evaluation of recombinant *Leishmania donovani* Enolase as a suitable vaccine candidate against experimental Visceral Leishmaniasis, Reema Gupta, Pramod K Kushawaha, Chandra Dev Pati Tripathi, Shyam Sundar and Anuradha Dube

91. Silencing of *Brugia malayi* trehalsoe-6-phosphate phosphatase gene by RNA interference impairs female worm embryogenesis and parasite survival, Susheela Kushwaha, Prashant K Singh, Mohd Shahab and Shailja Misra Bhattacharya

92. Identification and purification of potentially protective cDNA clones of *Brugia malayi* by screening of L3 cDNA library with irradiated L3 protected *Mastomys coucha* serum, Prashant K Singh, Susheela Kushwaha, Jyoti Gupta and Shailja Misra Bhattacharya

93. N-methyl-6 7-dimethoxyisoquinolone in *Annona squamosa* twigs is the major immune modifier to elicit polarized Th1 immune response in BALB/c mice, Vishal K Soni, Nasreen Bano, Manisha Pathak, Dinesh Kumar Yadav, Rakesh Maurya and Shailja Misra Bhattacharya

94. An intracellular protein N-6-adenine-specific methylase (N-6-MTase) and a surface protein (wsp) of *Brugia malayi* endosymbiont *Wolbachia* trigger comparable immune response in BALB/c mice, Ajay Rana, Manisha Pathak, Meenakhsi Verma and Shailja Misra Bhattacharya

95. *Brugia malayi* recombinant protein cocktail exhibit enhanced protection in experimental host *mastomys coucha* by eliciting augmented immune activation, Nidhi Shrivastava, Jeetendra K Nag, Prashant K Singh, Susheela Kushwaha and Shailja MisraBhattacharya

96. *Bauhinia racemosa* leaves exhibit antifilarial activity against filarial parasite *Brugia malayi*, Sweta Misra, Jyoti Gupta, Suriya P Singh, Koneni V Sashidhara and Shailja Misra Bhattacharya

97. Role of protein kinase signaling and pattern recognition receptors in Macrophage foam cell formation, Minakshi Rana, Vishal Singh, Rajiv Lochan Tiwari, Ankita Singh, Madhu Dikshit and Manoj Kumar Barthwal

23rd National Conference of Parasitology, Chennai (18-20 November)

98. Recent developments in drug discovery for tissue schizontocidal antimalarial drugs, SK Puri

99. Heme Detoxification Protein (HDP) and its role in resistance to antimalarial drug Arteether, Awakash Soni, Santosh Kumar and SK Puri

100. Quantitiating liver stage parasite burden during pre-erythrocytic schizogony in experimental rodent malaria model, Arif J Siddiqui, Jyoti Bhardwaj and SK Puri

101. Understanding the role of redox system in resistance to antimalarial drug Arteether, Kirtika Prakash, Santosh Kumar, Awakash Soni and SK Puri

102. Repetitive malaria sporozoite inoculation under mefloquine treatment protects against live challenge, Jyoti Bhardwaj, Arif J Siddiqui, Annapurna Gupta and SK Puri

103. Febrifugine combination: A potent moiety as antimalarial, Sarika Gunjan, Sidharth Sharma, Atul Kumar and Renu Tripathi

104. Implication of human brain endothelial cells (BB19) as cerebral malaria cytoadherence model, Hemlata Dwivedi, Sunil Kumar Singh and Renu Tripathi

105. Antimalarial potential of aryl cyclopropyl methanones, Swaroop Kumar Pandey, Arya Ajay, RP Tripathi and Renu Tripathi

106. *In vitro* culture of *Plasmodium falciparum*: Effect of RPNI medium on cytoadherence characteristic of the parasitized erythrocytes, Pooja Agarwal, SK Puri and Kumkum Srivastava

107. *In vitro* selection and characterization of Arteether resistant *Plasmodium falciparum*, Rajeev K Srivastava, Kamlesh K Mishra, SK Puri and Kumkum Srivastava

108. Effect of Pam3Cys induced protection on the therapeutic efficacy of miltefosine against experimental Visceral Leishmaniasis, Rahul Shivahare, Nishi Shakya, Shagun Shankar and Suman Gupta

109. Evaluation of a marine sponge - *Haliclona oculata* and its fractions for its efficacy against experimental visceral Leishmaniasis, Prashant Khare, Pragya Misra, Shishir Srivastava, Sunil Kumar Mishra, MN Srivastava, Vijai Lakshmi and Anuradha Dube

110. *Leishmania donovani*: Immunostimulatory cellular responses of membrane & soluble protein fractions of splenic amastigotes in cured patient & hamsters, Anuradha Dube, Pragya Misra, Shraddha Kumari, Rati Tandon, Mukesh Samant and Shyam Sundar

111. Prophylactic efficacy of *Withania somnifera* chemotype 118R –against *Leishmania donovani* infection in golden hamster, Chandra Dev Pati Tripathi, Anil K Jaiswal, Reema Gupta, Susheela Kushawaha, Shailja Misra Bhattacharya and Anuradha Dube

112. Molecular characterization of Cysteine-Leucine rich protein of *L. donovani* – A novel SAG resistant protein identified through differential proteomics, Sanchita Das, Rajendra Baharia, Rati Tandon, Prashant Khare, Anil Kumar Jaiswal, Ajit Kumar Chowdhury and Anuradha Dube

113. Failure of Mycobacterium w vaccine as an immunomodulator in managing acute and chronic *Leishmania donovani* infections in mouse and hamster, Rati Tandon, Pragya Misra, Vishal Kumar Soni, Nasreen Bano, Rajendra Kumar Baharia, Sanchita Das, Shailja Misra Bhattacharya and Anuradha Dube

114. Molecular and immnunological characterization of Nucleosomal Histone Proteins of *Leishmania donovani,* Rajendra Kumar Baharia, Rati Tandon, Pramod Kumar Kushawaha, Reema Gupta, Amogh Anant Sahasrabuddhe and Anuradha Dube

115. Glucose-6-phosphate dehydrogenase of *Brugia malayi* a putative chemotherapeutic target, Anita, Manish Kumar Suthar, Pawan Kumar Doharey, Shiv Vardan Singh, Smita Gupta, Sunita Yadav and JK Saxena

116. Cloning & expression of Calreticulin, an immunomodulatory protein of *Brugia malayi,* Sunita Yadav, Anita, Manish Kumar Suthar, Pawan Kumar Doharey, Shiv Vardan Singh, Smita Gupta and JK Saxena

XXIX Annual Meeting of Indian Academy of Neurosciences, New Delhi (30 November-1 December)

117. Hypoxia inducible factor-1 induced neuroprotection in cerebral ischemia/reperfusion injury, Neetu Singh, Gaurav Sharma, Vikas Mishra and Ram Raghubir

118. Combination therapy in cerebral stroke: Neuroprotective effects of Ifenprodil and Flurbiprofen, Vikas Mishra, Rajkumar Verma, Neetu Singh and Ram Raghubir

119. A study on neuroinflammation and its correlation with NMDA receptor in STZ (ICV) induced memory impared rat, Shivika Rai, Rakesh Shukla and C Nath

National Conference on Advances in Molecular Techniques and their Application in Health and Disease, Agra (30 Novemver – 01 December)

120. Effect of commercial vis-à-vis in house feed formulations on growth profile and organ weight of Sprague Dawley rat, Ravindra Singh, Ramesh Sharma, D Hansda, DS Upadhyay, RK Verma, S Singh, RK Gautam

EU-India Science & Technology Cooperation, Vienna, Austria (1-2 December)

121. Effect of curcuma oil on the endothelial celss after myocardial infarction in rats, Kumaravelu Jagavelu, Prem Prakash, Amit Manhas, Manoj Barthwal and Madhu Dikshit

48th Annual Convention of Chemists 2011 and the Celebration of the International Year of Chemistry, Allahabad (2-7 December)

122. Nine-in-One simultaneous quantitation of physico-chemically diverse molecules on RP-HPLC in drug discovery and development: Application to single pass intestinal perfusion study in rats upon cassette administration, Wahajuddin, SP Singh, KSR Raju and GK Jain

123. Quantitative bioanalytical studies of pharmaceutical(s) and Nutraceutical(s), Wahajuddin, SP Singh, KSR Raju and GK Jain

National Conference on Frontiers in Biological Sciences, Jaunpur (04-05 December)

124. GLUT-4 translocation stimulatory effect of a standardized fraction of *Peganum harmala,* Maurya CK, Jaiswal N, Narender T, Tamrakar AK

International Symposium on Innovative in Free Radical Research and Experimental Therapeutics & 5th Annual Convention of Association of Biotechnology and Pharmacy, Coimbatore, Tamilnadu (07-09 December)

125. Epigenetic Targeting in Hormonal Refractory Breast cancers: Therapeutic Impact and Future Directions Syed Musthapa Meeran, Samriddhi Shukla, Shweta N. Patel, Yuanyuan Li and Trygve O.Tollefsbol

Challenges in Drug Discovery and Development, Lucknow (9-10 December)

126. Expression, purification and characterization studies of Rv3001c, Kumar Sachin Singh and Sudheer Kumar Singh

127. Challenges and opportunities in drug discovery for malaria, SK Puri

128. Translationally controlled tumour protein homolog (TCTP): The artemisinin target protein in *Plasmodium,* Anuj Tripathi and SK Puri

129. Profiling and fingerprinting studies of *Gloriosa superba* using DART MS Technique, Vikash Bajpai, KR Arya and Brijesh Kumar

130. Phyto-chemical investigation of *Ajuga brecteosa* using DART MS and Q TOF LCMS (HRMS) techniques, Renu Pandey, Vikash Bajpai, Deepty Sharma, KR Arya and Brijesh Kumar

131. Mass fingerprinting analysis of *Berberis aristata, B Asiatica, Coscinium fenestratum* and *Mahonia borealis* using LC-QTOF HRMS techniques, Awantika Singh, Vikash Bajpai, KR Arya and Brijesh Kumar

132. Profiling and fingerprinting studies of *Gloriosa superba* using DART MS Technique, Vikas Bajpai, KR Arya and Brijesh Kumar

133. Phytochemical investigation of *Ajuga bracteosa* using DART MS and Q-TOF LCMS (HRMS) techniques, Renu Pandey, Vikas Bajpai, Deepty Sharma, KR Arya and Brijesh Kumar

134. Mass fingerprinting analysis of Berberis aristata, Berberis asiatica, Coscinium fenestratum and Mahonia borealis using LC-QTOF HRMS Techniques, Awantika Singh, Vikas Bajpai, KR Arya and Brijesh Kumar

135. Rapid Identification of bio-flavonoids using electrospray ionization tandem mass spectrometry with MS/MS library, Nidhi Agrawal, Deepak Kumar, Pragya Singh, Shikha Awasthi, Rabi Sankar Bhatta and Sanjeev Kanojiya

136. Design and synthesis of the hybrid quinazolinone-chalcone/ pyrimidine/tetrazole as antileishmanial agents, Moni Sharma, Kuldeep Chauhan, Rashmi Sharma, Rahul shivhare, Suman Gupta and Prem MS Chauhan

137. Synthesis of â-carboline derivatives based on natural product and their biological evaluation, Shikha S Chauhan, Shahnawaz Khan, and Prem MS Chauhan

138. Synthesis and antimalarial activity of new heterocyclic hybrids based on chloroquine and rhodanine scaffolds, Kuldeep Chauhan, Anand K Pandey, Moni Sharma, Kumkum Srivastava, Sunil K Puri, Shiv Vardan Singh, JK Saxena and Prem MS Chauhan

139. A green synthesis of 2 3-dihydroquinazolin-4(1H)-ones derivatives, Rashmi Sharma and Prem MS Chauhan

140. First synthesis towards natural product Perspicamide analogues and their bioevaluation as antileishmanial agents, Anand Kumar Pandey, Shahnawaz Khan, Kuldeep Chauhan, Rahul Shivare, Suman Gupta and Prem MS Chauhan

141. A convenient desulfitative dimethylamination of the 2-Thiohydantoin scaffold using N,N-dimethylformamide, Shahnawaz Khan, Vikas Tyagi, Shashi Panday, Kirtika Singh and Prem MS Chauhan

142. Synthesis of novel tetrazole derivative of 4-aminoquinoline as potent antimalarials, Shashi Pandey, Shahnawaz Khan, Kumkum Srivastva, Sunil K Puri and Prem MS Chauhan

143. Generation of tetrahydro-â-carbolinediketopiperazines ring system via Ugi-4-CR followed by tandem deprotection-cyclization/Pictet-Spengler reactions in one pot, Vikas Tyagi, Shahnawaz Khan, Archana Giri and Prem MS Chauhan

144. Potentiating metronidazole scaffold against resistant trichomonas, Lalit Kumar, Veenubala, Ashish Jain, Nandlal, Amit Sarasvat, Santosh Jangir, Lokesh Kumar, Priyanka Shah, Jagdamba P Maikhuri, Mohd Imran Siddiqi, Gopal Gupta and Vishnu L Sharma

145. In process quality control and stability studies on centchroman, a non steroidal contraceptive agent, V Gupta, M Srivastava and AK Dwivedi

146. A new formulation of Centchroman, M Srivastava, S Singh, V Gupta and AK Dwivedi

147. Synthesis of 3-substituted-1-quinolin-4-yl-propan-1-one as potential spermicidal agents, RR Pandey, A Srivastava, R Malasoni, Ashish Jain, JP Maikhuri, G Gupta and AK Dwivedi

148. Stability indicating HPLC method for estimation of ar-turmerone in HM oil and its formulation, R Malasoni, A Naqvi, A Srivastava, RR Pandey, M Chaudhry and AK Dwivedi

149. Folic acid conjugated guar gum nanoparticles for targeting methotrexate to colon cancer, M Sharma, R Malik, A Verma, GS Banoth, J Sarkar, PR Mishra and AK Dwivedi

150. Preparation and optimization of arteether nanoemulsion with the use of high pressure homogenizer, P Dwivedi and PR Mishra

Society of Andrology Meeting, New Delhi (10-12 December)

151. Development of a new male contraceptive for 21st century in India: RISUG, RK Singh

7th International Conference on Yeast Biology, Mumbai (10-13 December)

152. Arachidonic acid and subinhibitory concentration of antifungals affect biofilm formation and PGE_2 level in species of *Candida and* amphotericin B resistant strain of *C. albicans,* Nripendra Nath Mishra and Praveen K Shukla

153. Characterization of immunodominant proteins of *Aspergillus fumigatus* from the diagnostic perspective, Rizwan Ahmed, Awanit Kumar and Praveen K Shukla

International Conference on New Horizons in Cancer Research: Biology to Prevention to Therapy, Gurgaon (13-16 December)

154. Genetic polymorphisms in fas, vdr, tp53 and birc5 genes and risks of carcinomas of upper aero digestive tract in north Indians, Sarvendra Vikram Singh, Vivek Kumar Garg, Mandira Sharma, Rashmi Chaturvedi and Srikanta Kumar Rath

155. Potential role of survivin in the diagnosis of carcinoma of urinary bladder, Srivastava AK, Singh PK, Singh P, Nayak S, Singh D, Dalela D, Goel MM, Rath SK and Bhatt MLB

7th J-NOST, Mohali (15-18 December)

156. Robust turn structures in a_3b cyclic tetrapeptides induced and controlled by Carbo-b ^{3} *Amino acid,* Anindra Sharma, ShriKant Sharma, R Ampapthi and Rama P Tripathi

OMICS Conferences, Kolkata (15- 18 December)

157. Functional analysis of PknJ (*Rv*2088) of *Mycobacterium tuberculosis* (H37Rv) using proteomics approach, Diwakar K Singh, Ruma Kumari, Susmita K Singh, Pramod K Singh and Kishore K Srivastava

XLIV Annual Conference of Indian Pharmacology Society on Challenges Ahead in Translational Pharmacology, Manipal, (19-21 December)

158. Metabolic stability of novel antithrombotic lead candidate CDRI-S002-333 using liver microsomes of different species and their respective genders, Amrita Saxena and GK Jain

159. Time dependent characterization and validation of angioplasty injury induced Rabbit Iliac Atherosclerosis Model, Vivek Khanna, Manish Jain, Abhishek Kumar Singh, Vishal Singh, Prem Prakash, Maria, Manoj Kumar Barthwal and Madhu Dikshit

160. Protective effect of Atorvastatin on neointimal hyperplasia in rats: G0/G1 arrest of cell proliferation, down regulation of Cyclin D, CDK 2 and CDK 4 as possible mechanisms, Manish Jain, Vishal Singh, Rajiv Lochan Tiwari, Ankita Singh, Madhu Dikshit and Manoj Kumar Barthwal

161. Enhanced level of circulatory oxidized low density lipoprotein positively associates with IL-1â production and severity of sepsis and shock, V Singh, J Bogra, M Kohli, M Dikshit and MK Barthwal

162. Extracellular signal regulated kinase and free radicals regulate IL-1 beta production in human monocytic Cells, Singh A, Singh V, Tiwari RL, Rana M, Dikshit M and Barthwal MK

XXXI Annual Conference of Society of Toxicology 2011, Jaipur (22-24 December)

163. Evaluation of Rosiglitazone cardiotoxicity in H9C2 cell line, Pratibha Mishra, Ajeet Kumar Verma, Pooja Pandey, Pallavi Srivastava, Prabhat Singh and SK Rath

164. Evaluation of the genotoxic potential of Quercetin, Neeti Jolly, Pratibha Mishra, Prabhat Singh, Pallavi Srivastava and Srikanta Kumar Rath

Indian Chemical Engineering Congress CHEMCON-2011, Bangalore (27-29 December)

165. Design of optimal process parameters for separation of Ketoprofen-enantiomers using simulating moving bed chromatography, R Singh, R Prasad, P Mondal and B Mohanty

166. Design of optimal process parameters by Taguchi method for separation of Ketoprofen enantiomers using simulating moving bed (SMB) chromatography, R Singh, R Prasad, P Mondal and B Mohanty

22nd all India Congress of Zoology and National Seminar on Recent Advances in Biological Sciences, Lucknow (29-31 December)

167. Evaluation of Rosiglitazone cardiotoxicity in *in vitro* and *in vivo* models, Pratibha Mishra, Ajeet Kumar Verma, Prabhat Singh and SKRath

168. Factors affecting the natural population of Indian Gharial (*Gavialis gangeticus*) in Katarnianghat Wild life Sanctuary in Bahraich, Uttar Pradesh, AK Srivastava, D Hansda and DS Upadhyay

4 Inter-Agency Linkages

Title of the Project	Principal Investigator
Ministry of Earth Sciences, Government of India	
National project on development of potential drugs from the ocean	Director
Ministry of Health & Family Welfare, Government of India	
Anti-fertility research program	Director
Drug for Neglected Diseases initiative, Geneva	
Lead identification for anti-leishmanial compounds	Dr. S.K. Puri
World Health Organization, Geneva, Switzerland	
Development of new macrofilaricidal and /or embryostatic agents	Dr. S. Bhattacharya
European Commission, Belgium	
Targeting protein synthesis in the apicoplast and cytoplasm of Plasmodium (MEPHITIS)	Dr. Saman Habib
Department of Science & Technology, Government of India	
Sophisticated Analytical Instrument Facility (SAIF)	Director
J.C. Bose Fellowship	Dr. T.K. Chakraborty
Electronic structure theory based investigation of conformational behavior and secondary structures of substituted β-proline based peptides" conformational studies and biological evaluation.	Dr. T.K. Chakraborty Dr. R.S. Ampapathi
Identification and characterization of protein(s) from arteether sensitive and arteether resistant rodent malaria parasites for elucidation of mechanism of resistance	Dr. S.K. Puri
Design, synthesis and biological evaluation of SIRT-1 activators for the treatment of type-II diabetes	Dr. Bijoy Kundu
Design and synthesis of flexible model based on Pyrazolo[3,4-d] pyrimidine for better understanding of arene interactions at molecular & supramolecular level	Dr. Kamlakar Awasthi
Chiron approach synthesis of natural products and natural product like molecules from carbohydrate based building blocks	Dr. A.K. Shaw
Characterization of natural antimony resistance related gene(s) of *Leishmania donovani*	Dr. Neena Goyal
Proteomic analysis of drug resistance in *Leishmania donovani* clinical isolates.	Dr. Neeloo Singh
Antimalarial principles from plants belonging to the genus veronia endemic to the western ghats	Dr. Kumkum Srivastava
Application of Baylis-Hillman chemistry for the synthesis of natural products and their mimics	Dr. Sanjay Batra
Amino acids as chiral synthons: Development of new synthetic protocols for creating natural products and related diversity in quest for anticancer agent	Dr. Gautam Panda
Design, synthesis and development of novel antileishmanial agents.	Dr. T. Narender
Structural characterization of gama-glutamylcysteine synthetase and glutathione synthetase from *Leishmania spp*.	Dr. J.V. Pratap
Effect of cancer chemotherapeutic drugs on spermatogonial stem cell niche, chromatin remodeling and epigenetic programming in male germ cells	Dr. D.P. Mishra
Investigation on immunomodulation mediated by *Mycobacterium tuberculosis* during persistent infection	Dr. Y.K. Manju

Title of the Project	Principal Investigator
Expression, intracellular localization and functional characterization of actin related proteins of leishmania	Dr. A.A. Sahasrabuddhe
Osteogenic actions of a naturally derived NP-1 pure compound on bone	Dr. Divya Singh
To study immunoprotective roles of methoxyisoflavones in estrogen-deficiency induced bone loss	Dr. Divya Singh
Polymeric nano-matrix -associated *in vivo* delivery of Kaempferol in rats for bone anabolic action	Dr. Ritu Trivedi
A systematic RNAi screen for identification of genetic modulators of HIV-NEF induced pathogenesis in a novel *Caenorhabditis elegans* model	Dr. Aamir Nazir
Evaluation of TGF-Beta activation mechanism and signaling during uterine tissue remodeling	Dr. R.K. Jha
Human cytochrome P4501B1 : Implications in centchroman treated harmone mediated MCF-7 tumor cell metabolism as a novel target for therapeutic intervention	Dr. Neetu Singh (Women Scientist Scheme)
DST & KAPL, Bangalore	
Development of antimicrobial agents from soil microflora	Dr. A.K. Saxena
Department of Biotechnology, Government of India	
Schizophrenia: Developing animal- models, translational markers and a possible treatment strategy	Dr. Gautam Palit
Cloning and overexpression of Th1 stimulatory polyproteins identified through proteomics for their prophylactic potential against experimental visceral lieshmaniasis	Dr. Anuradha Dube
Protective immunogenicity of Centrin KO live attenuated leshmania parasite in the animal models and in the human cells	Dr. Anuradha Dube
Post translational modifications induced by nitroxidative stress as biomarkers of vascular damage in diabetes *(DBT-INDIGO Project)*	Dr. Madhu Dikshit
Design and development of database and analytical tools for microarray data on *Leishmania donovani* parasite	Dr. Neeloo Singh
The birth of the first Indian Leishmania Genome Sequence	Dr. Neeloo Singh
Crystallographic and biochemical studies on Feast/Famine regulatory proteins from Mycobacteria	Dr. Ravishankar R.
Structural analysis of bacterial peptidyl-t RNA hydrolase enzymes and design of high affinity binders.	Dr. Ashish Arora
Generation and characterization of *Mycobacterium smegmatis* sigF mutant and studies on the sigF-mediated gene expression by microarray analysis	Dr. B.N. Singh
Understanding mechanism of action of the anti-osteoporotic activity of CDRI compounds K095 & 1709	Dr. S. Sanyal
Investigation on involvement of adipose tissue in persistence of pathogenic mycobacteria	Dr. Y.K. Manju
Isolation, identification, characterization and bioactivity assay of antidiabetic drug leads from few selected medicinal plants of north east India: Voyage for cure of diabetes	Dr. A.N. Gaikwad
Functional characterization of CRN 12 In leishmania parasites	Dr. A.A. Sahasrabuddhe
Investigation of effect of polysaccharide in modifying leishmanicidal potential of nanoparticulate system bearing chemotherapeutics agent	Dr. M.K. Chourasia
Understanding the mechanism of mitotic/spindle checkpoint using genetics approaches in fission yeast *Schizosacchromyces pombe*.	Dr. Shakil Ahmed
Identification of ER alpha interacting proteins from tamoxifen induced and uninduced MCF7 cells: A mass spectrometry based proteomics approach	Dr. A.K. Trivedi
Expression profiling of major testis specific genes in human semen/spermatozoa for identification of the biological role of these genes, their diagnostic utility and identification of novel targets for infertility treatment/male contraception	Dr. Rajender Singh

Title of the Project	Principal Investigator
Indian Council of Medical Research, Government of India	
Design, synthesis and biological evaluation of HIV-1 RT inhibitors-4- thiazolidinone compounds	Dr. S.B. Katti
Impact of adipokine and chemokine gene polymorphism and its protien expression in metabolic syndrome	Dr. Ashim Ghatak Dr. Rituraj Konwar
Nucleosomal histone proteins of *leishmania donovani*: Molecular & Immunobiochemical characterization for its potential as vacceine target against visceral leishmaniasis	Dr. Anuradha Dube
Development of bone anabolic agents from an Indian medicinal plant	Dr. N. Chattopadhyay
Effect of 2,3-diaryl-2H-1-benzopyran derivative on estrogen induced endometrical cell proliferations and uterine hyperplasis formation	Dr. Anila Dwivedi
Preclinical development of DSE-37[S,S"-{Disulfanediylbi (pyrrolidino-propane-2,1-diyl)} bis(piperidinothiocarbamate) as a vaginal contraceptive	Dr. Gopal Gupta
Design, synthesis and bioequivalence of new analogues of fluconazole for antifungal activity	Dr. P.K. Shukla
Evaluation of DNA based tools for antimalarial drug screening against *Plasmodium falciparum* and studies with modified (RPNI) medium	Dr. Kumkum Srivastava
Design, synthesis and bioevaluation of novel hybrid compounds for antimalarial activity	Dr. Sanjay Batra
Delivery system for the management of septic shock; Rational approach towards lipopolysaccharide (LPS), neutralization and detoxification	Dr. P.R. Mishra
Design, synthesis and evaluation of new chemical entities against a typical *Mycobacterium-2-fortuitum*	Dr. Gautam Panda
Cytokine gene polymorphism in breast cancer patients	Dr. Rituraj Konwar
Defense Research & Development Organization	
Synthesis of fracture and wound healing agents	Dr. N. Chattopadhyay
Synthesis of biologically active molecules from carbohydrates based ligands for potential applications in Defence	Dr. R.P. Tripathi
Effect of Indian Herbal preparation of hypobaric hypoxia induced epigenetic modifications in male germ cells : A proteomic analysis	Dr. D.P. Mishra
NMITLI (CSIR)	
Lead based drug development and genetic improvement of Ashwagandha *Withania somnifera*	Dr. Ram Raghubir Dr. S. Bhattacharya
Novel DPP IV Inhibitor for the treatment of diabetes	Dr. S.K. Rath Dr. S. Sanyal
UPCST	
Production of microbial heparinases to produce low molecular weight heparins used as antithrombotic agents	Dr. C.K.M. Tripathi
AYUSH	
Mass spectrum fingerprinting of Indian Medicinal plants w.r.t. antidiabetic aspect	Dr. Brijesh Kumar
Central Council of Research in Homeopathy	
Pharmacological screening of homeopathic medicine under drug standardization programme of CCRH	Dr. Rakesh Shukla
Industry Sponsored Projects	
DPP IV inhibitor (coded OCID 3570) in rhesus monkeys (Orchid Research Laboratory Limited, Chennai)	Dr. S.K. Puri
14-Days toxicity study of Garbh Pal Ras (Maharishi Ayurveda Products Ltd., New Delhi)	Dr. C. Nath
Stability and formulation development studies of omeloxifene and authentification of *cis* and *trans* standards (HLL Life Care, Thiruvananthapuram)	Dr. A.K. Dwivedi
Identification of bioactive marker(s) from *Cissus quadrangularis* extract (Supreem Pharmaceutical Mysore Pvt. Ltd., Mysore)	Dr. N. Chattopadhyay
14 days systemic toxicity study of RSIUSG adb and Ferrocept in rats (IIT, Kharagpur)	Dr. R.K. Singh

5 Human Resource Development

1 Training programmes attended by CDRI Staff

Name of trainee	Training program, Organizer and Duration
Dr. A.K. Dwivedi	• Workshop on production and certification of reference materials relevant for environmental analytics, N.P.L., New Delhi, 1-4 February 2011.
Dr. Y.S. Prabhakar	• Research methodology: Multivariate methods of analysis, CSIR- HRDC, Ghaziabad, 4-8 July 2011
Dr. Sharad Sharma	• Tenth OECD training Course for GLP Inspector, Jerusalem, Israel 30 October - 2 November 2011
Dr. D.S. Upadhyay	• International training course in Laboratory Animal Science, Faculty of Veterinary Medicine, Utrecht, University, Utrecht, the Netherlands 4-15 July 2011
Dr. Sudhir Kumar Singh	• Training programme on Research methodology and statistical methods: Designing for break through, CSIR-HRDC, Ghaziabad, 16-20 August 2011
Dr. Sarika	• Training programme on Research methodology and statistical methods: Designing for break through, CSIR-HRDC, Ghaziabad, 16-20 August 2011
Mr. Wahajuddin	• Science & communication workshop organized by The Welcome Trust/DBT India Alliance, Hyderabad, 7-9 June 2011 • Fourth Workshop on "Data analysis methods using population approach (Introductory and intermediate level)" organized by Population Approach Group of India, Coimbatore 2-4 June 2011 • International Workshop on "Safety Pharmacology" organized by Safety Pharmacology Society and Advinus Therapeutics, Bangalore, 13-14 April 2011
Dr. Shubha Shukla	• First Joint Safety Pharmacology Workshop, Advinus Therapeutics Ltd, Bangalore, 13-14 April 2011 • Research Methodology for Women Scientist, AIIMS, New Delhi, 3-7 October 2011.
Dr. Vineeta Tripathi **Dr. Vivek V. Bhosale** **Mr. Abhishek Kumar**	• Induction training program for newly recruited scientists B &C, CSIR- HRDC, Ghaziabad, 7-17 March 2011
Ms. Neha Topno	• Induction training program for newly recruited scientists B &C, CSIR- HRDC, Ghaziabad, 10-19 October 2011
Dr. P.K. Agnihotri, Mr. Sadan Kumar	• Training program on Competency development for technical officers, CSIR- HRDC, Ghaziabad, 22-25 February 2011
Mr. V. Nigam	• Training program on Competency development for technical officers, CSIR- HRDC, Ghaziabad, 28 November - 2 December 2011
Dr. AK Mandwal	• Training program on Competency development for technical officers, CSIR- HRDC, Ghaziabad, 20-24 June 2011
Mr. A.S. Kushwaha	• Crafting effective S&T communication, CSIR- HRDC, Ghaziabad, 24-26 August 2011
Ms. Deepmala	• Hands on training on endothelial cell culture and functions and basics of Angiogenesis, AU-KBC Research Centre, MIT, Anna University, Chennai, TN, 28 March - 8 April 2011

2 Ph.D. Thesis Submitted

	Student	Thesis Title	Research Supervisor
Jawaharlal Nehru University, New Delhi			
1	Kuldeep Kumar Roy	Design and synthesis of potential Alzheimer disease therapeutics and modeling studies on β_3–adrenergic receptor agonist	Dr. A.K. Saxena
2	Nilendra Singh	Studies on the role of NADPH oxidase as the source of ROS in cerebral injury	Dr. Ram Raghubir
3	Manavi Chatterji	Behavioral, biochemical and molecular perturbation in glutamate based animal models of Schizophrenia	Dr. Gautam Palit
4	Poonam Shukla	Synthesis, antidiabetics and antidyslipidemic activities of chalcones and related molecules	Dr. Ram Pratap
5	Shiv Kumar Verma	Molecular characterization of nitric oxide stimulatory molecules of *Brugia malayi* parasite	Dr. P.K. Murthy

	Student	Thesis Title	Research Supervisor
6	M. Lakshmi	Pharmacokinetic studies of anti-osteo porotic agents	Dr. G.K. Jain
7	Anupam Jyoti	Identification of nitric oxide synthase interactive proteins and their role in neutrophil extracellular trap formation	Dr. Madhu Dikshit
8	Ravi Shankar Keshari	Studies of nitric oxide mediated signaling in neutrophil free radical generation and extra cellular traps formation	Dr. Madhu Dikshit
9	Pramod Kumar Kushwaha	Cloning and over expression of Th-1 stimulatory proteins for their prophylactic potential against experimental visceral *Leishmania*	Dr. Anuradha Dubey
10	Vibhor Mishra	Structural and functional stability studies on phosphoserine amino-transferase and D-phosphoglycerate dehydrogenase from *Entamoeba histolytica*	Dr. Vinod Bhakuni
11	Javed Akhtar Siddiqui	Identification and characterization of novel natural compounds with multiple roles in bone cells and their mechanism of action	Dr. N. Chattopadhyay
12	Gaurav Swarnakar	Identification and characterization of novel natural compounds for anti-osteoporosis activity	Dr. N. Chattopadhyay
13	Kunal Sharan	Identification and characterization of novel orally active osteogenic natural compounds	Dr. N. Chattopadhyay
14	Bandana Chakravarti	Identification and determination of mode of action of compounds anti cancer breast activity	Dr. N. Chattopadhyay
15	Kishor Kumar	Molecular cloning, over expression, purification and characterization of triose phosphate isomerase enzyme of *Leishmania donovani*	Dr. Uma Roy
16	Ruma Kumari	Exploring insights of mycobacterial serine /threonine	Dr. K.K. Srivastava
17	Awanit Kumar	Immunosecretome analysis of *Aspergillus fumigatus* and generation of monoclonal antibodies	Dr. P.K. Shukla
18	Amit Saraswat	A quest for novel synthetic agents for management of benign prostatic hyperplasia and contraception	Dr. V.L. Sharma
19	Lalit Kumar	Design and synthesis of novel microbicidal spermicides	Dr. V.L. Sharma
20	Nishi	Modulation of Immune system as a novel strategy for Leishmania chemotherapy	Dr. Suman Gupta
21	Bijay Kumar	Analysis of proteins putatively involved in biogenesis of iron-sulphur cluster machinery in the apicoplast of *Plasmodium Falciparum*	Dr. Saman Habib
22	Ravinder	Cloning, expression and characterization of putative antimony resistance gene(s) to explore the molecular mechanism of antimony resistance in the *Leishmania donovani* field isolate	Dr. Neena Goel
23	Vandana	Structural and functional characterization of eubacterial DNA ligases	Dr. R. Ravishankar
24	Prabhat Singh	Evaluation of toxic effects of certain flavonoids	Dr. S.K. Rath
25	Amita Mishra	Synthesis of thiourea and guanidine derivatives as possible anti malarial reagent and development of new approaches to animated heterocycles	Dr. Sanjay Batra
26	Prem Prakash Pathak	Solution structure and dynamics of ADF/cofline from *Leishmania donovani*	Dr. Ashish Arora
27	Anjum Mahmood	Characterization of RD 1 related secretory protein(s) from *Mycobacterium tuberculosis* H37Rv	Dr. Ashish Arora
28	Subal Kumar Dinda	Design and synthesis and pharmacological evaluation of small organic molecule for therapeutic agents	Dr. Gautam Panda
29	Krishananda Samanta	Synthesis and Bioactive natural products and chiral heterocycles from α-amino acids	Dr. Gautam Panda
30	Rishi Kumar Gara	Studies on selective estrogen receptor modulator induced molecular events in cancer cells	Dr. D.P. Mishra
31	Abnish Gautam	Development of novel bone forming agents from natural and synthetic source	Dr. Divya Singh
32	Rajiv Lochan Tiwari	Elucidation of cellular signaling during macrophage differentiation and foam cell formation	Dr. Manoj Bharthwal
Lucknow University, Lucknow			
33	Sanjeev Kanojiya	LC/ESI-MS, MS/MS studies of bioactive compounds & their inclusion complexation ability with cyclodextrins	Dr. K.P. Madhusudanan

	Student	Thesis Title	Research Supervisor
34	Sandeep K Sharma	Characterization of surface antigens of *V. choleree*	Dr. Ranjana Srivastava
35	Niraj Kumar	Cloning, characterization and immunogenicity neurozoite surface protein -1 of malarial parasites	Dr. D.C. Kaushal
36	Sarika Yadav	Biochemical studies of adenosine deaminase of *Plasmodium yoelii*	Dr. J.K. Saxena
37	Swayam Prakash Srivastava	Biochemical, molecular & physiological basis of action of selected terrestrial plants	Dr. Arvind K. Srivastava
38	Vijay Kumar	Ketone dithioacetal –derived 2- pyranones and their C-/ N- nucleophile induced ring products	Dr. Atul Kumar
39	Smita Rai	Characterization of mechanism(s) of antimony resistance in Leishmania fields isolates	Dr. Neena Goyal
Chhatrapati Shahu Ji Maharaj University, Kanpur			
40	Alok Kumar Verma	Synthesis of some potential anti hyperglycemic and anti hyperlipidemic agents	Dr. Ram Pratap
41	Pragya Misra	Studies on TH 1 stimulatory amastigote proteins for their prophylactic potential against experimental visceral Leishmaniasis	Dr. Anuradha Dubey
42	Meenakshi	Design and synthesis of peptides and peptidomimetics of biological significance.	Dr. W. Haq
		Banaras Hindu University, Varanasi	
43	Dinesh Kumar Yadav	Chemical investigation of medicinal plants and synthesis of biologically active natural products	Dr. Rakesh Maurya
44	Nimish Singh	Synthesis of aromatics, hetrocycles and carbohydrate derivatives as chemotherapeutic agents	Dr. R.P. Tripathi
Jamia Hamdard, New Delhi			
45	Santosh Kumar Tota	Study on the role of central Renin-Angiotensin System (RAS) in memory function and its interaction with brain derived neutrophilic factor (BDNF)	Dr. C. Nath
46	Sheelendra Pratap Singh	Investigation of pharmacokinetic interaction of flavonoids with anti osteoporotic compounds (s)	Dr. G.K. Jain
B R Ambedkar University, Agra			
47	Sudhir Kumar Sharma	Design and synthesis of novel based polycycles of biological interest	Dr. Bijoy Kundu
48	Piyush Kumar Agarwal	Novel application of the Pictet-Spengler reaction leading to the synthesis of N-rich polyhetrocycles of biological interest	Dr. Bijoy Kundu
49	Ravindra Singh	Studies on biological parameters of albino rat (Sprague Dawley rat) under the influence of commercial and in-house feed formulations	Dr. D.S. Upadhyay
Birla Institute of Technology & Science, Ranchi			
50	Raj Kumar Verma	Studies on the molecular mechanism of glutamate transporters in glutamate homeostasis drugging cerebral ischemia/ reperfusion injury	Dr. Ram Raghubir
Jadavpur University, Kolkata			
51	Pinki Pal	Synthesis of modified sugar derivatives of biological importance	Dr. A.K. Shaw
Chaudhary Charan Singh University, Meerut			
52	Abdhesh Kumar	A synthetic approach towards the development of coumarin anologs as potential pharmaceutical agents	Dr. K.V. Sashidhara
Dr. Ram Manohar Lohia Avadh University, Faizabad			
53	Vivek Parashar Pandey	Synthetic studies in sugar hybrid molecules: Development of new chemotherapeutic agents	Dr. R.P. Tripathi
MJP Rohilkhand University, Bareilly			
54	Mradul Mishra	Studies on new anti malarial agents: Synthesis and bio-evaluation	Dr. R.P. Tripathi
		Gautam Buddha Technical University, Lucknow	
55	Vikas Mishra	Analysis of NMDAR and ASIC mediated excitotoxicity and acidotoxicity in cerebral ischemia/reperfusion injury	Dr. Ram Raghubir
Integral University, Lucknow			
56	Deeba Zaidi	Role of oxidative stress in Centchroman mediated apoptosis: *In vitro* studies	Dr. A.K. Balapure

3 MD Thesis Submitted

	Name of Researcher	Title of Thesis	Name of Supervisor from CSIR-CDRI	Name of University
1	Dr. Samar Zia	Prediction of endometriosis with serum and peritoneal fluid markers in patients with Chronic Pelvic pain & infertility	Dr. Ashim Ghatak & Dr. Rituraj Konwar	Chhatrapati Shahu Ji Maharaj University, Kanpur
2	Dr. Milli Jain (MD)	Study on activity of NO Synthase in hematopoietic malignancies with social reference to Myeloid Neoplasms	Dr. Madhu Dikshit	Jawaharlal Nehru University, New Delhi
3	Dr. Vivek Srivastava	A comparative study of C-reactive protein and interleukin following Non-surgical periodontal therapy in diabetic subjects with chronic periodontitis	Dr. P.K. Murthy	B R Ambedkar University, Agra

4 MD - PhD Thesis Submitted

1	Dr Nikhil Kothari	Biomarkers of sepsis and septic shock in critically ill patients	Dr Madhu Dikshit	Jawaharlal Nehru University, New Delhi

5 Sponsored training provided to external aspirants

Under the above program, the institute imparted training to the post-graduate students, fellows from foreign countries and aspirants from academia and industries across the India in the area of drug & pharmaceutical research, techniques in laboratory animals, tissue & cell culture, instrumentation, sophisticated analytical instruments and other laboratory techniques as given below:

5.1 Training to Post Graduate Students

During the calendar year, a total of 168 Post-graduate students from 35 universities and their affiliated colleges from all over the country were selected on merit basis and were imparted training in various disciplines of drugs and pharmaceutical research for 4-10 months duration.

5.2 Training to the students from NIPER, Raebareli

CDRI being a mentor institute for the NIPER, Raebareli, imparted one year project training in biomedical research to 30 M.S.(Pharm) Pharmaceutics & Medicinal Chemistry specialization students

5.3 International training under bilateral cooperation

Long-term/short term training was provided to the following trainees from abroad:

Name and Address of Trainee	Fellowship	Supervisor	Duration
Mr. O. Ismaila Ishola Assistant Lecturer, Department of Pharmacology, College of Medicine, University of Lagos, Nigeria	CSIR-TWAS Fellowship for Postgraduate studies	Dr. Rakesh Shukla	25 May, 2010 to 18 March, 2011
Dr. The Su Moe Lecturer, Department of Biotechnology, Mandalay Technological University, Kyaukse, Mandalay Division, Myanmar	RTFDCS Fellowship for Postdoctoral Research	Dr. Ranjana Srivastava	16 March, 2010 to 11 March, 2011
Dr.(Ms) Ngueguim Tsofack Florence Assistant Lecturer, Laboratory of Animal Physiology, Faculty of Science, University of Yaounde 1, Yaounde, Cameroon	C.V. Raman International Fellowship for African Researchers for Post Doctoral research	Dr. Naibedya Chattopadhyay	14 February, 2011 to 11 August, 2011

5.4 Training under cooperation with INSA & NASI

Under the programme, 9 INSA & NASI fellows from different institutes were provided training in different aspects of biomedical research.

5.5 Adhoc Training

5.5.1 Training on tissue culture techniques was imparted to Drs. A. K. Singh, Mradula Chauhan, Shobhana Vaish, Chandra Dev & Rajkumar Bharti Dental Surgeons, C.S.M. Medical University, Lucknow for M.Phil Program.

5.5.2 Mr. Achut Neopane and Mr. Ganesh Rana from Anandvan Leoprosy Hospital, Lalitpur, Nepal were provided 1 week Training in Breeding and management of laboratory animals (1 week)

5.5.3 Ms. Anupama Kumari, Institute of Liver and Biliary Sciences, Vasant Kunj, New Delhi -7 was provided 1 month training in Breeding and management of laboratory animals

5.5.4 Abhilasha Sood, Panjab University, Chandigarh was provided with two weeks training on MCAo model learning in Pharmacology division

5.5.5 Mr. K.M.N. Prasad, Project fellow, Department of Biotechnology, Indian Institute of Technology, Guwahati was provided 3 weeks hands on training for "Maintenance of *in vitro* culture of *Plasmodium falciparum*" in the Parasitology division

6 Honours and Awards

Dr. C. Nath

- Dr. D.N. Prasad Memorial Oration Award – 2007 awarded by ICMR in 2011

Dr. Gautam Panda

- CRSI Medal in Recognition of his Contributions to Research in Chemistry
- Japan Society for the Promotion of Science Invitation Fellowship for Research in Japan

Dr. Shailja Bhattacharya

- Elected Fellow of the National Academy of Sciences, India 2011

Dr. Renu Tripathi

- Recognition Award by Zoological Society of India

Dr. Rajender Singh

- Young Scientist Award 2011, Indian National Science Academy
- Young Scientist Award 2011, Indian Science Congress Association

Dr. Gautam Palit

- Elected Secretary (International), Indian Pharmacological Society for the year 2012-15

Dr. R.P. Tripathi

- Excellence in Carbohydrate Research Award 2011 by ACCTI

Dr. Madhu Dikshit

- Elected President of the Cytometry Society of India

Dr. Sanjay Batra

- Professor D.K. Banerjee Memorial Lecture Award, Department of Organic Chemistry, IISc, Bangalore

Dr. Syed Musthapa

- Gold Medal 2011 for work excellence by Association of Biotechnology and Pharmacy
- Young Scientist Award-2011, Association of Biotechnology and Pharmacy

Dr. Anil Balapure

- CDRI Oration Award Lecture, Indian Pharmacological Society

Mr. Wahajuddin

- Prof. AK Dey Award 2011 for Analytical Chemistry by Indian Chemical Society, Kolkata
- Bioanalysis Young Investigator 2011, by Bioanalysis – an International Journal

Dr. Ashish Arora

- Prof. S. Subramanian's 60th Birth day Lecture Award for NMRS-2011.
- National Bioscience Award 2011.

Dr. Jiaur R Gayen

- ABAP Senior Scientist – 2011 award, Association of Biotechnology and Pharmacy
- Fellow of Association of Biotechnology and Pharmacy

Dr. Suman Gupta

- Best Poster Award - Biological sciences, Conference of Indian Society of Chemists and Biologists, Lucknow

Dr. Vibhor Mishra (Student of Dr. Vinod Bhakuni)

- Eli Lilly and Company Asia Outstanding Thesis Award – 2011 (Second prize)
- Young Scientist Award and Best Presentation Award, 23rd National Congress of Parasitology, Chennai, 2011

Dr. Amantullah Ansari (Student of Dr. Kamlakar Avasthi)

- Eli Lilly and Company Asia Outstanding Thesis Award – 2011 First prize
- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Chemistry

Dr. Virender Singh (Student of Dr. Sanjay Batra)

- Selected for Nehru Fellowship by CSIR with Dr. Nitin T. Patil
- Selected for Kothari Fellowship from UGC

Mr. Subir Biswas (Student of Dr. Saman Habib)

- Dr. M.M. Dhar Memorial Award

Mrs. Nishi (Student of Dr. Suman Gupta)

- Prof. M.B. Mirza award of The Indian Society for Parasitology for the best published research work carried out in India. Chennai, 2011

Ms. Deeba Zaidi (Student of Dr. Anil Balapure)

- Appreciation Award for Poster, 79th meeting of Society of Biological chemists, India

Ms. Sunita Yadav (Student of Dr. JK Saxena)

- Best Poster Award at 23rd National Congress of Parasitology, Chennai, 2011

Mr. Awakash Soni (Student of Dr. SK Puri)

- Award for best poster presentation in 23rd National Conference of Parasitology, 18-20 November, Anna University, Chennai

Mr. Prateek Tripathi (Trainee-student of Dr. Jawahar Lal)

- Best Poster award in the 3rd CDRI-NIPER (RBL) Symposium on Medicinal Chemistry and Pharmaceutical Sciences

Ms. Ankita Misra (Student of Dr. Madhu Dikshit)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Biology

Mr. Kunal Saran (Student of Dr. DP Mishra)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Biology

Mr. Anupam Jyoti (Student of Dr. Madhu Dikshit)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Biology

Ms. Santosh Jangir (Student of Dr. VL Sharma)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Chemistry

Mr. Vivek Khanna (Student of Dr. Madhu Dikshit)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Pharmaceutics/ Pharmacology

Mr. Sheelendra Pratap Singh (Student of Dr. GK Jain)

- CSIR-CDRI Diamond Jubilee Award for Best Oral Presentation in Pharmaceutics/ Pharmacology
- Selected for 3rd Novartis Biotechnology Leadership Camp (BioCamp), Hyderabad

Mr. Amit Kumar Gupta (Student of Dr. AK Saxena)

- Selected for 3rd Novartis Biotechnology Leadership Camp (BioCamp), Hyderabad
- Member of Winning team of Novartis BioCamp 2011

Mr. Swaroop Kumar Pandey (Student of Dr. Renu Tripathi)

- Second Best Poster Award in 22nd All India Congress of Zoology, Lucknow

CSIR-Central Drug Research Institute, Lucknow

Other Activities


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, भारत
CSIR INDIA

1 Major Events Organized

National Seminar and Workshop on Mass Spectrometry

Sophisticated Analytical Instrument Facility, CSIR-CDRI organized a National seminar on Mass Spectrometry followed by Workshop during 11-14 January 2011. Seventy three participants from different academic institutions and industries attended the seminar and workshop. Invited speakers were all international experts and had delivered the current state of mass spectrometry with the highlights of hot topics and potential future course of advances in mass spectrometry. The workshop provided a golden opportunity to experience the state of the art MS techniques and initiate lively discussion among veteran research scientists, academicians and budding researchers to share their knowledge in the frontier areas of chemical and biological sciences.

Diamond Jubilee International Conference

	Name & Address of Speaker	Topic
	**Prof. Horst Kessler** Institute for Advanced Study, TU Munchen, Lichbergstrasse 4, 85747 Garching, Germany	Rational and combinatorial design of selective integrin inhibitors
	**Prof. David Crich** Centre de Recherche de Gif, Institut de Chimie des Substances Naturelles, CNRS, Avenue de la Terrasse, 91198 Gif-sur-Yvette, France	New methodology for the synthesis of peptides, glycosides and their conjugates
	**George Fleet** Department of Chemistry, University of Oxford, Mansifield Road, OX1 3TA, UK	Monosaccharides mimics and mirrors
	**Prof. Med. Katja Becker** Chair of Nutritional Biochemistry Interdisciplinary Research Center, Justus-Liebig University Giessen, Heinrich-Buff-Riff-Ring 26-32, 35392, Giessen, Germany	Redox-based antimalarial drug discovery an update
	**Prof. Roger New** Executive Director & Cofounder, Proxima Concepts Limited, London NW 36ZW, UK	New frontiers in protein therapeutics
	**Prof. Malcolm Walkinshaw** Director, Institute of Structural and Molecular Biology School of Biological Sciences, University of Edinburgh, Edinburgh.	The glycolytic pathway as a target for structure based inhibitor design
	**Dr. Satyajit Rath** National Institute of Immunology, New Delhi	The calibration of cellular responses to stimulation: A case study in T- lymphocytes

Panel Discussion on the Scientist's Place in Health and Medicine

A panel discussion on 'The Scientist's Place in Health and Medicine' was organized on the 11 of February 2011. Prof. Rooprekha Verma, Philosopher, ex-VC, Lucknow University; Prof. Imrana Qadeer, Doctor, Community Medicine, JNU; Dr. Satyajit Rath, Scientist, NII and Leena Menghaney, Activist, Doctors without Borders/ Médecins Sans Frontières were the panellists who spoke on different aspects of the science-society debate during the occasion.

Diamond Jubilee & Annual Sports Prize Distribution Function

CSIR-CDRI Diamond Jubilee & Annual Sports Prize Distribution Function was held on 15 February 2011 in the main auditorium of the institute. Dr. (Mrs.) Sushmita Chakraborty was the Chief Guest on the occasion. Dr. T.K. Chakraborty, Director, CSIR-CDRI presided over the function. During the function, prizes were distributed to the winners of different track and field events held at the Institute as a part of Annual Day celebrations.

Diamond Jubilee Annual Day Celebrations

CSIR-CDRI, Lucknow celebrated its 60th Annual Day on 17 February 2011. Shri Pawan Kumar Bansal, Hon'ble Minister for Parliamentary Affairs, Science & Technology and Earth Sciences was the Chief Guest on the occasion. Prof. N.K. Ganguly, Chairman, CSIR-CDRI Research Council and former Director General, ICMR presided over the function. Prof. S.K. Brahmachari, DG, CSIR participated in the event through video conference. During the day, an exhibition on drugs developed by CSIR-CDRI and other facilities available at CSIR-CDRI was organized. On the occasion, employees who had completed 25 years of service in CSIR-CDRI, during the year, were felicitated by presenting mementos. Winners of Diamond Jubilee Award for best oral presentations in Life Sciences and Chemical Sciences were awarded with cash prizes and certificates. Dr. M.M. Dhar Memorial Award for Best Thesis was given to research fellow. Incentive awards for best publications in biological sciences and chemical sciences and best patents were announced and awardees were given a certificate and cash prize.

36th Mellanby Memorial Lecture

In memory of Sir Edward Mellanby, Founder Director, CSIR-CDRI, the 36th Mellanby Memorial Lecture was organized on February 17, 2011. The lecture was delivered by Prof. Dorairajan Balasubramanian, Director of Research, L.V. Prasad Eye Institute, Banjara Hills, Hyderabad. The topic of his lecture was "Stem cell therapy to repair the damaged cornea of the eye". Dr. Balasubramanian discussed the results of a long term consecutive interventional case studies of 401 autologous cultivated limbal epithelial transplantations done at L.V. Prasad Eye Institute. He opined that reconstruction of damaged ocular outer surface using the corneal epithelial sheet obtained by cultivating limbal derived stem cells is a viable surgical option for treating limbal stem cell deficiency.

Chemtech/Pharma World Expo-2011

CSIR-CDRI participated in the Chemtech/Pharma World Expo-2011 which was organized as a Silver Jubilee event by the Chemtech Foundation from 23-26 February 2011 at Bombay Exhibition Centre, Goregaon, Mumbai. The theme was New Drug Discovery and Availability of New Drugs for Masses at Affordable Price. CDRI drugs like Saheli as Contraceptive, Novex- DS for the management of dysfunctional uterine bleeding to avoid hysterectomices, E-Mal for the treatment of cerebral and chroloquine resistant malaria and Memory Sure for the improvement of the memory. CDRI has also been projected in OSDD program of CSIR in the area of tuberculosis. The exhibition was attended by large number of delegates.

National Science Day Celebrations

Institute celebrated the National Science Day on 28th February 2011 in its premises. In the forenoon, Science quiz and extempore speech competition was organized exclusively for research scholars, project assistants and trainees. Prof. M.C. Pant, Director, Ram Manohar Lohiya Institute of Medical Sciences, Lucknow was the Chief Guest of the valedictory function, organized in the afternoon. Dr. T.K. Chakraborty, Director, CSIR-CDRI chaired the function. Prof. Pant delivered National Science Day Lecture on Cancer Education in Community. Winners of the competition were awarded with cash prize and certificate.

3rd CSIR-CDRI-NIPER (RBL) Symposium on Medicinal Chemistry and Pharmaceutical Sciences

The 3rd CDRI -NIPER (RBL) Symposium on Medicinal Chemistry & Pharmaceutical Sciences was organized during 03-05 March, 2011 at Central Drug Research Institute, Lucknow. This symposium was organized to expose students of NIPER (RBL) and other Pharma students of the country to recent developments and current state of the art research being conducted in frontier areas

of Drug Discovery & Development and augment their knowledge in focused areas of Pharmaceutical Sciences. The invitation was extended to internationally known scientists of Academia & Industry and symposium was attended by 203 registered delegates. The inaugural key note lecture was delivered by Dr. C. M. Gupta, former Director, CSIR-Central Drug Research Institute, Lucknow. The Inaugural function was presided over by Dr. P. K. Seth former Director, IITR & CEO, Biotech Park, Lucknow. Total 18 lectures were delivered by the eminent speakers both from Academia and Pharma Industry. During two days deliberations several current topics such as (i) Small RNA: Big impact and robust hope in modern medicine, (ii) Emerging trends in API developments, (iii) High throughput proteomics for translation research, (iv) Flexibility in drugs and their targets: Challenges in drug design investigated using computer simulation approach, (v) Sustained Release Injectable Products: Case Study of Commercially Successful Novel Drug Delivery Systems were discussed by the speakers.

Symposium on Magnetic Resonance

A symposium on Magnetic Resonance was jointly organized by Council of Scientific and Industrial Research and The National Academy of Sciences, India, Lucknow Chapter on 7 March 2011 in CSIR-CDRI. During the event, Prof. Richard R. Ernst, a Nobel Laureate, Honorary Doctor, Swiss Academy of Science, Switzerland presented his deliberations on 'The Fascination and Benefits of Magnetic Resonance in Chemistry, Biology and Medicine'.

Laboratory Animal Technician Training Course

A Laboratory Animal Technician Training Course was organized for a period of two weeks w.e.f. March 7-18, 2011 at National Laboratory Animal Centre CSIR-CDRI, Lucknow with financial support of the National Institute of Animal Welfare (NIAW), Ministry of Environment & Forests, Government of India. The course was aimed at providing comprehensive education and training to the technicians and attendants engaged in the area of laboratory animal

care, breeding and management with a view to improve their skill and competence in various lab animal techniques, their handling, restraint, routine care and management practices. Total 19 candidates from various institutes/Medical colleges of Lucknow participated and successfully completed the training course.

Holistic Health Education Programme for Rural Schools

Under the ongoing project on Holistic Health Education Programme for Rural Schools CSIR-CDRI Lucknow organized another Health Awareness Lectures and Health Check up Camp at Disha Public School, Matee, District Barabanki on 25th March 2011 with the financial support from CSIR New Delhi. The Camp was organized in collaboration with CMO office, Barabanki, in which about 300 students and staff of the school enthusiastically participated. The students were thoroughly examined by the team of doctors deputed by the Chief Medical Officer Barabanki and medicines were distributed free of cost to the students as per the advice.

Seminar on Purification Media by GE Healthcare Life Sciences

GE Healthcare Life Sciences organized a one day seminar on Purification Media on 4 April 2011 at CSIR-CDRI. Experts from the above organization gave lecture on following topics: Detergent screening for optimized purification conditions for Histidine-tagged membrane proteins & Multimodal chromatography – the "All in One" resin; Purification of GST-tagged proteins using prepacked columns; Protein phosphorylation and sample prep and simple protein purification and enrichment with magnetic beads. Scientists and research fellows from CSIR-CDRI and other Lucknow based institutes participated in the deliberations.

Training Program on Research Applications of Flow Cytometry

CSIR-CDRI and BD Biosciences (India) organized a five-day training program on 'Research Applications of Flow Cytometry' from 16-20 May 2011. The program covered diverse research applications of flow cytometry such as multicolor immunophenotyping, cell cycle and apoptosis, cell signaling, cytokine analysis and cell sorting through a mix of didactic presentations, interactive discussion sessions and wet lab demonstrations.

Fourteen research scholars attended this wet lab course. Program coordinators, Dr. Madhu Dikshit, CSIR-CDRI and Dr. Paresh Jain, BD biosciences provided Scientific support. Presentations/ Lectures were given by Dr. Paresh Jain, Dr. Amitava Mohanty, Mr. T. Nagarjuna, Dr. Madhu Dikshit, Dr. Amit Misra. Wet lab experiment on apoptosis was performed by Mr. Anupam Jyoti and Mr. Ravi Shankar Keshari.

Orientation Programme for CSIR-CDRI's Newly Joined Staff

CSIR-CDRI, Lucknow for the first time organized Orientation program to its newly joined scientists, technical staff and administrative personnel to familiarize them with the vision, mission, goals, ethos /culture of CSIR-CDRI and introduce them to national / global S&T and industrial scenario, IPR and contract R&D etc. The first phase of the program was held during 7-29 June 2011 which included visits to all the divisions of CSIR-CDRI. About 19 newly joined scientists and 12 technical staff participated in this orientation program. During their visit, all the Head of divisions gave a brief introduction of their laboratory followed by visit to all the laboratory and facilities in that division and interaction with bench scientists to have hands-on experience.

Hindi Karyashala

A two day workshop on Hindi Bhasha was organized at CSIR-Central Drug Research Institute, Lucknow during 27-28 June 2011, in which, the members of Nagriya Rajbhasha Karyanvayan Samiti (NRKS) Lucknow and all the employees of CSIR-CDRI

participated. On this occasion Prof. S. P. Dikshit, Ex- HOD, Hindi Department, Lucknow University addressed the workshop as the Chief Guest. Dr. V.N. Tiwari delivered a lecture on, "Unicode font ki sahayta se computers par Hindi main Karya karne ki sambhavnayen". Besides, Dr. Vijay Karn, Professor, Vidyant College, Lucknow and Dr. S.K. Tiwari, Scientist also delivered their talks. The workshop was concluded with the vote of thanks by Dr. V. N. Tiwari, Secretary, Nagriya Rajbhasha Karyanvayan Samiti (NRKS) Lucknow.

Three Day Workshop on Scientific & Technological Cooperation between CSIR and TISTR

A three day workshop for the five member delegation from TISTR, Thailand in the areas of Herbal drugs / medicinal plants: Lung & brain diseases, diabetes and hepatitis' was organized during 28-30 June 2011 at CSIR-CDRI, Lucknow. The delegates were briefed with the activities of the institute and enquired upon the happenings at TISTR, Thailand. There were exchanges of assurances on future collaborative measures from both institutes. Domain experts in the above area from CSIR-CDRI, CSIR-IITR and CSIR-CIMAP gave detailed presentations on different topics of interest followed by visit to the laboratories. In the concluding session, the delegation expressed their satisfaction over the workshop and added that they shall brief about this workshop to the Governor, TISTR who shall, later this year, may invite the Director and other domain experts to visit TISTR and enable them to establish the research groups on Diabetes, Toxicology etc and can initiate the bilateral collaborative research programs. The Director, CSIR-CDRI handed over the mementos and certificate of participation to all the delegates.

Seminar on Biomolecular Interaction Studies Using Biolayer Interferometry Technology & New Applications of Microarrays in Drug Discovery

iLife Discoveries, Manesar, Gurgaon Haryana, organized a one day seminar on Biomolecular interaction studies using biolayer

interferometry technology & new applications of microarrays in drug discovery on 27 July 2011. Dr. Vipul Bhargav, Associate Director of iLife Discoveries delivered a talk on use of Biolayer interferometry technology and microaarays in drug discovery. Mr. Ashwani Kamal, Application Scientist explained the technical details of above techniques. Scientists and Research fellows working in this domain participated in the programme and interacted with the experts.

Live Demonstration cum Training Programme by Thomson Innovation

Thomson Innovation is a single, integrated solution that combines intellectual property, scientific literature, business data and news with analytic, collaborative and alerting tools in a robust platform. Thomson Innovation organized a live demonstration cum training programme on 12 August 2011 at CSIR-CDRI. In this programme, representatives demonstrated how they give us the ability to research IP on our own terms. Gain optimal search power with Custom Fields, an exciting new capability that lets us incorporate our own data with global patent data for better, more relevant business decisions.

Sadbhawana Diwas

"Sadbhawana Diwas" was celebrated in the institute on 19 August 2011 with a theme to promote national integration and communal harmony among people of all religions, languages and regions. The idea behind observance of Sadbhawna Diwas is to avoid violence and to promote goodwill among the people. All the employees of CSIR-CDRI participated in this occasion and took the "Pledge of Sadbhawana" that they will work for the emotional oneness and harmony of all the people of India regardless of caste, region, religion or language.

Symposium on Proteins Shaped His Life: In Vinod's Memory

A one day symposium entitled "Proteins Shaped His Life-in Vinod's Memory" was organized by CSIR-CDRI to pay tribute to late Dr. Vinod Bhakuni on August 24, 2011. The occasion was graced by former Directors of the Institute and family members of Dr. Vinod Bhakuni. Scientists and students of the institute joined to pay respects to his memory. The symposium started with a presentation of photographs of Dr. Vinod Bhakuni and an account of his scientific contributions. Dr. CM Gupta, former Director, CSIRCDRI talked about his 27-year association with Dr. Bhakuni. The scientific session had prominent speakers from across the country as detailed below:

Prof. D Balasubramanian
The Greek Key Motif in crystallins and eye lens transparency

Prof. K Muniyappa
Recombinational DNA repair in mycobacteria: Protein structures mechanisms and search for inhibitors

Dr. Shekhar Mande
Allosteric changes in the cAMP receptor protein and the universality of cAMP mediated signaling

Prof. Rajiv Bhat
Effects of stress osmolytes on the stability, folding and aggregation of proteins

Prof. P Guptasharma
A novel 'structure-sensitive' fluorescence from polypeptide backbones associated with electron transport

Dr. K Prakash
Proofreading and discard mechanisms in pre-mRNA splicing

Six Monthly Meeting of Nagar Rajbhasha Karyanvayan Samiti, Lucknow

The six monthly meeting of Nagar Rajbhasha Karyanvayan Samiti (NRKS), Lucknow was organized in main auditorium of CSIR-CDRI, Lucknow on 26th August 2011. On this occasion, Dr T.K. Chakraborty, Director, CSIR-CDRI and President, Nagar Rajbhasha Karyanvayan Samiti (NRKS), Lucknow chaired the meeting. During the meeting, Dr. V.N. Tiwari, Senior Hindi Officer, CSIR-CDRI and Secretary NRKS presented the report of all 67 offices.

Three offices were given distinguished awards and ten offices were felicitated for working in Hindi. Three offices were awarded for publication of Rajbhasha Patrika and other 35 offices

were felicitated for organizing the Hindi workshops. Mr. Vinod Kumar, Deputy Director (Executive North area), Rajbhasha Vibhag, Home Ministry, Indian Government, also delivered a speech on this occasion. Meeting was completed with vote of thanks by Controller of Administrator, CSIR-CDRI, Lucknow.

Hands-on Training Course on 2D DIGE Technology

To utilize 2D DIGE technology on a larger scale in CDRI - create a cohesive unit of students who complement each other with collective learning and help other users in this institute, a hands-on training course was organized during 6-9 September 2011. The experts from GE Health Technology assisted in conducting the programmes, which included preparation of protein samples for 2D from different sources, labeling of protein samples, IEF and 2 dimension gel electrophoresis, scanning of gels, analysis of images using Image-Platinum software and experience with Decyder, the DIGE software. Ten research scholars from different divisions who are using Proteomics approach in their PhD project attended the programme and received hands-on training.

Advanced Workshop on Research Applications of Flow Cytometry

A specialized workshop in flow cytometriy analysis of apoptosis was organized from 19 to 22 September 2011 for the participants from all over India. A total of 6 aspirants from different laboratories across India were selected for the training program based on their biodata and need/usage of this workshop for participant. The main focus of the workshop was on studies related to apoptosis and use of flow cytometry technique for performing these studies. Core faculties, Dr. BS Dwarkanath (INMAS, New Delhi), Dr. Madhu Dikshit, Dr. Anil Gaikwad (CSIR-CDRI, Lucknow), Dr. Paresh Jain and Dr. Amitav Mohanti (BD India Pvt. Ltd) successfully demonstrated four detailed experiments – Annexin V/PI (early stage apoptosis), JC-1 mitochondrial depolarization experiment, Caspase activation assay (Mid stage apoptosis) and TUNEL for DNA fragmentation (Late stage apoptosis). One day was dedicated for one experiment covering all aspect like technique introduction, theory, and practical issues/troubleshooting and execution of experiments and analysis. The workshop was concluded on 22 September 2011 with distribution of certificates to participants and resource persons.

Lecture by Prof. C.N.R. Rao as a part of International Year of Chemistry Celebrations

As a part of the International Year of Chemistry 2011 (IYC 2011) celebrations, CSIR-CDRI organized a lecture by Padma Vibhushan Prof. CNR Rao, FRS, National Research Professor and Linus Pauling Research Professor, JNCASR, Bangalore and Chairman, Science Advisory Council to the Prime Minister of India on 21st September, 2011. Function was attended by the Directors of all CSIR labs, more than 225 students of various colleges and universities based at Lucknow and CSIR-CDRI staff Dr. TK Chakraborty, Director, CSIR-CDRI formally welcomed Dr. Rao to the event and introduced to the audience about the life and achievements of Prof. Rao. Dr. Rao delivered a lecture on 'Chemistry: Glorious Past and Exciting Future' in which he pointed out how Chemistry is an instrument to alleviate human suffering, to improve the quality of human life and build necessary bridges. He described that Chemistry as the queen and servant of biology as well as material sciences in this lucid and simple booklet on the development and importance of Chemistry. During the event, 'Chemistry Today' a booklet by Prof. Rao to celebrate the IYC 2011 was distributed to the students. Dr. Sanjay Batra, organizing secretary of the event gave vote of thanks.

CSIR-CDRI Award-2011 for Excellence in Drug Research

CSIR-CDRI Awards 2011 for Excellence in Drug Research has been instituted in the year 2004 to honour the Indian researchers below 45 years of age who have contributed significantly to the broad areas of drug research. The Award is being given in two categories viz. Life Sciences and Chemical Sciences. Each award carries a cash prize of Rs. 20000 and a citation. The prestigious

CSIR-CDRI Award for Excellence in Drug Research for the year 2011 in Life Sciences has been awarded to Dr. Shantanu Chowdhury, IGIB, New Delhi for his work on **"Genome wide predictions of G-quadruplex as promising drug targets"** whereas in Chemical Sciences the award has gone to Dr. Gangadhar J. Sanjayan, NCL, Pune for his work on **"Design and development of artificial proteins scaffolds which may be of considerable use in intervening various protein-protein interactions and cell membrane interactions".**

A presentation ceremony of CDRI Awards - 2011 was held on 26 September 2011. Prof. N. Jayaraman, Department of Organic Chemistry, Indian Institute of Science, Bangalore presided over the function and a lecture on PETIM Dendrimer Gene Delivery Platforms. Dr. Chowdhury delivered the award oration on 'Another dimension to gene regulation: The emerging story of G-quadruplex DNA structure as molecular targets'. Dr. Sanjayan delivered award oration on 'From peptides to foldamers: Use of non-covalent interactions in structural design'.

CSIR Foundation Day Celebrations

The Institute celebrated the 69th CSIR Foundation Day on September 26, 2011. During the day, a Science Exhibition was organized in the CSIR-CDRI Museum which was inaugurated by the Chief Guest of the event Prof. N. Jayaraman, Department of Organic Chemistry, Indian Institute of Science, Bangalore. The exhibition remained open for students and public throughout the day. More than 400 students and teachers from different schools and colleges visited exhibition and some selected laboratories.

The main function was organised in the afternoon. The chief guest Prof. N. Jayaraman from IISc, Bangalore addressed the audience. CSIR-CDRI Newsletter (Vol.3 No.1 – April to September, 2011) was released during the event. In the meeting, 26 retired

employees of CSIR-CDRI as well as those 13 colleagues who completed 25 years of service in CSIR were felicitated and given a certificate, wrist watch and a shawl in recognition to their service towards the growth and development of the institution. Prizes were also awarded to the winners of essay/quiz competition organized on the occasion by Dr. (Mrs.) Susmita Chakraborty.

Faculty Training & Motivation and Adoption of Schools & Colleges by CSIR-CDRI, Lucknow

With an aim to take up training and motivational programs for selected science teachers to upgrade their knowledgebase and skills in new and emerging areas of science and to raise the standard of science education and learning capabilities of students in selective schools/colleges to nurture a cadre of the most brilliant and gifted youths to take up science as a career, HRDG, CSIR has initiated "Faculty Training & Motivation and Adoption of Schools & Colleges by CSIR Labs." program. Under this scheme, CSIR-Central Drug Research Institute, for the year 2011-12, has adopted 3 local Colleges namely (i) Government Jubilee Inter College, Shahmina Road, (ii) Government Inter College, Husainabad and (iii) Government Girls Inter College, Shahmina Road.

CSIR-CDRI formally launched the above program on 26th September, 2011. In the forenoon, the students and teachers from adopted schools were taken around the different laboratories and

museum of CSIR-CDRI and apprised them about the research activities being carried out at CSIR-CDRI and achievements. Inaugural function, held in the afternoon, was attended by Principals, teachers and large number of students of the adopted colleges. Dr. TK Chakraborty, Director, CSIR-CDRI presided over the function. Dr. DN Upadhyay, Principal Scientist and Program Coordinator gave welcome address. Principals of adopted schools expressed their views on the program. Director, CSIR-CDRI gave presidential remarks and presented token of contributions by CSIR-CDRI to each schools comprising of chemicals and minor equipments costing about Rs. 50000 towards improving the laboratory infrastructure of schools. Mr. Vinay Tripathi, Senior Principal Scientist & Head, Division of S&T Management gave vote of thanks.

Workshop on Mass Spectrometry

Sophisticated Analytical Instrumentation Facility, CSIR-Central Drug Research Institute organized a workshop on Mass Spectrometry on 26-30 September 2011. Eleven aspirants from different laboratories/institutes across India attended the program. The speakers and application people were all experts and had delivered the current state of mass spectrometry with the highlights of hot topics and potential future course of advances in mass spectrometry. In this workshop all the participants were trained to work on 4000 Q Trap LCMSMS and 4800 Maldi TOF/TOF instruments and encouraged to ask queries and questions from the experts. The workshop provided a golden opportunity to experience the state of the art MS techniques and initiated lively discussion among research scientists, and budding researchers to share their knowledge in the frontier areas of chemical and biological sciences. The beginners got a chance to familiarize themselves with mass spectrometric techniques and gained confidence by seeing its applications and data interpretation in real situations.

Scientific and Technical Awareness Programme on Animal Experimentation

The Division of Laboratory Animals, at CSIR-Central Drug Research Institute, Lucknow organized "Scientific and Technical Awareness Program on Animal Experimentation" as a part of human resource development programme of the institute for the animal users especially the newly joining scientists, technical staff, research fellows and project assistants of different biological disciplines of the institute from October 10-14, 2011. The event was aimed at providing the participants a preliminary understanding about the methods of humane care of experimental animals and common animal techniques so that they are able to practice the animal welfare issues during course of animal experiments in their research protocols. This programme was also considered as crucial pre-requisite to obtain uniform and reliable research findings to be generated from experimental animals. The Awareness programme included both, theoretical and practical aspects of following major areas in laboratory animal care, management and animal techniques.

About 19 participants from CSIR-CDRI underwent training under this program.

Vigilance Awareness Week 2011

In accordance with the guidelines of Central Vigilance Commission, Vigilance Awareness Week was organised during 31 October to 5 November 2011. All members of the CDRI staff took pledge to ensure transparency, identify root causes of corruption and eradicate it from the society at all cost to the best of their abilities. Dr. G.K. Goswami, IPS, SSP, Indian Railway, Lucknow delivered an interesting talk on the subject. During the week, several programs were organized including Lecture, Debate and Essay competition. Winners of the events were given prizes during the valedictory function, chaired by Dr. T.K. Chakraborty, Director, CSIR-CDRI, held on November 5, 2011.

One day symposium on Antimalarials: Current approaches and future directions

A one day symposium on Antimalarials: Current approaches and future directions under the aegis of OSDDm, OSDDChem Outreach and MMV was organized on 16 November 2011. The audience included scientists, faculty and students from CSIR-CLRI, Chennai, CSIR-NIIST, Trivandrum, IIT, Kanpur and Guwahati, IISER, Mohali, Calcutta University, CSIR-IITR, CSIR-CIMAP and CSIR-CDRI. The Director CSRI-CDRI Dr. T.K. Chakraborty initiated the meeting by welcoming the guests from India and abroad. Dr. Chakraborty emphasized on the role of the open science for the development of anti-infectives and apprised the audience about the significance of different programs CSIR has initiated in the area. Dr. Jeremy Burrow, Head Discovery, MMV, Geneva was the first speaker of the day. He gave a brief introduction about the functioning of the MMV, a virtual and "not-for-profit" foundation with the mission to discover, develop and deliver antimalarial drugs. Speakers from India and abroad gave deliberations on current approaches and future directions for antimalarials. Dr. Saman Habib, CSIR-CDRI gave a talk on proposed OSDDm program.

Communal Harmony Week 2011

In accordance with the guidelines of National Foundation for Communal Harmony, the Institute celebrated Communal Harmony Week during 19-25 November, 2011. All staff members of the CDRI took a pledge on this occasion to effectively promote the values of communal harmony and national integration amongst the people.

Workshop on Gene expression studies on Affymetrix Microarray platform

A Workshop on Gene expression studies on Affymetrix Microarray platform was organized in Toxicology Division from 28 November to 1 December 2011. The experts from ILS assisted the programme which includes preparation of samples, labeling samples, Hybridization, Image analysis using software and data interpretations. Since the workshop was hands-on in nature, participation was limited to only ten research fellows, from different divisions.

National Conference on Challenges in Drug Discovery and Development

Indian Society of Chemists and Biologists, India organized its National Conference on "Challenges in Drug Discovery and Development (CDDD-2011) on 9-10 December 2011. Dr. P.M.S. Chauhan, General Secretary of the ISCB was organizing secretary of this conference. Prof. Anamik Shah, president of ISCB and Dr. G.C. Saxena, president of Indian Council of Chemists and former VC Agra and Avadh University were present in inaugural function. The two days scientific programs included 17 invited lectures by the eminent scientists and 4 oral presentations. 50 posters were presented by young scientists and Ph. D. students in three different poster sessions. Several Scientists presented their work on Drug Research, Chemical Sciences, Bionanotechology, Chemical Biology, Glycobiology and Biochemistry. About 150 delegates from India have participated this conference. The close interaction of scientists with varied interests in diverse fields of the research is important. This conference has provided common platform and opportunities to the researchers in the areas of chemical sciences and biological sciences and other related areas to interact with each other for mutual benefits.

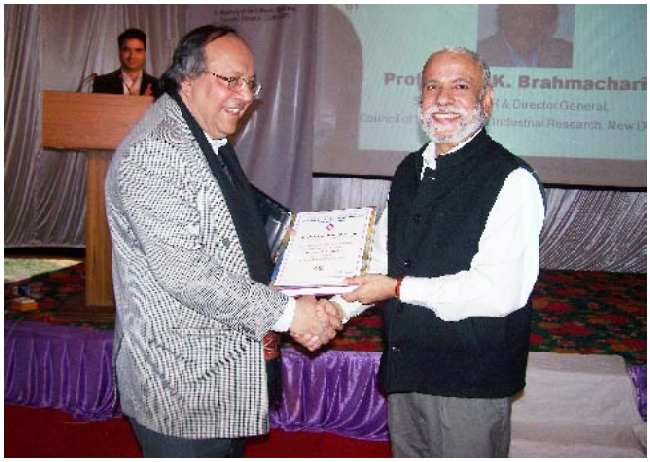
One Day Conference on From Molecules to Medicine

One Day conference on From Molecules to Medicine was held at CSIR-CDRI on 14 December 2011. Dr. Nitya Anand, Former

Director, CSIR-CDRI presided over the inauguration function. Dr. TK Chakraborty, Director, CSIR-CDRI delivered welcome address. Scientific session was chaired by Prof. Manoj Kumar, VC, Lucknow University. Prof. CL Khetrapal gave a talk on Role of NMR in human health. He discussed how NMR technique can be used to control the metabolic disorders and heart diseases. The interrelationship between science and spirituality was discussed at length. Dr. Naresh Kumar, from Pharmalabs Pvt. Ltd. Mumbai, discussed how molecules find their way to market and how simple techniques are useful in creating novelty in the molecules so that it becomes a block buster. Dr. Anshuman Dixit from ILS, Bhuvaneshwar discussed the role of molecular modeling in drug discovery and different approaches to fatten the drug development. Prof. Manoj Kumar chaired the session. Dr. Nityanad ex- director CDRI presided over the function and felicitated Dr. AK Saxena on occasion of his 60th Birthday. Dr. BN Dhawan, ex-director CDRI also shared his views on this occasion. A gathering of scientists and students from different disciplines interacted during conference. Dr. RP Tripathi proposed a vote of thanks.

37th Mellanby Memorial Lecture

In memory of Sir Edward Mellanby, Founder Director, CSIR-CDRI, the 37th Mellanby Memorial Lecture was organized on February 10, 2012. The lecture was delivered by Prof. Samir K Brahmchari, Director General of CSIR, New Delhi. The topic of his lecture was “Science 2.0: Open Source Drug Discovery in Cyber Space”. Prof.



Brahmachari discussed about the web based open innovation platform which opens up new opportunities for a systems biology approach to identify the Achiilles’ heel in the Mtb bug. He said, using this new dataset, we have built a protein interaction map of Mtb including more than 1400 proteins and identified the set of proteins which are essential in maintaining the integrity of this protein network for the growth and survival of Mtb. The talk explored how such an approach can make drug discovery faster and affordable.

2 Distinguished Visitors and Lectures

	Name & Address	Topic	Date
1.	**Dr. Pavan Muttil** University of New Mexico, Albuquerque	Inhaled dry powder for chemotherapy and vaccination	04.01.2011
2.	**Dr. Simi Ali** Newcastle University, UK	Regulation of chemokine function during inflammation	04.01.2011
3.	**Dr. S.C. Pandey** University of Illinois, USA	Epigenetics-beyond the genome in alcoholism	19.01.2011
4.	**Dr. Kallolmay Biswas** University of Edinburgh, UK	Success in selective catalysis for organic synthesis and development of drugs in medicinal chemistry	21.01.2011
5.	**Dr. Shantanu Chakraborty** Cincinnati Children's Hospital, USA	Twistl and Tbx20 function in heart development and disease	25.01.2011
6.	**Prof. Peter York** University of Bradford, UK	Particle engineering for respiratory drug delivery	31.01.2011
7.	**Dr. M.K. Raizada** University of Florida, USA	Angiotensin converting enzyme2 as novel target for cardio-pulmonary therapeutics	08.02.2011
8.	**Dr. P.N. Yadav** University of North Carolina, USA	Critical role of serotonin and its receptors in antipsychotic drug action	21.02.2011
9.	**Dr. Ateeq Ahmad** Jina Pharmaceuticals Inc., USA	Targeting HER2, ER and endoxifen as a new cornerstone for breast cancer therapy	25.03.2011
10.	**Dr. Rajeev S. Menon** Australian National University, Canberra	A journey in synthesis: From perhydroazulenes to a gold mine of heterocycles	30.03.2011
11.	**Dr. Martine Defais** CNRS, France	Biological science cooperative programme between CNRS and India and Europe	08.04.2011
12.	**Dr. Parul Tripathi** ICGEB, New Delhi	Atherosclerosis: The immunological orchestra	25.04.2011
13.	**Dr Amit K Pandey** University of Massachusetts Medical School, USA	*Mycobacterium tuberculosis* on steroids	19.05.2011
14.	**Dr. Ravi Natarajan** Kemxtree, Mumbai	Discovery of a new class of potent, selective and orally efficacious P38 MAP Kinase inhibitors for the treatment of Rheumatoid Arthritis	23.05.2011
15.	**Dr. Denis Martin** DNDi, Geneva	DNDi strategies to identify and develop new chemical entities to treat visceral leishmaniasis	07.06.2011
16.	**Dr. Kumaravelu Jagavelu** Mayo Clinic, Rochester	Protective role of MK2 in atherosclerosis	09.06.2011
17.	**Dr. Susanta Kar** CSIR-IICB, Kolkata	From cells to signalling cascades: Manipulation of macrophage defense by leishmania parasites	14.06.2011
18.	**Dr. Shreedhara Gupta** Heritage Institute of Technology, Kolkata	A new vista towards parasitic protozoans: Leishmania and Trypanosoma	16.06.2011
19.	**Dr. Kempaiah Rayavara** Laboratory of Malaria and Vector Research, NIH, USA	Functional mechanosensitive ion channel in *Plasmodium falciparum*	01.07.2011
20.	**Prof. Tejender S. Thakur** Indian Institute of Science, Bangalore	Computational and experimental studies on weak non.bonded interactions	27.07.2011
21.	**Dr. Subhabrata Chaudhury** University of Glasgow, UK	Towards the total synthesis of potent antifungal agent Gambieric Acid A: Stereo selective preparation of A.D ring fragment	09.08.2011

	Name & Address	Topic	Date
22.	**Dr. Srinivas Pentyala** Stony Brook Medical Centre, New York	Translational approach to drug discovery	09.08.2011
23.	**Prof. Raj Kumar** The Commonwealth Medical College, Scranton, USA	Structure and functions of the steroid hormone receptors	18.08.2011
24.	**Dr. Yusuf Akhter** European Molecular Biology Laboratory, Hamburg, Germany	Molecular and structural studies on targets from *Mycobacterium tuberculosis*	25.08.2011
25.	**Dr. Senthil Duraisamy** G7 Synergon Private Limited, Bangalore	G.Protein coupled receptor (GPCRs) and drug discovery: A historical perspective	29.08.2011
26.	**Dr. S. Chandrasekhar** CSIR-IICT, Hyderabad	Total synthesis of marine natural products as pharmaceutical leads	19.09.2011
27.	**Prof. Dr. Jörg Rademann** Leibniz Research Institute for Molecular Pharmacology, Germany	Fragment based protein ligand discovery by dynamic ligation screening	04.11. 2011
28.	**Dr. Mallikarjun Badadani** University of California Irvine, USA	VCP (p97) functions, diseases and mouse model	2.12.2011
29.	**Dr. Ajit C. Kunwar** CSIR-IICT, Hyderabad	Prof. K Rangadhama Rao Memorial Lecture (2011) entitled Peptidic. 'Foldamers' – Structural Perspectives from NMR	5.12.2011

3 Invited Lectures Delivered by Institute Scientists

Dr. T.K. Chakraborty

- Challenges in drug discovery – from natural products to designer molecules, 4th International Conference on Drug Discovery & Therapy (ICDDT), Dubai, 12-15 February 2012
- Organic synthesis & drug discovery, NOST, IISER, Mohali, 15 December 2011
- Carbohydrates and beyond – from design to synthesis, CSIR-IICB, Kolkata, 24 November 2011
- Development of novel cationic antimicrobial cyclic peptides, IIT, Madras, 29 October 2011
- Organic synthesis in drug discovery (XVII Zaheer Memorial Lecture), Lucknow University, Lucknow, 22 October 2011
- Organic synthesis in drug discovery (Foundation Day Lecture), CSIR-NIIST, Trivandrum, 10 October 2011
- Carbohydrates and beyond – from design to synthesis, INDO-RUSSIAN Meeting on Glycosciences, Zelinsky Institute, Moscow, 13-16 June 2011
- Cyclooligomerization – A simple way to make complex structures (1) IIT, Kanpur, (on the occasion of IYC), 15 April 2011 (2) Guru Nanak Dev University, Amritsar, 28 March 2011 (3) RTOS, Bharathidasan University, Tiruchirappalli, 23-24 February 2011

Dr. A.K. Saxena

- Science & Healthcare, INSPIRE internship science camp programme of DST, Integral University, Lucknow, 18 November 2011
- Translational research: Converting an idea to product, New Delhi, 12 November 2011
- Challenges in tuberculosis treatment, Sir MVIT Campus, Bangalore, 4 November 2011
- Overview on 2D & 3D QSAR: Computational approach to structure based ligand design, NITTTR, Bhopal, Goa extension centre, Goa, 19 October 2011
- Docking studies and pharmacophore development, NITTTR, Bhopal, Goa extension centre, Goa, 18 October 2011
- Basics and applications of QSAR and molecular modeling, Biotech Park, Lucknow, 12 October 2011
- Drug designing and a case study, Biotech Park, Lucknow, 23 September 2011
- Hierarchical virtual screening: Identification of potential high affinity and selective β3 –Adrenergic receptor agonists, Maribor, Slovenia, 7 September 2011
- QSAR & molecular modeling studies in antihistamines (H1), Central University of Punjab, Bathinda, 3 May 2011
- Indo-US NIAID TB drug discovery forum – Exploring opportunities for research collaboration, New Delhi, 21 April 2011
- Drug discovery and development: Current status, RITES, Lucknow, 23 March 2011
- Let food be safe and medicated, University of Saskatchewan, Saskatoon, Canada, 14 February 2011
- Computer aided drug design in drug discovery research: A case study of carbamates as potential antialzheimer agents, University of Allahabad, Allahabad, 5 February 2011
- Basics in drug design: A case study of Pyrazinopyridoindole analogues, University of Delhi, New Delhi, 29 December 2010

Dr. S.K. Puri

- Challenges and opportunities in drug discovery for malaria, CSIR-CDRI, Lucknow, 10 December 2011
- Recent developments in drug discovery for tissue schizontocidal antimalarial drugs, Anna University, Chennai, 20 November 2011

Dr. Ram Raghubir

- Essence of pharmacovigilance practice and its future in India, Patna, India, 18-20 November 2011
- Search for novel antihypertensive, BITS, Ranchi, 1 September 2011
- Search of bioactives from nature, NIPER, Mohali, 19 July 2011
- Role of NADPH-Oxidase in cerebral ischemia reperfusion injury, M.S. University, Vadodara, 1-3 February 2011
- Role of laboratory animals in drug research, IVRI, Izatnagar, 27 January 2011
- Current trends in drug discovery and development, College of Pharmacy, Kanpur University, Kanpur, 22 January 2011

Dr. Gautam Palit

- Scientific approaches in developing leads from natural products for peptic ulcer disease, IPS, Manipal University, Manipal, 19 December 2011
- BESEB as memory enhancer, CSIR-CDRI, Lucknow, 26 November 2011
- Pharmaco-therapeutic actions of *Panax ginseng* on stress and stress related neuropsychiatric disorders in rodents, Seoul, 11 November 2011
- Chemistry and biology of antioxidants: Natural products based antioxidants from medicinal plants as leads towards development of novel drugs, Delhi University, New Delhi, 10 October 2011
- Scientific approaches for the development of potential drugs for neuropsychiatric disorders, University of Pune, 14 February 2011

Dr. C. Nath

- Role of indigenous herbal medicines in Alzheimer's disease, CSM Medical University, Lucknow, 3 December 2011
- Neuropharmacological perspectives of Alzheimer's disease: Present & Future, Jaipur, 19 September 2011
- Animal experiments for drug development, Indian National Science Academy (INSA), 15 September 2011
- Regulatory requirements of preclinical studies prior to clinical trials, All India Institute of Medical Sciences (AIIMS), 26 August 2011
- Concepts of regulatory pre-clinical studies In drug development, Mahavir Cancer Sansthan, Patna, 10 June 2011
- Basic elements in planning of clinical research & publication, Hind Institute of Medical Sciences, Barabanki, 06 May 2011

Dr. P.K. Murthy

- Research on how to get rid of an uninvited guest, Integral University, Lucknow, 18 November 2011

Dr. Madhu Dikshit

- Neutrophils derived free radicals and nitric oxide: Role in host degence and inflammation, Lucknow University, Lucknow, 23 December 2011
- Biochemical, molecular and functional status of NO/NOS in human mature and immature neutrophils, (1) Frankfurt University, Germany, 6 December 2011 (2) Villa Vigoni, Italy, 24 March 2011
- Functional assays and assessment by flow cytometry, PGI, Chandigrah, 11 October 2011
- Neutrophil free radical generation – involvement of iNOS, Panjab University Chandigarh, 8-9 October 2011
- Flow cytometry to assess cell functions and apoptosis, CSIR-CDRI, Lucknow, 19 September 2011
- Biochemical and molecular characterization of iNOS in human neutrophils and its functional importance, Sapienza University Di Rome, Rome, Italy, 9 September 2011
- Function, importance, biochemical and molecular characteristics nitric oxide synthase in human neutrophils, Madrid, Spain, 6 September 2011
- Neutrophils, free radicals and nitric oxide in various pathologies, NII, New Delhi, 3 March 2011

Dr. Anuradha Dube

- Strategies for developing safe and effective vaccines against visceral leishmaniasis, CSIR-CIMAP, Lucknow, 14 November 2011

Dr. M. Abbas

- Mathematical modeling of data in post genomic Era, Bioinformatics Centre, Biotech Park, Lucknow, 14 September 2011

Dr. Uma Roy

- Novel streptococcus lipase: Potential Biocatalysts for Industry, Saai College of Medical Sciences & Technology, Kanpur, 7 March 2011

Dr. Rakesh Shukla

- Mechanisms of neuroinflammation in astroglial cells and its modulation by melatonin, Jiwaji University, Gwalior, 30 November 2011
- Concepts of safety pharmacological studies, BHU, Varanasi, 24 February 2011
- Rodent models used for cognitive enhancer, IVRI, Bareily, 30 January 2011

Dr. N. Chattopadhyay

- Constituents of medicinal plants positively impact bone metabolism more than those derived from the dietary source: Evidences from *in vitro*, *in vivo* and pharmacokinetic studies, CSIR-NEIST, Jorhat, 18 Mar 2011

Dr. R.P. Tripathi

- Evolution of Green Chemistry to access new chemotherapeutic agents, Mizoram University, International Conference on Advances in Environmental Chemistry, 17 November 2011
- शर्करा जनित पदार्थों से दवा के विकास में हमारा एक प्रयास, NCL Pune, 18 August 2011
- Application of chemistry for human health, SRM Engineering College of Technology, 3 April 2011
- Chemistry driven approach towards tuberculosis, UP college, Varanasi, 12 March 2011
- New chemotherapeutics agents against microbial and parasitic infection involving efficient synthetic strategies, SLIET, Longowal, Punjab, 07 February 2011

Dr. Arvind K. Srivastava

- Search for potential biomolecules from ocean, Annamalai University, Tamilnadu, 16 September 2011

Dr. Neeraj Sinha

- Emerging trends in testing 'Teratology' of pharmaceuticals, SHIATS-Deemed University, Allahabad, 25 November 2011
- Safety evaluation of the ayurvedic medicine - An overview, (1) CSJM University, Kanpur, 26 March 2011 (2) State Ayurvedic College, Lucknow, 5 March 2011

Dr. P.M.S. Chauhan

- Design and synthesis of Nitrogen heterocycles as novel therapeutic agents, (1) Osmania University, Hyderabad, 28 December 2011 (2) Nagpur, Maharashtra 10 February 2011
- Perspectives and challenges in drug research: Design and synthesis of Nitrogen heterocycles as novel therapeutic agents, (1) Dayalbagh Educational Institute,(Deemed University), Agra, 6 November 2011 (2) Annamalai University, 14 October 2011 (3) Rajkot, 7 February 2011
- Design and synthesis of Nitrogen heterocycles as antiparasitic agents, Saurashtra University, Rajkot, 29 September 2011

Dr. P.K. Shukla

- Monoclonal antibodies in diagnosis and therapy of fungal infections, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, 1 August 2011
- Emerging scenario for diagnosis and treatment of fungal infection, CSMM University, Lucknow, 11 February 2011

Dr. R. K. Singh

- Drug induced haematotoxicity and its amelioration by plant products, Seminar on Pharmacist: A Health Care Professional, Rameshwaram Institute of Technology and Management, Lucknow, 26 November 2011
- Animal models for leukemia and its prevention by plant products, Mahavir Cancer Sansthan, Patna, 10 June 2011

Dr. Brijesh Kumar

- Chemical profiling of *Berberis aristata, Berberis asiatica* and *Cossinium fenestratum* using high resolution Mass Spectrometry instruments for quality control, Kottayam, 12 September 2011
- Chemical profiling of *Piper betle, Tinospora cordifolia* and *Mahonia borealis* using High Resolution Mass Spectrometry instruments for quality assurance, CSIR-NBRI, Lucknow, 17 December 2011

Dr. Neena Goyal

- Identification of inhibitors of leishmanial Dipeptidylcarboxy-peptidase: A novel target for drug discovery, Cancun, Mexico, 14 December 2011

Dr. Saman Habib

- Open Source Drug Discovery for Malaria, OSDD-MMV symposium on 'Anti-malarials: current approaches and new directions, CSIR-CDRI, Lucknow, 16 November 2011
- Factors involved in translation initiation and ribosomal recycling in *Plasmodium* organelles, ISS, Rome, 6 October 2011
- Metabolic functions of the *Plasmodium* apicoplast, CSIR-CDRI Diamond Jubilee International Symposium, 10 February 2011

Dr. S.K. Rath

- Cancer: The genetic association, Training school for Biology Teachers, S.C.B. PG College, Hardoi, UP, 15 November 2011

- Cell culture research: The understanding of cancer, AMITY University, Lucknow, 3 April 2011
- Genotoxicity evaluation; Past, present and future, Bharatidasan University, Tiruchi, 3 February 2011

Dr. Amit Mishra

- Inhalable particles for value-added drug delivery in Tuberculosis, Mumbai, 14 November 2011
- Nano and "dunno" in drug and antigen delivery, NIPER, Chandigarh, 1 March 2011
- Biodegradable nanoparticles in the murine vagina: Trans-cervical retrograde transport and induction of proinflammatory cytokines, IITR, Lucknow, 2 February 2011

Dr. Sanjay Batra

- Cascade strategies for the syntheses of aza-heterocycles, GNDU Amritsar, 23 December 2011
- Drug discovery efforts for anti-infectives: Paradigm shift towards Open Source Model, CSIR-CECRI, Karaikudi, 20 December 2011
- Transition metals-assisted strategies for the synthesis of diverse annulated pyrazoles, NCL, Pune, 9 December 2011
- Probing allylamines for heterocyclic synthesis, Allahabad University, Allahabad, 5 December 2011
- Antimalarials: CDRI's perspective and Chemistry Outreach, Antimalarials: Current Approaches and Future Directions, CDRI, Lucknow, 16 November 2011
- Engineering new routes to heterocycles via Morita-Baylis-Hillman chemistry, Indian Institute of Science, Bangalore, 4 November 2011
- A Medicinal Chemist's perspective, IIT-M, Chennai, 28 October 2011
- Template-directed synthesis of diverse annulated-â-carbolines, Jammu University, Jammu, 23 September 2011
- Allylamines: A versatile source for Aza-heterocycles, School of Chemistry, University of Hyderabad, Hyderabad, 19 August 2011
- Template-directed synthesis of diverse annulated beta-carbolines, DST school on Green Chemistry, IIT, Guwahati, 8 March 2011
- Allylamines from Morita-Baylis-Hillman chemistry: A versatile source to aza-heterocycles, DST school on Green Chemistry, IIT, Guwahati, 7 March 2011
- Repositioning of drugs, NII, New Delhi, 11 February 2011

Dr. Kumkum Srivastava

- *In-vitro* culture of human malaria parasite, *Plasmodium falciparum* - A journey to recent developments, Amity University, Lucknow, 4 March 2011

Dr. Ashish Arora

- Determining the solution structure of peptides and proteins using NMR spectroscopy, IMTECH, Chandigarh, 20 October 2011
- Structural characterization of drug target proteins using NMR spectroscopy, Biotech Park, Lucknow, 13 October, 2011
- NMR studies of drug target proteins at CSIR-CDRI, IIT, Kanpur, 15 April 2011

Dr. Atul Goel

- Molecular diversity-oriented synthesis of aromatic scaffolds and their light emitting properties, Lucknow University, Lucknow, 15 October 2011

Dr. Gautam Panda

- Synthesis of natural products and natural product-like molecules in drug discovery research, Institute for Molecular Science, Okazaki, Japan, 29 September 2011

Dr. Jimut Kanti Ghosh

- Synthetic peptides to understand structure-function relationships in naturally occurring antimicrobial peptides and a voltage gated ion channel, S. Banerjee College, Hooghly, West Bengal, 18 November 2011.

Dr. K.R. Arya

- Chemical profiling of Indian medicinal plants using high resolution Mass Spectrometry instruments for quality assurance, CSIR-NBRI, Lucknow, 17 December 2011
- Validation and rapid characterization of an ethnobotanical lead for osteogenic activity isolated from traditional plant used for healing fractured bone in Uttarakhand Himalaya, Institute of Holistic Medical Sciences (IHMS), Kottayam, 12 September 2011

Dr. T. Narender

- Development of dual acting agents (antihyperglycemic and antidyslipidemic) from the Indian medicinal plants, (1) Gurunanak College of Pharmacy, Nagpur, 24 November 2011 (2) Institute for Holistic Medical Sciences (IHMS), Kottayam, 11 September 2011

Dr. S. Sanyal

- Bile acid receptor agonist GW4064 regulates PPARã coactivator-1á expression through estrogen receptor-related receptor, Indira Gandhi Pratisthan, Lucknow, 14 November 2011

Dr. R.S. Ampapathi

- Structural studies of NTD of STAT4 protein, IICT, Hyderabad, 23 March 2011

Dr. Ritu Trivedi

- Cell Culture Techniques for bioactivity evaluation, NDRI, Karnal, 10 March 2011.

Dr. Akhilesh K. Tamrakar

- Natural molecules with GLUT4 translocation stimulatory effect for the treatment of insulin resistance, Institute for Holistic Medical Sciences, Kottayam, 13 September 2011.

Dr. Arun Trivedi

- Functional inactivation of C/EBPalpha in myeloid leukemia, Pune, 16 October 2011
- Proteomic approaches in myeloid leukemia, New Delhi, 5 April 2011

Dr. Rajender Singh

- Genomics in functional bowel diseases, SGPGI, Lucknow, 5 August 2011

Dr. Sanjeev Kumar Shukla

- Polysilanes as UV/NUV Light Emitters, D.S. (P.G.) College, Kanpur, 23 January 2011

Dr. J.R. Gayen

- Role of Chromogranin-A in hypertension and diabetes, Karunya University, Coimbatore, 9 December 2011

Mr. Harish Gauniyal

- NMR and its applications, chemistry of biologically active compounds, CIMAP, Lucknow 28 January 2011

4 Visits Abroad

Name of the Scientist	Country	Purpose of Visit (Period of Deputation)
Dr. T.K. Chakraborty	Russia	To deliver an invited lecture at INDO-RUSSIAN Meeting (13-16 June 2011)
	Dubai	To deliver an invited lecture at International conference (12-15 February 2012)
Dr. A.K. Saxena	Canada	To participate in a workshop (13-15 February 2011)
	Slovenia & Germany	To attend the International symposium (03-16 September 2011)
Dr. Gautam Palit	South Korea	To deliver an invited lecture in international conference (9-11 November 2011)
Dr. Madhu Dikshit	Italy	To attend a conference and project meeting (23-26 March 2011)
	Spain	Meeting with Prof. Santiago Lamas (31 August– 14 September 2011)
	Italy	To deliver a lecture (9 September 2011)
	Austria	To participate as a speaker in EU-India Science & Technology Cooperation Days 2011 (01-02 December 2011)
	Germany	To attend project meeting (03-07 December 2011)
Dr. Rakesh Shukla	Scotland	Under INSA-RSE International exchange program (24 August- 23 September 2011)
Dr. Sudhir Kumar Sinha	Switzerland	To participate in the Indo-Swiss symposium (04-06 May 2011)
		For advance research work (01-30 October 2011)
Dr. D.S. Upadhyay	The Netherlands	To attend International training course (04-15 July 2011)
Dr. Neena Goyal	Mexico	To attend an International conference (11-15 December 2011)
Dr. Neeloo Singh	USA	International fellowship for senior biomedical scientist (14-28 February 2011)
Mr. Pradeep Kumar Shrivastava	Brazil	To attend international symposium and workshop (17-24 October 2011)
Dr. Shard Sharma	Israel	To attend OECD GLP training course for GLP inspectors (31 October – 02 November, 2011)
Dr. Saman Habib	UK	To attend a meeting (14 March 2011)
	Italy	To attend the meeting (06-07 October 2011)
Dr. Atul Goel	Germany	To complete remaining research work under Alexander von Humboldt Fellowship (02 May - 30 July 2011)
Dr. J. Venkatesh Pratap	France	To carry out an experiment at the European Synchrotron Radiation Facility (09-12 July 2011)
Dr. Manoj Barthwal	USA	To carry out the advance research (15 November 2010 - 14 November 2011)
Dr. Ritu Trivedi	Australia	To attend the meeting (04-08 September 2011)
Dr. Aamir Nazir	Australia	To attend the conference (10-13 July 2011)

5 Membership of Scientific Societies and Committees

Dr. Tushar K. Chakraborty

- **Member**, American Chemical Society, USA
- **Life Member**, (1) Chemical Research Society of India, (2) Indian Chemical Society, (3) Indian Peptide Society
- **Member,** (1) Senior Science Committee, OSDD; (2) Chemical Sciences Sectional Committee, Indian Academy of Sciences; (3) Sectional Committee III in Chemical Sciences, The Indian National Science Academy (4) Program Advisory Committee (Organic Chemistry), DST; (5) Steering Committee, National Bio-resource Development Board, DBT; (6) Sub-committee of Sponsored Schemes Research Committee, CSIR; (7) Expert Committee, Drugs and Pharmaceuticals Research Programme, DST; (8) Drugs Technical Advisory Board, Ministry of Health & Family Welfare (9) Technical Advisory Committee, Technology Development and Utilization Programme for Women, DSIR; (10) High Powered Committee, NMITLI Projects, CSIR
- **Member Editorial Board**, (1) Indian Journal of Chemistry, B; (2) Indian Journal of Biochemistry & Biophysics; (3) The Natural Products Journal

Dr. A.K. Saxena

- **Member**, American Chemical Society, USA
- **Member**, (1) Expert Committee, Ministry of Chemicals & Fertilizers, Department of Pharmaceuticals (India) (2) IND Committee, Directorate General of Health Services, Office of Drugs Controller General (India), (3) REACH INDIA TASK FORCE, Department of Chemical and Petrochemicals, Govt. of India (4) Board of International Charitable Foundations' (Scientific Partnership) Coordinating Board, Russia, (5) Board of Directors, American Bibliography Inc. USA
- **UGC Nominee**, Advisory Committee, Special Assistance Programme, (1) Department of Chemistry, Saurashtra University, Rajkot, (2) Department of Chemistry, A. P. S University, Rewa
- **Secretary**, QSAR Society of India
- **Life Member**, (1) Indian Chemical Society, (2) Indian Association of Medicinal Chemists

Dr. S.K. Puri

- **Vice President**, Indian Society for Parasitology
- **Member**, Scientific Advisory Committee, Vector Control Research Centre, Pondicherry

Dr. G. Palit

- **Member**, International Advisory committee of International Congress of Ethnopharmacology

Dr. C. Nath

- **Life Member**, (1) International Brain Research Organization; (2) National Academy of Medical Sciences; (3) Indian Pharmacological Society; (4) Indian Academy of Neurosciences; (5) Society of Toxicology, India
- **Member**, (1) Advisory Committee for IND Permission, Drug Controller General of India, Ministry of Health, Government of India; (2) Research Council, IITR; (3) Academic committee, JNU, New Delhi
- **Member**: Editorial Board, Toxicology International

Dr. Ashim Ghatak

- **Member,** (1) American College of Clinical Pharmacology; (2) National Academy of Medical Sciences (MNAMS)
- **Fellow** of Indian College of Physicians-FICP

Dr. A.K. Dwivedi

- **Life Member**, Indian Pharmaceutical Association
- **Member**, Drugs Panel for New Drugs Manufacturing Licenses, Directorate of Medical & Health Services, Uttar Pradesh
- **Joint Secretary**, Indian Society of Chemists and Biologists, Lucknow

Dr. Madhu Dikshit

- **President**, Cytometry Society of India
- **Member**, (1) Steering Committee, MoES Project, New Delhi; (2) Organic & Medicinal Chemistry and Chemical Technology Research Committee, CSIR, New Delhi

Dr. Anuradha Dube

- **Member**, **Editorial Board**, (1) Journal of Biomedical Research; (2) BioMed Central, Infectious Diseases (Open Access)

Dr. J.K. Saxena

- **Secretary**, Indian Society for Parasitology
- **Vice President**, Society of Biologists and Chemists
- **Member**, Editorial Board, Asian Pacific Journal of Tropical Medicine
- **Life Member**, Indian Society for Parasitology; (2) Society of Biological Chemists (India); (3) Indian Immunological Society; (4) International Society of Applied Biology; (5) Indian National Science Congress Association; (6) Indian Society of Chemists and Biologists
- **Fellow**, Zoological Society of India

Dr. Naibedya Chattopadhyay

- **Member**, **Editorial Board**, (1) American Journal of Physiology (Endocrinology Metabolism), (2) Biochemical Pharmacology, (3) World Journal of Pharmacology

Dr. Neeraj Sinha

- **Life Member**, (1) National Academy of Sciences, Allahabad, (2) Indian Society of Cell Biology, New Delhi, (3) Society of Toxicologists of India, Izatnagar, (4) Indian Science Congress Association, Kolkata, (5) Association of Biotechnology and Pharmacy, India.

Dr. D.S. Upadhyay

- **Member**, (1) CPCSEA sub-committee for rehabilitation of laboratory animals, (2) Live Stock Feed, Equipments and System, Sectional Committee, FAD 5, Bureau of Indian Standards, New Delhi, (3) Veterinary Council of India; (4) U.P Veterinary Council, Lucknow
- **CSIR Nominee**, National Institute of Animal Welfare, MoEF, Govt. of India

Dr. P.M.S. Chauhan

- **General Secretary**, Indian Society of Chemists and Biologists
- **Executive Member and Sectional President**, Indian Council of Chemists (30th ICC, Hyderabad)
- **Editor- in- Chief,** Chemistry & Biology Interface
- Member, Editorial board (1) **Future Medicinal Chemistry,**

(2) Journal Research and Reports in Medicinal Chemistry; (3) Mycobacterial Diseases (4) Global Journal of Organic Chemistry

Dr. Anila Dwivedi

- **Life Member,** (1) Society of Reproductive Biology and Comparative Endocrinology, India; Indian Society for Study of Reproduction and Fertility; Endocrine Society of India

Dr. V.L. Sharma

- **Life member,** (1) Chemical Research Society of India, Bangalore

Dr. Renu Tripathi

- **Life Member**, Zoological Society of India, Bodh Gaya
- **Member**, Organizing Committee, 22nd All India Congress of Zoology 2011

Dr. D.N. Upadhyay

- **Life Member**, Society for Advancement of Electrochemical Science & Technology

Dr. M.N. Srivastava

- **Member**, Board of panel for PSC on R&D of Central Sector Scheme for Conservation Development and Sustainable Management of Medicinal plants, National Medicinal Plants Board, (AYUSH), Ministry of Health & Family Welfare, Government of India

Dr. A.K. Srivastava

- **Life Member**, Indian Society of Parasitology

Dr. Neena Goyal

- **Member, Executive Committee**, Indian Society for Parasitology

Dr. Saman Habib

- **Member**, (1) Expert Advisory Group, CRIMALDDI (Coordination, Rationalization and Integration of Antimalarial Drug Discovery Initiatives) project of the European Union; (2) Indian Society for Cell Biology

Dr. Gopal Gupta

Life member, Indian Society for Study of Reproduction and Fertility

Dr. Jawahar Lal

- **Advisor,** Current Trends in Pharmaceutical Research
- **Member, Editorial Advisory Board,** Chemistry & Biology Interface

Dr. Srikanta Kumar Rath

- **Joint Secretary-Elected**, Indian Society for Cell Biology (2011-13);
- **Life member**, (1) Indian Society of Cell Biology; (2) Society of Toxicology, India; (3) Environmental Mutagen Society of India; (4) Genome Foundation, India
- **Member**, **Editorial Board**, Toxicology International

Dr. Amit Misra

- **Life Member**, Indian Pharmaceutical Association

Dr. Sanjay Batra

- **Member**, (1) Council of NOST, India (2011-2014); (2) Governing Council, Chemical Research Society of India, Bangalore

Dr. Ashish Arora

- **Member**, NMRS, India

Mr. Prem Prakash

- **Life member**, Indian Pharmaceutical Association

Dr. Atul Goel

- **Life member,** (1) Chemical Research Society of India, Bangalore; (2) Indian Chemical Society

Dr. R.K. Tripathi

- **Life Member**, (1) Society of Toxicology, India; (2) Indian Society of Cell Biology

Dr. K.R. Arya

- **Member,** (1) Executive Council, Society of Ethnobotanists; (2) Board of panel for DPC in Directorate of Census (U.P.), Govt of India

Dr. P.R. Mishra

- **Member**, **Editorial Board**, (1) Recent Patents in Drug Delivery and Formulations, (2) Journal of Pharmaceutical and Biomedical Sciences
- **Founder Member**, Indian Nanoscience Society
- **Life Member**, Indian Pharmaceutical Association

Dr. Manish K. Chourasia

- **Life Member**, Indian Pharmacy Graduate Association

Dr. Dhananjoy Hansda

- **Member**, Indian Association of Veterinary Microbiologists, Immunologists & Specialists in Infectious Diseases
- **Member**, West Bengal Veterinary Council

Dr. Akhilesh Tamrakar

- **Member**, Society of Biological Chemist, India

Dr. Prem Prakash Yadav

- **Life member,** Chemical Research Society of India, Bangalore

Dr. Kalyan Mitra

- **Life Member**, Electron Microscopy Society of India (EMSI)

Dr. Aamir Nazir

- **Life Member**, Indian Society of Cell Biology

Dr. Poonam Singh

- **Life Member**, Society of Toxicology, India
- **Member**, Editorial/Advisory Board, International Journal of Comprehensive Pharmacy

Mr. Ranveer Singh

- **Life member**, Indian Institute of Chemical Engineer

Mr. Wahajuddin

- **Member**, **Editorial Board**, (1) Journal of Bioequivalence & Bioavailability; (2) Analytica Pharmaceutica Acta; (3) Pharmaceutical Regulatory Affairs
- **Life Member**, (1) Indian Society for Mass Spectrometry; (2) Indian Pharmacological Society; (3) Indian Science Congress Association; (4) Laboratory Animal Science Association of India; (5) Biotechnology Research Society of India; (6) Indian Society of Analytical Scientists; (7) Association of Biotechnology and Pharmacy; (8) Society of Biological Chemists, India; (9) IDMA- Association of Pharmaceutical Analysts (APA)

Dr. Sripathi Rao Kulkarni

- **Life Member**, (1) Association of Microbiologists of India; (2) Society for Information Science, India

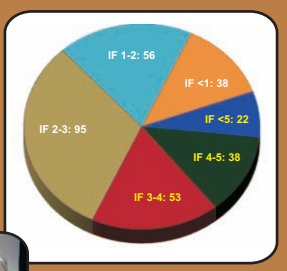
Dr. J.R. Gayen

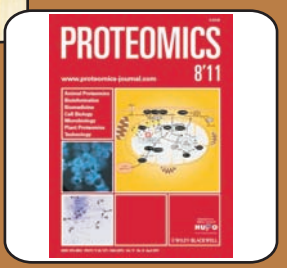
- **Life Member**, (1) The Society of Biological Chemists (India), Bangalore, India; (2) Association of Biotechnology and Pharmacy (ABAP), India; (3) Indian Society for Mass Spectrometry (ISMAS), Mumbai, India
- **Fellow** of Association of Biotechnology and Pharmacy, Guntur

Dr. Sanjeev Yadav

- **Life Member**, (1) Indian Science Congress Association, Kolkata; (2) Society for Science & Environment, India

Notes





अनुसंधान उपलब्धियाँ


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्, भारत
CSIR INDIA

1 पेटेण्ट्स

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भारत में स्वीकृत पेटेण्ट्स 2011	:	02
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विदेशों में स्वीकृत पेटेण्ट

2011

1. **शीर्षक**: हर्बल एक्सट्रैक्ट्स ऑफ *सैलिकोर्निया* स्पेशीज़, प्रॉसेस ऑफ प्रिपरेशन देयर ऑफ, यूज़ देयर ऑफ अगेन्स्ट ट्युबरकुलोसिस।
कीनियन पेटेण्ट नं. एपी/पी/2006/003567 **स्वीकृति की तिथि**: 29.07.2011
अन्वेषक: मीना रजनीकांत राठौर, भूपेन्द्र घनवन्तराय शेठिया, जयन्त बटुकराय पांड्या, पुष्पितो कुमार घोष, प्रकाश जगजीवन भाई डोडिया, ब्रह्म शंकर श्रीवास्तव, रंजना श्रीवास्तव, अनिल श्रीवास्तव, छित्तर मल गुप्ता और विनीता चतुर्वेदी।

2. **शीर्षक**: हर्बल एक्सट्रैक्ट्स ऑफ *सैलिकोर्निया* स्पेशीज़, प्रॉसेस ऑफ प्रेपरेशन देयर ऑफ, यूज़ देयर ऑफ अगेन्स्ट ट्युबरकुलोसिस।
सूडान पेटेण्ट नं. एपी/पी/2006/003567 **स्वीकृति की तिथि**: 29.07.2011
अन्वेषक: मीना रजनीकांत राठौर, भूपेन्द्र घनवन्तराय शेठिया, जयन्त बटुकराय पांड्या, पुष्पितो कुमार घोष, प्रकाश जगजीवन भाई डोडिया, ब्रह्म शंकर श्रीवास्तव, रंजना श्रीवास्तव, अनिल श्रीवास्तव, छित्तर मल गुप्ता और विनीता चतुर्वेदी।

3. **शीर्षक**: हर्बल एक्सट्रैक्ट्स ऑफ *सैलिकोर्निया* स्पेशीज़, प्रॉसेस ऑफ प्रेपरेशन देयर ऑफ, यूज़ देयर ऑफ अगेन्स्ट ट्युबरकुलोसिस।
तंजानियन पेटेण्ट नं. एपी/पी/2006/003567 **स्वीकृति की तिथि**: 29.07.2011
अन्वेषक: मीना रजनीकांत राठौर, भूपेन्द्र घनवन्तराय शेठिया, जयन्त बटुकराय पांड्या, पुष्पितो कुमार घोष, प्रकाश जगजीवन भाई डोडिया, ब्रह्म शंकर श्रीवास्तव, रंजना श्रीवास्तव, अनिल श्रीवास्तव, छित्तर मल गुप्ता और विनीता चतुर्वेदी।

4. **शीर्षक**: हर्बल एक्सट्रैक्ट्स ऑफ *सैलिकोर्निया* स्पेशीज़, प्रॉसेस ऑफ प्रेपरेशन देयर ऑफ, यूज़ देयर ऑफ अगेन्स्ट ट्युबरकुलोसिस।
जाम्बियन पेटेण्ट नं. एपी/पी/2006/003567 **स्वीकृति की तिथि**: 29.07.2011
अन्वेषक: मीना रजनीकांत राठौर, भूपेन्द्र घनवन्तराय शेठिया, जयन्त बटुकराय पांड्या, पुष्पितो कुमार घोष, प्रकाश जगजीवन भाई डोडिया, ब्रह्म शंकर श्रीवास्तव, रंजना श्रीवास्तव, अनिल श्रीवास्तव, छित्तर मल गुप्ता और विनीता चतुर्वेदी।

5. **शीर्षक**: हर्बल एक्सट्रैक्ट्स ऑफ *सैलिकोर्निया* स्पेशीज़, प्रॉसेस ऑफ प्रेपरेशन देयर ऑफ, यूज़ देयर ऑफ अगेन्स्ट ट्युबरकुलोसिस।
जिम्बॉम्बियन पेटेण्ट नं. एपी/पी/2006/003567 **स्वीकृति की तिथि**: 29.07.2011
अन्वेषक: मीना रजनीकांत राठौर, भूपेन्द्र घनवन्तराय शेठिया, जयन्त बटुकराय पांड्या, पुष्पितो कुमार घोष, प्रकाश जगजीवन भाई डोडिया, ब्रह्म शंकर श्रीवास्तव, रंजना श्रीवास्तव, अनिल श्रीवास्तव, छित्तर मल गुप्ता और विनीता चतुर्वेदी।

6. **शीर्षक**: न्यू हर्बल कॉम्पोज़ीशन फॉर ट्रीटिंग गैस्ट्रिक अल्सर।
कनाडियन पेटेण्ट नं. 2480223 **स्वीकृति की तिथि**: 21.06.2011
अन्वेषक: जनस्वामी मधुसूदन राव, उपरपल्ली सम्पतकुमार, बोग्गवरपु सुब्रमण्या शास्त्री, झिल्लू सिंह यादव, कोंडापुरम विजय राघवन, गौतम पालित, दीपक राय, मधु दीक्षित, पन्नियमपल्ली माधवनकुट्टी वैरियर, त्रिकोविल शंकरन मुरलीधरन और कोल्लथ मुरलीधरन।
सहायक सदस्य: द्वारका नाथ भल्ला, तरूण लता सेठ और मो. सलीम अन्सारी।

7. **शीर्षक:** *ज़ाइलोकारपस ग्रेनेटम*, मैंग्रोव पौधे के फलों से ऐन्टीडायबिटिक और ऐन्टीहाइपरलिपिडेमिक अंश के पृथक्करण की प्रक्रिया।
यूएस पेटेन्ट नं. 7959954 **स्वीकृति की तिथि:** 14.06.2011
अन्वेषक: विजय लक्ष्मी, अजित सक्सेना, राजेश कुमार, राघवेन्द्र पाल, सत्यवान सिंह, अरविन्द कुमार श्रीवास्तव, प्रीति तिवारी, दीपक रैना, अनिल कुमार रस्तोगी, सुधीर श्रीवास्तव, रमेश चन्द्रा, अंजू पुरी और राम रघुबीर
सहायक सदस्य: हृदय राम मिश्रा, सुरेश चन्द्रा, नवीन प्रकाश मिश्रा, मुकेश श्रीवास्तव, टीका राम, आर.आर. गुप्ता

8. **शीर्षक:** एन इम्प्रूव्ड प्रॉसेस फॉर प्रिपरेशन ऑफ ट्रांस–3,4–डायरिलक्रोमान
साउथ अफ्रीका पेटेन्ट नं. 2010/04272 **स्वीकृति की तिथि:** 30.03.2011
अन्वेषक: देवी प्रसाद साहू
सहायक सदस्य: आत्मा प्रसाद द्विवेदी

9. **शीर्षक:** हर्बल मेडिकामेन्ट्सय फॉर ट्रीमेन्ट ऑफ न्यूरोसेरेब्रोवैस्कुलर डिस्ऑर्डर्स।
जापानी पेटेण्ट नं. 4695839 **स्वीकृति की तिथि:** 04.03.2011
अन्वेषक: मधुर रे, राघवेन्द्र पाल, सत्यवान सिंह और नन्दू मल खन्ना।
सहायक सदस्य: झरना अरुण और माधुरी चौधरी।

2010 (वार्षिक प्रतिवेदन 2010–2011 में शामिल नही)

1. **शीर्षक:** हर्बल मेडिकामेन्ट्स फॉर ट्रीमेन्ट ऑफ न्यूरोसेरेब्रोवैस्कुलर डिस्ऑर्डर्स।
कोरियन पेटेण्ट नं. 10–1001815 **स्वीकृति की तिथि** 09.12.2011
अन्वेषक: मधुर रे, राघवेन्द्र पाल, सत्यवान सिंह और नन्दू मल खन्ना।
सहायक सदस्य: झरना अरुण और माधुरी चौधरी।

2. **शीर्षक:** हर्बल मेडिकामेन्ट्स फॉर ट्रीमेन्ट ऑफ न्यूरोसेरेब्रोवैस्कुलर डिस्ऑर्डर्स।
एस्टोनियन पेटेण्ट नं. पी 200400097 **स्वीकृति की तिथि:** 13.10.2010
अन्वेषक: मधुर रे, राघवेन्द्र पाल, सत्यवान सिंह और नन्दू मल खन्ना।
सहायक सदस्य: झरना अरुण और माधुरी चौधरी।

भारत में स्वीकृत पेटेण्ट

2011

1. **शीर्षक:** एन्टी हाइपर ग्लाइसेमिक और एण्टी डिस्लिपिडमिक एजेन्ट्स के रूप में ऑक्सीसब्सटीट्यूटेड।
इण्डियन पेटेण्ट नं. 247797 **स्वीकृति की तिथि:** 20.05.2011
अन्वेषक: राम प्रताप, मावुरपु सत्यनारायणन, चण्डीश्वर नाथ, राम रघुबीर, अंजू पुरी, रमेश चन्दर, प्रीति तिवारी, बृजेन्द्र कुमार त्रिपाठी तथा अरविन्द कुमार श्रीवास्तव।

2. **शीर्षक:** नॉवेल स्पर्मीसाइडल एण्ड एण्टीफंगल एजेण्ट्स।
इण्डियन पेटेण्ट नं. 245815 **स्वीकृति की तिथि:** 02 फरवरी, 2011
अन्वेषक: अनिल कुमार द्विवेदी, विष्णु लाल शर्मा, निहारिका कुमारिया, किरण कुमार, गोपाल गुप्ता, जगदम्बा प्रसाद मैखुरी, जनक दुलारी धर, प्रदीप कुमार, अब्दुल हक अंसारी, प्रवीण कुमार शुक्ला, मनीष कुमार राजा राय, कुन्नथ पद्मनाभन मधुसूदनन्, राम चन्द्र गुप्ता
सहायक सदस्य: भवानी शंकर जोशी, तारा रावत, सोमेन्द्र नाथ राय, सिराज़ आलम अंसारी

विदेशों में आवेदित पेटेण्ट

2011

1. **शीर्षकः** पॉलीमरिक नैनोमैट्रिक्स एसोशिएटेड डिलीवरी ऑफ कैम्पफेरॉल इन रैट्स टु इम्प्रूव इट्स ओस्टियोजेनिक एक्शन।
पीसीटी एप्लिकेशन नं. 020110111285 **आवेदन की तिथिः** 29.08.2011
अन्वेषकः प्रभात रंजन मिश्रा, रितु त्रिवेदी, गिरीश कुमार गुप्ता, अविनाश कुमार, वर्षा गुप्ता, श्रीकांत कुमार रथ, कामिनी श्रीवास्तव, नैबेद्य चट्टोपाध्याय और अनिल कुमार द्विवेदी।

2. **शीर्षकः** पॉलीमरिक नैनोमैट्रिक्स एसोशिएटेड डिलीवरी ऑफ कैम्पफेरॉल इन रैट्स टु इम्प्रूव इट्स ओस्टियोजेनिक एक्शन।
पीसीटी एप्लिकेशन नं. 2010217238 **आवेदन की तिथिः** 26.08.2011
अन्वेषकः प्रभात रंजन मिश्रा, रितु त्रिवेदी, गिरीश कुमार गुप्ता, अविनाश कुमार, वर्षा गुप्ता, श्रीकांत कुमार रथ, कामिनी श्रीवास्तव, नैबेद्य चट्टोपाध्याय और अनिल कुमार द्विवेदी।

3. **शीर्षकः** अस्थि संबंधी विकृतियों से बचाव एवं उपचार हेतु सब्सटीट्यूटेड बेन्ज़फ्यूरोक्रोमीन्स और संबंधित कम्पाउण्ड्स।
चायनीज़ पेटेण्ट नं. 200980152325.9 **आवेदन की तिथिः** 23.06.2011
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अवनीश कुमार गौतम, रश्मि पाण्डे, रितु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरिश कुमार जैन और अनिल कुमार द्विवेदी।
सहायक सदस्यः अब्दुल मलिक और अविनाश कुमार

4. **शीर्षकः** अस्थि संबंधी विकृतियों से बचाव एवं उपचार के लिये सब्सटीट्यूटेड बेन्ज़फ्यूरोक्रोमीन्स और संबंधित कम्पाउन्ड्स।
कोरियन पेटेण्ट नं. 10–2011–7012523 **आवेदन की तिथिः** 31.05.2011
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अवनीश कुमार गौतम, रश्मि पाण्डे, ऋतु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन तथा अनिल कुमार द्विवेदी।
सहायक सदस्यः अब्दुल मलिक एवं अवनीश कुमार।

5. **शीर्षकः** सब्स्टीट्यूटेड बेन्ज़फ्यूरोक्रोमीन्स एण्ड रिलेटेड कम्पाउण्ड्स फॉर द प्रिवेन्शन एण्ड ट्रीमेन्ट ऑफ बोन रिलेटैड डिस्आर्डर्स।
जापानीज़ एप्लिकेशन नं. 2011–535212 **आवेदन की तिथिः** 06.05.2011
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अबनीश कुमार गौतम, रश्मि पाण्डेय, रितु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन और अनिल कुमार द्विवेदी।
सहायकः अब्दुल मलिक और अविनाश कुमार

6. **शीर्षकः** अस्थि संबंधी विकृतियों से बचाव एवं उपचार के लिये सब्सटीट्यूटेड बेन्ज़फ्यूरोक्रोमीन्स और संबंधित कम्पाउन्ड्स।
यूरोपियन पेटेन्ट नं. 09787590.0 **आवेदन की तिथिः** 05.05.2011
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अवनीश कुमार गौतम, रश्मि पाण्डे, ऋतु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन तथा अनिल कुमार द्विवेदी।
सहायक सदस्यः अब्दुल मलिक एवं अवनीश कुमार।

7. **शीर्षकः** अस्थि संबंधी विकृतियों से बचाव एवं उपचार के लिये सब्सटीट्यूटेड बेन्ज़फ्यूरोक्रोमीन्स और संबंधित कम्पाउन्ड्स।
यू.एस. पेटेन्ट एप्लिकेशन नं. 13/127913 **आवेदन की तिथिः** 05.05.2011
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अवनीश कुमार गौतम, रश्मि पाण्डे, ऋतु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन तथा अनिल कुमार द्विवेदी।
सहायक सदस्यः अब्दुल मलिक एवं अवनीश कुमार।

2011 (वार्षिक प्रतिवेदन 2010–2011 में शामिल नही)

1. **शीर्षकः** नॉवेल डोनर–एक्सेप्टर फ्लूरीन स्कैफ़ल्ड ए प्रॉसेस एण्ड यूजेज़ देयरऑफ।
चायनीज़ एप्लिकेशन नं. 200980119745.7 **आवेदन की तिथिः** 29.09.2011
अन्वेषकः अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन और आर.एस. आनन्द।

2. **शीर्षकः** नॉवेल डोनर एक्सेप्टर फ्लूरीन स्कैफ़ल्ड ए प्रॉसेस एण्ड यूजेज़ देयरऑफ।
डेमोक्रेटिक रिपब्लिक ऑफ कोरिया एप्लिकेशन नं. 20101150004288 **आवेदन की तिथिः** 18.11.2010
अन्वेषक अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन और आर.एस. आनन्द।

3. **शीर्षकः** *उल्मस वॉलिचियाना* प्लैनकॉन डिराइव्ड एक्सट्रैक्ट डेज़िग्नेटेड ऐज़ 'ओस्टियोऐनाबोल' एण्ड इट्स कम्पाउण्ड्स इप्लाएड इन प्रिवेन्शन ऑरट्रीटमेन्ट ऑफ ओस्टिओ हेल्थ रिलेटेड डिस्आर्डर्स।
जापानीज़ एप्लिकेशन नं. 2010–549257 **आवेदन की तिथिः** 02.11.2010
अन्वेषकः राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी, मणिक्कावसगम, गिरीश कुमार जैन कमल राम आर्या और नैबेद्य चट्टोपाध्याय।
सहायक सदस्यः सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त और अमृता केन्दुरकर।

4. **शीर्षकः** ए बायोएक्टिव एक्स्ट्रेक्ट/फ्रेक्शन फ्रॉम *अल्मस वल्लिचियाना* एण्ड इट्स कम्पाउण्डस फॉर प्रिवेन्शन फॉर ट्रीटमेण्ट ऑफ ओस्टियो–हेल्थ डिस्ऑर्डस।
चाईनीज़ एप्लिकेशन नं. 200980113792.0 **आवेदन की तिथिः** 02.10.2010
अन्वेषकः राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दिकी, गौरव स्वर्णकर, गीतांजलि मिश्रा, लक्ष्मी मणिकावसागाम, गिरिश कुमार जैन, कमल राम आर्या, नैबेद्य चट्टोपध्याय
सहायक सदस्यः सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त और अमृता केन्दुरकर।

5. **शीर्षकः** नॉवेल हाइड्रोक्ज़ी फंक्शनलाइज्ड 1,2,4–ट्राइऑक्जेन्स एण्ड देयर डेरीवेटिव्स यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड ए प्रॉसेस फॉर द प्रिपरेशन देयर ऑफ।
वियतनाम एप्लिकेशन नं. 1–2010–02715 **आवेदन की तिथिः** 11.10.2010
अन्वेषकः चन्दन सिंह, वेद प्रकाश वर्मा और सुनील कुमार पुरी।

6. **शीर्षकः** नॉवेल हाइड्रोक्ज़ी फंक्शनलाइज्ड 1,2,4–ट्राइऑक्जेन्स एण्ड देयर डेरीवेटिव्स यूज़फुल एज़ ऐण्टीमलेरियल एजेण्ट्स एण्ड ए प्रॉसेस फॉर द प्रिपरेशन देयर ऑफ।
एरिपो एप्लिकेशन नं. एपी/पी/2010/005405 **आवेदन की तिथिः** 08.10.2011
अन्वेषकः चन्दन सिंह, वेद प्रकाश वर्मा और सुनील कुमार पुरी।

7. **शीर्षकः** नॉवेल डोनर एकसेप्टर फ्लोरिन स्कैफ्ल्ड्सः ए प्रॉसेस एण्ड यूजेज़ देअरऑफ।
यूएस एप्लिकेशन नं. 12/894428 **आवेदन की तिथिः** 30.09.2010
अन्वेषक :अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन और आर.एस. आनन्द।

8. **शीर्षकः** नॉवेल हाइड्रोक्ज़ी फंक्शनलाइज्ड 1,2,4–ट्राइऑक्जेन्स एण्ड देयर डेरीवेटिव्स यूज़फुल एज़ ऐण्टीमलेरियल एजेण्ट्स एण्ड, प्रॉसेस फॉर द प्रिपरेशन देयर ऑफ।
ब्रजिलियन एप्लिकेशन नं. पी10822467–6 **आवेदन की तिथिः** 27.09.2010
अन्वेषकः चन्दन सिंह, वेद प्रकाश वर्मा और सुनील कुमार पुरी।

9. **शीर्षकः** नॉवेल हाइड्रोक्ज़ी फंक्शनलाइज्ड 1,2,4–ट्राइऑक्जेन्स एण्ड देयर डेरीवेटिव्स यूज़फुल ऐज़ ऐण्टीमलेरियल एजेण्ट्स एण्ड ए प्रॉसेस फॉर द प्रिपरेशन देयर ऑफ।
ओएपीआई एप्लिकेशन नं. 1201000324 **आवेदन की तिथिः** 27.09.2010
अन्वेषकः चन्दन सिंह, वेद प्रकाश वर्मा और सुनील कुमार पुरी।

10. **शीर्षक:** ए बायोऐक्टिव एक्सट्रैक्ट/फ्रैक्शन फ्रॉम *अल्मस वॉलिचियाना* एण्ड इट्स कम्पाउण्ड्स फॉर प्रिवेन्शन एण्ड ट्रीटमेन्ट ऑफ ओस्टियो–हेल्थ डिस्ऑर्डर्स।
यूरोपियन एप्लिकेशन नं. 09718537.5 **आवेदन की तिथि:** 03.09.2010
अन्वेषक: राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मणिक्कावसगम, गिरीश कमार जैन, कमल राम आर्या और नैबेद्य चट्टोपाध्याय।
सहायक सदस्य: सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त और अमृता केन्दुरकर।

11. **शीर्षक:** ए बायोऐक्टिव एक्सट्रैक्ट/फ्रैक्शन फ्रॉम *अल्मस वॉलिचियाना* एण्ड इट्स कम्पाउण्ड्स फॉर प्रिवेन्शन एण्ड ट्रीटमेन्ट ऑफ ओस्टियो–हेल्थ डिस्ऑर्डर्स।
यूएस एप्लिकेशन नं. 12/920927 **आवेदन की तिथि:** 03.09.2010
अन्वेषक: राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मणिक्कावसगम, गिरीश कमार जैन, कमल राम आर्या और नैबेद्य चट्टोपाध्याय/
सहायक सदस्य: सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त और अमृता केन्दुरकर।

भारत में आवेदित पेटेण्ट

1. **शीर्षक:** ट्राइएज़ोल *सब्स्टीट्यूटेड टर्पिनाइल* पाइराजोलिडिन फॉर प्रिपरेशन देयरऑफ।
एप्लिकेशन नं. 3493डीइएल2011 **आवेदन की तिथि:** 05.12.2010
अन्वेषक: शिवाजी नारायण सूर्यवंशी।, सुमन गुप्ता, अविनाश तिवारी, शालिनी सिंह, मोनिका मित्तल और राहुल शिवहरे
सहायक सदस्य: मंजु।

2. **शीर्षक:** टर्पिनाइल आइसोक्ज़ैजोल बेस्ड हाइब्रिड कम्पाउण्ड्स एण्ड प्रॉसेस फॉर प्रिपरेशन देयरऑफ।
एप्लिकेशन नं.3494 डीईएल2011 **आवेदन की तिथि:** 05.12.2011
अन्वेषक: शिवाजी नारायण सूर्यवंशी, सुमन गुप्ता, अविनाश तिवारी, शालिनी सिंह, मोनिका मित्तल और राहुल शिवहरे।
सहायक सदस्य: मंजु।

3. **शीर्षक:** हेट्रोटर्पेनाइड कार्बोज़ाइलिक एसिड एण्ड डेरीवेटिव्स एण्ड ए प्रॉसेस फॉर प्रिपरेशन देयर ऑफ।
एप्लिकेशन नं. 3495 डीईएल2011 **आवेदन की तिथि:** 05.12.2011
अन्वेषक: शिवाजी नारायण सूर्यवंशी, सुमन गुप्ता, अविनाश तिवारी, शालिनी सिंह, मोनिका मित्तल और राहुल शिवहरे
सहायक सदस्य: मंजु।

4. **शीर्षक:** सब्स्टीट्यूटेड 4–ऐरिथयज़ोल–2 हाइड्रोज़न डेरिवेटिव फॉर ट्रीटमेंट ऑफ ट्यूबरक्युलोसिस।
एप्लिकेशन नं. 1580डीईएल 2011 **आवेदन की तिथि:** 03.06.2011
अन्वेषक: सुप्रिया सिंह, कुलदीपक कुमार रॉय, संदीप कुमार शर्मा, रंजना श्रीवास्तव, विनीता चतुर्वेदी तथा अनिल कुमार सक्सेना।
सहायक सदस्य: ज़ाहिद अली तथा अरिमर्दन सिंह कुशवाहा।

5. **शीर्षक:** *डैलबर्जिया सिस्सों* से निष्कर्षित सत् और कम्पाउण्डस का उपयोग अस्थि स्वास्थ्य संबंधी विकृतियों के उपचार और रोकथाम के लिये किया गया।
एप्लिकेशन नं. 1206 डीईएल 2011 **आवेदन की तिथि:** 25.04.2011
अन्वेषक: राकेश मौर्या, प्रीति दीक्षित, रितु त्रिवेदी, विक्रम खेडिग्कर, ज्योति गौतम, अविनाश, दिव्या सिंह, शैलेन्द्र प्रताप सिंह, वहाजुद्दीन, गिरीश कुमार जैन और नैबेद्य चट्टोपाध्याय।
सहायक सदस्य: सतीश चन्द तिवारी, बेन्दांकला चकीज़ा और प्रियंका कुशवाहा।

6. **शीर्षक:** ओलिगोपेप्टाइड्स एण्ड फॉर प्रिपरेशन देयरऑफ।
एप्लिकेशन नं. 0732डीईएल2011 **आवेदन की तिथि:** 16.03.2011
अन्वेषक: तुषार कान्ति चक्रवर्ती, गजुला प्रवीण कुमार, दुलाल पाण्डा, और जयन्त अस्थाना।

7. **शीर्षक:** सब्सिट्यूटेड 1, 2, 3, 4–टेट्राहाइड्रोक्यूनोलिन–7–यिल कार्बामेट्स, दिअर प्रिपेरेएशन एण्ड यूज़ दिअरऑफ एज़ एसिटायलकोलिनएस्टरेज (ACHE) इन्हिबिटर्स फॉर द ट्रीटमेण्ट ऑफ अल्ज़ाइमर्स एण्ड अदर न्यूरोडिजेनेरेटिव, डिज़ीज।
एप्लिकेशन नं. 0363डीईएल2011 **आवेदन की तिथि:** 14 फरवरी, 2011
अन्वेषक: कुलदीप कुमार राय, संतोष कुमार टोटा, चण्डीश्वर नाथ, राकेश शुक्ला, अनिल कुमार सक्सेना।

8. **शीर्षक:** अरईल अरईल मिथाइल थियो एरिनेस (AAMTAs) एज़ ऐण्टीमलेरियल एजेण्ट्स एण्ड ए प्रोसेस फॉर द प्रिपरेशन दिअरऑफ।
एप्लिकेशन नं. 0364डीईएल2011 **आवेदन की तिथि:** 14 फरवरी, 2011
अन्वेषक: गौतम पाण्डा, प्रियंका सिंह, संजीत कुमार दास, सुबल कुमार डिण्डा, मनीष गोयल, उदय बंधोपध्याय।

9. **शीर्षक:** नॉवेल 3, 3–स्पाइरोएनेलेटेड 5, 6–डाइसब्सिट्यूटेड–1, 2, 4–ट्राइऑक्सेन्स एज, एण्टीमलेरियल एजेण्ट्स एण्ड ए प्रोसेस फॉर द प्रिपरेशन दिअरऑफ।
एप्लिकेशन नं. 0265डीईएल2011 **आवेदन की तिथि:** 14 फरवरी, 2011
अन्वेषक: प्रेम प्रकाश यादव, सुनील कुमार पुरी, रंजनी मौर्या, अवकाश सोनी

10. **शीर्षक:** चिरॉल 3–अमिनोमिथाइलपाइपरिडाइन डेरीविटव्स एज़ इन्हिबिटर्स ऑफ कोलॉजेन इन्ड्यूस्ड प्लेटलेट एक्टिवेशन एण्ड एथेशन
एप्लिकेशन नं. 208डीईएल2011 **आवेदन की तिथि:** 31 जनवरी, 2011
अन्वेषक: दिनेश कुमार दीक्षित, मधु दीक्षित, तनवीर इरशाद सिद्दीकी, अनिल कुमार, रवि शंकर भट्टा, गिरीश कुमार जैन, मनोज कुमार भरथवाल, अंकिता मिश्रा, विवेक खन्ना, प्रेम प्रकाश, मनीष जैन व विशाल कुमार
सहायक सदस्य: सुरेन्द्र सिंह, सीपी पाण्डे, कान्ता भूटानी एवं एम एस अंसारी

2 वैज्ञानिक सम्मेलनों में प्रस्तुत शोध पत्र

2010

इण्टरनेशनल सिम्पोज़ियम ऑन टीबी डायग्नोस्टिक्सः इनोवेटिंग टु मेक एन इम्पैक्ट, नई दिल्ली (16 से 17 दिसम्बर, 2010)

1. एसोसिएशन ऑफ एचएलए एण्ड वीडीआर वैरिएंट्स विद साइटोकाइन प्रोफाइल एण्ड वैक्टीरियल वाएबिलिटी इन *एम. ट्युबरकुलोसिस*–इनफ़ेक्टेड ह्यूमन एमडीएमएस फॉलोइंग ट्रीटमेन्ट विद एण्टी ट्युबरकुलोसिस ड्रग्स एण्ड ड्रग–लोडेड माइक्रोपार्टिकल्स; अमित के. सिंह, राजीव गर्ग और अमित मिश्रा।

2011

नेशनल सेमिनार ऑन मॉस स्पेक्ट्रोमीट्री–2011, लखनऊ (11 से 12 जनवरी)

1. न्यू टेक्नीक्स ऑन मास स्पेक्टोमीट्री ऑफ नैच्युरल प्रॉजेक्ट; विकास वाजपेयी, निखिल कुमार और बृजेश कुमार।
2. ऐप्लिकेशन ऑफ क्यू–टॉफ मॉस स्पेक्ट्रोमीटर ऑन *अल्मस वालिचियाना* प्लाण्ट; दीप्ति शर्मा, के.आर. आर्या और बृजेश कुमार।
3. रैपिड आइडेन्टीफिकेशन ऑफ हर्बल प्रोडक्ट्स यूजिंग कैरेक्टराइजेशन मॉस स्पेक्ट्रम ''फिंगरप्रिंट''; प्रज्ञा सिंह, संजीव कनौजिया, दीपक कुमार मिश्रा, संजीव के. शुक्ला और बृजेश कुमार।

कीस्टोन सिम्पोज़ियम (जे3) ट्युबरकुलोसिसः इम्यूनोलॉजी सेल बायोलॉजी एण्ड नॉवेल वैक्सिनेशन स्ट्रैटजीज़, वैंकूवर, कनाडा (15 से 20 जनवरी)

4. वैरिएशन्स इन मैक्रोफ़ेज रिस्पॉन्स टु इन्फेक्शन विद *माइकोबैक्टीरियम ट्युबरकुलॉसिस* एण्ड ट्रीटमेन्ट विद माइक्रोपार्टिकल्स अफेक्ट बैक्टीरियल सरवाइवल; अमित के. सिंह, राजीव गर्ग और अमित मिश्रा।

तृतीय नेशनल सिम्पोज़ियम ऑफ मॉडर्न ट्रेन्ड्स इन डिफ़रेन्शियल एण्ड मैथमेटिकल मॉडलिंग इन बायोसाइंसेज़, लखनऊ विश्वविद्यालय (15 से 16 जनवरी)

5. मैथमैटिकल एप्रोच फॉर स्टडींग कन्ट्रोल ऑफ ग्लूकोज़ लेवल्स इन टाइप 1 डायबिटीज़ मेलिटस; मुकेश श्रीवास्तव, ऋचा श्रीवास्तव, ए.के. श्रीवास्तव और एम. अब्बास।

नेशनल सिम्पोज़ियम ऑफ न्यू पैराडाइम्स इन लेबोरेटरी एनीमल साइंस इन एन इरा ऑफ एडवांस्ड बायोमेडिकल रिसर्च, आईवीआरआई, आइजट नगर (28 से 29 जनवरी)

6. रोल ऑफ फिज़िकल फेक्टर्स ऑन हाउसिंग एनवॉयरमेन्टल एण्ड वेल्फेयर ऑफ लेबोरेटरी एनिमल्स, ए बेस लाइन ऑफ बायोमेडिकल रिसर्च; ए.के. श्रीवास्तव और डी. हन्सदा।
7. स्टेरीलाइज़ेशन प्रोसिज़र ऑफ केज़ेस ड्रिंकिंग बॉटल्स एण्ड बेडिंग मटेरियल फॉर हाउसिंग ऑफ लेबोरेटरी एनीमल्स इन एन एनीमल फैकेल्टी, ए.के. भार्गव, ए.के. श्रीवास्तव एण्ड डी हन्सदा।
8. सर्टेन ऑर्गन्स ऑफ बायोमेडिकल इम्पोर्टन्स ऑफ लेबोरेटरी एनिमल्स, डी हन्सदा, ए.के. श्रीवास्तव, के. राय और डी.एस. उपाध्याय।
9. इफेक्ट ऑफ न्यूट्रिशियन ऑन द ग्रोथ पैरामीटर्स ऑफ स्प्रेग्यू डेवले रेट (*रैट्स नर्वेज़िक्स*), पॉम्पी मुखोपाध्याय, डी.एस. उपाध्याय, रबीन्द्र सिंह और डी. हन्सदा।
10. इक्टोपैरासिटिसाइडल एजेण्ट यूज्ड इन डिफरेन्ट कन्सन्ट्रेशन फॉर ट्रीटमेन्ट ऑफ लेबोरेटरी रोडेण्ट एट सेन्ट्रल ड्रग रिसर्च इंस्टीट्यूट, लखनऊ, डी. हन्सदा, ए.के. श्रीवास्तव, के. राय और डी.एस. उपाध्याय।
11. इफेक्ट ऑफ ओपन फार्मूला बेस्ड सीडीआरआई, फीड ऑन बॉडी वैट गैन, विसरल ऑर्गेन्स वेट एण्ड हीमेटोलॉजिकल पैरामीटर्स इन एसडी रैट, रवीन्द्र सिंह, डी. हन्सदा और डी.एस. उपाध्याय।
12. एन ओवरव्यू: द यूज़ ऑफ माइस इन ऑबेसिटी रिसर्च, अर्चना मिश्रा, डी.एस. उपाध्याय, के. राय एण्ड बी.एच. मंजूनाथ प्रभु।
13. क्लीनिकल ट्राइल ऑफ अज़िथ्रोमायसीन टू कंट्रोल द प्रिविलेन्स ऑफ सर्विकल लिम्फेडिनाइटिस इन चार्ल्स फोस्टर रैट, एस.एन.ए रिज़वी, के. राय और डी.एस. उपाध्याय।
14. इफेक्ट्स ऑफ ब्रीडिंग प्रोसिज़र ऑफ लेबोरेटरी एनीमल्स फॉर बेटर एम्ब्रियो कलेक्शन, बी.एच. मंजूनाथ प्रभु, के. राय और डी. एस. उपाध्याय।

15. इफेक्ट्स ऑफ टेम्प्रेचर एण्ड फोटोपीरियड ऑन रिप्रोडक्शन इन द फीमेल गिनी पिंग (*कैविया पॉर्सेल्स*): के. राय, बी.एच, मंजूनाथ प्रभु एण्ड डी.एस. उपाध्याय।

16. ब्रीडिंग टेक्नीक इन गिनी पिग्स, के. राय, बी.एच. मंजूनाथ प्रभु एण्ड डी.एस. उपाध्याय।

17. गुड लेबोरेटरी प्रैक्टिस (जीएलपी) इन लेबोरेटरी एनिमल फेसिलिटी, हिमांग्शु कौशिक बोरा।

18. गेप्स एण्ड नीड्स इन लेबोरेटरी एनीमल साइंस टू सपोर्ट करेन्ट बायोमेडिकल रिसर्च, डी.एस. उपाध्याय।

19. ऐजुकेशन एण्ड ट्रेनिंग इन लेबोरेटरी एनीमल साइंसः इण्डियन सिनेरियो, डी.एस. उपाध्याय।

दि रमनभाई फाउण्डेशन पाँचवीं इण्टरनेशनल सिम्पोज़ियम ऑन करेन्ट ट्रेन्ड्स इन फार्मास्युटिकल साइंसेज़, अहमदाबाद (01 से 04 फरवरी)

20. इफेक्ट्स ऑफ ऐक्यूट वर्सज़ क्रोनिक ट्रीटमेण्ट इन केटामाइन इन माइसः बिहेवियरल एण्ड न्यूरोकेमिकल एबनॉरमैलिटीज़; मानवी चटर्जी और गौतम पालित।

एडवान्सेज़ इन ट्रांसलेशनल रिसर्च एण्ड मेडिसिन, अहमदाबाद (01 से 04 फरवरी)

21. रोज़ीग्लिाटाज़ोन मीडिएटेड न्यूरोप्रोटेक्शन इन एमसीएओ मॉडल इज़ नॉट मीडिएटेड वाइ ग्लुटामेट ट्रान्सपोर्टर 1; राजकुमार वर्मा, विकास मिश्रा, दिनकर सैसमाल और राम रघुबीर।

22. एमर्जिंग मॉलीक्युलर टार्गेट्स फॉर नॉवेल थेराप्यूटिक स्ट्रैटेजीज़ इन स्ट्रोक; राम रघुबीर।

23. फ्लरबीप्रूफेन न्यूरोप्रोटेक्टिव इफेक्ट इन फ़ोकल सेरेब्रल ईश्मिया; विकास मिश्रा, राजकुमार वर्मा और राम रघुबीर।

15वी. आईएससीबीसी इण्टरनेशनल कांफ्रेंस, विश्वविद्यालय, राजकोट (04 से 07 फरवरी)

24. काइरान एप्रोच सिन्थेसिस ऑफ नैच्युरल प्रॉडक्ट्स एण्ड नैच्युरल प्रॉडक्ट लाइक मॉलीक्युल्स फ्रॉम कार्बोहाइड्रेट बेस्ड बिल्डिंग ब्लॉक्स; अरूण कुमार शॉ।

25. डिज़ाइन एण्ड सिन्थेसिस ऑफ द हाईब्रिड क्विनाजोलिनोन–ट्राइएजीन एज़ एण्टीलीशमैनियल एजेण्ट्स; मोनी शर्मा, के. चौहान, सुमन गुप्ता और पी.एम.एस. चौहान।

26. सिन्थेसिस एण्ड बायोलॉजिकल इवैल्युएशन ऑफ इन्डोलाइल ग्लूऑक्जीलएमाइड्स एज़ ए न्यू क्लास एण्टीलीशमैनिअल एजेण्ट्स;शिखा एस. चौहान, लीना गुप्ता, पी.एम.एस. चौहान, मोनिका मित्तल, प्रीति विश्वकर्मा और सुमन गुप्ता।

27. कैरेक्टराइज़ेशन ऑफ *ब्रूज़िया मैलाई* थाइमिडाइलेट काइनेज़, ए प्यूटेटिव ड्रग टार्गेट; पवन कुमार दोहरे, अनीता, मनीष कुमार सुथार, शिववरदान सिंह और जे.के. सक्सेना।

28. *प्लासमोडियम योएली*–एक्सप्रेशन एण्ड प्यूरीफिकेशन ऑफ न्यूक्लियोसाइड फोस्फोरायलेज़, मनीष कुमार सुथार, अनीता, पवन कुमार दोहरे, शिव वरदान सिंह एण्ड जे. के. सक्सेना

29. आरटीमिसनीन एंड इट्स डेरिवेटिव्स एज इनहीबिटर्स ऑफ एण्टीऑक्सिडेन्ट सिस्टम ऑफ *प्लासमोडियम योएली*, शिव वरदान सिंह, अनीता, मनीष कुमार सुथार, पवन कुमार दोहरे एंड जे.के. सक्सेना

30. टिश्यू अपटेक ऑफ एन एरिलापिपराज़ाइन डिराइव्ड एसएआरएम फॉर बिनाइन प्रास्टैटिक हाइपरप्लेज़िया मैनेजमेंट; जे. लाल, ए. सारस्वत और एस.के. पाण्डे।

31. डिज़ाइन एण्ड सिंन्थेसिस ऑफ न्यू चालकोन डिराइवेटिव्स कन्टेनिंग ट्रायएज़ीन मॉइटी विद पोटेन्ट एण्टीट्युबरकुलर एक्टिविटी; आनन्द कुमार पाण्डे, कुलदीप चौहान, विनीता चतुर्वेदी, संदीप के. शर्मा, रंजना श्रीवास्तव और पी.एम.एस. चौहान।

32. सिन्थेसिस् एण्ड एण्टी–माइक्रोबियल ऐक्टिविटी इवैल्युएशन ऑफ नॉवेल डाइथायोकार्बामेट–अमीनोक्विनोलिन / पिरीडीन कन्जुगेट्स; कुलदीप चौहान, मोनी शर्मा, आनन्द कुमार पाण्डे, अतीन्द्र कुमार पाण्डे, पी.के. शुक्ला और पी.एम.एस. चौहान।

33. डिज़ाइन एण्ड सिन्थेसिस् ऑफ हाइब्रिड क्विनाज़ोलिनन–ट्रयज़ीन एज़ एण्टीलीशमैनियल एजेण्ट्स; मोनी शर्मा, कुलदीप चौहान, सुमन गुप्ता और पी.एम.एस. चौहान।

34. सिन्थेसिस् ऑफ न्यू–4–अमीनोक्विनोलिन–शिफ़ बेस डिराइवेटिव्स एज़ पोटेण्ट एनटीमलेरियल एजेण्ट्स; रश्मि शर्मा, मोनी शर्मा, कुमकुम श्रीवास्तव और पी.एम.एस. चौहान।

35. ए वर्सटाइल सिन्थेसिस् ऑफ टेट्राज़ोल टीथर्ड बीटा– कार्बोलाइन्स वाया यूजीआई–4सीजी रिऐक्शन्स; शाहनवाज़ खान, विकास त्यागी, शशि पाण्डे, हर्ष एम. गौनियाल और पी.एम.एस. चौहान।

36. सिन्थेसिस ऑफ एमाडायाक्विन–एप्लिसिनाप्सिन हाइब्रिड्स एज़ नॉवेल एण्टीमलेरियल एजेण्ट्स; शशि पाण्डे, शाहनवाज़ खान, कुमकुम श्रीवास्तव, हर्ष एम. गौनियाल और पी.एम.एस. चौहान।

37. सिन्थेसिस् एण्ड बायोलॉजिकल इवैल्युएशन ऑफ इन्डोलिल ग्लाइआक्ज़ीलैमाइड एज़ ए न्यू क्लास ऑफ एण्टी लीशमैनियल एजेण्ट्स; शिखा एस. चौहान, लीना गुप्ता, पी.एम.एस. चौहान, मोनिका मित्तल, प्रीति विश्वकर्मा और सुमन गुप्ता।

38. ए माइक्रोवेव असिस्टेड सिन्थेसिस् ऑफ फ्यूज्ड लैक्टैम (1,2)–ए (1,4), बेन्ज़ोडायज़–एपाइन डेरिवेटिव बाइ सीक्वेन्शियल यूजीआई / कपलिंग रिऐक्शन; विकास त्यागी, शाहनवाज़ खान और पी.एम.एस. चौहान।

39. डिज़ाइन एण्ड सिन्थेसिस् ऑफ 3–(एजोल–1–इल) फेनिल प्रोपेन्स एज़ माइक्रोबिसाइडल स्पर्मिसाइड्स फॉर प्रोफाइलैक्टिक कॉन्ट्रासेप्शन; ललित कुमार, अमित सारस्वत, नन्द लाल, आशीष जैन, सुमित कुमार, एस.टी.वी.एस. किरन कुमार, जगदम्बा प्रसाद मैखुरी, अतीन्द्र कुमार पाण्डे, प्रवीन कुमार शुक्ला, गोपाल गुप्ता और विष्णु एल. शर्मा।

40. ऐरिल पाइपिरैजीन्स फॉर मैनेजमेन्ट ऑफ बिनाइन प्रॉस्टैटिक हाइपरप्लेसिया–डिज़ाइन सिन्थेसिस् एण्ड बायोलॉजिकल इवैल्यूएशन; अमित सारस्वत, ललित कुमार, नन्दलाल, राजीव कुमार, जगदम्बा प्रसाद मैखुरी, दिवाकर दलेला, कीर्ति, गोपाल गुप्ता और वी.एल. शर्मा।

41. पाइपैराजीन डिराइण्ड एण्टीस्पर्मेटॉजनिक एजेण्ट्स ऐज़ ओरल कॉन्ट्रासेप्टिव फॉर मेनः डिज़ाइन सिन्थेसिस् एण्ड *इन विट्रो* इवैल्यूएशन; नन्द लाल, ललित कुमार, अमित सारस्वत, विकास वर्मा, जे.पी. मैखुरी, गोपाल गुप्ता और विष्णु एल. शर्मा।

30वां एनुअल कन्वेन्शन ऑफ इण्डियन एसोसिएशन फॉर कैन्सर रिसर्च (आईएसीआर) एण्ड इण्टरनेशनल सिम्पोज़ियम ऑन सिग्नलिंग नेटवर्क एण्ड कैन्सर, आईआईसीबी, कोलकाता (06 से 09 फरवरी)

42. आईएल–6 एण्ड आईएल–10 ज़ीन पॉलीमॉर्फिज़्म्स एण्ड ब्रेस्ट कैन्सर रिस्क इन नॉर्दन इण्डियन पॉप्युलेशन; पूजा सिंह, लक्ष्मी वी. नायक, हेमन्त कुमार बिड, संदीप कुमार और रितुराज कोनवर।

14वीं पंजाब साइंस कांग्रेस, लोंगोवाल, पंजाब (07 से 09 फरवरी)

43. न्यू कीमोथेरेप्यूटिक्स एजेण्ट्स अगेन्स्ट माइक्रोबियल एण्ड पैरासाइटिक इन्फेक्शन इनावॉल्विग एफिशिएन्ट सिन्थेटिक स्ट्रैटेजीज़; आर.पी. त्रिपाठी।

44. सिन्थेसिस एण्ड बायो–इवैल्युएशन ऑफ अल्काइलएमिनोएरिल फिनाइल साइक्लोप्रोपाइल मिथेनॉन्स एंज़ एण्टीट्युबरकुलर एण्ड एण्टी मलेरियल एजेण्ट्स; अजय आर्या, वन्दना सिंह, बी. एन. सिंह, वी. चतुर्वेदी आर. त्रिपाठी और आर.पी. त्रिपाठी

37वीं एनुअल कांफ्रेंस ऑफ इण्डियन इम्यूनोलॉजी सोसायटी, जम्मू (07 से 10 फरवरी)

45. एक्सप्रेशन, प्योरीफिकेशन एण्ड कैरकेक्टराइज़ेशन ऑफ ट्रेहैलोज़–6–फॉस्फेट फॉस्फ़टेज़ फ्रॉम ह्यूमन लिम्फैटिक पैरासाइट *ब्रूज़िया मैलाइ*; सुशीला कुशवाहा, प्रशांत के. सिंह, अजय कुमार राना और शैलेजा मिश्रा–भट्टाचार्य।

46. एन–मिथाइल–6,7–डाइमेथॉक्ज़ाइआइसोक्विनोनन आइसोलेटेड फ्रॉम *एन्नोना स्क्वामोसा* बार्क आप रेगुलेट द टी एण्ड बी सेल पॉपुलेशन एण्ड मैक्रोफेज़ेज फंक्शन इन वॉल्ब/सी. माइस; विशाल के. सोनी, नसरीन बानो, मनीषा पाठक, दिनेश कुमार यादव, राकेश मौर्या, स्वतंत्र कुमार जैन और शैलजा मिश्रा–भट्टाचार्य।

47. फंक्शनल कैरेक्टराइजेंशन ऑफ एटीपेज आरएनए हेलिकेज ऑफ ह्यूमन लिम्फैटिक फाइलेरियल पैरासाइट *ब्रूज़िया मैलाई* यूजिंग आरएनए इण्टरफियरेन्स; मेघना सिंह, प्रशांत के. सिंह और शैलजा मिश्रा–भट्टाचार्य।

48. डैम मिथाइलेज़ ऑफ एन्डोसिम्बायोटिक *वाल्बाशिया* फ्रॉम लिम्फैटिक फाइलेरिया *ब्रूज़िया मैलाई*, एन आइडियल ड्रग टारगेट कॉज़ेज इम्यून सप्रेशन इन माइस; अजय राणा, विशाल के. सोनी, सुशीला कुशवाहा, प्रशांत के. सिंह और शैलजा मिश्रा–भट्टाचार्य।

49. कॉकटेल वेक्सिनेशन विद *ब्रूज़िया मैलाई* रिकॉम्बीनेन्ट प्रोटीन कन्फर इफेक्टिव प्रोटेक्शन अगेन्स्ट इनफेक्टिव लार्वल चैलेन्ज़ इन *मैस्टोमिस काउचा*; निधि श्रीवास्तव, जितेन्द्र के. नाग, सुशीला कुशवाहा, प्रशान्त के सिंह और शैलजा मिश्रा– भट्टाचार्य।

50. जेडुनिन एण्ड फाइटोजेडुनिन ऑफ *जाइलोकारपस ग्रेन्टम* डिमांस्ट्रेट मैक्रोफाइलेरिसाइडल एक्टिविटी अगेन्स्ट *ब्रूज़िया मैलाइ* इन एक्सपेरीमेन्टल रोडेन्ट होस्ट; श्वेता मिश्रा, मीनाक्षी वर्मा, ज्योति गुप्ता, विजय लक्ष्मी और शैलजा मिश्रा–भट्टाचार्य।

51. द मैरिन स्पॉन्ज *हैलिकोना ऑक्युलेटा* पज़ेसेस एण्टी फाइलेरियल एक्टिविटी अगेन्स्ट एक्सपेरीमेन्टल ह्यूमन लिम्फैटिक फाइलेरियल पैरासाइट *ब्रूजिया मैलाइ* इन रोडेन्ट मॉडल; ज्योति गुप्ता, श्वेता मिश्रा, विजय लक्ष्मी और शैलजा मिश्रा–भट्टाचार्य।

तृतीय इण्टरनेशनल सिम्पोज़ियम ऑन ड्रग मेटाबोलिज्म एण्ड फार्माकोकाइनेटिक्स, एप्लिकेशन्स टुवर्ड ड्रग डिस्कवरी एण्ड डेवलपमेन्ट, मोहाली (11 से 13 फरवरी)

52. इफेक्ट ऑफ फेनिटोइन–एन एण्टीएपिलेप्टिक ऑन फार्माकोकाइनेटिक्स प्रोफाइल ऑफ एन एण्टीमलेरियल ट्राइऑक्ज़ेन इन रैट्स; एच.एन. कुशवाहा, एन. गौतम, ए. मिश्रा, बी. सिंह और एस.के. सिंह।

53. फार्माकोकाइनेटिक्स ऑफ एस007–967, एन एरिलपिराइज़ाइन डिराइव्ड एसएआरएम, फॉर विनाइन प्रॉस्टैटिक हाइपरप्लेसिया मैनेज़मेण्ट; बी. हीरलाल, पी. त्रिपाठी, एस.के. पाण्डे, एस. सारस्वत और जे. लाल।

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54. एडवानन्ड टेक्नीक्स फॉर रिग्रेशन एण्ड क्लासिफिकेशन इन माइनिंग ऑफ बायोमेडिकल डेटा; अब्बास एम., मुकेश श्रीवास्तव और मोहम्मद इमरान सिद्दीकी।

तृतीय नाइपर (रायबरेली)–सीडीआरआई सिम्पोज़ियम ऑन मेडिसिनल केमिस्ट्री एण्ड फार्मास्युटिकल साइंस, सीडीआरआई, लखनऊ (03 से 05 मार्च)

55. सीपीजी–ओडीएन 2006 एण्ड माइल्टेफोज़िनः ए पोटेन्शियल कॉम्बीनेशन फॉर ट्रीटमेन्ट ऑफ एक्सीपेरीमेन्टल विसरल लीशमैनिआसिस; सुमन गुप्ता, श्रृद्धा ए. साने, निशी शाक्य, प्रीति विश्वकर्मा और डब्ल्यू. हक।

56. पोटेन्शियल यूज़ ऑफ Pam3Cys, इन इम्यूनो कीमाथेरैपी ऑफ विसरल लीशमैनिआसिस; निशी शाक्य, प्रीति विश्वकर्मा और सुमन गुप्ता।

57. फार्माकोकाइनेटिक्स ऑफ एस007–967, एन ऐरिल पाइपैरिजीन डिराइव्ड एसएआरएम, फॉर बीपीएच मैनेजमेन्ट इन रैट्स; बी. हीरालाल, पी. त्रिपाठी, एस.के. पाण्डे, ए. सारस्वत और जे. लाल।

58. सिन्थेसिस ऑफ गैलक्टोपैरनोसाइल अमीना एलकोहलः लीड मॉलक्यूलस फॉर टयूबरक्लोसिस, उदय प्रकाश त्रिपाठी, अनीन्द्र शर्मा, आर. पी. त्रिपाठी

59. डिज़ाइन, सिन्थेसिस एण्ड एण्टी ट्युबलकुलर इवैल्युएशन ऑफ हाइब्रिड मॉलीक्युल्स; प्रियंका, नम्रता आनन्द, बी.एन. सिंह, विनीता चतुर्वेदी और आर.पी. त्रिपाठी।

60. एप्लीकेशन ऑफ ब्युटेनॉइल–सी–ग्लाइकोसाइड इन द सिन्थेसिस ऑफ ग्लूकोपाइरैनोसिलमिथाइलपाइरेजोलिन्स, पिरीमिडीन्स एण्ड बाइफेनिल्स; सीरत फातिमा, विवेक पी. पाण्डे, एस.एस. बिष्ट और आर.पी. त्रिपाठी।

61. सिन्थेसिस्, कैरेक्टराज़ेशन एण्ड बायोलॉजिकल इवैल्युऐशन ऑफ नॉवेल एण्टीस्पर्मेटाजेनिक एजेण्ट्स एज़ मेल कॉन्ट्रासेप्टिव्स; वीनू बाला, संतोष जांगिड ललित कुमार, अमित सारस्वत, नन्दलाल, सौरभ माहेश्वरी, गोपाल गुप्ता और वी.एल. शर्मा।

62. डिज़ाइन एण्ड सिन्थेसिस् ऑफ नॉवेल अल्काइल फॉस्फेट एनालॉग्स एज़ पॉसिबल स्पर्मिसाइड्स; संतोष जांगिड, वीनू बाला, ललित कुमार, अमित सारस्वत, नन्दलाल गोपाल गुप्ता और वी.एल. शर्मा।

63. सिन्थेसिस् एण्ड बायोलॉजिकल स्टडीज़ ऑफ डायरिल बेन्जोपाइरन्सः एपॉपटॉसिस इन्डक्शन एण्ड इनहिबिशन ऑफ हाइपरप्लेसिया फॉर्मेशन इन रैट यूटरस; शंघानी वाई, मो.के. हुसैन, वी. चन्द्रा, आई. फ़ातिमा, आर. सक्सेना, एस. किचलू, के. हजैला और ए. द्विवेदी।

एनुअल मीटिंग ऑफ द इण्डियन सोसाइटी ऑफ ह्यूमन जेनेटिक्स, मनीपाल (14–15 फरवरी)

64. पॉलिमॉरफिज़्म्स इन द एम टीएचएफआर जीन आरए रिस्क फैक्टर फॉर मेल इनफर्टिलिटी इन इण्डिया; निशी गुप्ता और राजेन्दर सिंह।

17वीं कांफ्रेंस ऑफ नेशनल मेग्नेटिक रिसोअन्स सोसायटी, अमृतसर (1–4 मार्च 2011)

65. सोल्यूशन स्ट्रक्चर ऑफ एडीएफ / कोफिलिन फ्रॉम *लीशमैनिया डोनोवनी* एण्ड *टॉक्सोप्लाज़्मा गॉन्डाइ*; प्रेम पी. पाठक, वैभव के. शुक्ला, अनुपम जैन, सरिता त्रिपाठी और आशीष अरोड़ा।

66. स्ट्रक्चरल एनालिसिस ऑफ बैक्टीरियल पेप्टाइडिल टी–आरएनए हाइड्रोलेज़; अशोक कुमार, राहुल यादव और आशीष अरोड़ा।

5वी. सिमरिंग वैक्सीन सिम्पोज़ियम 2011 ''वैक्सीन–द की पैराडाइम फॉर द 21 सेन्चुरीज़ हेल्थ केयर स्ट्रैटजीज़'' बेडेन, आस्ट्रिया (28 अप्रैल से 01 मई 2011)

67. टु कम्पेयर द रिलीज़ आफ नाईट्रिक ऑक्साइड ऑफ्टर एडमिनिस्ट्रेशन ऑफ एचबीएसएजी लोडेड पॉलिमरिक लैमिलर सब्स्ट्रेट पार्टिकल्स पीएलएसपी (पीएलजीए (75:25), एण्ड माइक्रोस्फीयर्स एमएस (पीएलजीए(50:50)), इन माइस; वी. सैनी, पी.के. मूर्ति और डी.वी. कोहली।

द्वितीय इण्टरनेशनल एनुअल कांफ्रेंस ऑन, मॉडल्स ऑफ ह्यूमन डिज़ीजेज़, ''बेटर मॉडल्स फॉर बेटर ड्रग्स'' यूनिवर्सिटी ऑफ टोरन्टो, टोरन्टो, कनाडा (28 जून)

68. इम्यून सेल्स एण्ड स्केलेटल मसल कनेक्ट इन्फ्लेमेशन विद इंस्युलिन रेज़िस्टेन्स; पिनॉन एन., फिन्क एन.एन., शर्टज़र जे. डी., ताम्रकर ए.के., केलवलरमानी जी., सी. समान, के. ऐरेन, बिलान पी.जे. और क्लिप ए.।

एनुअल कांफ्रेंस ऑफ द जेनेटिक्स सोसाइटी ऑफ ऑस्ट्रल–एशिया, मेलबर्न, आस्ट्रेलिया (10 से 13 जुलाई)

69. इफेक्ट ऑफ डाइटरी एपिजेनेटिक इन्टरवेन्शन्स ऑन पार्किन्सनिज़्म इन *सीनोरैब्डाइटिस एलेगैन्स*; पूजा जडिया, शशि राज समी, सुपिन्दर कौर और आमिर नाज़िर।

इण्टरनैशनल कांफ्रेंस ऑन जीनॉमिक्स एण्ड प्रोटियॉमिक्स, कालीकट (14 से 16 जुलाई)

70. एपिजेनिन प्रोटेक्ट्स अगेन्स्ट लिथोकोलिक एसिड–इन्ड्यूज्ड लिवर इंज्युरी एण्ड ऑक्सीडेटिव स्ट्रेस इन माइस; पी. सिंह, पी. के. सिंह, ए.के. श्रीवास्तव, एस.के. मौर्य, एस. शर्मा और एस.के. रथ।

71. डायग्नोस्टिक एबिलिटी ऑफ एक्स–लिंक्ड इनहिबिटर ऑफ एपॉप्टॉसिस (एक्सआईएपी) इन यूरिनरी ब्लैडर कैंसर; एस.के. श्रीवास्तव, पी.के. सिंह, पी. सिंह, एस. नायक, डी. दलेला, एम. एम. गोयल, एस.के. रथ और एम.एल.बी. भट्ट।

ऑल इण्डिया काउन्सिल फॉर टेक्निकल एजूकेशन (एआईसीटीइ) सेमिनार ऑन ''इण्डस्ट्री एक्सपेक्टेशन्स फ्रॉम फार्मेसी कॉलेज'', गाजियाबाद, (06 से 08 अगस्त)

72. कम्पैरेटिव फार्माकोकाइनेटिक ड्रग इन्टरैक्शन बिटवीन गाबापेन्टिन, एन एण्टीएपिलेप्टिक एण्ड सीडीआरआई–97/78, एन एण्टीमलेरियल इन मेल एण्ड फीमेल रैट्स; एस.एन. कुशवाह, एस.एच. सिद्दीकी और एस.के. सिंह।

नैशनल सेमिनार ऑन केमइन्फॉरमैटिक्स, कोयम्बटूर (26 अगस्त)

73. थ्योरेटिकल ड्रग डिज़ाइन इन ड्रग रिसर्च पैराडाइम; वाई.एस. प्रभाकर।

माइक्रोसोलर एनर्जी जेनरेशन एण्ड यूटिलाइज़ेशन, कानपुर (03 से 04 सितम्बर)

74. सिन्थेसिस ऑफ डोनर–एक्सेप्टर फ्लूरेनथीनः एप्लिकेशन इन ऑर्गेनिक लाइट एमिटिंग डायोड्स; गौरव तनेजा, विजय कुमार, आनन्द आर.एस. और अतुल गोयल।

75. सिन्थेसिस ऑफ नॉन ऐगीग्रेटिंग डोनर एक्सेप्टर पाइरेनिलएरिन्स फॉर ब्लू ऑर्गेनिक लाइट एमिटिंग डिवाइसेज़; पंकज नाग, विजय कुमार, आनन्द आर.एस. और अतुल गोयल।

द्वितीय एशिया पैसिफ़िक ओस्टियोपोरोसिस एण्ड बोन मीटिंग, गोल्ड कोस्ट, ऑस्ट्रेलिया (04 से 08 सितम्बर)

76. एज़ एण्ड स्केलेटल साइट अफेक्ट रिस्पॉनसिवनेस ऑफ बोन मैरो स्ट्रोमल सेल्स फ्रॉम डिफरेन्ट ट्रैबिक्युलर कम्पार्टमेन्ट्स इन डिफरेन्ट फिज़ियोलॉजिकल कन्डीशन्सः इफेक्ट ऑफ एस्ट्रोज़न एण्ड विटमिन डी; रितु त्रिवेदी और अविनाश कुमार।

द्वितीय इण्टरनैशनल कांफ्रेंस ऑन होलिस्टिक मेडिसिन कोट्टायम (11 से 13 सितम्बर)

77. नैच्युरल मॉलिक्यूल्स विद GLUT4 ट्रान्सलोकेशन स्टिम्युलेट्री इफेक्ट फॉर द ट्रीटमेन्ट ऑफ इन्स्युलिन रेज़िस्टेन्स; ए.के. ताम्रकार, एन. जायसवाल, सी.के. मौर्य, आर. मौर्य और ए.के. श्रीवास्तव।

70वीं एनुअल मीटिंग ऑफ द जैपनीज़ कैन्सर एसोसिएशन (जे.सी.ए.) नागोया, जापान (03 से 05 अक्टूबर)

78. पॉलीमॉरफिज्म इन सर्टेन टीपी53 टारगेट जीन्स एसोशिएट रिस्क्स ऑफ अपर ऐरो डाइजेस्टिव ट्रैक्ट कार्सिनोमाज़ इन नॉर्थ इण्डियन्स; सर्वेन्द्र विक्रम सिंह, अमित कुमार मित्रा, विवेक कुमार गर्ग, रश्मि चतुर्वेदी, मन्दिरा शर्मा और श्रीकांत कुमार रथ।

आईओएफ रीजनल्स पहली मिडिलईस्ट एण्ड अफ्रीका ओस्टियोपोरोसिस मीटिंग, दुबई (19 से 22 अक्टूबर)

79. टेरोहील हेज़ पोटेन्शियल एज़ एन ओस्टियोप्रोटेक्टिव एण्ड फ्रैक्चर रिपेयर एजेण्ट; दिव्या सिंह, रश्मि पाण्डे, अमित कुमार, अतुल गोयल नैबेद्य चट्टोपाध्याय।

इण्डिया एकैडमी ऑफ न्यूरो साइन्सेज़, नई दिल्ली (28 से 29 अक्टूबर)

80. इन्वॉल्वमेन्ट ऑफ इण्डोप्लाज्मिक रेटिक्युलम स्ट्रेस एण्ड नाइट्रोज़ेटिव स्ट्रेस इन रोटिनोन इन्डयूज्ड न्यूरोटॉक्सिसिटीः ए स्टडी ऑन *इन वीवो* एण्ड *इन विट्रो* टेस्ट सिस्टम्स; पी. गोस्वामी, एस. सिंह, एस. स्वर्णकार, एस. गुप्ता और सी नाथ।

52वीं एनुअल कांफ्रेंस ऑफ एएमआई, इण्टरनेशनल कांफ्रेन्स ऑन माइक्रोबियल बायोटेक्नोलॉजी फॉर सस्टैनेबल डेवलपमेन्ट, चण्डीगढ़ (03 से 06 नवम्बर)

81. सिरीन थ्रिओनिन प्रोटीन काइनेज़ ऑफ *माइक्रोबैक्टीरियम ट्युबरकुलोसिस* डाउन रेगुलेट्स द एक्सप्रेशन ऑफ होस्ट काइनेज़; रूमा कुमारी, सुष्मिता के. सिंह, दिवाकर के. सिंह, प्रमोद के सिंह और किशोर कुमार श्रीवास्तव।

82. पोस्ट ट्रांसलेशनल मॉडीफिकेशन इन विरूलेन्स फैक्टर्स कॉन्ट्रीब्यूट टु पैथोजेनेसिस ऑफ माइकोबैक्टीरिया; प्रमोद के. सिंह, रूमा कुमारी, सुष्मिता के. सिंह, दिवाकर के. सिंह, समीर तिवारी और किशोर के. श्रीवास्तव।

83. एफिकेसी ऑफ बीसीजी वैक्सीन अगेन्स्ट *माइक्रोबैक्टीरियम ट्युबरकुलोसिस* इन एक्सपेरीमेन्टल ट्युबरकोलोसिस बाइ ओवर एक्सप्रेशन ऑफ आरवी3097सी इन *माइक्रोबैक्टीरियम बोविस* बीसीजी; विपुल कुमार सिंह और अरुनव दासगुप्ता।

84. रैपिड *इन वीवो* असेसमेन्ट ऑफ ड्रग एण्ड वैक्सीन कैन्डीडेट्स अगेन्स्ट नॉन ट्युबरकुलोसिस माइकोबैक्टीरियम; विवेक कुमार कश्यप और अरुनव दासगुप्ता।

85. प्रोडक्शन ऑफ स्टीरियो स्पेसिफिक लैक्टिक एसिड *राइजोपस एराइज़स*; एम. सिंह, एस. मेहरोत्रा, ए.के. पाण्डे और सी.के.एम. त्रिपाठी।

80वीं एनुअल मीटिंग ऑफ द सोसाइटी ऑफ बायोलॉजिकल केमिस्ट (भारत), लखनऊ (12 से 15 नवम्बर)

86. पीई प्रोटीन्स आर डिफरेन्शियली एक्सप्रेस्ड बाइ *माइक्रोबैक्टीरियम ट्युबरकुलोसिस* ड्यूरिंग इन्फेक्शन इनसाइड द होस्ट; सुष्मिता के. सिंह, रूमा कुमारी, दिवाकर के. सिंह, समीर तिवारी और किशोर के. श्रीवास्तव।

87. स्ट्रक्चर बेस्ड डिस्कवरी ऑफ पोटेन्ट एस–ऐडिनॉसिल–एल–होमोसिस्टीन हाइड्रोलेज़ इनहिबिटर्स एज़ पोटेन्शियल

एण्टीलीशमैनियल एजेण्ट्स; प्रशांत खरे, अमित के. गुप्ता, प्रवीन के. गजुला, कृष्णा वाय सुनकरी, अनिल के जयसवाल, संचिता दास, प्रीति बाजपेयी, टी.के. चक्रवर्ती, अनुराधा दुबे और अनिल के. सक्सेना।

88. एफिकेसी ऑफ नैनोइमल्शन ऑफ ऐम्फोटेरिसिन बी अगेन्स्ट *लीशमैनिया डोनोवनी* इन्फेक्शन; अनिल के. जयसवाल और अनुराधा दुबे।

89. मॉलीक्युलर कैरेक्टराइज़ेशन ऑफ ए नॉवेल हाइपोथेटिकल प्रोटीन ऑफ *लीशमैनिया डोनोवनी*एज ए पोटेन्शियल वैक्सीन/ड्रग टारगेट; राजेन्द्र कुमार बहेरिया, रति टण्डन, प्रमोद कुमार कुशवाहा, रीमा गुप्ता, संचिता दास और अनुराधा दुबे।

90. इवैल्युएशन ऑफ रिकॉम्बीनेन्ट *लीशमैनिया डोनोवनी* ईनोलेज़ एज़ ए स्यूटेबल वैक्सीन कैन्डीडेट अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनिआसिस; रीमा गुप्ता, प्रमोद के. कुशवाहा, चन्द्र देवपति त्रिपाठी, श्याम सुन्दर और अनुराधा दुबे।

91. साइलेन्सिस ऑफ *ब्रूज़िया मैलाईट्रेहेलोज–6* फॉस्फेट फॉस्फेटेज़ ज़ीन बाय आरएनए इण्टरफियरेन्स इम्पेयर्स फ़ीमेल वर्म एम्ब्रयोजेनेसिस एण्ड पैरासाइट सर्वाइवल; सुशीला कुशवाह, प्रशांत के सिंह, मो. शहाब और शैलजा मिश्रा–भट्टाचार्य।

92. आइडेण्टीफिकेशन एण्ड प्योरीफिकेशन ऑफ पोटेन्शियली प्रोटेक्टिव सीडीएनए क्लोन्स ऑफ *ब्रूज़िया मैलाई* बाइ स्क्रीनिंग ऑफ एल3 सीडीएनए लाइब्रेरी विद इरैडिएटेड एल3 प्रोटेक्टेड *मैस्टोमीज़ कॉउचा* सीरम; प्रशांत के सिंह, सुशीला कुशवाह, ज्योति गुप्ता और शैलजा मिश्रा–भट्टाचार्य।

93. एन मिथाइल–6,7 डाइमिथाक्सीआइसोक्विनोलीन इन *एन्नोना स्क्वामोसा* ट्विग्स इज़ द मेज़र इम्यून मॉडीफॉयर टु इलिसिट पोलाराइज़्ड टीएच1 इम्यून रिस्पान्स इन बीएएलबी/सी माइस; विशाल के. सैनी, नसरीन बानो, मनीषा पाठक, दिनेश कुमार यादव, राकेश मौर्य और शैलजा मिश्रा–भट्टाचार्य।

94. एन इन्ट्रासेल्युलर प्रोटीन एन–6–ऐडेनाइन–स्पेसिफिक मिथाइलेज़ (एस–6एमटीऐज) एण्ड ए सर्फेस प्रोटीन (डब्ल्यूएसपी) आफ़ *ब्रूज़िया मैलाइ*एण्डोसिम्बॉएन्ट *वॉल्बेशिया* ट्रिगर कम्पैरेबल इम्यून रिस्पॉन्स इन बीएएलबी/सी माइस; अजय राणा, मनीषा पाठक, मीनाक्षी वर्मा और शैलजा मिश्रा–भट्टाचार्य।

95. *ब्रूज़िया मैलाइ* रिकॉम्बीनेन्ट प्रोटीन कॉकटेल एक्ज़िबिट एनहैन्स्ड प्रोटेक्शन इन एक्सपेरीमेन्टल होस्ट मैस्टोमीज़ काउचा बाइ एलिसिटिंग ऑगमेन्टेड इम्यून एक्टिवेशन; निधि श्रीवास्तव, जितेन्द्र के. नाग, प्रशांत के. सिंह, सुशीला कुशवाहा और शैलजा मिश्रा–भट्टाचार्य।

96. *बौहिनिया रेसिमोसा* लीक्स एक्ज़िबिट एण्टीफाइलेरियल एक्टिविटी अगेन्स्ट फाइलेरियल पैरासाइट *ब्रूज़िया मैलाई*, श्वेता मिश्रा, ज्योति गुप्ता, सुप्रिया पी. सिंह, कोनेनी वी शशिधरा और शैलजा मिश्रा–भट्टाचार्य।

97. रोल ऑफ प्रोटीन काइनेज़ सिग्नलिंग एण्ड पैटर्न रिकग्निशन रिसेप्टर्स इन मैक्रोफेज़ फोम सेल फार्मेशन; मीनाक्षी राणा, विशाल सिंह, राजीव लोचन तिवारी, अंकिता सिंह, मधु दीक्षित और मनोज कुमार बर्थवाल।

23वीं नेशनल कांफ्रेंस ऑफ पैरासिटॉलाजी, चेन्नई (18 से 20 नवम्बर)

98. रिसेन्ट डेवलपमेन्ट इन ड्रग डिस्कवरी फॉर टिशू शान्ज़ॉन्टॉसाइडल एन्टीमलेरियल ड्रग, एस के पुरी

99. हीम डिटॉक्सीफ़िकेशन प्रोटीन (एचडीपी) एण्ड इट्स रोल इन रेजिस्टेन्स टु एण्टीमलेरियल ड्रग अर्टीथर; अवकाश सोनी, संतोष कुमार और एस.के. पुरी।

100. क्वानटिशिएटिंग लिवर स्टेज़ पैरासाइट बर्डेन ड्यूरिंग प्री–इरिइथ्रोसाइटिक शाइज़ोगॉनी इन एक्सपेरीमेन्टल रोडेन्ट मलेरिया मॉडल; आरिफ जे. सिद्दीकी, ज्योति भारद्वाज और एस.के. पुरी।

101. अण्डर स्टैडिंग द रोल ऑफ रिडॉक्स सिस्टम इन रेज़िस्टेन्स टु एण्टी मलेरियल ड्रग अर्टीथर; कषतिका प्रकाश, संतोष कुमार, अवकाश सोनी और एस.के. पुरी।

102. रिपिटिटिव मलेरिया स्पॉराजॉइट इनाक्युलेशन अण्डर मेफ्लोक्वीन ट्रीटमेन्ट प्रोटेक्टस अगेन्स्ट लाइव चैलेन्ज; ज्योति भारद्वाज, आरिफ़ जे. सिद्दीकी अन्नापूर्णा गुप्ता और एस.के. पुरी।

103. फेब्रिफ्युजीन कॉम्बिनेशनः ए पोटेण्ट मॉइटी एज़ एण्टीमलेरियल, सारिका गुंजन, सिद्धार्थ शर्मा, अतुल कुमार और रेनू त्रिपाठी।

104. इम्प्लिकेशन ऑफ ह्यूमन ब्रेन इन्डोथीलियल सेल्स (बीबी19) एज़ सेरेब्रल मलेरिया साइटोऐधेरेन्स मॉडल; हेमलता द्विवेदी, सुनील कुमार सिंह और रेणु त्रिपाठी।

105. एन्टीमलेरियल पोटैन्शियल ऑफ अराइल साइक्लाप्रॉपियल मैथनोनेस, स्वरूप कुमार पाण्डे, आर्या अजय, आर.पी. त्रिपाठी एंड रेणु त्रिपाठी

106. *इन विट्रो* कल्चर ऑफ *प्लाज़मोडियम फैल्सीपैरम*: इफेक्ट ऑफ आरपीएनआई मीडियम ऑन साइटोऐथेरेन्स कैरेक्टरिस्टि ऑफ पैरासिटाइज्ड इराइथ्रोसाइट्स पूजा अग्रवाल, एस.के. पुरी और कुमकुम श्रीवास्तव।

107. *इन विट्रो* सेलेक्शन एण्ड कैरेक्टराइजेशन ऑफ आर्टीथर रेज़िस्टेन्ट प्लाज़मोडियम फैल्सीपैरम; राजीव के. श्रीवास्तव, कमलेश के. मिश्रा, एस.के. पुरी और कुमकुम श्रीवास्तव।

108. इफेक्ट ऑफ Pam3Cys इन्ड्यूज्ड प्रोटेक्शन ऑद द थेरेप्यूटिक एफिकेसी ऑफ माइल्टफोज़िन अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनिएसिस; राहुल शिवहरे, निशी शाक्य, शगुन शंकर और सुमन गुप्ता।

109. इवैल्यूएशन ऑफ ए मेरिन स्पॉन्ज–*हैलिक्लोना ऑक्युलेटा* एण्ड इट्स फ्रैक्शन्स फॉर इट्स एफिकेसी अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनिएसिस; प्रशांत खरे, प्रज्ञा मिश्रा, शिशिर श्रीवास्तव, सुनील कुमार मिश्रा, एम.एन. श्रीवास्तव, विजयलक्ष्मी और अनुराधा दुबे।

110. *लीशमैनिया डोनोवनी* इम्यूनोस्टिमुलेटरी सेल्युलर रिस्पॉन्सेज़ ऑफ मेम्ब्रेन एण्ड सॉल्युबल प्रोटीन फ्रैक्शन्स ऑफ स्प्लेनिक एमैस्टिगोट्स इन क्योर्ड पेशेन्ट्स एण्ड हैमस्टर्स; अनुराधा दुबे, प्रज्ञा मिश्रा, श्रृद्धा कुमारी, रति टंडन, मुकेश सामंत और श्याम सुन्दर।

111. प्रोफाइलैक्टिक एफिकेसी ऑफ *विथैनिया सोम्नीफेरा* केमोटाइप 118आर–अगेन्स्ट *लीशमैनिया डोनोवनी*इनफेक्शन इन गोल्डन हैमस्टर; चन्द्र देवपति त्रिपाठी, अनिल के जयसवाल, रीमा गुप्ता, सुशीला कुशवाहा, शैलजा मिश्रा भट्टाचार्य और अनुराधा दुबे।

112. मॉलीक्युलर कैरेक्टराइजेशन ऑफ सिस्टीन–ल्युसिन रिच प्रोटीन ऑफ *एल. डोनोवनी*–ए नॉवेल एसएजी रेज़िस्टेन्ट प्रोटीन आइडेंटीफाइड थ्रू फिडरेंशियल प्रोटियॉमिक्स; संचिता दास, राजेन्द्र बहारिया, रति टंडन, प्रशांत खरे, अनिल कुमार जयसवाल, अजीत कुमार चौधरी और अनुराधा दुबे।

113. फेल्योर ऑफ माइकोबैक्टीरियम डब्ल्यू वैक्सीन एज़ एन इम्यूनोमॉड्युलेटर इन मैनेजिंग एक्यूट एण्ड क्रोनिक *लीशमैनिया डोनोवनी* इनफेक्शन्स इन माउस एण्ड हैमस्टर; रति टंडन, प्रज्ञा मिश्रा, विशाल कुमार सोनी, नसरीन बानो, राजेन्द्र कुमार बहरिया, संचिता दास, शैलजा मिश्रा भट्टाचार्य और अनुराधा दुबे।

114. मॉलिक्यूलर एंड इमन्यूनोलॉजिकल कैरेक्टराइजेशन ऑफ न्यूक्लियोसोमल हिसटोन प्रोटिन्स ऑफ लेशमानिया डोनोवनी, राजेन्द्र कुमार बहारिया, रति टंडन, प्रमोद कुमार कुशवाही, रीमा गुप्ता, अमोघ अनन्त सहस्रबुधे एंड अनुराधा दुबे

115. ग्लूकोज़–6 फॉस्फेट डिहाइड्रोजिनेज़ ऑफ *ब्रूज़िया मैलाइ* ए प्यूटेटिव कीमोथेराप्यूटिक टारगेट; अनीता, मनीष कुमार सुथार, पवन कुमार दोहरे, शिववरदान सिंह, स्मिता गुप्ता सुनिता यादव और जे.के. सक्सेना।

116. क्लोनिंग एंड एक्सप्रेशन ऑफ कलरेटिक्युलिन, एन इम्यूनोमोड्यूलेटरी प्रोटिन ऑफ ब्रूजिया मैलाइ, सुनीता यादव, अनीता, मनीष कुमार साथुर, पवन कुमार धोरे, शिव वरदान सिंह, स्मिता गुप्ता एंड जे.के. सक्सेना

XXIX एनुअल मीटिंग ऑफ इण्डियन एकेडमी ऑफ न्यूरोसाइंसेज़, नई दिल्ली (30 नवम्बर से 01 दिसम्बर)

117. हाइपॉक्ज़िया इन्ड्यूसिबल फैक्टर–1 इन्ड्यूज्ड न्यूरोप्रोटेक्शन इन सेरेब्रल इश्चिमिया/रिपरफ्यूज़न इंज्युरी; नीतू सिंह, गौरव शर्मा, विकास मिश्रा और राम रघुबीर।

118. कॉम्बीनेशन थेरैपी इन सेरेब्रल स्ट्रोकः न्यूरोप्रोटेक्टिव इफेक्ट्स ऑफ इफेनप्रोडिल एण्ड फ्लुर्बिप्रोफेन; विकास मिश्रा, राजकुमार वर्मा, नीतू सिंह और राम रघुबीर।

119. ए स्टडी ऑन न्यूरोइन्फ्लेमेशन एण्ड इट्स कोरिलेशन विद एनएमडीए रिसेप्टर इन एसटीजेड (आईसीवी) इन्ड्यूज्ड मेमोरी इम्पेयर्ड रैट; शिविका राय, राकेश शुक्ला और सी. नाथ।

नेशनल कांफ्रेंस ऑन एडवांसेज़ इन मॉलीक्युलर टेक्नीक्स एण्ड देअर एप्लीकेशन इन हेल्थ एण्ड डिज़ीज़, आगरा (30 नवम्बर से 01 दिसम्बर)

120. इफेक्ट ऑफ कर्मिश्यल विस–ए–विस इन हाउस फीड फार्म्युलेशन ऑन ग्रोथ प्रोफाइल एण्ड ऑर्गन वेट ऑफ स्प्रेग डॉवले रैट, रवीन्द्र सिंह, रमेश शर्मा, डी. हंसदा, डी.एस. उपाध्याय, आर.के. वर्मा, एस. सिंह और आर. के. गौतम,

यूरोप–इण्डिया साइंस एण्ड टेक्नोलॉजी कोआपरेशन, वियना, ऑस्ट्रिया (01 से 02 दिसम्बर)

121. इफेक्ट ऑफ करक्यूमा ऑयल आन द इण्डोथीलियल सेल्स आफ्टर मायोकार्डियल इन्फेक्शन इन रैट्स; कुमारवेलु जगवेलु, प्रेम प्रकाश, अमित मनहास, मनोज बर्थवाल और मधु दीक्षित।

48वीं एनुअल कनवेन्शन ऑफ केमिस्ट्स 2011 एण्ड द सेलेब्रेशन ऑफ द इण्टरनेशनल इयर ऑफ केमिस्ट्री, इलाहाबाद (02 से 07 दिसम्बर)

122. नाइन–इन–वन साइमल्टेनियस क्वान्टिटेशन ऑफ फिज़िकोकेमिकली डाइवर्स मॉलीक्यूल्स ऑन आरपी–एचपीएलसी इन ड्रग डिस्कवरी एण्ड डेवलपमेन्टः ऐप्लिकेशन टु सिंगल पास इन्टेन्स्टाइल परफ्यूज़न स्टडी इन रैट्स अपॉन कैसेट एडमिनिस्ट्रेशन; वहाजुद्दीन , एस.पी. सिंह, के.एस.आर. राजू और जी.के. जैन।

123. क्वानटिटेटिव बायोएनालिटिकल स्टड्डीज़ ऑफ फार्मास्युटिकल (स) एण्ड न्यूट्रास्युटिकल; वहाजुद्दीन, एस.पी. सिंह, के.एस. आर. राजू और जी.के. जैन।

नेशनल कांफ्रेंस ऑन फ्रंटियर्स इन बायोलॉजिकल साइन्सेज़, जौनपुर (04 से 05 दिसम्बर)

124. GLUT-4 ट्रांसलोकेशन स्टिम्युलेटरी इफेक्ट ऑफ ए स्टैन्डर्डाइज्ड फ्रैक्शन ऑफ *पेगानम हर्माला*; सी.के. मौर्य, एन. जयसवाल, टी. नरेन्द्र और ए.के. ताम्रकार।

इण्टरनेशनल सिम्पोज़ियम ऑन इनोवेटिव इन फ्री रैडिकल रिसर्च एण्ड एक्सपेरीमेन्टल थेराप्यूटिक्स एवं 5वीं एनुअल कन्वेंशन ऑफ एसोसिएशन ऑफ बायोटेक्नोलॉजी एण्ड फार्मेसी, कोयम्बटूर (07 से 09 दिसम्बर)

125. एपिजेनेटिक टार्गेटिंग इन हार्मोनल रिफ्रैक्टरी ब्रेस्ट कैन्सर्स: थेराप्यूटिक इम्पैक्ट एण्ड फ्यूचर डायरेक्शन्स; सैय्यद मुस्तफा मीरान, समषद्धि शुक्ला, श्वेता एन. पटेल, युवान्युवान ली और ट्रायग्वी ओ. टॉलेफ्सबोल।

चैलेनजेज़ इन ड्रग डिस्कवरी एण्ड डेवलपमेन्ट, लखनऊ (09 से 10 दिसम्बर)

126. एक्सप्रेशन, प्यूरीफिकेशन एण्ड कैरेक्टराइजेशन स्ट्डीज ऑफ आरवी3001सी; सचिन कुमार सिंह और सुधीर कुमार सिंह।

127. चैलेन्जेज़ एण्ड ऑपर्चुनिटीज़ इन ड्रग डिस्कवरी फॉर मलेरिया; एस.के. पुरी।

128. ट्रांसलेशनली कन्ट्रोल्ड ट्यूमर प्रोटीन होमोलॉग (टीसीटीपी): द आर्टीमिसिनिन टारगेट प्रोटीन इन *प्लाज़मोडियम*; अनुज त्रिपाठी और एस.के. पुरी।

129. प्रोफाइलिंग एण्ड फिंगर प्रिन्टिंग स्ट्डीज़ ऑफ *ग्लोरिओसा सुपर्बा* यूजिंग डार्ट एमएस टेक्नीक; विकास बाजपेई, के.आर. आर्या और बृजेश कुमार।

130. फाइटो केमिकल इन्वेस्टीगेशन ऑफ *अजूगा ब्रेक्टिओसा* यूजिंग डार्ट एमएस और क्यू टॉफ एलसीएमएस (एचआरएमएस) टेक्नीक्स; रेनू पाण्डे, विकास बाजपेई, दीप्ति शर्मा, के.आर. आर्या और बृजेश कुमार।

131. मास फिंगरप्रिंटिंग एनालिसिस ऑफ *बर्बेरिस ऐरिस्टेटा, बी. एशियैटिका, कॉसिनियम फेनेस्ट्रेटम*, और *महोनिया बोरिऐलिस* यूजिंग एलसी–क्यूटीओएफ एचआरएमएस टेक्नीक्स; अवन्तिका सिंह, विकास बाजपेई, के.आर. आर्या और बृजेश कुमार।

132. प्रोफाइलिंग एण्ड फिंगरप्रिंटिंग स्ट्डीज़ ऑफ *ग्लोरिओसा सुपर्बा* यूजिंग डार्ट एमएस टेक्नीक; विकास बाजपेई, के.आर. आर्या और बृजेश कुमार।

133. फाइटोकेमिल इन्वेस्टीगेशन ऑफ *अजूगा ब्रैक्टिओसा* यूजिंग डार्ट एमएस एण्ड क्यू टॉफ एलसीएमएस (एचआरएमएस) टेक्नीक्स; रेणु पाण्डे, विकास वाजपेयी, दीप्ति शर्मा, के.आर. आर्या और बृजेश कुमार।

134. मास फिंगर प्रिंटिंग एनालिसिस ऑफ *बर्बेरिस ऐरिस्टेटा, बर्बेरिस एशिऐटिका, कॉसिनियम फेनेस्ट्रेटम* और *महोनिया बोरिऐलिस* यूजिंग एलसी– क्यूटॉफ–एचआरएमएस टेक्नीक्स; अवन्तिका सिंह, विकास बाजपेई, के.आर. आर्या और बृजेश कुमार।

135. रैपिड आइडेण्टीफिकेशन ऑफ बायो फ्लेवोनाइड्स यूजिंग इलेक्ट्रोस्प्रे आयोनाइज़ेशन टैन्डम मास स्पेक्ट्रोमीट्री विद एमएस/एमएस लाइब्रेरी; निधि अग्रवाल, दीपक कुमार प्रज्ञा सिंह, शिखा अवस्थी, रविशंकर भट्टा और संजीव कनौजिया।

136. डिज़ाइन एण्ड सिन्थेसिस़ ऑफ द हाइब्रिड क्विनॉजॉलिनॉन–चालकोन/पिरीमिडीन/टेट्राज़ोल एज़ एण्टी लीशमैनियल एजेण्ट्स; मोनी शर्मा, कुलदीप चौहान, रश्मि शर्मा, राहुल शिवहरे, सुमन गुप्ता और पी.एम.एस. चौहान।

137. सिन्थेसिस़ ऑफ बीटा–कार्बोलिन डिराइवेटिव्स बेस्ड ऑन नैच्युरल प्रॉडक्ट एण्ड देयर बायोलॉजिकल इवैल्युएशन; शिखा एस. चौहान, शाहनवाज़ खान, और पी.एम.एस. चौहान।

138. सिन्थेसिस़ एण्ड एण्टीमलेरियल एक्टिविटी ऑफ न्यू हेट्रोसाइक्लिक हाइब्रिड्स बेस्ड ऑन क्लोरोक्विन एण्ड रोडानाइन स्कैफोल्ड्स; कुलदीप चौहान, आनन्द के पाण्डे, मोनी शर्मा, कुमकुम श्रीवास्तव, सुनील के. पुरी, शिव वरदान सिंह, जे.के. सक्सेना और पी.एम.एस. चौहान।

139. ए ग्रीन सिन्थेसिस़ ऑफ 2,3–डिहाइड्रोक्विनाज़ोलिन– 4(1एच)–वन्स डिराइवेटिव्स; रश्मि शर्मा और पी.एम.एस. चौहान।

140. फर्स्ट सिन्थेसिस़ टुवर्ड्स नैच्युरल प्रॉडक्ट पर्सपिकेमाइड एनालॉग्स एण्ड देयर बायोइवैल्युएशन एज़ एण्टीलीशमैनिअल एजेण्ट्स; आनन्द कुमार पाण्डे, शाहनवाज़ खान, कुलदीप चौहान, राहुल शिवहरे, सुमन गुप्ता और पी.एम.एस. चौहान।

141. ए कन्वीनिएन्ट डिसल्फाइटेटिव डाइमिथाइलएमिनेशन ऑफ द 2–थायोहाइडैन्टाइन स्कैफ़ोल्ड यूजिंग एन, एन–डाइमिथाइलफार्मेमाइड; शाहनवाज़ खान, विकास त्यागी, शशि पाण्डे, कीर्तिका सिंह और पी.एम.एस. चौहान।

142. सिन्थेसिस़ ऑफ नॉवेल टेट्राज़ोल डिराइवेटिव ऑफ 4–अमीनोक्विनोलिन एज़ पोटेन्ट एण्टीमलेरियल्स; शशि पाण्डे, शाहनवाज़ खान, कुमकुम श्रीवास्तव, एस.के. पुरी और पी.एम. एस. चौहान।

143. जेनेरेशन ऑफ टेट्राहाइड्रो बीटा–कार्बोलीनडाइकीटोपाइपेराज़ाइन्स रिंग सिस्टम वाया यूजीआई–4 सीआर फॉलोड बाय टैन्डम डिप्रोटेक्शन साइक्लाइज़ेशन/पिक्टेट–स्पेंगलर रिऐक्शन्स इन वन पॉट; विकास त्यागी, शाहनवाज़ खान, अर्चना गिरि और पी. एम.एस. चौहान।

144. पोटेन्शिएटिंग मेट्रोनाइडाज़ोल स्कैफल्ड अगेन्स्ट रेज़िस्टेन्ट टाइकोमोनाज़; ललित कुमार, वीनूबाला, आशीष जैन, नन्द लाल, अमित सारस्वत, संतोष जांगिङ लोकेश कुमार, प्रियंका शाह, जगदम्बा पी. मैखुरी, मोहम्मद आई सिद्दीकी, गोपाल गुप्ता और विष्णु एल. शर्मा।

145. इन प्रॉसेस क्वालिटी कंट्रोल एण्ड स्टैबिलिटी स्टडीज़ ऑन सेन्टक्रोमान, ए नॉन स्टेरायडल कान्ट्रासेप्टिव एजेण्ट; वी. गुप्ता, एम. श्रीवास्तव और ए.के. द्विवेदी।

146. ए न्यू फार्मुलेशन ऑफ सेन्टक्रोमान; एम. श्रीवास्तव, एस. सिंह, वी. गुप्ता और ए.के. द्विवेदी।

147. सिन्थेसिस ऑफ 3–सब्स्टीट्यूटेड–क्विनोलीन–4–इल–प्रोपेन–1–ओन एज़ पोटेन्शियल स्पर्मिसाइडल एजेण्ट्स; आर. आर. पाण्डे, ए. श्रीवास्तव, आर. मालासोनी, आशीष जैन, जे.पी. मैखुरी, जी. गुप्ता और ए.के. द्विवेदी।

148. स्टैबिलिटी इन्डिकेटिंग एचपीएलसी मेथड फॉर एस्टीमेशन आर–टर्मिरोन इन एचएम ऑयल एण्ड इट्स फार्मुलेशन; आर. मालासोनी, ए. नकवी, ए. श्रीवास्तव, आर.आर. पाण्डे, एम. चौधरी और ए.के. द्विवेदी।

149. फोलिक एसिड कन्जुगेटेड गुआर गम नैनोपार्टिकल्स फॉर टार्गेटिंग मीथोट्रेक्ज़ेट टु कोलन कैन्सर; एम. शर्मा, आर. मलिक, ए. वर्मा, जी.एस. बनोथ, जे. सरकार, पी.आर. मिश्रा और ए.के. द्विवेदी।

150. प्रिपरेशन एण्ड ऑप्टिमाइजेशन ऑफ आर्टीथर नैनाइमल्शन विद द यूज़ ऑफ हाई प्रेशर होमोजिनाइज़र; पी. द्विवेदी, पी.आर. मिश्रा।

सोसाइटी ऑफ एण्ड्रॉलॉजी मीटिंग, नई दिल्ली (10 से 12 दिसम्बर)

151. डेवलपमेन्ट ऑफ ए न्यू मेल कॉन्ट्रोसेप्टिव फॉर 21st सेन्चुरी इन इण्डियाः आरआईएसयूजी; आर.के. सिंह।

7वीं इण्टरनेशनल कांफ्रेंस ऑन यीस्ट बायोलॉजी, मुम्बई (10 से 13 दिसम्बर)

152. एरैकिडोनिक एसिड एण्ड सब–इनहिबिटरी कांसट्रेशन ऑफ एण्टीफंगल्स अफेक्ट बायोफिल्म फ़ार्मेशन एण्ड पीजीई2 लेविल इन स्पेशीज़ ऑफ *कैन्डिडा* एण्ड ऐम्फोट्राइसिन बी रेज़िस्टेन्ट स्ट्रेन ऑफ *सी. ऐल्बिकन्स*; नृपेन्द्र नाथ मिश्रा और प्रवीन के. शुक्ला।

153. कैरेक्टराइज़ेशन ऑफ इम्यूनोडॉमिनेन्ट प्रोटीन्स ऑफ एस्पर्गिलस फ्युमिगेटस फ्रॉम द डायगनॉस्टिक पर्सपेक्टिव; रिज़वान अहमद, अवनीत कुमार और प्रवीन के. शुक्ला।

इण्टरनेशनल कांफ्रेंस ऑन न्यू होराइज़न्स इन कैंन्सर रिसर्चः बायोलॉजी टु प्रिवेन्शन टु थेरैपी, गुडगाँव, (13 से 16 दिसम्बर)

154. जेनेटिक पॉलीमॉरफिज़्म्स इन fas, vdr, tp53 एण्ड birc5 ज़ीन्स एण्ड रिस्क्स ऑफ कार्सिनोमाज़ ऑफ अपर ऐरो डाइजेस्टिव ट्रैक्ट इन नॉर्थ इण्डियन्स; सर्वेन्द्र विक्रम सिंह, विवेक कुमार गर्ग, मन्दिरा शर्मा, रश्मि चतुर्वेदी और श्रीकान्त कुमार रथ।

155. पोटेन्शिल रोल ऑफ सर्वाइविन इन द डायग्नॉसिस ऑफ कार्सिनोमा ऑफ यूरिनरी ब्लैडर; ए.के. श्रीवास्तव, पी.के. सिंह, पी. सिंह, एस. नायक, डी. सिंह, डी. दलेला, एम.एम. गोयल, एस.के. रथ और एम.एल.बी. भट्ट।

7वीं जे–नॉस्ट, मोहाली (15 से 18 दिसम्बर)

156. रोबस्ट टर्न स्ट्रक्चर्च इन a_3b साइक्लिक टेट्रापेप्टाइड्स इन्ड्यूज्ड एण्ड कन्ट्रोल्ड बाइ कार्बो. b^3 अमीनो एसिड; अनीन्द्र शर्मा, श्रीकांत शर्मा, अम्पापति आर. और रमापति त्रिपाठी।

ओमिक्स कांफ्रेंसेज़ कोलकाता (15 से 18 दिसम्बर)

157. फंक्शनल एनालिसिज़ ऑफ पीकेएनजे (आरवी2088) ऑफ *मैकोबैक्टीरियम ट्युबरकुलोसिस* (एच37आरवी) यूजिंग प्रोटियोमिक्स ऐप्रोच; दिवाकर के. सिंह, रूमा कुमार, सुष्मिता के सिंह, के. सिंह और किशोर के. श्रीवास्तव।

XLIV एनुअल कांफ्रेंस ऑफ इण्डियन फार्माकॉलोज़ी सोसाइटी ऑन ''चैलेन्जेज़ एहेड इन ट्रांसलेशनल फार्माकोलॉजी'', मनिपाल (19 से 21 दिसम्बर)

158. मेटाबोलिक स्टैबिलिटी आफ नॉवेल एण्टीथ्रॉम्बोटिक लीड कैन्डीडेट सीडीआरआई–एस002–333 यूजिंग लिवर माइक्रोजोम्स ऑफ डिफ़रेन्ट स्पेशीज़ एण्ड देयर रिसपेक्टिव जेन्डर्स; अमष्त सक्सेना और जी.के. जैन।

159. टाइम डिपेन्डेन्ट कैरेक्टराइज़ेशन एण्ड वैलिडेशन ऑफ ऐन्जियोप्लास्टी इंजरी इन्ड्यूज्ड रैबिट इलिएक ऐथ्रोस्कलेरोसिस मॉडल; विवेक खन्ना, मनीष जैन, अभिषेक कुमार सिंह, विशाल सिंह, प्रेम प्रकाश, मारिया, मनोज कुमार बर्थवाल और मधु दीक्षित।

160. प्रोटेक्टिव इफेक्ट ऑफ ऐटॉरवैस्टैटिन ऑन नियोइन्टिमल हाइपरप्लेसिया इन रैट्सः जीओ/जीवन अरेस्ट ऑफ सेल पॉजीफरेशन, डाइन रेगुलशन ऑफ साइक्लिन डी, सीडीके2 और सीडीके4 एज़ पॉसिबल मेकैनिज़्म्स; मनीष जैन, विशाल सिंह, राजीव लोचन तिवारी, अंकिता सिंह, मधु दीक्षित और मनोज कुमार बर्थवाल।

161. एनहैन्स्ड लेबिल ऑफ सर्कुलेटरी ऑक्सीडाइज्ड लो डेन्स्टी लियोप्रोटीन पॉजिटिवली एसोशिएट्स विद आईएल–1बीटा प्रोडक्शन एण्ड सिविऐरिटी ऑफ सेप्सिस एण्ड शॉक; वी. सिंह, जे. वोगरा, एम. कोहली, एम. दीक्षित और एम.के. बर्थवाल।

162. एक्स्ट्रासेल्युलर सिग्नल रेगुलेटेड काइनेज़ एण्ड फ्री रैडिकल्स रेगुलेट आईएल–1बीटा प्रोडक्शन इन ह्यूमन मोनोसाइटिक सेल्स; ए. सिंह, वी. सिंह, आर.एल. तिवारी, एम. राना, एम दीक्षित और एम. के. बर्थवाल।

31वीं एनअुल कांफ्रेंस ऑफ सोसाइटी ऑफ टॉक्सीकोलॉजी 2011 आईआईएस यूनिवर्सिटी, जयपुर, (22 से 24 दिसम्बर)

164. इवैल्युऐशन ऑफ रोज़ीग्लिटाज़ोजन कार्डियोटॉक्सिसिटी इन एच9सी2 सेल लाइन; प्रतिभा मिश्रा, अजीत कुमार वर्मा, पूजा पाण्डे, पल्लवी श्रीवास्तव, प्रभात सिंह और एस.के. रथ।

165. इवैल्युऐशन ऑफ द जेनोटॉक्सिक पोटेन्शियल ऑफ क्वर्सटीन; नीति जॉली, प्रतिभा मिश्रा, प्रभात सिंह, पल्लवी श्रीवास्तव और श्रीकांत कुमार रथ।

इण्डियन केमिकल इंजीनियरिंग कांग्रेस केमकॉन–2011, एमएस रमैया इंस्टीट्यूट ऑफ टेक्नोलॉजी, बंगलौर, (27 से 29 दिसम्बर)

166. डिज़ाइन ऑफ ऑप्टिमल प्रॉसेस पैरामीटर्स वाई टैगुची मेथड फॉर सेपरेशन ऑफ कीटोप्रोफेन इनैन्शियोमर्स यूजिंग सिम्यूलेटिंग मूविंग वेड (एमएसबी) कीमैटोग्राफी, आर. सिंह, आर. प्रसाद, पी. मण्डल और वी. मोहंती।

167. डिज़ाइन ऑफ ऑप्टिमल प्रोसेज़ पैरामीटर्स बाइ टैगुची मेथड फॉर सेपेरेशन ऑफ किटोप्रोफेन एनैन्शियोमर्स यूज़िग सिम्युलेटिंग मूविंग बेड (एसएमबी) क्रोमेटोग्राफी, आर. सिंह, आर. प्रसाद, पी. मण्डल और बी. मोहन्ती।

22वीं ऑल इण्डिया कांग्रेस ऑफ जूलॉजी एण्ड नेशनल सेमिनार ऑन रीसेन्ट ऐडवान्सेज़ इन बायोलॉजिकल साइन्सेज़, लखनऊ (29 से 31 दिसम्बर)

168. इवैल्युएशन ऑफ रोजिग्लिटाज़ोजन कार्डियोटॉक्सिसिटी इन *इन विट्रो* एण्ड *इन वीवो* मॉडल्स; प्रतिभा मिश्रा, अजीत कुमार वर्मा, प्रभात सिंह और एस.के. रथ।

169. फैक्टर अफेक्टिंग द नेच्युलर पॉपुलेशन ऑफ इण्डियन गैरियल (*गैविएलिस गंगेटिक्स*) इन कटार्नियनघाट वाइल्ड लाइफ सेंचुरी इन बहराइच, उत्तर प्रदेश, ए.के. श्रीवास्तव, डी. हंसदा और डी. एस. उपाध्याय

3 अन्तःअभिकरण संबद्धता

परियोजना का शीर्षक	प्रधान अन्वेषक
पृथ्वी विज्ञान मंत्रालय, भारत सरकार	
नेशनल प्रोजेक्ट ऑन डेवलपमेण्ट ऑफ पोटेन्शियल ड्रग्स फ्रॉम दि ओसियन	निदेशक
स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार	
एण्टीफर्टिलिटी रिसर्च प्रोग्राम	निदेशक
ड्रग फॉर निग्लेक्टेड डिजीजेज़ इनिशिएटिव, जेनेवा (DNDi, Geneva)	
लीड आईडेण्टीफिकेशन फॉर एण्टी–लीश्मैनियल कम्पाउण्डस	डॉ. एस.के. पुरी
विश्व स्वास्थ्य संगठन, जेनेवा, स्विट्ज़रलैण्ड	
डेवलपमेण्ट ऑफ न्यू मैक्रोफ़ाइलेरिसाइड एण्ड/ऑर इम्ब्राइओस्टेटिक एजेण्ट्स	डॉ. शैलजा भट्टाचार्य
युरोपियन कमीशन, बेल्ज़ियम	
टारगेटिंग प्रोटीन सिंथेसिस इन दि एपिकोप्लास्ट एण्ड सायटोप्लाज्म ऑफ प्लाज्मोडियम (MEPHITIS)	डॉ. समन हबीब
विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार	
परिष्कृत विश्लेषणात्मक उपकरण सुविधा (सैफ़)।	निदेशक
जे.सी. बोस फेलोशिप।	डॉ. टी.के. चक्रवर्ती
इलेक्ट्रानिक स्ट्रक्चर थ्योरी बेस्ड इन्वेस्टीगेशन ऑफ कनफर्मेशनल बिहेवियर एण्ड सेकेण्डरी स्ट्रक्चर्स ऑफ सब्स्टीट्यूटेड β–प्रोलीन बेस्ड पेप्टाइड्स कनफर्मेशनल स्ट्डीज़ एण्ड बायोलॉजिकल इवैल्युएशन।	डॉ. टी.के. चक्रवती डॉ. आर.एस. अम्पापति
आइडेण्टीफिकेशन एण्ड कैरेक्टराइज़ेशन ऑफ प्रोटीन्स फ्रॉम आर्टीथर सेन्सिटिव एण्ड आर्टीथर रेजिस्टेन्ट रोडेन्ट मलेरिया पैरासाइट्स फॉर इल्युसिडेशन ऑफ मेकैनिज़म ऑफ रेज़िस्टेन्स।	डॉ. एस.के. पुरी
डिज़ाइन, सिन्थेसिस् एण्ड बायोलॉजिकल इवैल्युएशन ऑफ SIRT-1 ऐक्टिवेटर्स फॉर द ट्रीटमेन्ट ऑफ टाइप–।। डायबिटीज़।	डॉ. बिजोय कुण्डू
डिज़ाइन एण्ड सिन्थेसिस् ऑफ फ्लेक्सिबल मॉडल बेस्ड ऑन पाइराजोलो [3,4–डी] पिरीमिडीन फॉर बेटर अंडरस्टैडिंग ऑफ ऐरीन इन्टरैक्शन्स ऐट मॉलीक्युलर एण्ड सुप्रामॉलीक्युलर लेवल।	डॉ. कमलाकर अवस्थी
काइरॉन ऐप्रोच सिन्थेसिस् ऑफ नैचुरल प्रॉडक्ट्स एण्ड नैचुरल प्रॉडक्ट लाइक मॉलीक्युल्स फ्रॉम कार्बोहाइड्रेट बेस्ड बिल्डिंग ब्लाक्स।	डॉ. ए.के. शॉ
कैरेक्टराइजेशन ऑफ नैचुरल एण्टीमोनी रेज़िस्टेन्स रिलेटेड जीन्स ऑफ *लीशमैनिया डोनोवनी।*	डॉ. नीना गोयल
प्रोटियोमिक एनालिसिस ऑफ ड्रग रेज़िस्टेन्स इन लीशमैनिया डोनोवनी क्लीनिकल आइसोलेट्स।	डॉ. नीलू सिंह
एण्टीमलेरियल प्रिंसिपल फ्रॉम प्लान्ट्स बिलांगिंग टु द जेनस बेरोनिया एनडेमिक टु द वेस्टर्न घाट्स।	डॉ. कुमकुम श्रीवास्तव
एप्लीकेशन ऑफ बेलिस–हिलमेन कैमिस्ट्री फॉर द सिन्थेसिस् ऑफ नैचुरल प्रॉडक्ट्स एण्ड देयर मिमिक्स।	डॉ. संजय बत्रा
अमीनो ऐस्ड्स एज़ काइरल सिन्थॉन्सः डेवलपमेन्ट ऑफ न्यू सिन्थेटिक प्रोटोकॉल्स फॉर क्रिएटिंग नैचुरल प्रॉडक्ट्स एण्ड रिलेटेड डायवर्सिटी इन क्वेस्ट फॉर एण्टीकैसर एजेण्ट।	डॉ. गौतम पाण्डा
डिज़ाइन, सिन्थेसिस् एण्ड डेवलपमेण्ट ऑफ नॉवेल एण्टीलीशमैनियल एजेण्ट्स।	डॉ. टी. नरेन्द्र

परियोजना का शीर्षक	प्रधान अन्वेषक
स्ट्रक्चर कैरेक्टराइज़ेशन ऑफ गामा–ग्लूटमाइलसिस्टीन सिन्थटेज़ एण्ड ग्लूटाथिऑन सिन्थटेज़ फ्रॉम लीशमैनिया स्पिशीज।	डॉ. जे.वी. प्रताप
इफेक्ट ऑफ कैन्सर कीमोथेरेप्यूटिक ड्रग्स ऑन स्पर्मेटागोनियल स्टेम सेल निके, क्रोमैटिन रिमॉडलिंग एण्ड एपिजेनेटिक प्रोग्रमिंग इन मेल जर्म सेल्स।	डॉ. डी.पी. मिश्रा
इन्वेस्टीगेशन ऑन इम्यूनोमॉडुलेशन मीडिएटेड बाइ *माइकोबैक्टीरियम ट्युबरकुलोसिस* ड्यूरिंग परसिस्टेन्ट इन्फेक्शन।	डॉ. वाई.के. मंजू
एक्सप्रेशन, इन्ट्रासेल्युलर लोकलाइज़ेशन एण्ड फंक्शनल कैरेक्टराइज़ेशन ऑफ ऐक्टिन रिलेटेड प्रोटीन्स ऑफ लीशमैनिया ।	डॉ. ए.ए. सहस्त्रबुद्धे
ओस्टियोजेनिक एक्शन्स ऑफ ए नैचुरली डिराइव्ड एनपी–1 प्योर कम्पाउण्ड ऑन बोन ।	डॉ. दिव्या सिंह
टू स्टडी इम्यूनोप्रोटेक्टिव रोल्स ऑफ मिथॉक्सीआइसोफ्लोवॉन्स इन एस्ट्रोजेन–डिफीशिएन्सी इन्ड्यूज्ड बोन लॉस।	डॉ. दिव्या सिंह
पॉलीमेरिक नैनो–मैट्रिक्स–एसोशिएटैड *इन वाइवो* डिलीवरी ऑफ कैम्पफेरॉल इन रैट्स फॉर बोन एनाबोलिक एक्शन।	डॉ. रितु त्रिवेदी
ए सिस्टमैटिक आरएनएआई (RNAi) स्क्रीन फॉर आइडेण्टीफिकेशन ऑफ जेनेटिक माड्युलेट्र्स ऑफ एचआईवी–एनईएफ इन्ड्युज्ड पैथोजेनेसिस इन ए नॉवेल *सीनॉरहैबडाइटिस एलिगैन्स* मॉडल।	डॉ. आमिर नाज़िर
इवैल्युएशन ऑफ टीजीएफ–बीटा एक्टिवेशन मेकैनिज़म एण्ड सिंग्नलिंग ड्यूरिंग यूटराइन टिश्यू रिमॉडलिंग।	डॉ. आर.के. झा
ह्यूमन साइट्रोक्रोम पी4501बी1 : इम्प्लिकेशन्स इन सेन्टक्रोमान ट्रीटेड हार्मोन मीडिएटेड एमसीएफ–7 ट्यूमर सेल मेटाबोलिज़्म एज ए नॉवेल टारगेट फॉर थेराप्यूटिक इन्टरवेन्शन	डॉ. नीतू सिंह (वीमेन साइंटिस्ट स्कीम)
डीएसटी एण्ड केएपीएल, बैंगलोर	
डेवलपमेन्ट ऑफ एण्टीमाइक्रोबियल एजेण्ट्स फ्रॉम सॉइल माइक्रोफ्लोरा।	डॉ. ए.के. सक्सेना
डिपार्टमेन्ट ऑफ बायोटेक्नोलॉजी, गवर्नमेन्ट ऑफ इण्डिया	
शाइज़ोफ्रेनिया: डेवेलपिंग एनीमल–मॉडल्स, ट्रांसलेशनल मारकर्स एण्ड ए पॉसिबल ट्रीटमेन्ट स्ट्रैट्जी।	डॉ. गौतम पालित
क्लोनिंग एण्ड ओवरएक्सप्रेशन ऑफ टीएच1 स्टिम्युलेटरी पॉलीप्रोटीन्स आइडेन्टीफाइड थ्रू प्रॉटियामिक्स फॉर दियर प्रोफाइलैक्टिक पोटेन्शियल अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनिएसिस	डॉ. अनुराधा दुबे
प्रोटेक्टिव इम्यूनोजेनिसिटी ऑफ सेन्ट्रिन केओ (KO) लाइव एटिन्युएटेड लीशमैनिया पैरासाइट इन द ऐनिमल मॉडल्स एण्ड इन द ह्यूमन सेल्स।	डॉ. अनुराधा दुबे
पोस्ट ट्रांसलेशनल मॉडिफ़िकेशन्स इन्ड्यूज्ड बाइ नाइट्रोआक्सीडेटिव स्ट्रेस एज़ बायोमार्कस ऑफ बैस्कुलर डैमेज इन डायबिटीज़ (डीबीटी–आईएनडीआईजीओ प्रोजेक्ट)।	डॉ. मधु दीक्षित
डिज़ाइन एण्ड डेवलपमेन्ट ऑफ डाटाबेस् एण्ड एनालाइटिकल टूल्स फॉर माइक्रोऐरे डेटा ऑन *लीशमैनिया डोनोवनी* पैरासाइट।	डॉ. नीलू सिंह
द बर्थ ऑफ द फर्स्ट इण्डियन लीशमैनिया जीनोम सीक्वेन्स।	डॉ. नीलू सिंह
क्रिस्टलोग्रैफिक एण्ड बायोकेमिकल स्ट्डीज ऑन फ़ीस्ट/फैमाइन रेगुलेटरी प्रोटीन्स फ्रॉम मायकोबैक्टीरिया।	डॉ. रविशंकर आर.
स्ट्रक्चरल एनालिसिस ऑफ बैक्टीरियल पेप्टाइडिल–टी आरएनए हाइड्रोलेज़ एन्जाइम्स एण्ड डिज़ाइन ऑफ हाई ऐफिनिटी बाइन्डर्स।	डॉ. आशीष अरोड़ा
जेनरेशन एण्ड कैरेक्टराइजेशन ऑफ *मायकोबैक्टीरिया स्मेगमैटिस* सिगएफ (sigF) म्यूटेन्ट एण्ड स्ट्डीज़ ऑफ द सिगएफ–मीडिएटेड ज़ीन एक्सप्रेशन बाई माइक्रोऐरे एनालिसिस।	डॉ. बी.एन. सिंह
अन्डरस्टैडिंग मेकैनिज़्म ऑफ ऐक्शन ऑफ द एण्टी–ओस्टियोपोरोटिक ऐक्टिविटी ऑफ सीडीआरआई कम्पाउण्ड्स के095 1709।	डॉ. एस. सान्याल

परियोजना का शीर्षक	प्रधान अन्वेषक
इन्वेस्टीगेशन ऑन इन्वॉल्वमेन्ट ऑफ ऐडिपोज टिश्यू इन परसिस्टेन्स ऑफ पैथोजेनिक माइकोबैक्टीरिया।	डॉ. वाई.के. मंजू
आइसोलेशन, आइडेन्टीफिकेशन, करैक्टराइज़ेशन एण्ड बायोएक्टिविटी ऐसे ऑफ एण्टीडायबिटिक ड्रग लीड्स फ्रॉम फ्यू सेलेक्टेड मेडिसिनल प्लान्ट्स ऑफ नॉर्थ ईस्ट इण्डियाः वॉएज फॉर क्योर ऑफ डिजीज़।	डॉ. ए.एन. गायकवाड़
फंक्शनल कैरेक्टराइजेशन ऑफ सीआरएन 12 इन लीशमैनिया पैरासाइट।	डॉ. ए.एच सहस्रबुद्धे
इन्वेस्टीगेशन ऑफ इफेक्ट ऑफ पॉलीसैक्राइड इन मॉडीफाइंग लीशमैनिसाइडल पोटेन्शियल ऑफ नैनोपार्टिकुलेट सिस्टम बेयरिंग कीमोथेराप्यूटिक्स एजेण्ट।	डॉ. एम.के. चौरसिया
अण्डरस्टैडिंग द मेकैनिज़्म ऑफ माइटोटिक/स्पिंडल चेकपॉइन्ट यूजिंग जेनेटिक्स ऐप्रोचेज़ इन फ़िशन यीस्ट *शाइज़ोसैक्रोमाइसेज़ पोम्बे*।	डॉ. शकील अहमद
आईडेण्टीफिकेशन ऑफ इआर अल्फा इन्टरैक्टिंग प्रोटीन्स फ्रॉम टैमोक्ज़ीफेन इन्डयूज्ड एण्ड अनइन्ड्यूज्ड एमसीएफ7 सेल्सः ए मॉस स्पेक्ट्रोमीट्री बेस्ड प्रोटियामिक्स ऐप्रोच।	डॉ. ए.के. त्रिवेदी
एक्सप्रेशन प्रोफ़ाइलिंग ऑफ मेजर टेस्टिस स्पेसिफिक जीन्स इन ह्यूमन सीमेन/स्पर्मेटोजोआ फॉर आइडेण्टीफिकेशन ऑफ द बायोलॉजिक रोल ऑफ दीज़ जीन्स, देयर डायग्नोस्टिक यूटिलिटी एण्ड आइडेण्टीफिकेशन ऑफ नॉवेल टारगेटस फॉर इन्फर्टिलिटी ट्रीटमेन्ट/मेल कॉन्ट्रासेप्शन।	डॉ. राजेन्द्र सिंह
इण्डियन काउंसिल ऑफ मेडिकल रिसर्च, गवर्नमेन्ट ऑफ इण्डिया	
डिज़ाइन, सिन्थेसिस एण्ड बायोलॉजिकाल इवैल्युएशन ऑफ एचआईवी–1 आरटी इनहिविटर्स–4 थायजोलिडिनॉन कम्पाउण्ड्स।	डॉ. एस.बी. कट्टी
इम्पैक्ट ऑफ ऐडिपोकाइन एण्ड केमोकाइन जीन पॉलीमॉरफिज़्म एण्ड इट्स प्रोटीन एक्सप्रेशन इन मेटाबोलिक सिन्ड्रोम।	डॉ. असीम घटक व डॉ. रितुराज कोनवर
न्यूक्लिओज़ोमल हिस्टोन प्रोटीन्स ऑफ लीशमैनिया डोनोवनीः मॉलीक्युलर एण्ड इम्यूनोबायोकैमिकल कैरेक्टराइजेशन फॉर इट्स पोटेन्शियल एज़ वैक्सीन टारगेट अगेन्स्ट विसरल लीशमेनिआसिस।	डॉ. अनुराधा दुबे
डेवलपमेन्ट ऑफ बोन एनाबोलिक एजेण्ट्स फ्रॉम एन इण्डियन मेडिसनल प्लांट।	डॉ. एन. चट्टोपाध्याय
इफेक्ट ऑफ 2,3,–डायएरिल–2एच–1–बेनजोपाइरन डेरिवेटिव ऑन एस्ट्रोजेन इनड्यूस्ड एन्डोमीट्रिकल सेल प्रॉलीफ़रेशन्स एण्ड यूटराइन हाइपरप्लासिस फॉरमेशन।	डॉ. अनिला द्विवेदी
प्रीक्लीनिकल डेवलपमेन्ट ऑफ डीएसई–37[एस,एस"-{डाइसल्फ़ेनडायल्बी (पाइरोलिडिनो–प्रोपेन–2,1–डाइल)} (पिपरीडिनोथियोकार्बामेट) एज़ ए वज़ाइल कान्ट्रासेप्टिव।	डॉ. गोपाल गुप्ता
डिज़ाइन, सिन्थिसिस एण्ड बायोइक्विवैलन्स ऑफ न्यू एनालॉग्स ऑफ फ्लूकोनाजोल फॉर एण्टीफंगल एक्टिविटी।	डॉ. पी.के. शुक्ला
इवैल्युएशन ऑफ डीएनए बेस्ड टूल्स फॉर एण्टीमलेरियल ड्रग स्क्रीनिंग अगेन्स्ट *प्लाज़मोडियम फैल्सीपैरम* एण्ड स्टडीज विद मॉडीफाइड (आरपीएनआई) मीडियम।	डॉ. कुमकुम श्रीवास्तव
डिज़ाइन, सिन्थिसिस एण्ड बायोइवैल्युएशन ऑफ नॉवेल हाइब्रिड कम्पाउण्ड्स फॉर एण्टीमलेरियल एक्टिविटी।	डॉ. संजय बत्रा
डिलीवरी सिस्टम फॉर द मैनेजमेण्ट ऑफ सेप्टिक शॉक; रैशनल एप्रोच टुवर्डस लिपोपॉलीसैक्राइड (एलपीएस), न्यूट्रलाइज़ेशन एण्ड डिटॉक्सीफिकेशन।	डॉ. पी.आर. मिश्रा
डिज़ाइन, सिन्थिसिस एण्ड इवैल्युएशन ऑफ न्यू कैमिकल एन्टिटीज़ अगेन्स्ट टिपिकल *माइक्रोबैक्टीरियम–2–फॉरट्यूटम*।	डॉ. गौतम पाण्डा
साइटोकाइन ज़ीन पॉलीमॉरफ़िज़्म इन ब्रेस्ट कैन्सर पेशेन्ट्स।	डॉ. रितुराज कोनवर
डिफेन्स रिसर्च एण्ड डेवलपमेन्ट ऑर्गनाइज़ेशन	
सिन्थिसिस ऑफ फ्रैक्चर एण्ड वून्ड हीलिंग एजेण्ट्स।	डॉ. एन. चट्टोपाध्याय

परियोजना का शीर्षक	प्रधान अन्वेशक
सिन्थिसिस ऑफ बायोलॉज़िकली एक्टिव मॉलीक्युल्स फ्रॉम कार्बोहाइड्रेट्स बेस्ट लिगैण्ड्स फॉर पोटेन्शियल अप्लीकेशन्स इन डिफेन्स।	डॉ. आर.पी. त्रिपाठी
इफेक्ट ऑफ इण्डियन हर्बल प्रिपरेशन ऑफ हाइपोबेरिक हाईपॉक्ज़िया इन्ड्यूस्ड एपिजेनेटिक मॉडीफिकेशंन्स इन मेल जर्म सेल्सः ए प्रॉटियोमिक एनालिसिस्।	डॉ. डी.पी. मिश्रा
एनएमआईटीएलआई (सीएसआईआर)	
लीड बेस्ड ड्रग डेवलपमेन्ट एण्ड जेनेटिक इम्प्रूवमेन्ट ऑफ अश्वगंधा *विथानिया सोमनीफेरा*।	डॉ. राम रघुबीर डॉ. एस. भट्टाचार्या
नॉवेल डीपीपी IV इनहिबिटर फॉर द ट्रीटमेन्ट ऑफ डायबिटीज़।	डॉ. एस.के. रथ डॉ. एस. सान्याल
यूपीसीएसटी	
प्रोडक्शन ऑफ माइक्रोबियल हेपारीनेजेज़ टु प्रोड्यूज़ लो मॉलीक्युलर वेट हैपारिन्स यूज्ड एज़ एण्टीथ्रॉम्बोटिक एजेण्ट्स।	डॉ. सी.के.एम. त्रिपाठी
आयुष	
मॉस स्पेक्ट्रम फिंगरप्रिंटिंग ऑफ इण्डियन मेडिसिनल प्लांट्स डब्ल्यू.आर.टी. एण्टीडायबिटिक आसपेक्ट।	डॉ. बृजेश कुमार
सेन्ट्रल काउंसिल ऑफ रिसर्च इन होम्योपैथी	
फार्माकोलोजिकल स्क्रीनिंग ऑफ होम्योपैथिक मेडिसिन अण्डर ड्रग स्टैण्डर्डाइज़ेशन प्रोग्राम ऑफ सीसीआरएच।	डॉ. राकेश शुक्ला
इण्डस्ट्री स्पॉन्सर्ड प्रोजेक्ट्स	
डीपीपी इनहिबिटर (कोडेड ओसीआईडी 3570) इन रीसस मंकीज़। (अर्चिड रिसर्च लेबारेट्री लि., चेन्नई)	डॉ. एस.के. पुरी
14–डेज़ टॉक्सिसिटी स्टडी ऑफ गर्भ पल रस (महर्षि आयुर्वेद प्रोडक्ट्स लि., नई दिल्ली)	डॉ. सी. नाथ
स्टैबिलिटी एण्ड फॉर्म्युलेशन डेवलपमेन्ट स्ट्डीज़ ऑफ ओमिलॉक्ज़ीफीन एण्ड ऑथेन्टिफिकेशन ऑफ *सिस* एण्ड *ट्रांस* स्टैन्डर्ड्स।	डॉ. ए.के. द्विवेदी
आइडेन्टिफिकेशन ऑफ बायोएक्टिव मार्कर्स फ्रॉम *साइसस क्वारैंग्युलरीज़* एक्सट्रैक्ट (सुप्रीम फार्मास्युटिकल मैसूर प्रा. लि., मैसूर)	डॉ. एन. चट्टोपाध्याय
14 डेज़ सिस्टमिक टॉक्सिसिटी स्टडी ऑफ RSIUSG adb एण्ड फ़ेरासेप्ट इन रेट्स (आईआईटी, खड़गपुर)	डॉ. आर.के. सिंह

4 मानव संसाधन विकास

1. प्रशिक्षण कार्यक्रमों में सीडीआरआई कर्मचारियों की प्रतिभागिता

प्रशिक्षु का नाम	प्रशिक्षण कार्यक्रम, आयोजक एवं अवधि
डॉ. ए.के. द्विवेदी	• वर्कशाप ऑन प्रोडक्शन एण्ड सर्टीफिकेशन ऑफ रिफरेन्स मैटेरियल्स रेलेवेन्ट फॉर इनवायरमेन्टल एनालिटिक्स, एनपीएल, नई दिल्ली (01 से 04 फरवरी, 2011)
डॉ. वाई.एस. प्रभाकर	• रिसर्च मेथोडोलॉजीः मल्टीवैरिएट मेथड्स ऑफ एनालिसिस, सीएसआईआर–एचआरडीसी, गाजियाबाद (04 से 08 जुलाई, 2011)
डॉ. शरद शर्मा	• दसवीं ओईसीडी ट्रेनिंग कोर्स फॉर जीएलपी इन्स्पेक्टर, जेरुसलम, इज़रायल (30 अक्टूबर से 02 नवम्बर, 2011)
डॉ. डी.एस. उपाध्याय	• इण्टरनेशनल ट्रेनिंग कोर्स इन लेबोरेटरी ऐनिमल साइंस, फेकल्टी ऑफ वेटेरिनरी मेडिसिन, उत्रेच्ट यूनिवर्सिटी, उत्रेच्ट, नीदरलैण्ड्स (04 से 15 जुलाई, 2011)
डॉ. सुधीर कुमार सिंह	• ट्रेनिंग प्रोग्राम ऑन रिसर्च मेथॉडालॉजी एण्ड स्टेटिस्टीकल मेथड्सः डिज़ाइनिंग फॉर ब्रेक थ्रू, सीएसआईआर–एचआरडीसी, गाजियाबाद (16 से 20 अगस्त, 2011)
डॉ. सारिका	• ट्रेनिंग प्रोग्राम ऑन रिसर्च मेथॉडालॉजी एण्ड स्टेटिस्टीकल मेथड्सः डिज़ाइनिंग फॉर ब्रेक थ्रू, सीएसआईआर–एचआरडीसी, गाजियाबाद (16 से 20 अगस्त, 2011)
श्री वहाजुद्दीन	• साइंस एण्ड कम्युनिकेशन वर्कशॉप ऑर्गनाइज्ड बाय द वेल्कम ट्रस्ट/डीबीटी इण्डिया अलाइंस, हैदराबाद, (07 से 09 जून, 2011) • चौथा वर्कशाप ऑन "डाटा एनालिसिस मेथड्स यूज़िंग पॉप्युलेशन अप्रोच (इन्ट्रोडक्टरी एण्ड इण्टरमीडिएट लेवल)" ऑर्गनाइज्ड बाइ पॉप्युलेशन अप्रोच ग्रुप ऑफ इण्डिया, कोयम्बटूर (02 से 04 जून, 2011) • इण्टरनेशनल वर्कशॉप ऑन "सेफ्टी फार्माकोलॉजी" अर्गेनाइज्ड बाय सेफ्टी फार्माकोलॉजी सोसायटी एण्ड एड्वाइनस थेराप्यूटिक्स, बंगलुरू, (13 से 14 अप्रैल, 2011)
डॉ. शुभा शुक्ला	• फर्स्ट ज्वाइंट सेफ्टी फार्माकोलॉजी वर्कशाप, एड्वाइनस थेराप्यूटिक्स, बंगलुरू, (13 से 14 अप्रैल, 2011) • रिसर्च मेथॉडालॉजी फॉर वूमेन साइंटिस्ट, ऐम्स, नई दिल्ली, (03 से 07 अक्टूबर, 2011)
डॉ. विनीता त्रिपाठी	• इंडक्शन ट्रेनिंग प्रोग्राम फॉर न्यूली रिक्रूटेड साइंटिस्ट बी एण्ड सी, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (07 से 17 मार्च, 2011)
डॉ. विवेक वी. भोसले	• इंडक्शन ट्रेनिंग प्रोग्राम फॉर न्यूली रिक्रूटेड साइंटिस्ट बी एण्ड सी, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (07 से 17 मार्च, 2011)
श्री अभिषेक कुमार	• इंडक्शन ट्रेनिंग प्रोग्राम फॉर न्यूली रिक्रूटेड साइंटिस्ट बी एण्ड सी, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (07 से 17 मार्च, 2011)
कु नेहा टोप्नो	• इंडक्शन ट्रेनिंग प्रोग्राम फॉर न्यूली रिक्रूटेड साइंटिस्ट बी एण्ड सी, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (10 से 19 अक्टूबर, 2011)
डॉ. पी.के. अग्निहोत्री	• ट्रेनिंग प्रोग्राम ऑन कम्पेटेन्सी डेवलपमेन्ट फॉर टेक्नीकल ऑफिसर्स, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (22 से 25 फरवरी, 2011)
श्री सदन कुमार	• ट्रेनिंग प्रोग्राम ऑन कम्पेटेन्सी डेवलपमेन्ट फॉर टेक्नीकल ऑफिसर्स, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (22 से 25 फरवरी, 2011)

ट्रेनी का नाम	ट्रेनिंग प्रोग्राम, आयोजक एवं अवधि
श्री वी. निगम	• ट्रेनिंग प्रोग्राम ऑन कम्पेटेन्सी डेवलपमेन्ट फॉर टेक्नीकल ऑफिसर्स, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (28 नवम्बर से 02 दिसम्बर, 2011)
डॉ. ए.के. मण्डवाल	• ट्रेनिंग प्रोग्राम ऑन कम्पेटेन्सी डेवलपमेन्ट फॉर टेक्नीकल ऑफिसर्स, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (20 से 24 जून, 2011)
श्री ए.एस. कुशवाहा	• क्राफ्टिंग इफेक्टिव एस एण्ड टी कम्युनिकेशन, सीएसआईआर–एचआरडीसी, गाज़ियाबाद, (24 से 26 अगस्त, 2011)
कु. दीपमाला	• हेन्ड्स ऑन ट्रेनिंग ऑफ इण्डोथिलियल सेल कल्चर एण्ड फंक्शन एण्ड बेसिक्स ऑफ एनजियोजेनेसिस, एयू–केबीसी रिसर्च सेण्टर, एमआईटी, अन्ना यूनिवर्सिटी, चेन्नई, तमिलनाडु, (28 मार्च से 08 अप्रैल, 2011)

2. प्रस्तुत शोध प्रबन्ध (पीएचडी) (2011)

	शोधकर्ता का नाम	शोध प्रबन्ध (थीसिस) का शीर्षक	गाइड
जवाहरलाल नेहरू विश्वविद्यालय, नई दिल्ली			
1	कुलदीप कुमार राय	डिज़ाइन एण्ड सिंन्थिसिस ऑफ पोटेन्शियल अल्ज़ाइमर डिज़ीज़ (एडी) थेराप्युटिक्स एण्ड मॉडलिंग स्ट्डीज ऑन β_3–एड्रेनर्जिक रिसेप्टर (β_3-A1) एगोनिस्ट।	डॉ. ए.के. सक्सेना
2	नीलेन्द्र सिंह	स्ट्डीज ऑन दि रोल ऑफ एनएडीपीएच आक्सीडेज़ एज़ दि सोर्स ऑफ आरओएस इन सेरेब्रल इन्ज्युरी।	डॉ. राम रघुबीर
3	मानवी चैटर्जी	बिहेवियरल बायोकेमिकल एण्ड मॉलीक्यूलर पर्टर्बेशन इन ग्लूटामेट बेस्ड एनीमल मॉडल्स ऑफ शाइज़ोफ्रेनिया।	डॉ. गौतम पालित
4	पूनम शुक्ला	सिन्थेसिस ऑफ एण्टीडायबिटिक एण्ड एण्टीडिस्लिपिडेमिक एक्टिविटीज़ ऑफ चालकोन्स एण्ड रिलेटेड मॉलीक्यूलस।	डॉ. राम प्रताप,
5	शिव कुमार वर्मा	मॉलीक्यूलर कैरेक्टराइजेशन ऑफ नाइट्रिक आक्साइड स्टिम्युलेटरी मॉलीक्यूल्स ऑफ *ब्रुजिया मैलाई* पैरासाइट।	डॉ. पी.के. मूर्ति
6	एम. लक्ष्मी	फार्माकोकाईनेटिक स्ट्डीज ऑफ एण्टी–ओस्टियोपोरेटिक एजेण्ट्स।	डॉ. जी.के. जैन,
7	अनुपम ज्योति	आइडेण्टीफिकेशन ऑफ नाइट्रिक आक्साइड सिन्थेज़ इण्टरैक्टिव प्रोटिन्स एण्ड देअर रोल इन न्यूट्रोफिल एक्स्ट्रासेल्युलर ट्रैप फॉर्मेशन।	डॉ. मधु दीक्षित
8	रविशंकर केशरी	स्ट्डीज़ ऑफ नाइट्रिक आक्साइड मीडिएटेड सिग्नलिंग इन न्यूट्रोफिल फ्री रेडिकल जनरेशन एण्ड एक्स्ट्रा सेल्युलर टैप्स फॉरमेशन।	डॉ. मधु दीक्षित
9	प्रमोद कुमार कुशवाहा	क्लोनिंग एण्ड ओवर एक्सप्रेशन ऑफ Th-1 स्टिम्युलेटरी प्रोटीन्स फॉर देयर प्रोफाइलैक्टिक पोटेन्शियल अगेन्स्ट एक्सीपेरीमेन्टल विसरल लीशमैनिया।	डॉ. अनुराधा दुबे
10	विभोर मिश्रा	स्ट्रक्चरल एण्ड फंक्शनल स्टेब्लिटी स्ट्डीज ऑन फॉस्फोसिरिन अमिनो–ट्रांसफेरेज़ एण्ड डि–फॉस्फोग्लाइसरेट डिहाइड्रोजिनेज फ्रॉम *इन्टैमीबा हिस्टोलिटिका*।	डॉ. विनोद भाकुनी
11	जावेद अख्तर सिद्दिकी	आइडेण्टीफिकेशन एण्ड कैरक्टेराइजेशन ऑफ नॉवेल नेच्युरल कम्पाउण्ड्स विथ मल्टीपल रोल्स इन बोन सेल्स एण्ड दियर मैकेनिज़्म ऑफ एक्शन।	डॉ. एन. चट्टोपाध्याय
12	गौरव कुमार	आइडेण्टीफिकेशन एण्ड कैरक्टेराइजेशन ऑफ नॉवेल ओरली एक्टिव ओस्टियोजेनिक नैच्युरल कम्पाउण्ड्स।	डॉ. एन. चट्टोपाध्याय
13	कुनाल शरन	आइडेण्टीफिकेशन एण्ड कैरक्टेराइजेशन ऑफ नॉवेल नैच्युरल कम्पाउण्ड्स फॉर एण्टी–ओस्टियोपोरोटिक एक्टिविटी।	डॉ. एन. चट्टोपाध्याय

	शोधकर्ता का नाम	शोध प्रबन्ध (थीसिस) का शीर्षक	गाइड
14	बन्दना चक्रवर्ती	आइडेण्टीफिकेशन एण्ड डिटरमिनेशन ऑफ मोड ऑफ एक्शन ऑफ कम्पाउण्ड्स फॉर एण्टी कैंसर ब्रेस्ट एक्टिविटी।	डॉ. एन. चट्टोपाध्याय
15	किशोर कुमार	मॉलीक्यूलर क्लोनिंग ओवर एक्सप्रेशन, प्योरीफिकेशन एण्ड कैरक्टराइज़ेशन ऑफ ट्रायोज़ फॉस्फेट आइसोमरेज़ एन्जाइम ऑफ *लीशमैनिया डोनोवनी*।	डॉ. उमा राय
16	रूमा कुमारी	एक्सप्लोरिंग इनसाइट्स ऑफ माइकोबैक्टीरियल सिरीन/थ्रिओनिन।	डॉ. के.के. श्रीवास्तव
17	अवनित कुमार	इम्यूनोसीक्रिटोम एनालिसिस ऑफ एस्परजिलस फ्युमिगेटस एण्ड जेनेरेशन ऑफ मोनोक्लोनल एण्टीबॉडीज़।	डॉ. पी.के. शुक्ला
18	अमित सारस्वत	ए क्वेस्ट फॉर नॉवेल सिंथेटिक एजेण्ट्स फॉर मेनैजमेन्ट ऑफ प्रॉस्टैटिक हाइपरप्लाज़िया एण्ड कॉन्ट्रासेप्शन।	डॉ. वी.एल. शर्मा
19	ललित कुमार	डिज़ाइन एण्ड सिन्थेसिस ऑफ माइक्रोबिकिड्ल स्पर्मिसाइड्स।	डॉ. वी.एल. शर्मा
20	निशी	मॉड्युलेशन ऑफ इम्यून सिस्टम एज़ ए नॉवेल स्ट्रैटजी फॉर लीशमैनिया कीमोथैरेपी।	डॉ. सुमन गुप्ता
21	बिजय कुमार	एनालिसिस ऑफ प्रोटिन्स प्युटेटिवली इनवॉल्व्ड इन बायोजेनेसिस ऑफ आयरन–सल्फर क्लस्टर मशीनरी इन दि एपिकोप्लास्ट ऑफ *प्लाज़मोडियम फैल्सीपैरम*।	डॉ. समन हबीब
22	रवीन्दर	क्लोनिंग, एक्सप्रेशन एण्ड कैरेक्टराइजेशन ऑफ प्यूटेटिव एण्टीमोनी रेज़िटेन्स जीन्स टू एक्सप्लोर द मॉलीक्यूलर *लीशमैनिया डोनोवनी* फील्ड आइसोलेट।	डॉ. नीना गोयल
23	वन्दना	स्ट्रक्चरल एण्ड फंक्शनल कैरेक्टराइज़ेशन ऑफ यूबैक्टीरियल डीएनए लाइगैजेज़।	डॉ. आर. रविशंकर
24	प्रभात सिंह	इवैल्युएशन ऑफ टॉक्सिक इफेक्ट्स ऑफ सर्टेन फ्लेवोनॉइड्स।	डॉ. एस.के. रथ
25	अमित मिश्रा	सिन्थिसिस ऑफ थायोयूरिया एण्ड गुवानिडीन डिराइवेटिव्स एज़ पॉसिबल एण्टी मलेरियल रिएजेन्ट एण्ड डेवलपमेन्ट ऑफ न्यू ऐप्रोचेज़ टु एनीमेटेड हेट्रोसाइकिल।	डॉ. संजय बत्रा
26	प्रेम प्रकाश पाठक	सोल्यूशन स्ट्रक्चर एण्ड डायनामिक्स ऑफ एडीएफ/कोफ्लाइन फ्रॉम *लीशमैनिया डोनोवनी*।	डॉ. अशीष अरोरा
27	अंजुम महमूद	करैक्टराइजेशन ऑफ आरडी 1 रिलेटैड सेक्रेटरी प्रोटीन(स) फ्रॉम *मायकोबैक्टीरियम ट्यूबरक्यूलोसिस* एच37आरवी (H37Rv)।	डॉ. अशीष अरोरा
28	सुबल कुमार डिंडा	डिज़ाइन एण्ड सिन्थेसिस एण्ड फार्माकोलॉजिकल इवैल्युएशन ऑफ स्माल आर्गेनिक मॉलिक्यूल फॉर थेराप्यूटिक एजेण्ट्स।	डॉ. गौतम पाण्डा
29	कृष्णानन्द सामंता	सिन्थेसिस् एण्ड बायोऐक्टिव नैच्युरल प्रॉडक्टस एण्ड काइरल हेट्रोसाइकल्स फ्रॉम α-अमिनो एसिड्स।	डॉ. गौतम पाण्डा
30	ऋषि कुमार	स्ट्डीज ऑन सेलेक्टिव इस्ट्रोजन रिसेप्टर माड्युलेटर इन्ड्यूज्ड मॉलीक्यूलर इवेन्ट्स इन कैन्सर सेल्स।	डॉ. डी.पी. मिश्रा
31	अबनीश गौतम	डेवलपमेण्ट ऑफ नॉवेल बोन फॉरमिंग एजेण्ट्स फ्रॉम नैच्युरल एण्ड सिंथेटिक सोर्स।	डॉ. दिव्या सिंह
32	राजीवलोचन तिवारी	इल्यूसिडेशन ऑफ सेल्युलर सिग्नलिंग ड्यूरिंग मैक्रोफेज डिफरेन्सिएशन एण्ड फोम सेल फॉरमेशन।	डॉ. मनोज बर्थवाल
लखनऊ विश्वविद्यालय, लखनऊ			
33	संजीव कनौजिया	एलसी/इएसआइ–एमएस, एमएस/एमएस स्टडीज ऑफ बायोएक्टिव कंपाउण्ड्स एण्ड देअर इन्क्लुजन कॉम्प्लेक्शन एबिलिटी विथ साइक्लोडेक्सट्रिन्स	डॉ.के. पी. मधुसूदनन

	शोधकर्ता का नाम	शोध प्रबन्ध (थीसिस) का शीर्षक	गाइड
34	संदीप के शर्मा	कैरेक्टराइजेशन ऑफ सर्फेस एण्टीजन ऑफ *वी. कॉलेरी*	डॉ. रंजना श्रीवास्तव
35	नीरज कुमार	क्लोनिंग, करैक्टराइजेशन एण्ड इम्युनोजेनेसिटी न्यूरोजॉइट सर्फेस प्रोटीन–1 ऑफ मलेरियल पैरासाइट्स।	डॉ. डी.सी. कौशल
36	सारिका यादव	बायोकेमिकल स्ट्डीज ऑफ एडिनोसिन डिएमिनेज ऑफ *प्लाज्मोडियम योएली*	डॉ. जे. के. सक्सेना
37	स्वयं प्रकाश श्रीवास्तव	बायोकेमिकल मोलिक्युलर एण्ड फिजियोलोजिकल बेसिस ऑफ एक्शन ऑफ सिलेक्टेड टेरेस्टियल प्लाण्ट्स	डॉ. अरविन्द के. श्रीवास्तव
38	विजय कुमार	कीटोन डाइथायोएसिटॉल–डिराइव्ड 2–पाइरैनॉन्स एण्ड देयर सी–/एन– न्यूक्लिओफाइल इन्ड्यूस्ड रिंग प्रॉडक्ट्स।	डॉ. अतुल कुमार
39	स्मिता राय	कैरेक्टराइज़ेशन ऑफ मेकैनिज़्म्स ऑफ एण्टीमोनी रेज़िस्टेन्स इन लीशमैनिया फील्ड्स आइसोलेट्स।	डॉ. नीना गोयल
छत्रपति शाहू जी महाराज विश्वविद्यालय, कानपुर			
40	आलोक कुमार वर्मा	सिन्थेसिस् ऑफ सम पोटेन्शियल एण्टी हाइपरग्लाइसेमिक एण्ड एण्टी हाइपरलिपिडेमिक एजेण्ट्स।	डॉ. रामप्रताप
41	प्रज्ञा मिश्रा	स्ट्डीज़ ऑन टीएच1 स्टिम्युलेटरी एमैस्टिगोट प्रोटीन्स फॉर देयर प्रोफाइलैक्टिक पोटेन्शियल अगेन्स्ट एक्सीपेरीमेन्टल विसरल लीशमैनिशयस।	डॉ. अनुराधा दुबे
42	मीनाक्षी	डिज़ाइन एण्ड सिन्थेसिस ऑफ पेप्टाइड्स एण्ड पेप्टीडॉमिमीटिक्स ऑफ बायोलॉजिकल सिग्नीफिकेन्स।	डॉ. डब्ल्यू. हक
बनारस हिन्दू विश्वविद्यालय, वाराणसी			
43	दिनेश कुमार यादव	केमिकल इन्वेस्टीगेशन ऑफ मेडिसिनल प्लाण्ट्स एण्ड सिन्थेसिस् ऑफ बायोलॉजिकली एक्टिव नैच्युरल प्रॉडक्ट्स।	डॉ. राकेश मौर्या,
44	निमिष सिंह	सिन्थेसिस् ऑफ ऐरोमैटिक्स, हिट्रोसाइकिल्स एण्ड कार्बोहाइड्रेट डिराइवेटिव्स एज़ कीमोथेरेप्यूटिक एजेण्ट्स।	डॉ. आर.पी. त्रिपाठी,
ज़ामिया हमदर्द, नई दिल्ली			
45	संतोष कुमार टोटा	स्टडी ऑन द रोल ऑफ सेन्ट्रल रेनिन–ऐन्जिओटेन्सिन सिस्टम (आरएएस) इन मेमोरी फंक्शन एण्ड इट्स इन्टरैक्शन विद ब्रेन डिराइव्ड न्यूट्रोफ़िलिक फैक्टर (बीडीएनएफ)।	डॉ. सी. नाथ
46	शीलेन्द्र प्रताप सिंह	इन्वेस्टीगेशन ऑफ फार्माकोकाइनेटिक इन्टरैक्शन ऑफ फ्लेवोनॉइड्स विद एण्टी ओस्टिओपोरोटिक कम्पाउण्ड्स।	डॉ. जी.के. जैन
बी.आर. अम्बेडकर यूनिवर्सिटी, आगरा			
47	सुधीर कुमार शर्मा	डिज़ाइन एण्ड सिन्थेसिस् ऑफ नॉवेल बेस्ड पॉलीसाइकल्स ऑफ बायोलॉजिकल इन्ट्रेस्ट।	डॉ. बिजॉय कुण्डू
48	पीयूष कुमार अग्रवाल	नॉवेल अप्लीकेशन ऑफ द पिक्टेट–स्पेंग्लर रिऐक्शन लीडिंग टु द सिन्थेसिस् ऑफ N–रिच पॉलीहेट्रोसाइकल्स ऑफ बायोलॉजिकल इन्ट्रेस्ट।	डॉ. बिजॉय कुण्डू
49	रविन्द्र सिंह	स्ट्डीज आन बायोलॉजिकल पैरामीटर्स ऑफ एल्बिनो रैट (*स्प्रैग डॉवले*) अन्डर द इन्फ्लुएन्स ऑफ कमर्शियल एण्ड इन–हाउस फीड फोर्मुलेशन्स	डॉ. डी. एस. उपाध्याय
बिरला इन्सटीट्यूट ऑफ टेक्नोलॉजी एण्ड साइंस, रांची			
50	राजकुमार वर्मा	स्ट्डीज आन दि मॉलिक्युलर मेकैनिज़्म ऑफ ग्लुटामेट ट्रांसपोरर्टस इन ग्लुटामेट होम्योस्टैसिस ड्रगिंग सेरेब्रल इस्कीमिया रिप्रेसर फ्यूज़न इंज्युरी।	डॉ. राम रघुबीर

	शोधकर्ता का नाम	शोध प्रबन्ध (थीसिस) का शीर्षक	गाइड
जाधवपुर विश्वविद्यालय, कोलकाता			
51	पिंकी पाल	सिन्थिसिंज़ ऑफ मॉडीफाइड शुगर डिराइवेटिव्स ऑफ बायोलॉजिकल इम्पॉर्टेन्स।	डॉ. ए.के. शॉ
चौधरी चरण सिंह विश्वविद्यालय, मेरठ			
52	अबधेश कुमार	ए सिन्थेटिक एप्रोर्च टूवर्डस दि डेवलपमेण्ट ऑफ कौमेरिन एनोलॉग्स एज़ पोटेन्शियल फार्मास्यूटिकल एजेण्ट्स।	डॉ. के.वी. शशिधरा
डॉ. राम मनोहर लोहिया अवध विश्वविद्यालय, फैजाबाद			
53	विवेक पराशर पाण्डेय	सिन्थेटिक स्ट्डीज इन शुगर हाइब्रिड मॉलिक्यूल्स : डेवलपमेन्ट ऑफ न्यू कीमोथेरेप्यूटिक एजेण्ट्स।	डॉ. आर.पी. त्रिपाठी
एम.जे.पी. रूहिलखण्ड विश्वविद्यालय, बरेली			
54	मृदुल मिश्रा	स्ट्डीज् ऑन न्यू एण्टी मलेरियल एजेण्ट्स : सिन्थेसिस् एण्ड बायो–इवैल्यूऐशन।	डॉ. आर.पी. त्रिपाठी,
गौतम बुद्ध टेक्निकल यूनिवर्सिटी, लखनऊ			
55	विकास मिश्रा	एनालिसिस ऑफ एनएमडीएआर एण्ड एएसआईसी मीडिएटेड एक्साइटोटॉक्सिसिटी एण्ड एसिडोटॉक्सिसिटी इन सेरेब्रल इश्चिमिया/रिपरफ्यूज़न इंज्युरी।	डॉ. राम रघुबीर
इन्टीग्रल यूनिवर्सिटी, लखनऊ			
56	दीबा जैदी	रोल ऑफ ऑक्सीडेटिव स्ट्रेस इन सेन्टक्रोमान मीडिएटेड एपोप्टोसिस : *इन विट्रो* स्ट्डीज़।	डॉ. ए.के. बालापुरे,

3. प्रस्तुत शोध प्रबन्ध (एमडी)

	शोधकर्ता का नाम	शोध प्रबंध का शीर्षक	सीएसआईआर–सीडीआरआई से गाइड का नाम	विश्वविद्यालय का नाम
1	डॉ. समर ज़िया	प्रिडिक्शन ऑफ इन्डोमीट्रियोसिस विथ सीरम एण्ड पेरीटोनियल फ्लुइड मार्कर्स इन पैशेन्ट्स विथ क्रोनिक पेल्विक पैन एण्ड इंफर्टिलिटी	डॉ. असीम घटक और डॉ. रितुराज कोनवर	छत्रपति शाहू जी महाराज विश्वविद्यालय, कानपुर
2	डॉ. मिली जैन (एमडी)	स्टडी ऑन एक्टिविटी ऑफ एनओ सिन्थिज़ इन हिमेटोपोइटिक मैलिग्नैन्सिज़ विथ सोशल रिफ्रेन्स टू मायलॉयड नियोप्लाज्म्स	डॉ. मधु दीक्षित	जवाहर नेहरू विश्वविद्यालय, नई दिल्ली
3	डॉ. विवेक श्रीवास्तव	ए कम्पैरेटिव स्ट्डी ऑफ सी–रिऐक्टिव प्रोटीन एण्ड इंटरल्यूकिन फॉलोइंग नॉन–सर्ज़िकल पेरियोडोंटल थैरेपी इन डायबिटिक सब्जेक्ट विथ क्रोनिक पेरियोडॉन्टाइटिस	डॉ. पी.के. मूर्ति	बी.आर. अम्बेडकर यूनिवर्सिटी, आगरा

4. प्रस्तुत शोध प्रबन्ध (एमडी–पीएचडी)

1	डॉ. निखिल कोठारी	बायोमार्कर्स ऑफ सेप्सिस एण्ड सेप्टिक शॉक इन क्रिटिकली इल पेशेन्ट्स	डॉ. मधु दीक्षित	जवाहर लाल नेहरू विश्वविद्यालय, नई दिल्ली

5. बाह्य अभ्यर्थियों को प्रदान किया गया प्रायोजित प्रशिक्षण।

उपर्युक्त कार्यक्रम के अंतर्गत औषधि और औषधि निर्माण अनुसंधान, प्रयोगशाला जन्तु तकनीक, टिश्यू एवं सेल कल्चर, इन्स्ट्रूमेन्टेशन, परिष्कृत विश्लेषणात्मक उपकरणों एवं अन्य प्रयोगशाला तकनीक के क्षेत्र में संस्थान द्वारा पोस्ट ग्रेजुएट छात्रों, विदेशों के शोध छात्रों तथा संपूर्ण देश के शैक्षिक तथा उद्योग जगत के प्रतिभागियों को प्रशिक्षण प्रदान किया गया।

5.1 स्नातकोत्तर छात्रों को प्रशिक्षण

कैलेण्डर वर्ष के दौरान देश भर से 35 विश्वविद्यालयों तथा संबद्ध कॉलेजों से कुल 168 स्नातकोत्तर छात्रों का योग्यता के आधार पर चयन किया गया और औषधि तथा औषधि निर्माण अनुसंधान के विभिन्न विषयों में 4–10 महीनों का प्रशिक्षण दिया गया।

5.2 नाइपर, रायबरेली के छात्रों को प्रशिक्षण

सीडीआरआई में, नाइपर, रायबरेली के लिए एक संरक्षक संस्थान के रूप में 30 एम. फार्मा. छात्रों को जैव चिकित्सा अनुसंधान में एक वर्ष की परियोजना प्रशिक्षण प्रदान किया।

5.3 इन्सा (INSA) के सहयोग के अंतर्गत प्रशिक्षण

इस कार्यक्रम के अन्तर्गत डॉ. विनायक राम त्रिपाठी, प्रवक्ता, सूक्ष्म जीव विज्ञान, आरएमएल अवध विश्वविद्यालय, फैज़ाबाद को आण्विक और स्ट्रक्चरल बायोलॉजी प्रभाग में दो महीने का प्रशिक्षण प्रदान किया गया।

5.4 तदर्थ (Adhoc) प्रशिक्षण

5.4.1 सीएसएम चिकित्सा विश्वविद्यालय, लखनऊ के डॉक्टर्स ए.के. सिंह, मृदुला चौहान, शोभना वैश्य, चन्द्र देव और राजकुमार भारती डेंटल सर्जन्स को एम.फिल कार्यक्रम के लिए टिश्यू कल्चर तकनीक पर प्रशिक्षण प्रदान किया गया।

5.4.2 श्री अच्युत नियोपेन और श्री गणेश राणा, आनन्दवन लेप्रोसी अस्पताल, ललितपुर, नेपाल को प्रयोगशाला पशुओं के प्रजनन और प्रबंधन में एक सप्ताह का प्रशिक्षण प्रदान किया गया।

5.4.3 सुश्री अनुपमा कुमारी, लिवर और पित्त विज्ञान संस्थान, वसंत कुंज, नई दिल्ली को प्रयोगशाला पशुओं के प्रजनन और प्रबंधन में एक महीने का प्रशिक्षण प्रदान किया गया।

5.4.4 अभिलाषा सूद, पंजाब विश्वविद्यालय, चण्डीगढ़ को फार्माकोलॉजी प्रभाग में एमसीएओ मॉडल पर दो सप्ताह का प्रशिक्षण प्रदान किया गया।

5.4.5 श्री के.एम.एन प्रसाद, परियोजना प्रशिक्षार्थी, डिपार्टमेंट ऑफ बायोटेक्नोलॉजी, इण्डियन इंस्टीट्यूट ऑफ टेक्नोलॉजी, गुवाहाटी को पैरासीटालॉजी प्रभाग में ''मैन्टेनेन्स ऑफ *इन विट्रो* कल्चर ऑफ *प्लाज़्मोडियम फॉल्सीपेरम*'' पर 3 सप्ताह का प्रशिक्षण प्रदान किया गया।

5.5 द्विपक्षीय सहयोग के अंतर्गत अंर्तराष्ट्रीय प्रशिक्षण

निम्नलिखित विदेशी प्रशिक्षुओं को संस्थान में दीर्घ अवधि/लघु अवधि का प्रशिक्षण प्रदान किया गया।

प्रशिक्षु का नाम एवं पता	फेलोशिप	सुपरवाइजर	अवधि
श्री ओ. इस्माइला इशोला सहायक व्याख्याता, डिपार्टमेंट ऑफ फार्माकोलोजी, कॉलेज ऑफ मेडिसिन, युनिवर्सिटी ऑफ लागोस, नाइजीरिया	CSIR-TWAS फेलोशिप फॉर पोस्टग्रेजुएट स्टडीज	डॉ. राकेश शुक्ला	25 मई, 2010 से 18 मार्च, 2011
डॉ. थे सू मोय व्याख्याता, डिपार्टमेंट ऑफ बायोटेक्नोलोजी, माण्डले टेक्नोलोजिकल युनिवर्सिटी,क्यॉक्से माण्डले म्यान्मार	RTFDCS फेलोशिप फॉर पोस्टडॉक्टोराल रिसर्च	डॉ. रंजना श्रीवास्तव	16 मार्च, 2010 से 11 मार्च, 2011
डॉ. (सुश्री) ग्यूगुइम सोफेक फ्लोरेन्स सहायक व्याख्याता, लेबोरेटरी ऑफ एनिमल फिजियोलोजी, फैकल्टी ऑफ साइंस, युनिवर्सिटी ऑफ याउण्दे 1, याउण्दे कैमरून	सी. वी. रमन इन्टरनेशनल फेलोशिप फॉर अफ्रीकन रिसर्चर पोस्टडॉक्ट्रल रिसर्च	डॉ. नैबेद्य चट्टोपाध्याय	16 फरवरी, 2010 से 11 अगस्त, 2011

5 पुरस्कार एवं सम्मान

डॉ. सी. नाथ

- आई.सी.एम.आर. द्वारा 2011 में डॉ. डी.एन. प्रसाद स्मृति व्याख्यान पुरस्कार–2007 से पुरस्कृत किया गया।

डॉ. शैलजा भट्टाचार्य

- नेशनल एकेडमी ऑफ साइन्सेज़ इण्डिया 2011 में फ़ेलो चुनी गई।

डॉ. राजेन्दर सिंह

- इण्डियन नेशनल साइन्स एकेडमी द्वारा युवा वैज्ञानिक पुरस्कार 2011 से सम्मानित।
- इण्डियन साइंस कांग्रेस एसोसिऐशन द्वारा युवा वैज्ञानिक पुरस्कार 2011 से सम्मानित।

डॉ. आर.पी. त्रिपाठी

- ए.सी.सी.टी.आई. द्वारा 'एक्सेलेन्स इन कार्बोहाइड्रेट रिसर्च अवार्ड–2011' से पुरस्कृत।

डॉ. संजय बत्रा

- आर्गेनिक केमिस्ट्री डिपार्टमेन्ट, इण्डियन इन्स्टीट्यूट ऑफ साइंस, बंगलौर के चतुर्थ प्रो. डी.के. बैनर्जी स्मृति व्याख्यान पुरस्कार हेतु चयनित।

डॉ. अनिल बालापुरे

- सीडीआरआई ओरेशन अवार्ड लेक्चर 44 एनुअल कॉफ्रेन्स ऑफ द इण्डियन फ़ारमाकोलोजीकल सोसायटी, मनिपाल, कर्नाटक

डॉ. आशीष अरोरा

- प्रोफेसर एस. सुब्रामनियन बर्थ डे लेक्चर अवार्ड फॉर एनएमआरएस–2011
- नेशनल बायोसाइंस अवार्ड 2011

डॉ. गौतम पाण्डा

- रसायन विज्ञान अनुसंधान में योगदान हेतु सीआरएसआई मेडल प्रदान किया गया।
- जापान में प्रमोशन आफ साइंस इन्विटेशन फ़ेलोशिप से सम्मानित।

डॉ. रेनु त्रिपाठी

- 22वीं ऑल इण्डिया कांग्रेस ऑफ जूलॉजी एण्ड नैशनल सेमिनार ऑन रीसेन्ट ऐडवॉन्सेज इन बायोलॉजिकल साइन्सेज़: बायोडाइवर्सिटी एण्ड ह्यूमन वेलफेयर ऐट लखनऊ यूनिवर्सिटी, सम्मान पुरस्कार।

डॉ. गौतम पालित

- इलेक्टेड सेक्रेटरी (इण्टरनेशनल) इण्डियन फ़ारमाकोलोजी सोसायटी (2012 से 2015)

डॉ. मधु दीक्षित

- साइटोमीट्री ऑफ इण्डिया की प्रेसीडेण्ट चुनी गई।

डॉ. सैयद मुस्तफ़ा

- एसोसिएशन ऑफ बायोटेक्नोलॉजी एण्ड फार्मेसी द्वारा कार्य में उत्कृष्टता हेतु 'स्वर्ण पदक – 2011' से सम्मानित।
- एसोसिएशन ऑफ बायोटेक्नोलॉजी एण्ड फार्मेसी के युवा वैज्ञानिक पुरस्कार–2011 से सम्मानित।

डॉ. वहाजुद्दीन

- इण्डियन केमिकल सोसायटी, कोलकाता द्वारा एनालिटिकल केमिस्ट्री हेतु प्रो. ए.के. डे अवार्ड 2011 से सम्मानित।
- बायोएनालिसिस एन इण्टरनैशनल जर्नल द्वारा बायोएनालिसिस यंग इन्वेस्टीगेटर 2011 से सम्मानित।

डॉ. जियाउर आर. गायेन

- ऐसोसिएशन ऑफ बायोटेकनोलॉजी एण्ड फार्मेसी द्वारा फेलोशिप और 'एबीएपी सीनियर साइंटिस्ट–2011' अवार्ड से सम्मानित।

डॉ. (कु.) सुमन गुप्ता
- कान्फ्रेंस ऑफ इण्डियन सोसायटी ऑफ केमिस्ट्स एण्ड बायोलॉजिस्ट्स, लखनऊ द्वारा बायोलॉजिकल साइंसेज, चैलेन्जेज़ इन ड्रग डिस्कवरी एण्ड डेवलपमेन्ट–2001 पर बेस्ट पोस्टर अवार्ड प्रदान किया गया।

डॉ. विभोर मिश्रा(डॉ. विनोद भाकुनी के छात्र)
- इली–लिली एण्ड कम्पनी एशिया आउटस्टैंडिंग थीसिस अवार्ड–2011 (द्वितीय पुरस्कार)।
- 23वीं नेशनल कांग्रेस ऑफ पैरासिटालॉजी, चेन्नई 2011 का युवा वैज्ञानिक पुरस्कार एवं बेस्ट प्रेजेन्टेशन अवार्ड।

डॉ. अमानतुल्लाह अंसारी (डॉ. के.के. अवस्थी के छात्र)
- इली–लिली एण्ड कम्पनी एशिया अवार्ड–2011 का प्रथम पुरस्कार।
- केमिस्ट्री में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयंती पुरस्कार।

डॉ. वीरेन्द्र सिंह (डॉ. संजय बत्रा के छात्र)
- सीएसआईआर की नेहरू फेलोशिप के लिए डॉ. नितिन टी पाटिल के साथ चयनित।
- यूजीसी की कोठारी फेलोशिप हेतु चयनित।

श्री सुधीर बिस्वास (डॉ. समन हबीब के छात्र)
- डॉ. एम.एम. धर स्मृति पुरस्कार।

श्रीमती निशी (डॉ. सुमन गुप्ता की छात्रा)
- भारत में प्रकाशित सर्वोत्तम शोध कार्य के लिए इण्डियन सोसायटी फॉर पैरासिटालॉजी का प्रो. एम.बी. मिर्जा अवार्ड।

सुश्री दीबा ज़ैदी (डॉ. ए.के. बालापुरे की छात्रा)
- सोसायटी ऑफ बायोलॉजिकल कैमिस्ट, इंडिया की 79वी. बैठक में पोस्टर हेतु ऐप्रीसिएशन आवार्ड।

सुश्री सुनीता यादव (डॉ. जे.के. सक्सेना की छात्रा)
- 23वीं नैशनल कांग्रेस ऑफ पैरासीटालॉजी, चेन्नई 2011 में बेस्ट पोस्टर अवार्ड।

श्री अवकाश सोनी (डॉ. एस.के. पुरी के छात्र)
- 18–20 नवम्बर, अन्ना विश्वविद्यालय, चेन्नई में 23वीं नैशनल कांफ्रेंस ऑफ पैरासीटालॉजी में बेस्ट पोस्टर प्रेज़ेन्टेशन अवार्ड।

श्री प्रतीक त्रिपाठी (डॉ. जवाहर लाल के प्रशिक्षु छात्र)
- मेडिसिनल केमिस्ट्री एण्ड फार्मास्युटिक्ल साइन्सेज़ पर तृतीय सीडीआरआई–नाइपर, रायबरेली संगोष्ठी में बेस्ट पोस्टर अवार्ड।

सुश्री अंकिता मिश्रा (डॉ. मधु दीक्षित की छात्रा)
- जीव विज्ञान में उत्कृष्ट मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयन्ती पुरस्कार।

श्री कुनाल शरन (डॉ. डी.पी. मिश्रा के छात्र)
- जीव विज्ञान में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयन्ती पुरस्कार।

श्री अनुपम ज्योति (डॉ. मधु दीक्षित की छात्रा)
- जीव विज्ञान में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयन्ती पुरस्कार।

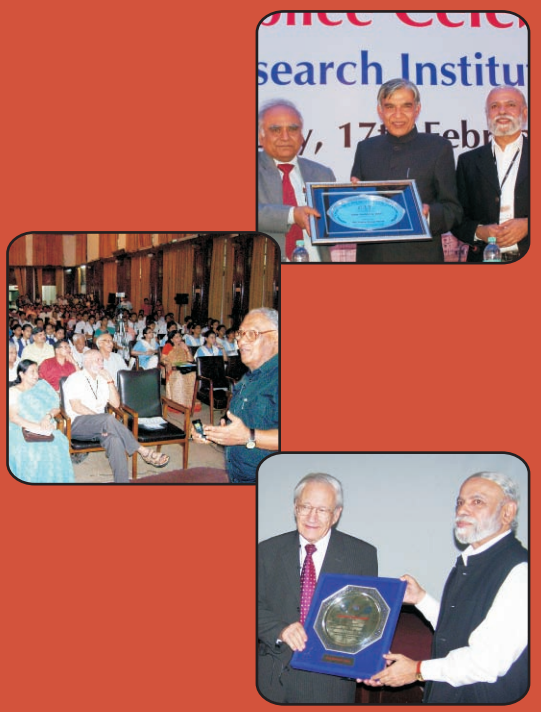
सुश्री सन्तोष जांगिड़ (डॉ. बी.एल. शर्मा की छात्रा)
- केमिस्ट्री में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयन्ती पुरस्कार।

श्री विवेक खन्ना (डॉ. मधु दीक्षित के छात्र)
- फार्मास्युटिक्स/फार्माकॉलोजी में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर–सीडीआरआई हीरक जयन्ती पुरस्कार।

श्री शीलेन्द्र प्रताप सिंह (डॉ. जी.के. जैन के छात्र)
- फार्मास्युटिक्स/फार्माकॉलोजी में सर्वोत्तम मौखिक प्रस्तुति हेतु सीएसआईआर– सीडीआरआई हीरक जयन्ती पुरस्कार।
- तृतीय नोवार्टिस बायोटेक्नॉलोजी लीडरशिप कैम्प (बायोकैम्प) हैदराबाद हेतु चयनित।

श्री अमित कुमार गुप्ता (डॉ. ए. के. सक्सेना के छात्र)
- तृतीय नोवार्टिस बायोटेक्नॉलोजी लीडरशिप कैम्प (बायोकैम्प) हैदराबाद हेतु चयनित।

श्री स्वरूप कुमार पाण्डेय (डॉ. रेनू त्रिपाठी के छात्र)
- द्वितीय सर्वश्रेष्ठ पोस्टर अवार्ड, 22वीं ऑल इंण्डिया कांग्रेस ऑफ जूलोजी, लखनऊ



CSIR-Central Drug Research Institute, Lucknow

अन्य गतिविधियाँ


वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्, भारत
CSIR INDIA

1 प्रमुख आयोजित कार्यक्रम

मॉस स्पेक्ट्रोमेट्री पर राष्ट्रीय सेमिनार एवं कार्यशाला

सीडीआरआई के परिष्कृत विश्लेषणात्मक उपकरण सुविधा विभाग (SAIF) द्वारा मॉस स्पेक्ट्रोमेट्री पर एक राष्ट्रीय संगोष्ठी एवं कार्यशाला का आयोजन 11 से 14 जनवरी, 2011में किया गया। इस संगोष्ठी एवं कार्यशाला में भारत के विभिन्न क्षेत्रों के 73 प्रतिभागियों ने हिस्सा लिया। सभी आमंत्रित वक्ताओं जो अन्तर्राष्ट्रीय स्तर के विषय विशेषज्ञ हैं, ने मॉस स्पेक्ट्रोमीट्री की वर्तमान अवस्था, भविष्य की संभावनाएँ, ज्वलंत मुद्दे एवं मॉस स्पेक्ट्रोमीट्री की उन्नत विधियों से संबंधित व्याख्यान दिए। कार्यशाला ने मॉस स्पेक्ट्रोमेट्री की तकनीक को समझने का एक सुनहरा अवसर प्रदान किया। साथ ही वरिष्ठ वैज्ञानिकों, शिक्षाविदों तथा भावी शोधकर्ताओं को रसायन एवं जीव विज्ञान के आधुनिकतम क्षेत्रों के ज्ञान को आपस में बाँटने का मौका भी प्रदान किया।

हीरक जयन्ती अन्तर्राष्ट्रीय सम्मेलन

सीएसआईआर–सीडीआरआई के हीरक जयंती समारोह के अन्तर्गत एक अन्तर्राष्ट्रीय सम्मेलन का आयोजन 10–11 फरवरी 2011 को किया गया। सम्मेलन में विभिन्न विषय विशेषज्ञों ने व्याख्यान दिए जो निम्नानुसार है :

	वक्ता का नाम एवं पता	विषय
	**प्रोफे. होस्ट केसलर** इन्स्टीट्यूट फॉर एडवांस स्ट्डी, टीयू मेन्चेन, लिचबर्गस्ट्रेज 4, 85147 गार्यिंग, जर्मनी	रैशनल एण्ड कॉम्बिनेटोरियल डिज़ाइन ऑफ सेलेक्टिव इनटेग्रिन इनहिबिटर पेप्टाइड्स,
	**प्रोफे. डेविड क्रिच** सेण्टर द रिसर्च द गिफ, इन्स्टीट्यूट द किमि देस सब्स्तान्सेस नेच्युरेल्स, सीएनआरएस, अवेन्यु द ला तेरेसी, 9118, गिफ–सर–यवेत, फ्रांस	न्यू मेथोडॉलॉजी फॉर द सिंथिसिस ऑफ पेप्टाइड्स ग्लाइकोसाइड्स एण्ड देयर कन्जुगेट्स
	**जॉर्ज फ्लीट** डिपार्टमेंट ऑफ कैमिस्ट्री, यूनिवर्सिटी ऑफ आक्सफोर्ड, मैन्सफील्ड रोड़ OX13 टीए, यू.के.	मोनोसैक्राइड्स मिमिक्स एण्ड मिरर्स
	**प्रोफे. मेड कैटजा बेकर** चेयर ऑफ न्यूट्रीशनल बायोकैमिस्ट, इण्टर डिसिप्लिनरी रिसर्च सेण्टर, जस्टस–लीबिग यूनिवर्सिटी जीसेन, हेनरिच–बफ़–रिफ–रिंग 26–323592, जीसेन, जर्मनी	रेडॉक्स–बेस्ड एण्टी मलेरियल ड्रग डिस्कवरी एन अपडेट
	**प्रोफे. रोजर न्यू** एक्जीक्यूटिव डायरेक्टर एण्ड को–फाउण्डर, प्रॉक्सिमा कॉनसेप्ट्स लिमिटेड, लंदन एनडब्ल्यू, 30जेडडब्ल्यू, यू.के.	न्यू फ्रंटियर्स इन प्रोटीन थेराप्यूटिक्स
	**प्रोफे. मेलकॉम वॉकिन्शॉ** इन्स्टीट्यूट ऑफ स्ट्रक्चरल एण्ड मॉलिक्युलर बायोलॉजी, स्कूल ऑफ बायोलॉजिकल साइंन्सेज, यूनिवर्सिटी ऑफ एडिनबर्ग, एडिनबर्ग	द ग्लाइकोलिटिक पाथवे एज़ ए टार्गेट फॉर स्ट्रक्चर बेस्ड इन्हिबिटर डिज़ाइन
	**डॉ. सत्यजीत रथ** नेशनल इन्स्टीट्युट ऑफ इम्युनोलॉजी, नई दिल्ली	द कैलिब्रेशन ऑफ सेल्युलर रिस्पॉन्सेज टु स्टिमुलेशन ए केस स्ट्डी इन टी–लिम्फोसाइट्स

स्वास्थ्य एवं औषधि में वैज्ञानिकों के स्थान पर सीडीआरआई पैनल विचार–विमर्श का आयोजन

स्वास्थ्य एवं औषधि में वैज्ञानिको का स्थान" विषय पर सीडीआरआई में 11 फरवरी, 2011 को पैनल डिस्कशन का आयोजन किया गया। कार्यक्रम में प्रो. रूपरेखा वर्मा, विचारक एवं पूर्व कुलपति, लखनऊ विश्वविद्यालय, प्रो. इमराना कादिर, डॉक्टर, सामुदायिक चिकित्सा, जवाहरलाल नेहरू विश्वविद्यालय, डॉ. सत्यजीत रथ, वैज्ञानिक एनआईआई एवं लीना मेन्घाने, कार्यकर्ता, डॉक्टर्स विथआउट बार्डर्स / मेडिसिन्स सॉन्स फ्रंटियर्स मुख्य वक्ता थे जिन्होंने विज्ञान एवं समाज के विभिन्न पहलुओं पर विचार–विमर्श किया।

सीडीआरआई हीरक जयन्ती और वार्षिक खेल पुरस्कार वितरण समारोह

सीडीआरआई हीरक जयंती एवं वार्षिक खेलों के पुरस्कार वितरण समारोह का आयोजन 15 फरवरी, 2011 को मुख्य सभागार में किया गया। कार्यक्रम की मुख्य अतिथि डॉ (श्रीमती) सुष्मिता चक्रवर्ती थीं। कार्यक्रम की अध्यक्षता निदेशक, सीडीआरआई ने की। कार्यक्रम में विभिन्न खेल स्पर्धाओं के विजेताओं को पुरस्कृत किया गया।

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ का हीरक जयन्ती समारोह (1951–2011)

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ ने 17 फरवरी, 2011 को अपना साठवाँ वार्षिक दिवस मनाया। इस अवसर पर संसदीय कार्य, विज्ञान एवं प्रौद्योगिकी तथा पृथ्वी विज्ञान मंत्री पवन कुमार बंसल मुख्य अतिथि थे। सीडीआरआई अनुसंधान परिषद के अध्यक्ष और आईसीएमआर के भूतपूर्व महानिदेशक प्रो. एन.के. गांगुली ने कार्यक्रम की अध्यक्षता की। सीएसआईआर के महानिदेशक प्रो. एस.के. ब्रह्मचारी ने वीडियों कांफ्रेसिंग के द्वारा कार्यक्रम को उद्‌बोधित किया। बाद में सीडीआरआई द्वारा विकसित की गयी औषधियों तथा यहाँ पर उपलब्ध अन्य सुविधाओं की प्रदर्शनी का आयोजन किया गया। इस अवसर पर सी.डी.आर.आई. में सेवा के 25 वर्ष पूर्ण करने वाले कर्मचारियों को स्मृति चिह्न देकर सम्मानित किया गया। लाइफ साइंसेज तथा केमिकल साइंसेज में सर्वोत्तम व्याख्यान प्रस्तुति के लिये नकद पुरस्कार तथा प्रमाण पत्र प्रदान किए गए। सर्वोत्तम थीसिस हेतु एम.एम. धर स्मृति पुरस्कार प्रदान किया गया।

36वाँ सर मेलानबी स्मृति व्याख्यान

17 फरवरी, 2011 को सीडीआरआई के भूतपूर्व संस्थापक निदेशक सर एडवर्ड मेलनबी की स्मृति में 36वें मेलनवी स्मृति व्याख्यान का आयोजन किया गया। डॉ. एल.वी. प्रसाद, नेत्र संस्थान, हैदराबाद के अनुसंधान निदेशक प्रो. डी. बालसुब्रमण्यम ने व्याख्यान प्रस्तुत किया। उनके प्रस्तुतीकरण का शीर्षक था ''स्टेमसेल थेरैपी टु रिपेयर द डैमेज्ड कॉर्निया ऑफ द आई।'' डॉ. बालसुब्रमण्यम ने एल.वी. प्रसाद नेत्र संस्थान में किये गये 401 ऑटोलोगस कल्टीवेटेड लिम्बल एपिथेलियल ट्रान्सप्लांटेशन के दीर्घ अवधि कॉन्सीक्यूटिव इण्टरनेशनल केस स्ट्डीज के परिणामों पर चर्चा की। उन्होंने बताया कि कि लिम्बल स्टेम सेल डेफिशिएन्सी को उपचारित करने के लिए क्षतिग्रस्त बाह्य ऑकुलर सर्फेस का पुनर्गठन, लिम्बल डिराइव्ड स्टेम सेल्स के संवर्धन द्वारा कॉर्नियल एपिथिलियल शीट प्राप्त करके किया जा सकता है। यह उपचार का एक उत्तम विकल्प है।

केमटेक/फार्मा वर्ल्ड एक्सपो–2011

सीएसआईआर–सीडीआरआई ने 23–26 फरवरी, 2011 को बॉम्बे एक्ज़िविशन सेन्टर गोरेगाँव, मुंबई में ''केमटेक/फार्मा वर्ल्ड एक्सपो–2011'' में भाग लिया जिसका आयोजन केमटेक फाउण्डेशन द्वारा रजत जयन्ती कार्यक्रम के रूप में किया गया था। कार्यक्रम की विषयवस्तु थीः नई औषधि खोज और जनता के लिये खर्च कर सकने योग्य मूल्य पर नई औषधियों की उपलब्धता। सीडीआरआई औषधियों में गर्भ निरोधक के रूप में सहेली हिस्टरेक्टोमाइसेज़ से बचाव के लिये डिस्फंक्शनल यूट्रिन ब्लीडिंग के प्रबंधन हेतु नोवेक्स डीएस, सेरेब्रल और क्लोरोक्वीन रेज़िस्टेन्ट मलेरिया के उपचार हेतु ई–माल और स्मृति में सुधार के लिये मेमोरी श्योर। सीडीआरआई को यक्ष्मा के क्षेत्र में सीएसआईआर के ओएसडीडी कार्यक्रम में प्रायोजित किया गया है। प्रतिनिधियों ने बड़ी संख्या में प्रदर्शनी को देखा।

राष्ट्रीय विज्ञान दिवस

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में राष्ट्रीय विज्ञान दिवस का आयोजन 28 फरवरी, 2011 को किया गया। इस अवसर

पर, साइंस क्विज़ तथा तात्कालिक भाषण प्रतियोगिता आयोजित की गई। राम मनोहर लोहिया इंस्टिट्यूट ऑफ मेडिकल साइंसेज के निदेशक, प्रोफ़े. एम. सी. पंत कार्यक्रम के मुख्य अतिथि थे। सी.एस. आई.आर.–सी.डी.आर.आई. के निदेशक डॉ. टी.के. चक्रवर्ती ने कार्यक्रम की अध्यक्षता की। प्रोफ. एम. सी. पंत ने इस अवसर पर व्याख्यान दिया। उनके व्याख्यान का शीर्षक था ''कैन्सर एजुकेशन इन कम्युनिटी।'' कार्यक्रम समापन के अवसर पर विभिन्न स्पर्धाओं के विजेताओं को पुरस्कृत किया गया।

चिकित्सा रसायन एवं औषधि निर्माण विज्ञान पर वैऔअप–केऔअसं, नाइपर (रायबरेली) संगोष्ठी

चिकित्सा रसायन एवं औषधि विज्ञान पर तृतीय संगोष्ठी का आयोजन 3 से 5 मार्च, 2011 में केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में किया गया। इस संगोष्ठी का उद्देश्य नाइपर (रायबरेली) एवं देश के अन्य फार्मेसी कॉलेजों के छात्रों को औषधि अनुसंधान विकास में वितरण प्रणालियों जैसे उन्नत क्षेत्रों में हुए आधुनिकतम विकास से अवगत कराना था। अनेक विशिष्ट विषयों के विशेषज्ञों ने व्याख्यान दिये तथा संगोष्ठी में पोस्टर प्रदर्शनी भी कार्यक्रम का हिस्सा था।

मैग्नेटिक रेजोनेन्स पर संगोष्ठी

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद तथा नेशनल अकादमी आफ साइंसेज, भारत के लखनऊ प्रभाग द्वारा संयुक्त रूप से मैग्नेटिक रेजोनेन्स पर एक संगोष्ठी का आयोजन दिनांक 07 मार्च, 2011 को किया गया। इस अवसर पर प्रोफे. रिचर्ड आर. अम्स्ट, नोबेल लॉरेट, मानद डॉक्टर, स्विस अकादमी ऑफ साइंस, स्विटजरलैण्ड ने ''द फैसिनेशन एण्ड बेनिफ़िट्स ऑफ मैग्नेटिक रेजोनेन्स इन कैमिस्ट्री, बायोलॉजी एण्ड मेडिसिन'' विषय पर रोचक व्याख्यान दिया।

प्रयोगशाला जन्तु तकनीशियनों का प्रशिक्षण कार्यक्रम

नेशनल इन्स्टीट्यूट ऑफ एनिमल वेलफेयर, पर्यावरण एवं वन मंत्रालय, भारत सरकार द्वारा वित्तपोषित द्विसाप्ताहिक प्रयोगशाला जन्तु तकनीशियनों के लिए प्रशिक्षण कार्यक्रम का आयोजन नेशनल लेबोरेट्री एनिमल सेन्टर, सीडीआरआई में 7 मार्च से 18 मार्च, 2011 तक किया गया। प्रशिक्षण कार्यक्रम का उद्देश्य प्रयोगशाला जन्तुओं की देखभाल, प्रजनन एवं प्रबंधन में संलग्न तकनीशियनों एवं सेवकों को विभिन्न प्रयोगशाला जन्तु तकनीकों, उनका उपयोग, नियमित देखभाल एवं प्रबंधन प्रभावों का प्रशिक्षण देकर अधिक सक्षम एवं उन्नत बनाना था। लखनऊ के विभिन्न संस्थानों/चिकित्सा महाविद्यालयों के कुल 19 प्रशिक्षणार्थियों ने प्रशिक्षण कार्यक्रम में हिस्सा लिया।

ग्रामीण विद्यालयों के लिये सम्पूर्ण स्वास्थ्य शिक्षा कार्यक्रम

सीडीआरआई, लखनऊ द्वारा सीएसआईआर, नई दिल्ली के आर्थिक सहयोग से 25 मार्च, 2011 को माती, बाराबंकी में दिशा पब्लिक स्कूल में स्वास्थ्य जागरूकता व्याख्यान और स्वास्थ्य परीक्षण शिविर का आयोजन किया गया। शिविर का आयोजन मुख्य चिकित्साधिकारी, बाराबंकी के सहयोग से किया गया जिसमें 300 छात्रों और स्कूल स्टाफ ने उत्साहपूर्वक भाग लिया। मुख्य चिकित्साधिकारी, बाराबंकी द्वारा प्रतिनियुक्त डाक्टरों की एक टीम ने भलीभाँति छात्रों का स्वास्थ्य परीक्षण किया और सलाह के अनुसार छात्रों को निःशुल्क दवाएं वितरित की गयीं।

जीई हेल्थकेयर लाइफसाइन्सेज द्वारा ''प्योरिफिकेशन मीडिया'' पर एक सेमिनार

सीडीआरआई में 4 अप्रैल, 2011 को जीई हेल्थकेयर लाइफ साइन्सेज द्वारा ''प्योरिफिकेशन मीडिया'' पर एक सेमिनार का आयोजन किया गया। उपर्युक्त संगठनों के विशेषज्ञों ने निम्नलिखित शीर्षकों पर व्याख्यान दिये : डिटरजेन्ट स्क्रीनिंग फॉर आप्टिमाइज्ड प्योरिफिकेशन कन्डीशन्स फॉर हिस्टिडाइन टैग्ड मेम्ब्रेन प्रोटीन एण्ड मल्टीमोडल क्रोमैटोग्राफी – द ''आल इन वन'' रेज़िन, प्योरिफिकेशन ऑफ जीएसटी–टैग्ड प्रोटिन्स यूजिंग प्रीपैक्ड कॉलम्स, प्रोटीन फॉसफोराइलेशन एण्ड सैम्पल प्रेपरेशन एण्ड सिम्पल प्रोटीन प्योरिफिकेशन एनड एनरिचमेन्ट विद मैग्नेटिक बीड्स। सीएसआईआर–सीडीआरआई और लखनऊ के अन्य संस्थानों के वैज्ञानिकों और शोध छात्रों ने विचार–विमर्श में भाग लिया।

रिसर्च ऐप्लिकेशन्स ऑफ फ्लो साइटोमीट्री' पर एक प्रशिक्षण कार्यक्रम

16 मई से 20 मई, 2011 की अवधि में सीडीआरआई और बीडी बायोसाइंसेज (इण्डिया) द्वारा रिसर्च एप्लिकेशन ऑफ फ्लो साइटोमीट्री पर एक प्रशिक्षण कार्यक्रम का आयोजन किया गया। कार्यक्रम में विभिन्न विचार–विमर्श सत्र प्रस्तुति और वेट लैब डिमॉस्ट्रेशन द्वारा फ्लो साइटोमीट्री के विभिन्न अनुसंधान प्रयोगों जैसे मल्टी कलर इम्यूनो–फेनोटाइपिंग सेल साइकिल और एपॉप्टासिस, सेल सिंग्नलिंग साइटोकाइन एनालिसिस और सेल सॉर्टिंग प्रस्तुत किये गये।

इस प्रशिक्षण कार्यक्रम के लिये सीडीआरआई के 55 जेआरएफ, एसआरएफ तथा प्रोजेक्ट असिस्टेन्ट ने आवेदन किया जिसमें वेट लैब हेतु 14 छात्रों का चयन किया गया। कार्यक्रम संयोजक सीडीआरआई की डॉ. मधु दीक्षित तथा बीडी बायोसाइन्सेज़ के डॉ. परेश जैन द्वारा वैज्ञानिक सहयोग प्रदान किया गया। डॉ. परेश जैन, डॉ. अमिताभ मोहन्ती, श्री टी. नागार्जुन, डॉ. मधु दीक्षित और डॉ. अमित मिश्रा द्वारा प्रस्तुतियां/व्याख्यान दिये गये। श्री अनुपम ज्योति और श्री रवि शंकर केशरी द्वारा एपाप्टॉसिस पर वेट लैब प्रयोग किये गये।

सीएसआईआर–सीडीआरआई में नवीन कार्यभार ग्रहण करने वाले स्टाफ हेतु ओरिएंटेशन कार्यक्रम

संस्थान में नए कार्यभार ग्रहण करने वाले वैज्ञानिक, तकनीकी और अन्य स्टाफ में संस्थान के क्रियाकलापों के प्रति जागरूकता उत्पन्न करने के लिए हमारे संस्थान के विज्ञान एवं प्रौद्योगिकी प्रबंधन प्रभाग द्वारा 7 से 29 जून, 2011 के बीच एक ओरिएंटेशन कार्यक्रम का आयोजन किया गया। इस कार्यक्रम में पिछले एक वर्ष के दौरान संस्थान में कार्यभार ग्रहण करने वाले 19 वैज्ञानिकों तथा 12 टेक्निकल स्टाफ सदस्यों ने भाग लिया और प्रत्येक प्रभाग के प्रभारी वैज्ञानिक तथा अन्य वैज्ञानिकों से बातचीत करने के साथ–साथ वहाँ उपलब्ध सुविधाओं और क्रियाकलापों के विषय में जानकारी प्राप्त की। भाग लेने वाले सदस्यों ने सभी प्रयोगशालाओं को जाकर देखा, और प्रत्येक वैज्ञानिक से बातचीत की। कार्यक्रम का द्वितीय चरण जिसमें आईपीआर प्रबंधन, परियोजना प्रबंधन, प्रशासनिक प्रक्रियाएं, वित्त एवं लेखा, प्रत्येक परियोजना क्षेत्र के उद्देश्य एवं क्रियाकलाप आदि विभिन्न विषयों पर व्याख्यान शामिल हैं, का आयोजन बाद में किया जायेगा।

हिन्दी कार्यशाला

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में दो दिवसीय सामूहिक हिन्दी कार्यशाला का आयोजन दिनांक 27–28 जून, 2011 को संस्थान के लघु प्रेक्षागृह में किया गया जिसमें नराकास, लखनऊ के समस्त सदस्य कार्यालयों के अधिकारियों/कर्मचारियों के साथ–साथ संस्थान के अधिकारियों/कर्मचारियों ने भी भाग लिया। इस अवसर पर उद्घाटन सत्र में मुख्य अतिथि के रूप में पधारे प्रो. एस.पी. दीक्षित, पूर्व प्रभागाध्यक्ष, हिन्दी विभाग, लखनऊ विश्वविद्यालय ने अपना व्याख्यान प्रस्तुत किया तथा संस्थान के वरिष्ठ हिन्दी अधिकारी डॉ. वी.एन. तिवारी जी ने 'यूनीकोड फांट की सहायता से कंप्यूटरों पर हिन्दी में कार्य करने की संभावनाएं' विषय पर अपना व्याख्यान दिया। डॉ. विजय कर्ण, रीडर, विद्यान्त कालेज, लखनऊ, एवं डॉ. एस. के. तिवारी, वैज्ञानिक ने इस अवसर पर प्रमुख वक्ता के रूप में अपना–अपना व्याख्यान प्रस्तुत किया। दिनांक 28 जून, 2011 को चतुर्थ सत्र के बाद डॉ. वी. एन. तिवारी, सचिव, नराकास के धन्यवाद ज्ञापन के पश्चात् कार्यशाला का समापन किया गया।

सीएसआईआर और टीआईएसटीआर के मध्य वैज्ञानिक एवं प्रौद्योगिकी सहयोग पर तीन दिवसीय कार्यशाला

28–30 जून, 2011 को ''हर्बल औषधियाँ/औषधीय पौधेः फेफड़े और मस्तिष्क की बीमारियों, मधुमेह और हेपाटाईटिस'' पर टीआईएसटीआर प्रतिनिधिमंडल तथा सीएसआईआर–सीडीआरआई के मध्य एक तीन दिवसीय कार्यशाला का आयोजन सीएसआईआर–सीडीआरआई, लखनऊ में किया गया। प्रतिनिधि मंडल को संस्थान के क्रियाकलापों से अवगत कराया गया और टीआईएसटीआर, थाईलैण्ड के विषय में जानकारी प्राप्त की गयी। दोनों संस्थानों की ओर से भविष्य में सहयोगात्मक कदम उठाए जाने पर सहमति व्यक्त की गयी। प्रयोगशाला भ्रमण के पश्चात् सीएसआईआर– सीडीआरआई, सीएसआईआर–आईआईटीआर, सीएसआईआर–सीमैप के उपर्युक्त क्षेत्रों के विशेषज्ञों ने विभिन्न विषयों पर विस्तृत प्रस्तुतियां दीं। समापन सत्र में सीडीआरआई के निदेशक ने प्रमाणपत्र तथा स्मृति चिह्न प्रतिनिधियों को प्रदान किया। प्रतिनिधिमंडल द्वारा यह उल्लेख किया गया कि वह इस कार्यशाला का विवरण टीआईएसटीआर की गवर्नर को देंगे जो इस वर्ष के अंत तक निदशेक तथा अन्य वज्ञौानिकों को आइटीएसटीआर का दौरा करने के लिये आमंत्रित कर सकती है जिससे वे टीआईएसटीआर के वैज्ञानिकों को मधुमेह, विषविज्ञान के अनुसंधान ग्रुप बनाने के लिये सक्षम बना सकें और द्विपक्षीय सहयोगात्मक अनुसंधान कार्यक्रमों का प्रांरभ किया जा सके।

औषधि अनुसंधान में बायोलेयर इन्टरफेरोमीट्री प्रौद्योगिकी और माइक्रोऐरे के नवीन अनुप्रयोग पर आधारित बायोमॉलीक्युलर इन्टरैक्शन अध्ययन पर सेमिनार

आइ लाइफ डिस्कवरीज़, गुडगांव, हरियाणा द्वारा औषधि खोज में बायोलेयर इण्टरफेरोमीट्री प्रौद्योगिकी और माइक्रोऐरे के नवीन

प्रयोग का उपयोग करके बायोमॉलीक्युलर इन्टरैक्शन स्टडीज़ पर बुधवार 27 जुलाई, 2011 को एक दिवसीय सेमिनार का आयोजन किया गया। लाईफ डिस्कवरीज़, मनेसर, के डॉ. विपुल भार्गव ने औषधि खोज में बायोलेयर इन्टरफेरोमीट्री टेक्नोलॉजी और माइक्रोऐरे के उपयोग पर अपने विचार व्यक्त किये और ऐप्लिकेशन वैज्ञानिक श्री अश्विनी कमल ने उपर्युक्त तकनीकी पर विस्तृत जानकारी और विवरण दिया। इस प्रभाव क्षेत्र में कार्यरत वैज्ञानिकों और शोध छात्रों ने कार्यक्रम में भाग लिया तथा विशेषज्ञों से बातचीत की।

थॉमसन इन्नोवेशन द्वारा प्रत्यक्ष प्रदर्शन सह प्रशिक्षण कार्यक्रम

थॉमस इनोवेशन एक एकल, एकीकृत समाधान है जो बौद्धिक सम्पदा, वैज्ञानिक साहित्य, व्यावसायिक आँकड़े और विश्लेषित समाचार, सहयोगात्मक और सतर्क करने वाले साधनों के समाचार एक मजबूत प्लेटफार्म पर सम्मिलित कर देता हे। थॉमस इनोवेशन द्वारा 12 अगस्त, 2011 को एक सीएसआईआर–सीडीआरआई में प्रत्यक्ष प्रदर्शन सह प्रशिक्षण कार्यक्रम का आयोजन किया गया। इस कार्यक्रम में उन्होंने यह प्रदर्शित किया कि किस प्रकार वे हमारी स्वयं की शर्तों पर बौद्धिक सम्पदा अनुसंधान की सामर्थ्य प्रदान करते हैं। एक ऐसी क्षमता जो बेहतर प्रसांगिक आईपी निर्णयों के लिये हमारे अपने आंकड़ों को ग्लोबल पेटेण्ट आंकड़ों के साथ समाविष्ट करेगी।

सद्भावना दिवस समारोह

स्वर्गीय प्रधानमंत्री राजीव गाँधी की स्मृति में संस्थान में 19 अगस्त, 2011 को उनकी जन्मतिथि से एक दिन पूर्व ''सदभावना दिवस'' मनाया गया। सद्भावना की मूल विषयवस्तु सभी धर्मों, भाषाओं और क्षेत्रों के लोगों में राष्ट्रीय एकता और साम्प्रदायिक सामंजस्य को बढ़ाना है। सद्भावना दिवस को मनाने का कारण हिंसा से दूर रहना और लोगों में सद्भावना को प्रोत्साहन देना है। सीएसआईआर–सीडीआरआई के सभी कमर्चारियों ने इसअवसर पर उपस्थित होकर सद्भावना की शपथ ली कि वे बगैर किसी जाति, क्षेत्र, धर्म या भाषा के भेदभाव के भारत के सभी लोगों की भावनात्मक एकता और मेल–जोल के लिये काम करेंगे।

''प्रोटीन्स ने उनके जीवन को आकार दिया: विनोदजी की स्मृति में'' विषय पर एक संगोष्ठी

डॉ. विनोद भाकुनी को श्रृद्धांजलि अर्पित करने के लिये सीएसआईआर–सीडीआरआई द्वारा 24 अगस्त, 2011 को एक दिवसीय संगोष्ठी ''प्रोटीन्स ने उनके जीवन को आकार दिया: विनोदजी की स्मृति में'' का आयोजन किया गया। इस अवसर पर संस्थान के भूतपूर्व निदेशक और डॉ. विनोद भाकुनी के परिवार के सदस्य उपस्थित थे। संस्थान के वैज्ञानिकों एवं छात्रों ने उनकी स्मृति में उनके प्रति श्रद्धांजलि अर्पित की। संगोष्ठी का प्रारंभ डॉ. विनोद भाकुनी के चित्रों के प्रदर्शन और उनके वैज्ञानिक योगदान के वर्णन से हुआ। सीएसआईआर–सीडीआरआई के भूतपूर्व निदेशक डॉ. सी.एम. गुप्ता ने डॉ. भाकुनी के साथ बिताये अपने 27 वर्षों के समय को याद किया। वैज्ञानिक सत्र में पूरे देश से आये प्रतिष्ठित वक्ताओं ने व्याख्यान प्रस्तुत किये। विवरण इस प्रकार है

प्रोफे. डी. बालसुब्रमनियम
एलवी प्रसाद, नेत्र संस्थान, हैदराबाद द ग्रीक की मोटिफ इन क्रिस्टैलिन्स एण्ड आइ लेन्स ट्रांसपेरेन्सी।

प्रोफे. के. मुनियप्पा
आईआईएससी, बंगलौर रिकॉम्बीनेषनल डीएनए रिपेयर इन माइकोबैक्टीरिया: प्रोटीन स्ट्रक्चर्स मेकैनिज़्म्स एण्ड सर्च फॉर इनहिबिटर्स।

डॉ. शेखर माण्डे
सीडीएफडी, हैदराबाद एलोस्टरिक चेन्जेज़ इन दि सीएएमपी रिसेप्टर प्रोटीन एन्ड द यूनिवेर्सेलिटी ऑफ सीएएमपी मीडिऐटेड सिग्नलिंग।

प्रोफे. राजीव भट्ट
जवाहरलाल नेहरू विश्वविद्यालय, नई दिल्ली इफेक्ट्स ऑफ स्ट्रेस ओस्मोलाइट्स ऑन द स्टैबिलिटी, फोल्डिंग एण्ड ऐग्रीगेशन ऑफ प्रोटीन्स।

प्रोफे. पी गुप्ता शर्मा
आईआईएसईआर, मोहाली ए नॉवेल ''स्ट्रक्चर सेन्सिटिव'' लोरेसेन्स फ्रॉम पॉलीपेप्टाइड बैकबोन्स एसोसिएटेड विद इलेक्ट्रॉन ट्रांसपोर्ट।

डॉ. के. प्रकाश
शिकागो विश्वविद्यालय, शिकागो, यूएसए
प्रूफरीडिंग एण्ड डिस्कार्ड मेकैनिज़्म्स इन प्री–एमआरएनए स्प्लाइसिंग।

नगर राजभाषा कार्यान्वयन समिति, लखनऊ की छमाही बैठक

नगर राजभाषा कार्यान्वयन समिति, लखनऊ की छमाही बैठक दिनांक 26 अगस्त, 2011 को अपराह्न 4.00 बजे केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ के मुख्य प्रेक्षागृह में सम्पन्न हुई। बैठक की अध्यक्षता केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ के निदेशक एवं अध्यक्ष, नगर राजभाषा कार्यान्वयन समिति, लखनऊ डॉ. टी. के. चक्रबर्ती ने की। इस अवसर पर संस्थान के वरिष्ठ हिन्दी अधिकारी एवं सचिव, नराकास, लखनऊ डॉ. विजय नारायण तिवारी ने अध्यक्ष महोदय तथा उपस्थित सभी विभागाध्यक्षों/कार्यालय प्रमुखों, हिन्दी अधिकारियों एवं अन्य कार्यालय प्रतिनिधियों का हार्दिक स्वागत करते हुए 67 कार्यालयों की समीक्षा करते हुए कार्यसूची के अनुसार अध्यक्ष महोदय की अनुमति से समीक्षा रिपोर्ट प्रस्तुत की।

इस अवसर पर तीन कार्यालयों को विशिष्ट पुरस्कार तथा प्रशस्ति पत्र एवं दस अन्य कार्यालयों को भी पुरस्कार तथा प्रशस्ति पत्र प्रदान किया गया। राजभाषा पत्रिका प्रकाशन के लिए तीन कार्यालयों को पुरस्कृत किया गया तथा 35 कार्यालयों को समाप्त छमाही के दौरान कार्यशाला हेतु प्रशस्ति पत्र प्रदान किये गये। इस अवसर पर भारत सरकार गृह मंत्रालय राजभाषा विभाग द्वारा पधारे उपनिदेशक कार्यान्वयन उत्तर क्षेत्र श्री विनोद कुमार शर्मा जी ने अपना व्याख्यान दिया। संस्थान के प्रशासन नियंत्रक ने धन्यवाद ज्ञापित करते हुए नराकास के विभिन्न सदस्य कार्यालयों से पधारे कार्यालय प्रमुखों के सहयोग के लिए आभार प्रकट किया।

2डी डीआईजीई प्रौद्योगिकी पर व्यवहारिक प्रशिक्षण पाठ्यक्रम

संस्थान में 6–9 सितम्बर 2011 को 2डी डीआईजीई प्रौद्योगिकी पर व्यवहारिक प्रशिक्षण प्राठ्यक्रम का आयोजन किया गया। जीई हेल्थ टेक्नोलॉजी के विशेषज्ञों ने कार्यक्रम आयोजित करने में सहायता दी। इसमें 2डी हेतु प्रोटीन के नमूने तैयार करना, प्रोटीन सैम्पल्स की लेबलिंग, आईईएफ और 2 आयाम जेल इलेक्ट्रोफ़ोरोसिस, जेल की स्कैनिंग, इमेज प्लैटिनम सॉटवेयर और डिज़ाइनर के अनुभवों का प्रयोग करके इमेज का विश्लेषण सम्मिलित है। विभिन्न प्रभागों के दस शोध छात्र जो अपने पी.एच.डी. परियोजनाओं में प्रोटियॉनिक्स अप्रोच का प्रयोग कर रहे हैं इस कार्यक्रम में उपस्थित हुए और व्यवहारिक प्रशिक्षण प्राप्त किया।

फ्लो साइटोमीट्री के अनुसंधान प्रयोग पर उच्च स्तरीय कार्यशाला

सम्पूर्ण भारत से आए हुये प्रतिभागियों के लिये दिनांक 19 से 22 सितम्बर 2011 की अवधि मे एपॉप्टॉसिस की फ्लो साइटोमीट्री विश्लेषण पर एक उच्च स्तरीय कार्यशाला का आयोजन किया गया। सम्पूर्ण भारत से विभिन्न प्रयोगशालाओं के 6 प्रतिभागियों को इस प्रशिक्षण कार्यक्रम के लिये उनके बायोडेटा पर आधारित आवश्यकता/उपयोगिता के आधार पर चुना गया। कार्यशाला का मुख्य केन्द्र एपॉप्टॉसिस से सम्बन्धित अध्ययन और इन अध्ययनों को निष्पादित करने की तकनीक पर था। महत्वपूर्ण शिक्षक वर्ग डा. बी.एस. द्वारकानाथ (आइ.एन.एम.ए.एस, नई दिल्ली) डा. मधु दीक्षित,

डॉ. अनिल गायकवाड़ (सी.एस.आई.आर–सी.डी.आर.आई., लखनऊ), डा. परेश जैन और डॉ. अमिताव मोहन्ती (बी.डी. इण्डिया प्राइवेट लि.) ने चार विस्तृत प्रयोगों को सफलतापूर्वक करके समझाया जिनमें ऐनेक्ज़िन वी/पी आई (ऐपॉप्टॉसिस की प्रारम्भिक अवस्था), जे सी–1 माइकाकॉन्ड्रियल डिपोलराइजेशन प्रयोग कैसपेस ऐक्टिवेशन समापन (मिडस्टेज ऐपॉप्टॉसिस) और डीएनए विखण्डन के लिये TUNEL (अंतिम चरण की एपॉप्टॉसिस) एक प्रयोग के लिए पूरा एक दिन समर्पित किया गया जिसके अंतर्गत सभी पक्ष जैसे तकनीक का परिचय, सिद्वान्त और प्रायोगिक मुद्दे, समस्याओं का निवारण और प्रयोग का क्रियान्वयन और विश्लेषण सम्मिलित थे। 22 सितम्बर 2011 को प्रतिभागियों को प्रमाण पत्र वितरित करने के साथ कार्यशाला समाप्त हुई।

प्रधानमंत्री के वैज्ञानिक सलाहकार प्रो. सी.एन.आर. राव का सीएसआईआर–सीडीआरआई में रसायन विज्ञान के अन्तर्राष्ट्रीय वर्ष पर व्याख्यान

रसायन विज्ञान का अन्तर्राष्ट्रीय वर्ष 2011 (आईवाईसी–2011), रसायन विज्ञान की उपलब्धियों और मानवता की भलाई के लिए उसके योगदान का विश्वव्यापी समारोह है। ''रसायन विज्ञान–हमारा जीवन, हमारा भविष्य'' के एकीकृत विषय पर आधारित मनोरंजन और शैक्षिक क्रिया–कलापों की एक श्रृंखला आई.वाई.सी.–2011 के अन्तर्गत सबके लिए है। आई.वाई.सी.–2011 समारोहों के एक भाग के रूप में सी.एस.आई.आर.–सी.डी.आर.आई. द्वारा 21 सितम्बर, 2011 को प्रधानमंत्री की वैज्ञानिक सलाहकार परिषद के अध्यक्ष और एफ.आर.एस. नेशनल रिसर्च प्रोफेसर एवं लाइनस पॉलिंग रिसर्च प्रोफेसर जे.एन.सी.ए.एस.आर., बैंगलुरु तथा पद्म विभूषण से अलंकृत प्रो. सी.एन.आर. राव के व्याख्यान का आयोजन किया गया। सभी सी.एस.आई.आर. प्रयोगशालाओं के निदेशक समारोह में उपस्थित थे। समारोह में लखनऊ के विभिन्न विद्यालयों और विश्वविद्यालयों के 225 छात्रों और सी.एस.आई.आर.–सी.डी.आर.आई. के स्टाफ ने भी भाग लिया। कार्यक्रम के दौरान 'केमिस्ट्री टुडे' पर छात्रों को एक पुस्तिका का वितरण भी प्रो. राव द्वारा किया गया।

सीएसआईआर–सीडीआरआई के निदेशक डॉ. टी.के. चक्रवर्ती ने डॉ. रॉव का स्वागत किया और उपस्थित लोगों को उनके जीवन और उपलब्धियों के विषय में जानकारी दी। प्रो. राव ने अपने व्याख्यान ''केमिस्ट्रीः ग्लोरियस पास्ट एण्ड एक्साईटिंग फ्यूचर'' में बताया कि किस प्रकार रसायन विज्ञान मनुष्य के कष्टों को कम करने, मानव जीवन की गुणवत्ता में सुधार करने का और बहुत–सी चीजों को जोड़ने का एक साधन है। आयोजक सचिव डॉ. संजय बत्रा ने धन्यवाद ज्ञापन दिया।

औषधि अनुसंधान में उत्कृष्टता के लिए सीएसआई आर–सीडीआरआई पुरस्कार–2011

सीएसआईआर–सीडीआरआई पुरस्कार–2011 उत्कृष्ट औषधि अनुसंधान हेतु प्रदान किये गये। सन् 2004 में इन पुरस्कारों को प्रारंभ करने का उद्देश्य 45 वर्ष से कम आयु के उन भारतीय अनुसंधानकर्ताओं को सम्मानित करने का था जिन्होंने औषधि अनुसंधान के क्षेत्र में महत्वपूर्ण योगदान दिया हो। यह पुरस्कार दो श्रेणियों में प्रदान किये जाते हैं –लाइफ साइंसेज़ और केमिकल साइंसेज़। प्रत्येक पुरस्कार में रूपये 20,000/– का एक नगद

पुरस्कार और एक प्रशस्ति पत्र दिया जाता है। लाइफ साइंसेज़ में औषधि अनुसंधान उत्कृष्टता हेतु वर्ष 2011 का प्रतिष्ठित सीएसआईआर–सीडीआरआई पुरस्कार आईजीआईबी, नई दिल्ली के डॉ. शान्तनु चौधरी को उनके कार्य ''जीनोम वाइड प्रेडिक्शन्स ऑफ जी–क्वाड्रुप्लेक्स एज़ प्रामिसिंग ड्रग टारगेट्स'' के लिए दिया गया जबकि केमिकल साइंसेज़ में यह पुरस्कार डॉ. गंगाधर जे. संजायन, एन.सी.एल., पुणे को उनकी कार्य ''डिजाइन एण्ड डेवलपमेन्ट ऑफ आर्टीफ़िशयल प्रोटिनटी स्कैफल्ड्स विच मे बि आफ कन्सीडरेवल यूज़ इन इण्टरवीनिंग वेरिअस प्रोटीन टु प्रोटीन इन्टरैक्शन्स एण्ड सेल मेम्ब्रेन इन्टरैक्शन्स'' पर प्रदान किया गया।

सीडीआरआई पुरस्कार–2011 हेतु 26 सितम्बर, 2011 को समारोह का आयोजन किया गया। इण्डियन इन्स्टीट्यूट ऑफ साइंस, बंगलुरू के प्रो. एन जयरामन ने कार्यक्रम की अध्यक्षता की और ''पीईटीआईएम डेन्ड्राइमर जीन डिलीवरी प्लैटफार्म्स'' पर अपना व्याख्यान प्रस्तुत किया। डॉ. चौधरी ने ''एनदर डाइमेन्शन टु ज़ीन रेगुलेशनः द इमर्जिंग स्टोरी ऑफ जी क्वाड्रुप्लेक्स डीएनए स्ट्रक्चर एज़ मॉजीक्युलर टारगेटस'' पर व्याख्यान प्रस्तुत किया। डॉ संजायन ने ''फ्रॉम पेप्टाइड्स टु फोल्डेमर्सः यूज़ ऑफ नॉन को–वैलन्ट इन्टरैक्शन्स इन स्ट्रक्चरल डिज़ाइन'' पर व्याख्यान प्रस्तुत किया।

69वाँ सीएसआईआर स्थापना दिवस समारोह

26 सितम्बर, 2011 को संस्थान में 69वाँ सीएसआईआर स्थापना दिवस मनाया गया। इस दिन सीएसआईआर–सीडीआरआई संग्रहालय में विज्ञान प्रदर्शनी का आयोजन किया गया जिसका उद्घाटन इण्डियन इन्स्टीट्यूट ऑफ साइंस, बैंगलुरू के प्रो. एन. जयरामन द्वारा किया गया, जो कार्यक्रम के मुख्य अतिथि थे। प्रदर्शनी छात्रों और सामान्य जनता के लिए दिन भर खुली रही। विभिन्न स्कूल और कॉलेजों के 400 से अधिक छात्रों और शिक्षकों ने प्रदर्शनी और कुछ चुनी हुई प्रयोगशालाओं को देखा।

मुख्य समारोह अपराह्न में आयोजित किया गया। मुख्य अतिथि आईआईएससी, बैंगलुरू के प्रो. जयरामन ने श्रोताओं को संबोधित

किया। कार्यक्रम के दौरान अप्रैल से सितम्बर के सीएसआईआर न्यूज़लेटर (वॉल्यूम 3 सं.1) का विमोचन किया गया। बैठक में सीएसआईआर–सीडीआरआई के 26 सेवानिवृत्त कर्मचारी और 13 सहयोगियों को जिन्होंने सीएसआईआर की सेवा में 25 वर्ष पूरे कर लिए थे, उन्हें संस्थान की उन्नति और विकास हेतु दी गयी उनकी सेवाओं के लिए एक प्रमाण–पत्र, एक कलाई घड़ी और एक शाल देकर सम्मानित किया गया। इस अवसर पर निबन्ध/क्विज़ प्रतियोगिताओं के विजेताओं को डॉ. (श्रीमती) सुष्मिता चक्रवर्ती द्वारा पुरस्कार प्रदान किये गये।

सीएसआईआर–एचआरडीजी की स्कूल कॉलेजों को गोद लेने, शिक्षक प्रशिक्षण और अभिप्रेरणा की योजना

राष्ट्रीय स्तर पर विज्ञान एवं प्रौद्योगिकी के विकास एवं जनशक्ति को प्रोत्साहन एवं सहायता देने के लिए सीएसआईआर–एचआरडीजी ने स्कूल/कॉलेजों को गोद लेने, शिक्षक प्रशिक्षण तथा प्रोत्साहन की एक योजना तैयार की है। इस योजना का उद्देश्य सीएसआईआर प्रयोगशालाओं के निकट के स्कूल और कॉलेजों के विज्ञान शिक्षकों के लिए प्रशिक्षण एवं प्रेरणा कार्यक्रमों का आयोजन करना और विज्ञान के नये और उभरते हुए क्षेत्रों में उनके ज्ञान का उन्नयन करना है। यह विज्ञान के छात्रों को सीएसआईआर प्रयोगशालाओं से व्यवहार

बनाकर उनको विज्ञान को जीविका के रूप में अपनाने के लिए अभिप्रेरित करने पर भी प्रयत्नशील है। इस योजना के अन्तर्गत सीएसआईआर– सीडीआरआई ने निम्नलिखित तीन कॉलेजों को गोद लिया है–राजकीय इण्टर कॉलेज, हुसैनाबाद, लखनऊ, राजकीय बालिका इण्टर कॉलेज, लखनऊ एवं राजकीय जुबली इण्टर कॉलेज, लखनऊ।

सीएसआईआर–सीडीआरआई, लखनऊ यह कार्यक्रम वर्ष 2005–2006 से आयोजित कर रहा है। अक्सर यह देखा गया है कि केमिकल सॉल्वेन्ट और उपकरणों की कमी के कारण कॉलेज वैज्ञानिक प्रयोग कराने में कठिनाई का अनुभव करते हैं। इस समस्या से निपटने के लिए सीडीआरआई के निदेशक केमिकल, उपकरण इत्यादि उपलब्ध कराने के लिए गोद लिए हुए कॉलेजों को उनकी आवश्यकतानुसार सहायता देंगे। इसके अतिरिक्त कॉलेजों की इच्छानुसार वैज्ञानिकों/तकनीशियनों को प्रतिनियुक्ति करके तकनीकी सहायता भी दी जायेगी और कॉलेज परिसर में व्याख्यानमाला का आयोजन भी किया जाएगा।

सीएसआईआर स्थापना दिवस पर गोद लिए गये कॉलेजों के 150 छात्र, 15 शिक्षक और प्रधानाचार्यों को हमारी प्रयोगशालाएं, सुविधाएं और संग्रहालय आदि को देखने के लिए आमंत्रित किया गया है।

सीएसआईआर–सीडीआरआई में मॉस स्पेक्ट्रोमीट्री पर कार्यशाला–2011 का आयोजन

केमिकल और बायोलॉजिकल साइंस में मॉस स्पेक्ट्रोमीट्री (एम. एस.) सर्वाधिक महत्वपूर्ण विश्लेषणात्मक उपकरणों के साथ–साथ तेजी विकसित हो रहा अनुसंधान क्षेत्र भी है। पिछले कुछ वर्षों में अनुसंधानकर्ताओं का ध्यान इस ओर आकर्षित हुआ है। एम.एस. में द्रुतगामी प्रगति के बावजूद यह उपकरण की ऊँची कीमतों और रख–रखाव के कारण वैज्ञानिक समुदाय की पहुँच के बाहर रहा है। आवश्यकता इस बात की है कि संभावित प्रयोगकर्ताओं में इस तकनीक के प्रति जागरूकता उत्पन्न की जाए।

26–30 सितम्बर, 2011 को सीएसआईआर–सीडीआरआई के परिष्कृत विश्लेषणात्मक उपकरण सुविधा प्रभाग (सैफ़) द्वारा मॉस स्पेक्ट्रोमीट्री पर एक कार्यशाला का आयोजन किया गया। विभिन्न प्रयोगशालाओं/संस्थानों के 11 सहभागी उपस्थित थे। कार्यशाला में उपस्थित सभी व्यक्ति अपने क्षेत्र के विशेषज्ञ थे। कार्यशाला में मॉस स्पेक्ट्रोमीट्री की वर्तमान स्थिति के साथ–साथ ज्वलन्त विषयों और प्रगति के शक्तिशाली भविष्य के दौर पर विचार–विमर्श किया गया। इस कार्यशाला में सभी सहभागी क्यू ट्रैप एलसीएमएसएमएस और

4800 मैल्डी टीओएफ/टीओएफ उपकरणों पर कार्य करने के लिए प्रशिक्षित थे और जानकारियाँ और प्रश्न पूछने के लिए प्रोत्साहित किये गये। कार्यशाला ने परिष्कृत एम.एस. तकनीक को अनुभव करने का स्वर्णिम अवसर प्रदान किया तथा अनुसंधानरत वैज्ञानिकों और नए शोधकर्ताओं के मध्य रसायन विज्ञान और जीव विज्ञानों के अग्रणी क्षेत्रों में अपने ज्ञान के आदान–प्रदान के लिए विचार–विमर्श का प्रारम्भ किया।

प्रयोगशाला जन्तु प्रभाग, सीएसआईआर–सीडीआरआई, लखनऊ में जन्तुओं पर किये जाने वाले वैज्ञानिक प्रयोगों पर आधारित वैज्ञानिक और तकनीकी जागरूकता कार्यक्रम

सीएसआईआर–सीडीआरआई के जन्तु प्रयोगशाला प्रभाग द्वारा संस्थान के मानव विकास कार्यक्रम के एक भाग के रूप में जन्तुओं के वैज्ञानिक प्रयोग पर 10–14 अक्टूबर, 2011 को 'वैज्ञानिक तकनीकी जागरूकता' कार्यक्रम का आयोजन किया गया। यह कार्यक्रम जन्तुओं के वैज्ञानिक प्रयोगकर्ताओं विशेष रूप से नया कार्यभार ग्रहण करने वाले वैज्ञानिकों, तकनीकी कर्मचारियों, शोध छात्रों और विभिन्न जैव विज्ञानों के परियोजना सहायकों के लिए आयोजित किया गया। इस आयोजन का उद्देश्य भागीदारों को प्रयोग में लाये जाने वाले जन्तुओं की मानवोचित देखभाल के तरीकों की प्रारंभिक जानकारी और सामान्य जन्तु तकनीक की जानकारी प्रदान करना था जिससे वे अपने अनुसंधान के अन्तर्गत जन्तुओं पर वैज्ञानिक प्रयोगों के दौरान जन्तुओं

के कल्याण के कार्य को व्यवहार में ला सके। जन्तुओं पर वैज्ञानिक प्रयोग से उत्पन्न एक समान और विश्वसनीय अनुसंधान निष्कर्ष प्राप्त करने के लिए इस कार्यक्रम को अत्यधिक महत्वपूर्ण एवं पूर्व अपेक्षित माना गया। सीएसआईआर–सीडीआरआई के लगभग 19 प्रतिभागियों ने कार्यक्रम में भाग लिया।

सतर्कता जागरूकता सप्ताह 2011

केन्द्रीय सतर्कता आयोग के दिशा–निर्देशों के अनुसार 25 अक्टूबर से 1 नवम्बर, 2011 के दौरान सतर्कता जागरूकता सप्ताह मनाया गया। सीएसआईआर–सीडीआरआई स्टाफ के सभी सदस्यों ने अपनी संपूर्ण क्षमता से किसी भी कीमत पर पारदर्शिता सुनिश्चित

करने, भ्रष्टाचार की जड़ तक पहुंचकर समाज से उसका उन्मूलन करने की शपथ ली। इस अवसर पर,विभिन्न प्रतियोगिताएँ आयोजित की गई। डॉ. जी. के. गोस्वामी, आइपीएस, एसएसपी, इण्डियन रेलवेज, कार्यक्रम के मुख्य अतिथि ने इस अवसर व्याख्यान प्रस्तुत किया। सीएसआईआर–सीडीआरआई के निदेशक डॉ. टी.के. चक्रवर्ती ने कार्यक्रम की अध्यक्षता की। उनके प्रस्तुतीकरण का शीर्षक था ''कैन्सर एजुकेशन इन कम्युनिटी।'' कार्यक्रम में विभिन्न स्पर्धाओं के विजेताओं को पुरस्कृत किया गया।

''मलेरियारोधीः वर्तमान दृष्टिकोण और भविष्य के निर्देश'' विषय पर एक दिवसीय संगोष्ठी

सीएसआईआर–सीडीआरआई में 16 नवम्बर, 2011 को ओएसडीडीएम, ओएसडीडी केम आउटरीच और एम.एम.वी. के तत्वावधान में एक दिवसीय संगोष्ठी ''मलेरियारोधीः वर्तमान दृष्टिकोण और भविष्य के निर्देश'' का आयोजन किया गया। इस संगोष्ठी का आयोजन सीएसआईआर–आईआईटीआर प्रेक्षागृह में किया गया जिसमें सम्पूर्ण भारत से आये हुये शोधकर्ताओं और विदेशों से आये हुये वक्ताओं ने भाग लिया। श्रोताओं में वैज्ञानिक, शिक्षक और सीएसआईआर–सीएलआरआई, चेन्नई; सीएसआईआर–एनआइआइएसटी, त्रिवेन्द्रम; आईआईटी, कानपुर और गुवाहाटी; आईआईएसईआर, मोहाली; कोलकाता विश्वविद्यालय; सीएसआईआर–आईआईटीआर; सीएसआईआर–सीमैप; और सीएसआईआर–

सीडीआरआई के छात्रों ने भाग लिया। सीएसआईआर–सीडीआरआई के निदेशक डॉ. टी.के. चक्रवर्ती ने भारत और विदेशों से आये हुए मेहमानों के स्वागत से बैठक का शुभारंभ किया। डॉ. चक्रवर्ती ने एण्टी–इन्फेक्टिव के विकास हेतु ओपन साइंस की भूमिका पर जोर दिया और इस क्षेत्र में सी.एस.आई.आर. द्वारा प्रारम्भ किये गये विभिन्न कार्यक्रमों के विषय में श्रोताओं को बताया। डॉ. जेर्मी बरो, हेड डिस्कवरी, एम.एम.वी., जेनेवा, दिवस के प्रथम वक्ता थे। उन्होंने बताया कि एम.एम.वी. एक ऐसी संस्था है जो लाभ के लिए नहीं है, बल्कि मलेरियारोधी औषधियों की खोज एवं विकास और वितरण का महान उद्देश्यपूर्ण कार्य करने के लिए बनाई गई है।

सांप्रदायिक एकता सप्ताह–2011

नेशनल फाउण्डेशन फॉर कम्युनल हार्मोनी के दिशा–निर्देशों के अनुसार संस्थान में दिनांक 19–25 नवम्बर, 2011 के दौरान सांप्रदायिक एकता सप्ताह मनाया गया। इस अवसर पर सीएसआईआर–सीडीआरआई के सभी स्टाफ सदस्यों ने लोगों में सांप्रदायिक सद्भावना और राष्ट्रीय एकता को प्रभावशाली तरीके से बढ़ाने की शपथ ली।

एफ़ीमीट्रिक्स माइक्रोऐरे प्लेटफार्म पर ज़ीन एक्सप्रेशन अध्ययन कार्यशाला

विष विज्ञान प्रभाग में 28 नवम्बर से 1 दिसम्बर, 2011 के ऐफीमीट्रिक्स माइक्रोऐरे प्लेटफार्म पर जीन एक्सप्रेशन अध्ययन कार्यशाला का आयोजन किया गया जिसमें आई.एल.एस. नमूनों को तैयार करना, लेबलिंग करना, हाईब्रिडाईडेटा, इमेज़ एनालिसिस और डेटा की व्याख्या सम्मिलित थी। कार्यशाला व्यवहारिक प्रशिक्षण हेतु होने के कारण भागीदारी सीमित थी, जिसमें विभिन्न प्रभागों से केवल 10 शोध छात्रों ने भाग लिया।

औषधि खोज और विकास में चुनौतियों पर राष्ट्रीय सम्मेलन (सीडीडीडी–2011)

इण्डियन सोसायटी ऑफ केमिस्ट्स एण्ड बायोलॉजिस्ट्स इण्डिया ने 9–10 दिसम्बर, 2011 को सीएसआईआर–सीडीआरआई, लखनऊ में ''चैलेन्जेज़ इन ड्रग डिस्कवरी एण्ड डेवलपमेन्ट (सीडीडीडी–2011)'' पर राष्ट्रीय सम्मेलन का आयोजन किया। आईएससीबी के महासचिव डॉ. पी.एम.एस. चौहान इस सम्मेलन के आयोजक सचिव थे। आईएससीवी के अध्यक्ष प्रो. अनामिक शाह, इण्डियन काउन्सिल ऑफ केमिस्ट्स के अध्यक्ष और आगरा तथा अवध विश्वविद्यालय के भूतपूर्व कुलपति डॉ. डी.सी. सक्सेना उद्घाटन समारोह में उपस्थित थे। दो दिवसीय कार्यक्रम में प्रख्यात वैज्ञानिकों के 17 व्याख्यान और 4 मौखिक प्रस्तुतीकरण सम्मिलित थे। तीन पोस्टर सत्रों में युवा वैज्ञानिकों और पीएच.डी. छात्रों द्वारा 50 पोस्टर प्रस्तुत किये गये। विभिन्न वैज्ञानिकों ने औषधि अनुसंधान, केमिकल साइंसेज़, बायोनैनोटेक्नोलॉजी केमिकल बायोलॉजी, ग्लाइकोबायोलॉजी, बायोकैमिस्ट्री पर अपना कार्य प्रस्तुत किया गया। भारत के लगभग 150 प्रतिनिधियों ने इस सम्मेलन में भाग लिया।

''अणुओं से औषधि तक'' विषय पर सेमिनार

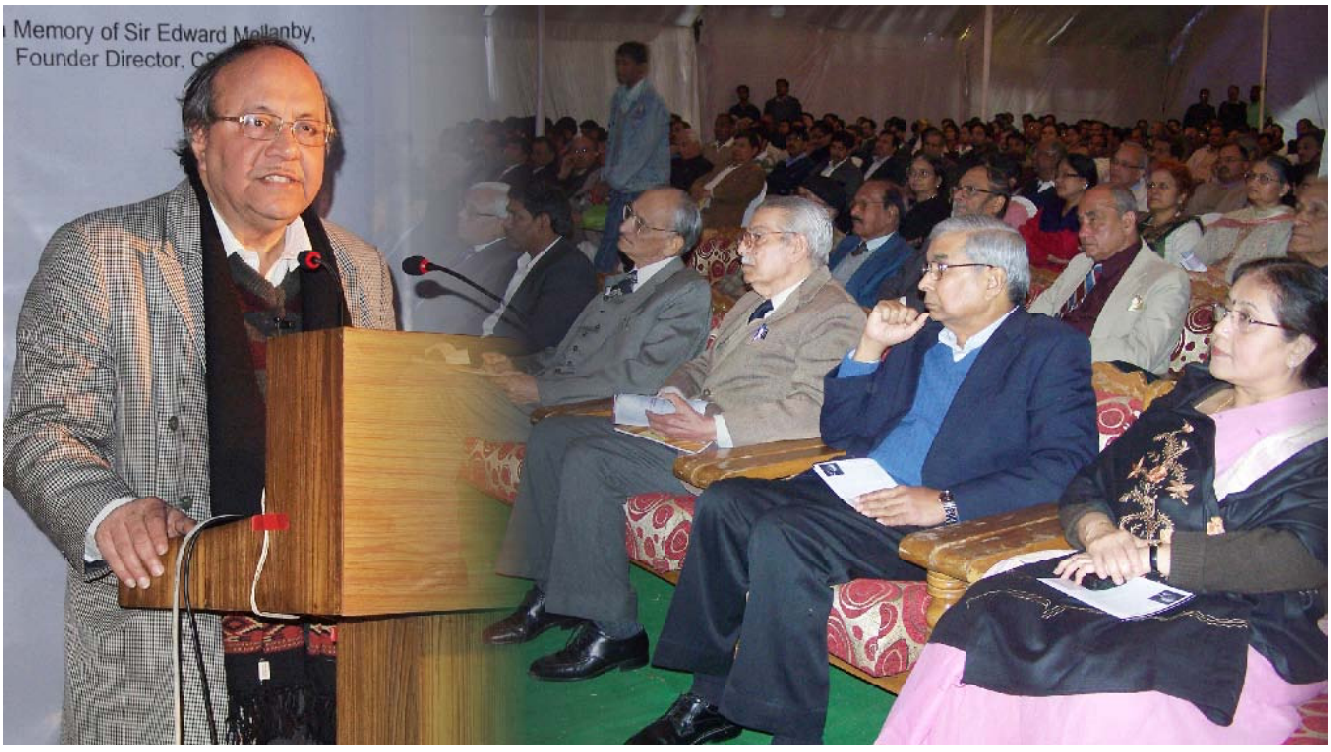
''अणुओं से औषधि तक'' विषय पर सेमिनार का आयोजन 17 दिसम्बर, 2011 को किया। सेमिनार में एसीबीएमआर, लखनऊ के निदेशक प्रो. सी.एल. खेत्रपाल ने मानव स्वास्थ्य में एनएमआर की

भूमिका पर चर्चा की। उन्होंने बताया कि किस प्रकार एनएमआर तकनीक का प्रयोग मेटाबोलिक विकृतियों और हृदय रोगों को नियंत्रित करने के लिए किया जाता है। विज्ञान और आध्यात्म के अंतरंग संबंधों पर विस्तृत चर्चा की गयी। फार्मा लैब प्रा. लि., मुंबई के डॉ. नरेश कुमार ने बताया कि किस प्रकार अणुओं में नवीनता उत्पन्न करने के लिए सरल तकनीक उपयोगी है जिससे इसमें पर्याप्त सफलता मिले। आई.एल.एस. भुवनेश्वर के डॉ. अंशुमान दीक्षित ने औषधि खोज में आण्विक मॉडलिंग की भूमिका और औषधि विकास की उन्नति के लिए विभिन्न तरीकों पर विचार–विमर्श किया। प्रो. मनोज कुमार सत्र के अध्यक्ष थे। सीएसआईआर–सीडीआरआई के भूतपूर्व निदेशक डॉ. नित्यानन्द ने डॉ. ए.के. सक्सेना के 60वें जन्मदिवस के अवसर पर उनको सम्मानित करने के लिए आयोजित किये गये कार्यक्रम की अध्यक्षता की। इस अवसर पर सीएसआईआर–सीडीआरआई के भूतपूर्व निदेशक डॉ. बी.एन. धवन ने भी अपने विचार व्यक्त किये। बाद में सीएसआईआर–सीडीआरआई के निदेशक डॉ. टी.के. चक्रवर्ती ने वक्ताओं से बातचीत की। वैज्ञानिकों एवं छात्राओं ने सत्र के दौरान एक दूसरे से विचार–विमर्श किया। अन्त में डॉ. आर.पी. त्रिपाठी ने धन्यवाद ज्ञापन दिया।

37वाँ सर मेलानबी स्मृति व्याख्यान

सीएसआईआर–सीडीआरआई के संस्थापक निदेशक सर एडवर्ड मेलनत्री की स्मृति में 37वाँ मेलनबी स्मृति व्याख्यान का आयोजन 10 फरवरी 2012 को किया गया। इस अवसर पर सीएसआईआर के महानिदेशक प्रो. समीर ब्रह्मचारी ने व्याख्यान दिया। उनके व्याख्यान

का शीर्षक था, ''साइन्स 2.0: ओपन सोर्स ड्रग डिस्कवरी इन सायबर स्पेस''। अपने व्याख्यान में उन्होने बताया Mtb bug के पहचान एवं निराकरण के लिए बेव बेस्ड ओपन इन्नोवेशन प्लेटफार्म ने नए अवसर प्रदान किए हैं। साथ ही उन्होने बताया कि इस नए डाटा सेट का उपयोग करते हुए हमने Mtb का एक प्रोटीन इन्टरेक्शन मैप तैयार किया है जिसमे 1400 से ज्यादा प्रोटीन्स सम्मिलित हैं। जिसमे वो प्रोटीन भी चिन्हित किए गए है जो Mtb के वृद्धि एवं अस्तित्व को बनाए रखने के लिए आवश्यक है। व्याख्यान से ज्ञात हुआ कि किस प्रकार इस विधि से औषधि अनुसंधान को त्वरित एवं सुगम बनाया जा सकता है।



2 अति विशिष्ट आगुन्तक एवं व्याख्यान का विवरण

नाम एवं पता	व्याख्यान का शीर्षक	दिनाँक
डा. प्रवीन मुत्तिल न्यू मेक्सिको विश्वविद्यालय अल्बुकर्क	इन्हेल्ड ड्राइ पाउडर फॉर कीमोथेरपी एण्ड वैक्सिनेशन	04.01.2011
डॉ. सिमी अली न्यूकैसल विश्वविद्यालय यूनाइटेड किंगडम	रेगुलेशन ऑफ केमोकाइन फंक्शन ड्यूरिंग इन्फ्लेमेशन	04.01.2011
डॉ. एस. सी. पांडे इलिनॉइस विश्वविद्यालय यूके	एपिजेनेटिक्स–बियॉन्ड द जीनोम इन अल्कोहलिज्म	19.01.2011
डॉ. कल्लोलमय बिस्वास एडिनबर्ग, विश्वविद्यालय यूके	सक्सेज इन सेलेक्टिव कैटालिसिस फॉर ऑर्गेनिक सिन्थेसिस् एण्ड डेवलपमेन्ट ऑफ ड्रग्स इन मेडिसिनल केमिस्ट्री	21.01.2011
डॉ. शान्तनु चक्रवर्ती सिनसिनाटी चिल्ड्रेन्स हॉस्पिटल, यूएसए	ट्विस्ट्ल एण्ड टीबीX20 फंक्शन इन हार्ट डिवलेपमेन्ट एण्ड डिजीज़	25.01.2011
प्रो पीटर यार्क ब्रैडफोर्ड विश्वविद्यालय यूके	पार्टिकल इन्जीनियरिंग फॉर रेस्पाइरेटरी ड्रग डिलीवरी	31.01.2011
डॉ. एम.के. रायजादा फ्लोरिडा विश्वविद्यालय यूएसए	एन्जियोटेन्सिन कनवर्टिंग एन्जाइम 2 एज नॉवेल टारगेट फॉर कार्डियोपल्मोनरी थेराप्यूटिक्स	08.02.2011
डॉ. पी.एन. यादव नार्थ कैरोलिना विश्वविद्यालय, यूएसए	क्रिटिकल रोल ऑफ सेरोटोनिन एण्ड इट्स रिसेप्टर्स इन एण्टीसाइकोटिक ड्रग एक्शन	21.02.2011
डॉ अतीक अहमद जिना फार्मास्युटिक्ल्स इंक. यूएसए	टार्गेटिंग एचईआर2 ईआर एण्ड एनडॉक्जिफेन एज ए न्यू कॉर्नरस्टोन फॉर ब्रेस्ट कैन्सर थेरैपी	25.03.2011
डॉ राजीव एस मेनन ऑस्ट्रेलियन नैशनल यूनिवर्सिटी, केनबरा	ए जर्नी इन सिन्थेसिसः फ्रॉम परहाइड्रोऐज्यूलिन्स टु ए गोल्ड माइन ऑफ हेट्रोसाइकल्स	30.03.2011
डॉ मार्टिन डिफेज सी एन आर एस, फ्रांस	बायोलॉजिकल साइंस कोऑपरेटिव प्रोग्राम बिटवीन सीएनआरएस एण्ड इंडिया एण्ड यूरोप	08.04.2011
डॉ पारूल त्रिपाठी आई सी जी ई बी, नई दिल्ली	ऐथ्रोस्क्लेरोसिसः द इम्यूनोलॉजिकल ऑरकेस्ट्रा	25.04.2011
डॉ अमित के पांडे मैसाचुसेट्स विश्वविद्यालय, मेडिकल स्कूल, यूएसए	माइकोबैक्टीरियम ट्यूबरकुलोसिस ऑन स्टेरॉयड्स	19.05.2011
डॉ. रविनटराजन केमक्स्ट्री, मुम्बई	डिस्कवरी ऑफ न्यू क्लास ऑफ पोटेन्ट, सेलेक्टिव एण्ड एफीकेशियस पी 38 एमएपी काइनेज इनहिबिटर्स फॉर द ट्रीटमेन्ट ऑफ रयूमैटाइड आर्थराइटिस	23.05.2011
डॉ. कुमारवेलु जगवेलु मेयो क्लीनिक, रोचेस्टर	प्रोटेक्टिव रोल ऑफ एमके2 इन ऐथ्रोस्क्लेरोसिस	09.06.2011
डॉ. डेनिस मार्टिन डीएनडीआई, जेनेवा	डीएनडीआई स्ट्रैटेजीज टु आइडेन्टिफाई एण्ड डेवलप न्यू केमिकल एन्टिटीज टु ट्रीट विसरल लीशमैनिएसिस	07.06.2011

नाम एवं पता	व्याख्यान का शीर्षक	दिनाँक
डॉ सुशान्त कार सीएसआईआर–आईआईसीबी, कोलकाता	फ्रॉम सेल्स टु सिगनलिंग कैस्केड्सः मैनिपुलेशन ऑफ मैक्रोफेज डिफेन्स बाय लीशमैनिया पैरासाइट्स	14.06.2011
डॉ. श्रीधर गुप्ता हेरिटेज इन्स्टीट्यूट ऑफ टेक्नोलॉजी, कोलकाता	ए न्यू विस्टा टुवर्ड्स पैरासाइटिक प्रोटोजोअन्सः लीशमैनिया एण्ड ट्रिपैनोसोमा	16.06.2011
डॉ. केम्पैइया रायावरा लेबोरेट्री ऑफ मलेरिया एण्ड बेक्टर रिसर्च, एनआईएच, यूएसए	फंक्शनल मेकैनोसेन्सिटिव आयन चैनल इन प्लाजमोडियम फैल्सीपैरम	01.07.2011
प्रो. तेजेन्दर एस. ठाकुर इण्डियन इन्स्टीट्यूट ऑफ साइंस, बैंगलोर	कम्प्यूटेशनल एण्ड एक्सपेरीमेन्टल स्टडीज़ ऑन वीक नॉन वॉन्टेड इन्टरैक्शन्स	27.07.2011
डॉ. शुभव्रत चौधरी ग्लासगो विश्वविद्यालय यूके	टुवर्ड्स द टोटल सिन्थेसिस ऑफ पोटेन्ट एन्टीफंगल एजेन्ट गेम्बीरिक एसिडः स्टीरियो सेलेक्टिव प्रिपरेशन ऑफ ए.डी. रिंग फ्रैगमेन्ट	09.08.2011
डॉ. श्रीनिवास पेन्टयाला स्टोनी ब्रुक मेडिकल सेन्टर, न्यूयार्क	ट्रान्सलेशनल ऐप्रोच टु ड्रग डिस्कवरी	09.08.2011
प्रो. राजकुमार द कॉमन वेल्थ मेडिकल कॉलेज, स्क्रैन्टन, यूएसए	स्ट्रक्चर एण्ड फंक्शन्स ऑफ द स्टेरॉयड हॉर्मोन रिसेप्टर्स	18.08.2011
डॉ यूसुफ अख्तर यूरोपियन मॉलीक्युलर बायोलॉजी लेबोरेट्री हैम्बर्ग, जर्मनी	मॉलीक्यूलर एण्ड स्ट्रक्चरल स्टडीज ऑन टार्गेट्स फ्रॉम माइकोबैक्टीरियम ट्यूबरकुलोसिस	25.08.2011
डॉ सेन्थिल दुरइसामी जी 7 सिनर्गान प्राइवेट लिमिटेड, बैंगलुरू	जी प्रोटीन कपल्ड रिसेप्टर (जीपीसीआरएस) एण्ड ड्रग डिस्कवरीः ए हिस्टोरिकल पर्सपेक्टिव	29.08.2011
डॉ. एस चन्द्रशेखर सीएसआईआर–आईआईसीटी, हैदराबाद	टोटल सिन्थेसिस् ऑफ मैरिन नैचुरल प्रॉडक्ट्स एज फार्मास्युटिकल लीड्स	19.09.2011
प्रो. डॉ. जोर्ग रेडमन लिबनिज रिसर्च इन्स्टीट्यूट फॉर मॉलीक्युलर, फार्माकॉलोजी, जर्मनी	फ्रैगमेन्ट बेस्ड प्रोटीन लिगैन्ड डिस्कवरी बाय डाइनामिक लाइगेशन स्क्रीनिंग	04.11. 2011
डॉ. मल्लिकार्जुन बदादानी कैलिफोर्निया विश्वविद्यालय इर्विन, यूएसए	वीसीपी (पी 97) फंक्शन, डिजीजेज़ एण्ड माउस मॉडल	2.12.2011
डॉ. अजीत सी कुँवर सीएसआईआर–आईआईसीटी, हैदराबाद	प्रो. के. रंगधामा मेमोरियल लेक्चर (2011) एनटाइटिल्ड पेप्टाइटिक फोल्डैमर्स–स्ट्रक्चरल पर्सपेक्टिव फ्रॉम एनएमआर	5.12.2011

3 संस्थान के वैज्ञानिकों द्वारा दिये गये व्याख्यान

डॉ. टी.के. चक्रवर्ती

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डॉ. अरुण त्रिवेदी

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डॉ. राजेन्द्र सिंह

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डॉ. संजीव कुमार शुक्ला

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डॉ. जे.आर. गायेन

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श्री हरीश गौनियाल

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4 विदेश यात्रा

वैज्ञानिक का नाम	देश	यात्रा का उद्देश्य (प्रतिनियुक्ति की अवधि)
डॉ. टी.के. चक्रवर्ती	रूस	भारत–रूस बैठक में व्याख्यान देने के लिए (13 से 16 जून, 2011) अन्तर्राष्ट्रीय सम्मेलन में व्याख्यान देने के लिए (12 से 15 फरवरी, 2012)
	दुबई	अन्तर्राष्ट्रीय सम्मेलन में भाग लेने के लिए (12 से 15 फरवरी, 2012)
डॉ. ए.के. सक्सेना	कनाडा	कार्यशाला में भाग लेने के लिए (13 से 15 फरवरी, 2011)
	स्लोवेनिया और जर्मनी	अन्तर्राष्ट्रीय संगोष्ठी में भाग लेने के लिए (03 से 16 सितम्बर, 2011)
डॉ. गौतम पालित	दक्षिणी कोरिया	अन्तर्राष्ट्रीय सम्मेलन में भाग लेने के लिए (09 से 11 नवम्बर, 2011)
डॉ. मधु दीक्षित	इटली	सम्मेलन व परियोजना बैठक में भाग लेने के लिए (23 से 26 मार्च, 2011)
	स्पेन	प्रो. सैंटियागों लामस के साथ बैठक हेतु (31 अगस्त से 14 सितम्बर, 2011)
	इटली	व्याख्यान देने के लिए (09 सितम्बर, 2011)
	वियना, ऑस्ट्रिया	यूरोपीय संघ–भारत विज्ञान एवं प्रौद्योगिकी समन्वयन दिवस 2011 में व्याख्यान देने के लिए (01 से 02 दिसम्बर, 2011)
	जर्मनी	परियोजना बैठक में भाग लेने के लिए (03 से 07 दिसम्बर, 2011)
डॉ. राकेश शुक्ला	स्काटलैण्ड	इन्सा–आरएसई अन्तर्राष्ट्रीय विनिमय कार्यक्रम के अन्तर्गत (24 अगस्त से 23 सितम्बर, 2011)
डॉ. सुधीर कुमार सिन्हा	स्विट्जरलैण्ड	इण्डो–स्विस संगोष्ठी में भाग लेने लिए (04 से 6 मई, 2011)
	स्विट्जरलैण्ड	अग्रिम अनुसंधान कार्य के लिए (01 से 30 अक्टूबर, 2011)
डॉ. डी.एस. उपाध्याय	नीदरलैण्ड	अन्तर्राष्ट्रीय प्रशिक्षण कार्यक्रम में भाग लेने के लिए। (04 से 15 जुलाई, 2011)
डॉ. नीना गोयल	मेक्सिको	अन्तर्राष्ट्रीय सम्मेलन में भाग लेने के लिए (11 से 15 दिसम्बर, 2011)
डॉ. नीलू सिंह	यूएसए	वरिष्ठ जैव चिकित्सा वैज्ञानिकों के लिये अन्तर्राष्ट्रीय फेलोशिप (14 से 28 फरवरी, 2011)
श्री प्रदीप कुमार श्रीवास्तव	ब्राजील	अन्तर्राष्ट्रीय सम्मेलन एवं बैठक में भाग लेने के लिए। (04 से 08 सितम्बर, 2011)
डॉ. शरद शर्मा	इज़रायल	जीएलपी निरीक्षकों के लिए ओईसीडी जीएलपी प्रशिक्षण कार्यक्रम में भाग लेने के लिए । (31 अक्टूबर से 02 नवम्बर, 2011)
डॉ. समन हबीब	यू.के.	बैठक में भाग लेने के लिए। (14 मार्च, 2011)
	इटली	बैठक में भाग लेने के लिए। (06 से 07 अक्टूबर, 2011)
डॉ. अतुल गोयल	जर्मनी	अलेंक्जेंडर वॉन हम्बोल्डट फेलोशिप के अन्तर्गत शेष शोध/अनुसंधान कार्य पूरा करने हेतु। (02 मई से 30 जुलाई, 2011)
डॉ. जे. वेंकटेश प्रताप	फ्रांस	यूरोपीय सिंक्रोट्रोन विकिरण सुविधा में प्रयोग कार्य हेतु। (09 से 12 जुलाई, 2011)
डॉ. मनोज बर्थवाल	यूएसए	अग्रिम अनुसंधान को जारी रखने के लिए। (15 नवम्बर, 2010 से 14 नवम्बर, 2011)
डॉ. रितु त्रिवेदी	आस्ट्रेलिया	बैठक में भाग लेने के लिए। (04 से 08 सितम्बर, 2011)
डॉ. आमिर नाज़ीर	आस्ट्रेलिया	वार्षिक सम्मेलन में भाग लेने के लिए। (10 से 13 जुलाई, 2011)

5 वैज्ञानिक समितियों की सदस्यता

डॉ तुषार कान्ति चक्रवर्ती

- **सदस्य** : अमेरिकन कैमिकल सोसाइटी, यू.एस.ए.
- **आजीवन सदस्य** : (1) कैमिकल रिसर्च सोसाईटी ऑफ इण्डिया; (2) इण्डियन कैमिकल सोसाइटी; (3) इण्डियन पेप्टाइड सोसाइटी
- **सदस्य** : (1) सीनियर साइंस कमेटी, ओएसडीडी; (2) कैमिकल साइंसेज सेक्शनल कमेटी, इण्डियन अकादमी ऑफ साइंसेज; (3) सेक्शनल कमेटी III इन कैमिकल साइंसेज, द इण्डियन नेशनल साइंस अकादमी (4) प्रोग्राम एडवाइज़री कमेटी (आर्गनिक कैमेस्ट्री) डीएसटी; (5) स्टियरिंग कमेटी, नेशनल बायो–रिर्सोस डेवलपमेंट बोर्ड, डीबीटी; (6) सब–कमेटी ऑफ स्पॉन्सर्ड स्कीम्स रिसर्च कमेटी, सीएसआईआर; (7) एक्सपर्ट कमेटी, ड्रग्स एण्ड फार्मास्यूटिकल्स रिसर्च प्रोग्राम, डीएसटी; (8) ड्रग्स टेक्निकल एडवाइज़री बोर्ड, मिनिस्टरी ऑफ हेल्थ एंड फैमिली वेलफेयर; (9) टेक्निकल एडवाइज़री कमेटी, टेक्नोलॉजी डेवलपमेण्ट एण्ड यूटीलाईजेशन प्रोग्राम फॉर विमिन, डीएसआईआर; (10) हाई पॉवरड कमेटी, एनएमआईटीएलआई प्रोजेक्ट्स, सीएसआईआर;
- **सदस्य, संपादक मंडल:** (1) इण्डियन जर्नल ऑफ कैमेस्ट्री, बी; (2) इण्डियन जर्नल ऑफ बायोकैमेस्ट्री एण्ड बायोफिजिक्स; (3) दि नेचुरल प्रोडक्ट्स जर्नल

डॉ ए.के. सक्सेना

- **सदस्य** : अमेरिकन केमिकल सोसाइटी, यू.एस.ए.
- **सदस्य** : (1) एक्सपर्ट कमिटी, मिनिस्टरी ऑफ केमिकल एंड फर्टीलाइजर, डिपार्टमेन्ट ऑफ फारमाक्यूटिकल्स (इंडिया); (2) आइएनडी कमिटी, डायरेक्टरेट जनरल ऑफ हेल्थ सर्विसेज, ऑफिस ऑफ ड्रग्स कन्ट्रोलर जनरल (इंडिया); (3) रीच इंडिया टास्क फोर्स, डिपार्टमेन्ट ऑफ केमिकल एंड पैट्रोकेमिकलस, गवर्नमेन्ट ऑफ इंडिया; (4) बोर्ड ऑफ इन्टरनेशनल चैरिटेबल फाउन्डेशनस (साइन्टिफिक पार्टनरशिप) कॉरडिनेटिंग बोर्ड, रशिया; (5) बोर्ड ऑफ डायरेक्टर्स, अमेरिकन बिब्लियोग्राफी इंक. यूएसए
- **यूजीसी नॉमिनी:** एडवाइजरी कमेटी, स्पेशल असिस्टेन्स प्रोगाम; (1) डिपार्टमेन्ट ऑफ केमिस्ट्री, सौराष्ट्र यूनिर्वसिटी, राजकोट; (2) डिपार्टमेन्ट ऑफ केमिस्ट्री, एपीएस यूनिर्वसिटी, रीवा
- **सचिव:** क्यूएसएआर सोसाइटी ऑफ इंडिया
- **आजीवन सदस्य:** (1) इण्डियन कैमिकल सोसाइटी; (2) इण्डियन एसोशिएसन ऑफ मेडिसिनल केमिस्ट

डॉ एस.के. पुरी

- **उपाध्यक्ष:** इंडियन सोसाइटी फॉर पैरासीटोलॉजी
- **सदस्य:** साइंटिफिक एडवाइज़री कमेटी, वेक्टर कांट्रोल रिसर्च सेण्टर, पांडिचेरी

डॉ जी. पालित

- **सदस्य:** इण्टरनेशनल एडवाइजरी कमेटी ऑफ इण्टरनेशनल कांग्रेस ऑफ इथनोफार्माकोलोजी

डॉ सी. नाथ

- **आजीवन सदस्य:** (1) इण्टरनेशनल ब्रेन रिसर्च अर्गोनाइजेशन; (2) नेशनल अकादमी ऑफ मेडिकल साइंसेज; (3) इण्डियन फार्माकोलॉजिकल सोसाइटी; (4) इण्डियन अकादमी ऑफ न्यूरोसाइंसेज; (5) सोसाइटी ऑफ टॉक्सीकोलॉजी, इण्डिया;
- **सदस्य:** (1) एडवाइजरी कमेटी फॉर आईएनडी परमिशन, ड्रग कन्ट्रोलर जनरल ऑफ इण्डिया, मिनिस्ट्री ऑफ हेल्थ, गवर्नमेंट ऑफ इण्डिया; (2) रिसर्च काउन्सिल, आइआईटीआर; (3) अकेडमिक कमेटी, जेएनयू, नई दिल्ली
- **सदस्य, संपादक मंडल:** टॉक्सीकोलॉजी इण्टरनेशनल

डॉ अशीम घटक

- **सदस्य:** (1) अमेरिकन कॉलेज ऑफ क्लीनिकल फार्माकोलोजी; (2) नेशनल अकेडमी ऑफ मेडिकल साइंसेज (एमएनएएमएस)
- **फेलो:** इंडियन कॉलेज ऑफ फिजिशियन्स–एफआइसीपी

डॉ ए.के. द्विवेदी

- **आजीवन सदस्य:** इण्डियन फार्मास्यूटिकल एसोसिएशन
- **सदस्य:** ड्रग्स पैनल फॉर न्यू ड्रग मैन्यूफैक्चिरिंग लाईसेंसेज़, डायरेक्ट्रेट ऑफ मेडिकल एण्ड हेल्थ सर्विसेज, यू.पी.
- **संयुक्त सचिव:** इंडियन सोसाइटी ऑफ केमिस्ट एंड बायोलॉजिस्ट, लखनऊ

डॉ मधु दीक्षित

- **प्रेसीडेंट:** द साइटोमेट्री सोसायटी ऑफ इण्डिया
- **सदस्य:** (1) स्टीयरिंग कमेटी, एमओइएस प्रोजेक्ट, न्यू दिल्ली, (2) ऑरगेनिक एंड मेडिसिनल केमिस्ट्री एंड केमिकल टेक्नोलॉजी रिसर्च कमिटी, सीएसआइआर, नई दिल्ली

डॉ अनुराधा दुबे

- **सदस्य, एडिटोरियल बोर्ड:** (1) जर्नल ऑफ बायोमेडिकल रिसर्च; (2) बायोमेड सेन्ट्रल, इन्फेक्शस डिजीज़ज (ओपन एक्सेज़)

डॉ जे.के. सक्सेना

- **सेक्रेटरी:** द इण्डियन सोसाइटी फॉर पैरासीटालॉजी
- **वाईस प्रेसीडेंट:** सोसाइटी ऑफ बायोलॉजिस्ट्स एण्ड कैमिस्ट
- **सदस्य:** एडिटोरियल बोर्ड, एशियन पैसिफिक जर्नल ऑफ ट्रोपीकल मेडिसिन
- **आजीवन सदस्य:** (1) इंडियन सोसाइटी फॉर पैरासिटोलॉजी; (2) सोसाइटी ऑफ बायोलॉजिकल केमिस्ट्स (इंडिया); (3) इंडियन इम्युनोलोजीकल सोसाइटी; (4) इन्टरनेशनल सोसाइटी ऑफ एप्लाइड बायोलॉजी; (5) इंडियन नेशनल साइंस कांग्रेस एसोशिऐसन; (6) इंडियन सोसाइटी ऑफ केमिस्टस एंड बायोलॉजिस्टस
- **फेलो:** जुलोजिकल सोसाइटी ऑफ इंडिया

डॉ नैबेद्य चट्टोपध्याय

- **सदस्य एडिटोरियल बोर्ड:** (1) अमेरिकन जर्नल ऑफ फिज़ियोलॉजी (इण्डोक्राइनोलॉजी मेटाबोलाजिम); (2) बायोकैमिकल फार्माकोलॉजी; (3) वर्ल्ड जर्नल ऑफ फार्माकोलॉजी

डॉ नीरज सिन्हा

- **आजीवन सदस्य:** (1) नेशनल अकादमी ऑफ साइंसेज, इलाहाबाद; (2) इण्डियन सोसाइटी ऑफ सेल बायोलॉजी, नई दिल्ली; (3) सोसाइटी ऑफ टॉक्सीलॉजिस्ट ऑफ इण्डिया, इज्जतनगर; (4) इण्डियन साइंस कांग्रेस एसोसिएशन, कोलकाता; (5) एसोसिएशन ऑफ बायोटेक्नोलॉजी एण्ड फार्मेसी, इण्डिया

डॉ डी.एस. उपाध्याय

- **सदस्य:** (1) सीपीसीएसईए सब–कमेटी फॉर रिहैबिलिटेशन ऑफ लेबोरेटरी एनीमल्स; (2) लाइव स्टॉक फीड, इक्विपमेन्ट्स एण्ड सिस्टम, सेक्शनल कमेटी, एफएडी 5, ब्यूरो ऑफ इण्डियन स्टैनडर्ड, नई दिल्ली; (3) वेटनरी कांउसिल ऑफ इण्डिया; (4) यूपी वेटनरी कॉन्सिल, लखनऊ
- **सीएसआईआर नामिनी:** नेशनल इंस्टीट्यूट ऑफ एनीमल वेलफेयर एमओइएफ, गवर्नमेन्ट ऑफ इंडिया

डॉ पी.एम.एस चौहान

- **जरनल सेक्रेटरी:** इण्डियन सोसाइटी ऑफ कैमिस्ट एण्ड बायोलॉजिस्ट
- **एक्सीक्यूटिव सदस्य एंड सेक्शनल प्रेसिडेन्ट:** इण्डियन कांउसिल आफ कैमिस्ट्स (30वीं आइसीसी, हैदराबाद)
- **एडिटर इन चीफ:** केमिस्ट्री एंड बायोलॉजी इन्टरफेस
- **सदस्य एडिटोरियल बोर्ड:** (1) फ्यूचर मेडिसिनल केमिस्ट्री; (2) जनरल रिसर्च एंड रिपोर्ट इन मेडिसिनल केमिस्ट्री; (3) माइकोबैक्टीरियल डिजीजेज; (4) ग्लोबल जनरल ऑफ ऑरगेनिक केमिस्ट्री

डॉ अनिला द्विवेदी

- **आजीवन सदस्य:** सोसाइटी ऑफ रीप्रोडक्टीव बायोलॉजी एंड कम्पैरटिव इन्डोक्राइनोलॉजी, इंडियन सोसाइटी फॉर स्टडी ऑफ रिप्रोडक्शन एंड फर्टिलिटी, इन्डोक्राइन सोसाइटी ऑफ इंडिया

डॉ वी एल शर्मा

- **आजीवन सदस्य:** केमिकल रिसर्च सोसाइटी ऑफ इंडिया, बैंगलुरु

डॉ रेणु त्रिपाठी

- **आजीवन सदस्य:** जूलोजिकल सोसाइटी ऑफ इंडिया, बोध गया
- **सदस्य :** ऑरगनाइजिंग कमेटी, 22 ऑल इंडिया कांग्रेस ऑफ जूलोजी 2011

डॉ डी.एन. उपाध्याय

- **आजीवन सदस्य:** सोसाइटी फॉर एडवान्समेन्ट ऑफ इलेक्ट्रोकेमिकल साइंस एंड टेक्नोलॉजी

डॉ एम. एन. श्रीवास्तव

- **सदस्य:** बोर्ड ऑफ पैनल फॉर पीएससी ऑन आर एंड डी ऑफ सेन्ट्रल सेक्टर स्कीम फॉर कन्सर्वेशन डेवलपमेन्ट एंड सस्टेनबल मैनेजमेन्ट ऑफ मेडिसिनल प्लाट्स, नेशनल मेडिकनल प्लाटंस बोर्ड, (आयुष), मिनिस्ट्री ऑफ हेल्थ एंड फैमिली वेलफेयर, गवर्नमेन्ट ऑफ इंडिया

डॉ ए.के. श्रीवास्तव

- **आजीवन सदस्य:** इण्डियन सोसाइटी ऑफ पैरासीटालॉजी

डॉ. नीना गोयल

- **सदस्य एक्सीक्युटिव कमिटि :** इण्डियन सोसाइटी फॉर पैरासीटालॉजी

डॉ समन हबीब

- **सदस्य:** (1) एक्सपर्ट एडवाईजरी ग्रुप, सीआरआईएमएएल डीडीआई (कोआर्डिनेशन, रेशनलाईजेशन एण्ड इंटग्रेशन ऑफ एण्टीमलेरियल ड्रग डिस्कवरी इनिशियेटिव) प्रोजेक्ट ऑफ द यूरोपियन यूनियन; (2) इण्डियन सोसाइटी फॉर सेल बायोलॉजी

डॉ गोपाल गुप्ता

- **आजीवन सदस्य:** इंडियन सोसाइटी फॉर स्टडी ऑफ रिप्रोडक्शन एण्ड फर्टिलिटी

डॉ जवाहर लाल

- **सलाहकार:** करेन्ट ट्रेन्ड्स इन फार्मास्यूटिकल रिसर्च
- **सदस्य एडिटोरियल एडवाइजरी बोर्ड:** केमिस्ट्री एण्ड बायोलॉजी इन्टरफेस

डॉ श्रीकांत कुमार रथ

- **ज्वांइट सेक्रेटरी–इलेक्टेड:** इण्डियन सोसाइटी फॉर सेल बायोलॉजी (2011–13)

- **आजीवन सदस्यः** (1) इण्डियन सोसाइटी ऑफ सेल बायोलॉजी; (2) सोसाइटी ऑफ टोक्सीकोलोजी, इंडिया;(3) एनवायरमेन्टल म्यूटाजन सोसाइटी ऑफ इंडिया; (4) जीनोम फाउण्डेशन, इंडिया
- **सदस्य एडिटोरियल बोर्डः** टोक्सीकोलोजी इन्टरनेशनल

डॉ अमित मिश्रा

- **आजीवन सदस्यः** इण्डियन फार्मास्यूटिक्ल एसोसिएशन

डॉ संजय बत्रा

- **सदस्यः** (1) कॉन्सिल ऑफ एनओएसटी, इंडिया (2011–2014); (2)गवर्निंग कॉन्सिल, केमिकल रिसर्च सोसाइटी ऑफ इंडिया, बैंगलुरू

श्री प्रेम प्रकाश

- **सदस्यः** इण्डियन फार्मास्यूटिक्ल एसोसिएशन

डॉ आशीष अरोरा

- **सदस्यः** एनएमआरएस, इंडिया

डॉ अतुल गोयल

- **आजीवन सदस्यः** (1) केमिकल रिसर्च सोसाइटी ऑफ इंडिया, बैंगलुरु; (2) इंडियन केमिकल सोसाइटी

डॉ आर.के. त्रिपाठी

- **आजीवन सदस्यः** (1) सोसाइटी ऑफ टॉक्सीकोलॉजी, इण्डिया; (2) इंडियन सोसाइटी ऑफ सेल बायोलॉजी

डॉ के. आर. आर्या

- **सदस्य एक्सक्यूटिव कॉन्सिलः** (1) सोसाइटी ऑफ इथेनोबोटेनिस्ट्स; (2) बोर्ड ऑफ पैनल फॉर डीपीसी इन डायरेक्टरेट ऑफ सेन्सस (यूपी), गवर्नमेन्ट ऑफ इंडिया

डॉ पी.आर. मिश्रा

- **सदस्य, एडिटोरियल बोर्डः** (1) रिसेण्ट पेटेण्टस इन ड्रग डिलवरी एण्ड फार्मुलेशन्स; (2) जर्नल ऑफ फार्मास्यूटिक्ल एण्ड बायोमेडिकल साइंसेज
- **फाउण्डर सदस्यः** इण्डियन नैनोसाइंस सोसाइटी
- **आजीवन सदस्यः** इंडियन फार्मास्युटिकल एसोसिएशन

डॉ मनीष चौरसिया

- **आजीवन सदस्यः** इंडियन फार्मेसी ग्रेजुएट एसोसिएशन

डॉ धनंजय हंसदा

- **सदस्यः** (1) इण्डियन एसोसिएशन ऑफ वेटरनरी माइक्रोबायोलॉजिस्ट, इंम्यूनॉलॉजिस्ट एण्ड स्पेशलिस्ट इन इन्फेक्शियस डिजीज़ेज; (2) वेस्ट बंगाल वेटरनरी कांउसिल

डॉ अखिलेश ताम्रकार

- **सदस्यः** सोसाइटी ऑफ बायोलॉजिकल केमिस्ट, इंडिया

डॉ प्रेम प्रकाश यादव

- **आजीवन सदस्यः** केमिकल रिसर्च सोसाइटी ऑफ इंडिया, बैंगलुरु

डॉ कल्याण मित्रा

- **आजीवन सदस्यः** इलेक्ट्रॉन माइक्रोस्कोपी सोसाइटी ऑफ इण्डिया (इएमएसआई)

डॉ आमिर नाज़िर

- **आजीवन सदस्यः** इण्डियन सोसाइटी ऑफ सेल बायोलॉजी

डॉ पूनम सिंह

- **आजीवन सदस्यः** सोसाइटी ऑफ टॉक्सीकोलॉजी, इण्डिया
- **सदस्य एडिटोरियल/एडवाइज़री बोर्डः** इण्टरनेशनल जर्नल ऑफ कॉम्प्रिहेन्सिव फार्मेसी

श्री रनवीर सिंह

- **आजीवन सदस्यः** बीएफएमयू इन्सटीट्यूट ऑफ केमिकल इंजीनियर

श्री वहाजुद्दीन

- **सदस्य, एडिटोरियल बोर्डः** (1) जर्नल ऑफ बायोइक्विवैलेन्स एण्ड बायोअवैलेबिलिटी; (2) एनालिटिकल फार्मास्यूटिक एक्टा; (3) फार्मास्यूटिकल रेगुलेटरी अफेयर्स
- **आजीवन सदस्य :** (1) इंडियन सोसाइटी फॉर मॉस स्पेक्ट्रोमेट्री; (2) इंडियन फार्माकोलॉजिकल सोसाइटी; (3) बीएफएमयू साइंस कांग्रेस एसोसिएशन; (4) लेबोरेट्री एनिमल साइंस एसोसिएशन ऑफ इंडिया; (5) बायोटेक्नालॉजी रिसर्च सोसाइटी ऑफ इंडिया; (6) बीएफएमयू सोसाइटी ऑफ एनालेटिकल सांइटिस्टस; (7) एसोसिएशन ऑफ बायोटेक्नोलॉजी एंड फार्मेसी; (8) सोसाइटी ऑफ बायोलॉजिकल केमिस्टस, इंडिया; (9) आईडीएमए–एसोसिएशन ऑफ फार्मास्युटिकल ऐनालिस्ट्स (एपीए)

डॉ श्रीपति राव कुलकर्णी

- **आजीवन सदस्यः** (1) एसोएिशन ऑफ माइक्रोबायोलाजिस्ट ऑफ इण्डिया; (2) सोसाइटी फॉर इनफारमेशन साइंस, इण्डिया

डॉ जे. आर. गायेन

- **आजीवन सदस्यः** (1) द सोसाइटी ऑफ बायोलॉजिकल केमिस्टस (इंडिया), बैंगलुरु; (2) एसोसिएशन ऑफ बायोटेक्नोलॉजी एंड फार्मेसी (एबीएपी), इंडिया; (3) बीएफएमयू सोसाइटी फॉर मॉस स्पेक्ट्रोमेटरी (आइएसएमएएस), मुम्बई
- **फेलोः** एसोसिएशन ऑफ बायोटेक्नोलॉजी एंड फार्मेसी, गुन्टूर

डॉ संजीव यादव

- **आजीवन सदस्यः** (1) इण्डियन साइंस कॉंग्रेस एसोसिएशन, कोलकाता; (2) सोसायटी फॉर साइंस एण्ड इनवाइरनमेन्ट, इण्डिया

Notes

THE STAFF

DIRECTOR

Tushar Kanti Chakraborty, M.Sc., Ph.D., FNA, FASc, FNASc, JC Bose Fellow

R & D DIVISIONS/UNITS

BIOCHEMISTRY

Senior Principal Scientists
J.K. Saxena, M.Sc., Ph.D., *In-Charge*
Uma Roy, M.Sc., Ph.D.
Gitika Bhatia, M.Sc., Ph.D.
A.K. Srivastava, M.Sc., Ph.D.

Principal Scientist
Neena Goyal, M.Sc., Ph.D.

Scientist
A.K. Tamrakar, M.Sc., Ph.D.

Sr. Technical Officers (3)
A.K. Khanna, M.Sc., Ph.D.
B. Maity, M.Sc., Ph.D.

Technical Assistants
Rima Ray Sarkar
Ishbal Ahmad

Sr. Technicians (2)
Suresh Yadav
B.R. Yadav (Retired on 31.12.2011)

Sr. Technician (1)
Ram Pal Rawat

Lab. Assistant
Ramesh Chandra
Noor Jehan

Jr. Steno
Vineet Pandey

BOTANY

Principal Scientist
M.N. Srivastava, M.Sc., Ph.D., *In-Charge*
S.M. Rajendran, M.Sc., Ph.D. (Transferred to CSIR – CECRI, Karaikudi)

Senior Scientist
K.R. Arya, M.Sc., Ph.D.

Scientist
D.K. Mishra, M.Sc., Ph.D.
Vineeta Tripathi, M.Sc., Ph.D.

Technical Assistant
Savita Tripathi, M.Sc.

Sr. Technician (2)
J.K. Joshi, M.Sc.

Lab. Assistants
Ram Jeewan (*Retired on 30-06-2011)*
K.K. Yadav
Devi Dutt
Maiku Lal
Makhan Lal
Gopi
Satya Narain

Lab Attendants (1)
R.C. Maurya
Lakhana Devi
N.K. Khanduri
Ashok Kumar

CLINICAL & EXPERIMENTAL MEDICINE

Chief Scientists
S.P.S. Gaur, M.B.B.S., M.D., *In-Charge*
A. Ghatak, M.B.B.S., M.D., MNAMS, FICP, MACCP
J.S. Srivastava, M.B.B.S., M.D., D.M., M.H.Sc.

Scientist
Vivek Vidyadhar Bhosale, M.B.B.S., M.D.

Technical Assistant
Shail Singh, M.Sc., Ph.D.

Lab. Assistant
Umesh Kumar

Sr. Steno
Mohd. Sufiyan

DRUG TARGET DISCOVERY AND DEVELOPMENT

Senior Principal Scientist
Sudhir K. Sinha, M.Sc., Ph.D., *In-Charge*

Principal Scientists
Neeloo Singh, M.Sc., Ph.D.
Vinita Chaturvedi, M.Sc., Ph.D.

Senior Scientists
Sabyasachi Sanyal, M.Sc., Ph.D.
Deepak Datta, M.Sc., Ph.D.

Scientists
Anil N. Gaikwad, M.S. (Pharm.), Ph.D.
Y.K. Manju, M.Sc., Ph.D.
Arun Kumar Trivedi, M.Sc., Ph.D.

Junior Scientist
Jayant Sarkar, M.V.Sc., Ph.D.

Technical Assistants
Ajay Singh Verma, M.Sc.
Shyam Singh, M.Sc.
Sanjeev Meena, M.Sc.
Priyanka Trivedi, M.Sc.

Sr. Technician (2)
Chandramool
Hori Lal

ENDOCRINOLOGY

Senior Principal Scientists
Naibedya Chattopadhyay, M.Sc., Ph.D., *In-Charge*
Anila Dwivedi, M.Sc., Ph.D.

Principal Scientists
Gopal Gupta, M.Sc., Ph.D.
F.W. Bansode, M.Sc., Ph.D.

Senior Scientists
Durga Prasad Mishra, M.Sc., Ph.D.
Syed Musthapa, M.Sc., Ph.D.

Scientists
Divya Singh, M.Sc., Ph.D.
Ritu Trivedi, M.Sc., Ph.D.
Rajender Singh, M.Sc., Ph.D.
Rituraj Konwar, M.V.Sc., Ph.D.
Rajesh Kumar Jha, M.Sc., Ph.D.

Junior Scientist
Hemant Kumar Bid, M.Sc., Ph.D. *(Resigned on 08-02-2011)*

Sr. Technical Officer (3)
J.P. Maikhuri, M.Sc., Ph.D.

Sr. Technical Officers (2)
Mohini Chhabra, B.Sc., CLSc.
Shakti Kitchlu, M.Sc.

Sr. Technical Officer (1)
Balvir Singh, M.Sc.

Technical Assistant
Preeti
Konika Gupta

Sr. Technicians (2)
P.K. Bhattacharya
Chattar Pal

Sr. Technician (1)
Geet Kumar Nagar

Lab. Assistants
N.P. Misra
B.P. Mirsa
R.G. Pandey

Lab Attendant (2)
Mahesh Chandra Tewari

Lab. Attendants (1)
Nabbulal
Ram Karan
Pradeep Singh

FERMENTATION TECHNOLOGY

Senior Principal Scientist
C.K.M. Tripathi, M.Sc., Ph.D., *In-Charge*
P.K. Shukla, M.Sc., Ph.D.

Principal Technical Officer
A.K. Joshi, M.Sc.

Sr. Technical Officers (3)
Shyamendra Mehrotra, B.Sc.
Bikram Banerjee, B.Sc.

Sr. Technical Officers (2)
Malkhan Singh, B.Sc. [Retired on 31-12-2011]
Agney Lal, B.Sc.

Sr. Technician (2)
Kishan Singh

Lab. Assistants
Lakshmi Prasad
A.N. Dixit

MEDICINAL AND PROCESS CHEMISTRY DIVISION

Chief Scientists
S.B. Katti, M.Pharm., Ph.D., *In-Charge*
A.K. Saxena, M.Sc., Ph.D.,FRSC.
Bijoy Kundu, M.Sc., Ph.D., *In-Charge, Electron Microscopy & Academic Affairs Unit*
Ram Pratap, M.Sc., Ph.D.
S.N. Suryawanshi, M.Sc., Ph.D.
Kamlakar Avasthi, M.Sc., Ph.D.

Senior Principal Scientists
Rakesh Maurya, M.Sc., Ph.D.
Kalpana Bhandari, M.Sc., Ph.D. [Retired on 30-04-2011]
R.P. Tripathi, M.Sc., M.Phil, Ph.D.
Kanchan Hajela, M.Sc., Ph.D.
W. Haq, M.Sc., Ph.D.
Y.S. Prabhakar, M.Sc., Ph.D.
Arun K. Shaw, M.Sc., Ph.D.
P.M.S. Chauhan, M.Sc., Ph.D.
V.L. Sharma, M.Sc., Ph.D.

Principal Scientists
Pradeep Kumar Srivastava, M.Sc.
Atul Kumar, M.Sc., Ph.D.
Sanjay Batra, M.Sc., Ph.D.
Atul Goel, M.Sc., Ph.D.
Gautam Panda, M.Sc., Ph.D.

Senior Scientists
T. Narender, M.Sc., Ph.D.
K.V. Sashidhara, M.Sc., Ph.D.
Maddi Shridhar Reddy, M.Sc., Ph.D.

Scientists
Prem Prakash Yadav, M.Sc., Ph.D.
Ranveer Singh, M.Tech.
Dipankar Koley, M.Sc., Ph.D.
Namrata Rastogi, M.Sc. Ph.D.

Principal Technical Officers
R.K. Asthana, M.Sc., Ph.D.
S.P. Vishnoi, M.Sc., Ph.D. *(Retired on 31-03-2011)*

Sr. Technical Officers (3)
A.K. Mandwal, M.Sc., Ph.D.
S.C. Tripathi, B.Sc.
Janki Prasad, AMIE, M.Tech.
Keshav Prasad, AMIE, M.Tech.
Suresh Chandra, B.Sc., L.L.B.
S.P.S. Bhandari, M.Sc. Ph.D.
P.N. Rai, Dip. Mech. Engg.
S.K. Kakaji, B.Sc.
Vasi Ahmed, B.Sc., L.L.B.
Zahid Ali, B.Sc.
Tara Rawat, B.Sc.

Sr. Technical Officers (2)
Deepali Pandey, B.Sc.
A.S. Kushwaha, B.Sc.

Technical Assistant
Ashok Kumar Sharma, B.Sc., D.Ch.E., A.M.I.E.

Technical Assistants
Atma Prakash Dwivedi, M.Sc.
Vidisha Sharma
K.S. Anil Kumar, M.Sc., P.G.D.C.A.
Tahseen Akhtar, M.Sc.
Surya Pratap Singh, M.Sc.

Sr. Technicians (2)
Preeti Rastogi, M.Sc.
Ramjeet, B.Sc., PGDC
Zaheer Ahmad (Glass Blowing)
Radha Rani Gupta, B.Sc.
Raju Arora, B.Sc.
Shashi Rastogi, M.Sc.
Mithilesh Sharma, M.Sc.
Veena Mehrotra, M.Sc.

Sr. Technicians (1)
Rajesh Kumar

K.M. Shukla, B.Sc.
Akhilesh Kumar Srivastava, B.Sc.
D.N. Vishwakarma
Manju, B.Sc.
Ram Lakhan

Technicians (1)
H.R. Misra, M.Sc.
N.P. Misra, M.Sc.
Krishna Kumar, B.Sc.

Lab. Assistants
Ram Sanehi
M.S. Bhol
J.C. Rajan

Lab Attendant (2)
Satish Chandra Yadav, B.Sc.

Sr. Steno (MACP)
Renuka Mushran

Sr. Steno (H) (ACP)
Avadhesh Kumar

Jr. Steno
Surendra Kumar

MICROBIOLOGY

Principal Scientist
K.K. Srivastava, M.Sc., Ph.D. *In-Charge*

Chief Scientist
Ranjana Srivastava, M.Sc., Ph.D., *(Retired on 30-04-2011)*

Senior Scientists
B.N. Singh, M.Sc., Ph.D.
Arunava Dasgupta, M.Sc., Ph.D.

Scientist
Sudhir Kumar Singh, M.Sc., M.Tech., Ph.D.

Junior/Trainee Scientist
Neha Topno, M.Sc.

Technical Assistant
Sandeep Kumar Sharma, M.Sc.

Sr. Technicians (2)
P.D. Misra
Nuzhat Kamal, B.Sc.

Sr. Technician (1)
D.K. Tripathi, M.Sc.

Lab. Assistants
U.C. Pandey *(retired on 28-02-2011)*
J.C. Pant *(Retired on 31-05-2011)*

Lab. Attendants (1)
Ravi Shankar Misra
Ram Prakash
Shyam Sunder Yadav

MOLECULAR & STRUCTURAL BIOLOGY DIVISION

Principal Scientist
Saman Habib, M.Sc., Ph.D., *In-Charge*

Chief Scientist
Vinod Bhakuni, M.Sc., Ph.D., FNA, FASc, FNASc,
(Expired on 15-07-2011)

Principal Scientists
Ravishankar, R., M.Sc., Ph.D.
Jimut Kanti Ghosh, M.Sc., Ph.D.

Senior Scientists
Ashish Arora, M.Sc., Ph.D.
J. Venkatesh Pratap, M.Sc., Ph.D.
Mohammad Imran Siddiqi, M.Sc., Ph.D.
Mohammad Sohail Akhtar, M.Sc., Ph.D.

Scientists
Amogh Anant Sahasrabuddhe, M.Sc., Ph.D.
Shakil Ahmed, M.Sc., Ph.D.
Dibyendu Banerjee, M.Sc., Ph.D.

Sr. Technical Officers (2)
R.K. Srivastava, B.Sc.
J.P. Srivastava, B.Sc., L.L.B.

Technical Assistants
Ruchir Kant, M.Sc.
Anupam Jain, M.Sc.
Sarita Tripathi, M.Sc.

Sr. Technician (2)
Ram Radhey Shyam

PARASITOLOGY

Chief Scientists
S.K. Puri, M.Sc., Ph.D., FNASc., *In-Charge*
Shailja Bhattacharya, FNASc, M.Sc., Ph.D.
P.K. Murthy, M.Sc., Ph.D.
Anuradha Dube, M.Sc., Ph.D.

Senior Principal Scientists
Suman Gupta, M.Sc., Ph.D.
N.A. Kaushal, M.Sc., Ph.D.
Renu Tripathi, M.Sc., Ph.D.

Principal Scientist
Kumkum Srivastava, M.Sc., Ph.D.

Senior Scientist
S. Rajakumar, M.Sc.

Scientist
Mrigank Srivastava, M.Sc., Ph.D.

Sr. Technical Officer (3)
A.K. Roy, M.Sc.

Sr. Technical Officer (2)
R.N. Lal, M.Sc.

Sr. Technicians (2)
V.K. Bose *(Retired on 31-03-2011)*
R.S. Dubey *(Retired on 31-05-2011)*
Ravi Kumar Mehra
K.K. Singh, M.Sc.

Lab. Attendants (1)
Prem Babu
Ram Das
Om Prakash

Sr. Steno (ACP)
T.S. Sasi Kumar *(Transferred to CIMAP in post of Private Secretary on dated 01-08-2011)*

Private Secretary
H.K. Khulve

PHARMACEUTICS

Chief Scientist
A.K. Dwivedi, M.Sc., Ph.D., *In-Charge*

Principal Scientist
Amit Misra, M.Pharm., Ph.D.

Senior Scientist
Prabhat Ranjan Mishra, M.Pharm., Ph.D.

Scientists
Manish Kumar Chourasia, M.Pharm., Ph.D.
Bathula Surender Reddy, M.Sc., Ph.D.

Sr. Technical Officer (3)
Madhuri Chaudhry, M.Sc.

Technical Assistant
V. Saravana Kumar, M.Sc., MPhil

Sr. Technician (2)
S.K. Bhatnagar, B.Sc.

Lab. Attendant (1)
Ram Kumar

Jr. Steno
Pooja Taneja

PHARMACOKINETICS AND METABOLISM

Chief Scientist
G.K. Jain, M.Sc., Ph.D., *In-Charge*

Principal Scientists
S.K. Singh, M.Sc., Ph.D.
Jawahar Lal, M.Pharm., Ph.D.

Scientist
R.S. Bhatta, M.Pharm., Ph.D.
Wahajuddin, M.S. Pharm.
Jiaur Rahaman Gayen,

Sr. Technical Officer (3)
S.K. Pandey, M.Sc.

Sr. Technician (1)
Narendra Kumar

Technician (1)
Akhilesh Kumar

Lab. Assistant
Shiv Lal

Lab. Attendants (1)
Ram Bhajan Shukla

Ram Sunder Lal
Chandramani

Sr. Steno
Nandita Pandey

PHARMACOLOGY

Chief Scientists
Madhu Dikshit, M.Sc., Ph.D., FNASc.,FASc., *In-Charge*
Ram Raghubir, M.V.Sc., Ph.D. (Retired on 31/01/2012)
G. Palit, M.B.B.S., M.D.,

Senior Principal Scientist
Rakesh Shukla, M.Sc., Ph.D.

Principal Scientist
Amar Nath, M.Sc.

Ramalingaswamy Fellow
Kumaravelu Jagavelu, M.Sc., Ph.D.

Ramanujam Fellow
Prem N Yadav, M.Sc., Ph.D.

Scientists
Manoj K. Barthwal, M.Sc., Ph.D.
Kashif Hanif, M.Sc., Ph.D.
Shubha Shukla, M.Sc., Ph.D.

Sr. Technical Officers (3)
S. Sengupta, B.Sc.
T.L. Seth, B.Sc.
Jharna Arun, B.Sc.

Sr. Technical Officers (2)
M.L. Bhatnagar, B.Sc.
V.S. Nigam, B.Sc.
C.P. Pandey, M.Sc.

Technical Assistants
Sultana Jawaid, B.Sc.
Sheeba Saji Samuel, M.Sc.
Sachi Bharti, M.Sc.
Smriti, M.Sc.
Pankaj Kumar Shukla, B.Sc., P.G.D.B.T.
Divya Mohan, M.Sc.
Deep Mala, M.Sc.
N.K. Prasnna Kumari (*Resigned on 30-06-2011*)

Sr. Technicians (2)
O.P. Pandey, B.A. *(Retired on 30-6-211)*
H.C. Verma, B.A.

Sr. Technicians (1)
Bharti Bhushan, B.Sc.
Shailendra Mohan, M.Sc., PGDCA
Ramesh Chandra, M.Sc.
Anil Kumar Verma, B.Sc.

Technician (1)
Surendra Singh, M.Sc., Ph.D.

Lab. Attendants (1)
Pankaj Sengupta
Hari Joshi
K.P. Mishra

Sr. Steno
Varun Kumar Pathak

TOXICOLOGY

Chief Scientist
C. Nath, M.B.B.S., M.D., *In-Charge*

Senior Principal Scientist
Neeraj Sinha, M.Sc., Ph.D., D.Sc.

Principal Scientists
R.K. Singh, M.Sc., Ph.D., D.Sc.,
Sharad Sharma, M.B.B.S., M.D.
S.K. Rath, M.Sc., Ph.D.

Senior Scientist
R.K. Tripathi, M.Sc., Ph.D.

Scientists
Aamir Nazir, M.Sc., Ph.D.
Smrati Bhadauria, M.Sc., Ph.D.
Sarika Singh, M.Sc., Ph.D.
Poonam Singh, M.Sc., Ph.D.

Sr. Technical Officers (3)
P.K. Agnihotri, M.Sc., Ph.D.
S.M. Verma, B.Sc.

Sr. Technical Officer (2)
Sadan Kumar, M.Sc.

Technical Assistants
Neeti Sagar, M.Sc.
Anurag Kumar Srivastava, B.Sc.
Anil Kumar Meena, M.Sc.
Navodayam Kalleti, M.Sc.

Sr. Technician (1)
Anupma, B.Sc.

Lab. Assistants
Mahabir
V.K. Samant
Shree Krishan
R.K. Sarkar

Lab. Attendants (1)
Ram Kumar
Nand Pal Yadav
Ganesh Prasad

CLINICAL PHARMACOLOGY UNIT (CDRI), SETH G.S. MEDICAL COLLEGE, MUMBAI

Technical Assistant
N.A. Rajwade *(Retired on 31-08-2011)*

Sr. Technicians (2)
P.S. Acharya
Vijal J. Ashar, M.Sc.

Lab. Assistant
R.B. Pawar

TECHNICAL INFRASTRUCTURE DIVISIONS / UNITS

BIOMETRY AND STATISTICS

Senior Principal Scientist
M. Abbas, M.Sc., Ph.D., *In-Charge*

Sr. Technical Officer (3)
Mukesh Srivastava, M.Sc., Ph.D.

Sr. Technician (2)
M.P.S. Negi

Lab. Attendant (1)
Savitri Devi

DIVISION OF LABORATORY ANIMALS

Senior Principal Scientist
D.S. Upadhyay, M.V.Sc., Ph.D., *In-Charge*

Principal Scientist
A.K. Srivastava, M.Sc., Ph.D.

Scientists
Dhananjoy Hansda, M.V.Sc.
Manjunatha Prabhu B.H., M.V.Sc.

Junior/Trainee Scientist
H.K. Bora, M.V.Sc

Sr. Technical Officers (3)
S.N.A. Rizvi, M.Sc.
A.K. Bhargava, B.Sc.

Sr. Technical Officer (2)
Karunesh Rai, M.Sc.

Technical Assistants
Shikha Mishra, M.Sc.

Sr. Technicians (2)
A.K. Dubey, B.A.
Ravinder Singh, M.Sc.
Ram Avatar
S.R. Yadav, B.A.

Sr. Technicians (1)
Deep Mala Misra *(Retired on 31-07-2011)*
Ravi Kumar Shukla
Sanjeev Kumar Saxena, B.Sc.
Narendra Kumar, B.A.
Dinesh Kumar, B.A.
Pradeep Tirkey

Technician (1)
Arun Sharma, B.Sc.

Sr. Steno (H)
Raj Kumar, B.A.

Lab. Assistants
Asharfi Lal *(Retired on 31-07-2011)*
Vikram Singh
Wazahtullah
Gaffar Ali
M.D. Kushwaha
V.B.L. Srivastava
T.B. Thapa
P.B. Thapa
Shiv Pal Singh
O.P. Verma, B.A.
S.K. Varma
Mohd. Saleem
G.K. Sharma
Dilip Kumar
R.P. Maurya

Lab. Attendants (1)
Changa Lal
Jameel Beg
Najbullah

DIVISION OF S & T MANAGEMENT

Senior Principal Scientists
Vinay Tripathi, M.Sc., M.B.A., P.G. Dip., *In-Charge*
A.K. Goel, M.Sc., Ph.D., *(Retired on 31-03-2011)*
N.S. Rana, M.Sc.

Principal Scientists
D.N. Upadhyay, M.Sc., Ph.D.
Prem Prakash, M.Pharm.

Scientists
Anand P. Kulkarni, M.Sc., Ph.D.
Sripathi Rao S. Kulkarni, M.Sc., Ph.D., P.G. Dip.

Junior Scientist
Sanjeev Yadav, M.Sc., Ph.D.

Principal Technical Officer
Shri Ram, B.Sc., L.L.B.

Sr. Technicians (2)
Krishna Prasad, B.Sc.
Chandrika Singh, B.Sc., L.L.B.

Technicians (1)
Preeti Agarwal, M.C.A.
Abhishek Ramnani, MBA

Hindi Officer
Neelam Srivastava, M.A., B.Ed., L.L.B.

Sr. Steno (ACP)
Manoshi Chatterjee, B.A., B.L.I.Sc.

Sr. Steno (H)
Jitendra Patel, M.A.

Lab. Assistant
Kishori Kumari

Lab. Attendant (1)
Pradeep Kumar Srivastava

INSTRUMENTATION

Chief Scientist
Ravinder Singh, B.E., *In-Charge*

Principal Scientist
N.K. Agarwal, M.Sc.

Principal Technical Officer
Usha Kapil, I.Sc., Diploma

Technical Officers
Sanjay Kumar, Diploma
Ram Karan Harijan, AMIE

Sr. Technician (2)
Kamal Singh
Laxmi Narain

S&T KNOWLEDGE RESOURCE CENTRE

Senior Principal Scientist
S.K. Mallik, M.A., M.L.I.Sc., *In-Charge*

Principal Technical Officers
Ali Kausar, B.F.A.
Seema Mehrotra, M.Sc.

Sr. Technical Officers (3)
Sanjay Kumar, M.L.I.Sc
G.C. Gupta, B.Sc.
V.K. Vohra, B.Sc. (Retired on 28-02-2011)
W.F. Rahman, M.A., M.L.I.Sc.
A.K. Verma, M.A., L.L.B.
R.M. Pathak, B.F.A.

Sr. Technical Officer (2)
R.N.S. Londhe, GD Art (Comm.), Art Teachers Dip.

Technical Officer
Ramesh Chandra Gupta, M.L.I.Sc.

Sr. Technicians (2)
B.K. Sethi
Nazir Akbar
Y.C. Pandey

Lab. Assistants
Rasheed Ahmad *(Expired on 26-06-2011)*
S. Islam

Lab. Attendant (1)
Deepayan *(Retired on 30-10-2011)*

Jr. Steno
Himanshu Upadhyay

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITY

Chief Scientist
D.K. Dikshit, M.Sc., Ph.D., *In-charge*

Principal Scientist
Brijesh Kumar, M.Sc., Ph.D.

Senior Scientists
Ravi Sankar Ampapathi, M.Sc., Ph.D.
Jagadeshwar Reddy Thota, M.Sc., Ph.D

Scientists
Sanjeev Kumar Shukla, M.Sc., Ph.D.
Sanjeev Kanojiya, M.Sc., Ph.D.

Principal Technical Officer
H.M. Gauniyal, M.Sc.

Sr. Technical Officers (3)
A.L. Vishwakarma, M.Sc.
Rakesh Khanna, B.Sc., A.I.C.
A.K. Sinha, M.Sc.
A. Vohra, B.Sc., M.A. (*Retired on 31-08-2011)*
A.K. Sircar, B.Sc., B.A.

Sr. Technical Officers (2)
Sunil Kumar, B.Sc.
Pramod Kumar, M.Sc.
R.K. Purshottam, B.Sc.

Technical Assistant
Binod Kumar Saw, M.Sc.

Sr. Technicians (2)
Ashok Pandey, B.Sc.
Sandeep Sengupta, B.Sc.
Abdul Haleem
Radhey Krishna, B.Sc., L.T., C.Lib.Sc.
Vashundhara Madhwar, B.A.
V.K. Maurya
A.K. Srivastava, M.Sc.

Sr. Technicians (1)
Madhu Chaturvedi
S.A. Singh, B.Sc., PGDCA
O.P. Gupta

Asst. (G) Grade I
V.K. Kanal

Lab. Assistant
Mohd Islam (Guest House)

Lab. Attendants (1)
Mansoor Ali
J.S. Singh

ACADEMIC AFFAIRS UNIT

Senior Principal Scientist
Alka Singh, M.Sc., Ph.D.

Principal Scientist
Anju Puri, M.Sc., Ph.D.

Sr. Technician (2)
A.K. Pandey

BUSINESS DEVELOPMENT DIVISION

Chief Scientist
Rajendra Prasad, M.Sc., Ph.D., *In-Charge*

Scientist
Naseem Ahmed Siddiqui, M.B.A.

Technical Assistant
Neelima Srivastava

ELECTRON MICROSCOPY UNIT

Scientist
Kalyan Mitra, M.Sc., Ph.D.

Principal Technical Officer
Abha Arya, B.Sc., B.Ed.

Technical Officer
Kavita Singh, M.Sc. Ph.D.

Technical Assistant
Manish Singh, M.Sc.
Garima Pant

Sr. Technician (2)
Madhuli Srivastava

COMPUTER DIVISION

Senior Principal Scientist
A.K. Srivastava, B.E., *In-Charge*

Principal Scientist
Kural, B.E.

Junior/Trainee Scientist
Abhishek Kumar, M.C.A.

Sr. Technical Officer (3)
J.A. Zaidi, M.Sc., M.L.I.Sc.

Technical Assistants
Ajay Kumar Maurya, M.C.A.
Arbind Kumar, B.C.A, PGDCA
Farah khan, B.C.A

TISSUE AND CELL CULTURE UNIT

Senior Principal Scientist
A.K. Balapure, M.Sc., Ph.D., *Unit In-Charge*

Sr. Technical Officer (3)
Ramesh Sharma, M.Sc., Ph.D.

DIVISION OF ENGINEERING SERVICES

Senior Superintending Engineer Group III (7)
Parvez Mahmood, B.Sc., *In-Charge*

Executive Engineers Group III (5)
Manoj Kumar, B.Sc.
Kamal Jain, B.E., M.B.A.

Technical Officers
Mohit Kumar Shukla
Jai Prakash
Sidho Hembrom

Technical Assistants
D.K. Vishwakarma
Ajay Kumar

Sr. Technicians (2)
A.K. Tewari
B.P. Sunwar
Khan Abdul Jabbar
Radhey Lal
Radhey Shyam
A.K. Sonkar
K.K. Kaul
Mahindra Singh
S.K. Kar
Pradhan Basudev
M.S. Verma
Naseem Mohammad
Harish Kumar
Vijay Kumar

Sr. Technicians (1)
Arun Kumar Srivastava
Verma Kamal Kishore
Ramesh Kunwar
G.C. Roy
Swapan Karmi
Ram Karan Ram
Rajesh Chand Dwivedi

Technicians (1)
Bhagwan Singh Pokhariya
R.A. Prajapati

Lab. Assistants
Raju
R.K. Yadav
Hussain Taqui
Ram Anjore
Kandhai Lal
N.K. Mudgal
Shiv Giri
Ramanuj
Rama

Tan Sen *(Retired on 28-02-2011)*
Phool Chand
Popinder Singh
T.P. Pathak
S.K. Yadav
Bishan Singh
A.K. Misra
Om Prakash
Iftikhar Ahmad
Shankar Roy
S.K. Bhattacharya
Z.U. Beg

Lab Attendants (2)
Ramesh Chandra
Tara Chand

Lab. Attendants (1)
Mohd. Irfan
Dhirendra Misra
Raju Vishwakarma
Ram Autar
Sandeep Roy
Hari Om Garg
Darshan Lal
Vishwanath Nigam
Satyajeet Roy
Ram Samujh
Bindeswari Prasad
Suresh Kumar
Pradeep Kumar
Ram Bilas
Gaya Prasad
Ram Asre

Asstt. (G) Grade I
N.K. Checker *(Retired on 30-09-2011)*
B.K. Shukla

Audio-Visual Section

Sr. Technical Officer (1)
A. Dayal, Diploma

Sr. Technicians (2)
V.K. Mishra
S.K. Biswas

Sr. Technician (1)
S.S. Bhakuni

Lab. Assistant
Raju

GENERAL ADMINISTRATION AND FACILITIES

ADMINISTRATION

Controller of Administration
L.R. Arya

Administrative Officer
K.P. Sharma

Private Secretary
G.M. Dayal

Jr. Steno
Kamla Kandpal

Lab. Assistants
Maiku Lal
Sohan Lal

DIRECTOR'S OFFICE

Private Secretary
Sumit Srivastava, B.Com.
Kanhaiya Lal, B.A. (Retired on 31-1-2012)
Sunita Chopra, B.A.

Lab. Attendant (1)
Nand Kishore

Helper Group D
Ramswarth Prasad Rai

ESTABLISHMENT I

Section Officers (G)
Sunil Kumar
Krishna Raj Singh
Nitu Kumari

Asstt. (G) Grade I
Vibhash Kumar

Asstt. (G) Grade II
Smriti Srivastava
Saju P. Nair
Reena Bisaria

Jr. Steno
Deepak Dhawan

Lab. Assistant
Vinod Kumar

Helper Gp-'C' Cdr-D
Manju Yadav

ESTABLISHMENT II

Section Officer (G)
Biranchi Sarang

Asstt. (G) Grade I
Rashmi Srivastava
Dilip Kumr Sen
Tej Singh
Lata Bhatia
Gangadin Yadav
Javed Sayed Khan
Md. Rijwan
Durgesh Kanchan
Riti Chaudhari

Sr. Steno
Vinod Kumar Yadav

Asstt. (G) Grade II
Aparna Bajpai
Neena Raizada
Madan Chandra (*Expired on 18.10.2011*)

Lab. Assistant
Bhagwanti Devi

Helper Group D
Ram Kumar

GENERAL SECTION

Section Officer (G)
C.S. Rao

Asstt. (G) Grade I
Kailash Chandra

Sr. Steno
Seema Rani Srivastava

Asstt. (G) Grade II
Rajendra Prasad
Ajay Shukla
Rani
Mohd. Irfan

Sr. Technicians (1)
K.K. Kashyap
Shakeel Ahmad Khan

Drivers
Prem Chand
Daya Shankar Singh

Helpers Group D
Kalpanath Sharma
Mohd. Saleem

BILL SECTION

Section Officer (G)
Madhuranjan Pandey

Asstt. (G) Grade I
H.K. Jauhar
Valsala G. Nair
Hem Chandra
Rama Dhawan
Harsh Bahadur
Vivek Bajpai
Dilip Kumar (Cash)

Asstt. (G) Grade II
Naseem Imam

Lab. Attendant (1)
Vinod Kumar Sharma
Lalji Prasad

Group 'D'
Sachin

VIGILANCE

Section Officer
Ramesh Singh

Asstt. (G) Grade I
C.P. Nawani
Chandra Kant Kaushik

Sr. Steno
P.S. Padmini *(Transferred to NIIST, Thiruvanathapuram)*

Jr. Steno
Ajay Kumar

Lab. Assistant
Shanti Devi

RECORDS

Asstt. (G) Grade I
Birendra Singh

Lab. Assistant
Ved Prakash Misra

HINDI SECTION

Senior Hindi Officer
V.N. Tiwari, M.A., Ph.D.

Sr. Steno (Hindi)
Anil Kumar

Lab. Assistant
Ghanshyam

SECURITY

Senior Security Officer
R.S. Deswal, B.Sc., L.L.B.

Security Guard Group D
Chakrasen Singh (Knowledge Resource Centre)

FINANCE & ACCOUNTS

Controller of Finance & Accounts
A.K. Dwivedi
Padam Singh (*Transferred to CSIR Hq*)

Section Officers (F&A)
A.K. Chauhan (*Transferred to CIMAP*)
Kanak Lata Mishra
Kailash Singh
Ram Rishi Raman
R.P. Tripathi

Private Secretary
V.P. Singh

Asstt. (F&A) Grade I
S.L. Gupta
Viresh
Mahesh Babu
R.C. Bisht
Ajitha Nair

Asstt. (F&A) Grade II (ACP)
Sashidharan Radha
U.K. Tewari

Asstt. (F&A) Grade II
D.K. Khare
Mahendra Kumar
Sanjay Kumar
Tahseen Talat

Asstt. (F&A) Grade III
S.A. Siddiqui
Chandrashekhar

Jr. Steno
Rekha Tripathi

Lab. Attendants (1)
Vikramaditya
Angad Prasad

Helper Group D
Mohd. Firoz

STORES & PURCHASE

Stores & Purchase Officer
S.K. Singh

Section Officers (Stores & Purchase)
Shekhar Sarcar
Praphul Kumar
Prasenjeet Mitra

Asstt. (S&P) Grade I
P.S. Chauhan
Arun Wadhera
A.K. Misra
A.K. Govil
H.B. Neolia

Asstt. (S&P) Grade II (ACP)
K.K. Mishra

Asstt. (S&P) Grade II
R.C. Dwivedi
M.C. Verma
Srikant Mishra

Asstt. (S&P) Grade III
Kanchan Bala
Vandana Parwani
G.P. Tripathi

Private Secretary
K.P. Ballaney

Lab. Assistants
Kishan Kumar
Rama Shukla
Kamlesh

Attendant
Hardwari

CSIR DISPENSARY

Medical Officers Group III (7)
D.K. Bhateja, M.B.B.S., M.D. *In-Charge*
Asha Negi, M.B.B.S., M.D.

Medical Officer Group III (4)
N.K. Srivastava, M.B.B.S., M.D.

Sr. Technician (2)
Nandita Dhar
H.U. Khan

Technician (1)
Shraddha
Shabana

Lab. Assistant
S.K. Paswan

Lab Attendant
Shubendra Kumar

Gp-'C' Cdr-D
Sundari

CANTEEN

Manager Gr. II (ACP)
J.P. Satti

Asstt. Manager & Store Keeper (ACP)
R.S. Tewari

Count Clerk (ACP)
Ram Jiyawan Tewari
Y.K. Singh

Cook (ACP)
Man Bahadur

Asstt. Halwai
Uma Shanker Tewari

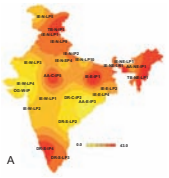
Bearers
Dil Bahadur
Ganga Ram
Rajender
Kripa Shanker
Sukhdev Prasad

S/Man
Raj Kumar

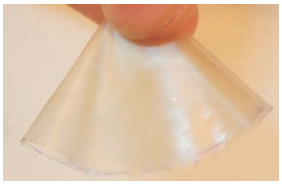
Wash Boys
Ram Murat
Dinesh Pal Singh

Notes

Description of Cover Page Pictures



APOBEC3B, a gene involved in innate response, exhibits insertion-deletion polymorphism across world populations and its insertion allele was observed to be nearly fixed in malaria endemic regions. The distribution of the *APOBEC3B* deletion was studied in 25 diverse Indian populations and severe or non-severe *Plasmodium falciparum* patients and ethnically-matched uninfected individuals from a *P. falciparum* endemic and a non-endemic region of India. Picture shows spatial distribution of the *APOBEC3B* deletion in Indian populations (Infection, Genetics and Evolution, 2012 ,12 (1) 142 ?148)



A dually protective vaginal contraceptive film formulation prepared using the novel non-surfactant spermicidal and anti-trichomonas compound pyrrolidinium pyrrolidine-1-carbodithiote. For details refer Section Progress in Research Projects, Chapter 2 Reproductive health research, Diabetes & Energy Metabolism, Page No. 9, Point No. 2.1.2.1.

Prof. N.K. Ganguly, Chairman, CSIR-CDRI Research Council and former Director General, ICMR presenting a Memento to Shri Pawan Kumar Bansal, Union Cabinet Minister, Parliamentary Affairs and Water Resources and the then Union Cabinet Minister, Science & Technology and Earth Sciences during CSIR-CDRI Diamond Jubilee Annual Day 17th February 2011. Also seen on the dais, Dr. TK Chakraborty, Director, CSIR-CDRI, Lucknow

Prof. Samir K. Brahmachari, Secretary, DSIR and DG, CSIR delivering 37th Mellanby Memorial Lecture at CSIR-CDRI on 10 Feb. 2012

Prof. CNR Rao, FRS, National Research Professor and Linus Pauling Research Professor, JNCASR, Bangalore and Chairman, Science Advisory Council to the Prime Minister of India delivering a lecture as a part of the International Year of Chemistry 2011 (IYC 2011) celebrations at CSIR-CDRI organized on 21st September, 2011

Dr. TK Chakraborty, Director, CSIR-CDRI, Lucknow in discussion with Prof. Richard R. Ernst, Nobel Laureate, Honorary Doctor, Swiss Academy of Science, Switzerland who visited to CSIR-CDRI to deliver a lecture during Symposium on Magnetic Resonance, jointly organized by Council of Scientific and Industrial Research and The National Academy of Sciences, India, Lucknow Chapter on 7 March 2011 in CSIR-CDRI in talk with

Dr. C. Nath, Chief Scientist, CSIR-CDRI receiving prestigious Dr. D.N. Prasad Memorial Oration Award – 2007 awarded by ICMR in 2011 from Shri Ghulam Nabi Azad, Union Cabinet Minister of Health and Family Welfare, Government of India

Dr. Rajender Singh, Scientist, CSIR-CDRI receiving Indian Science Congress Association Young Scientist Award 2011 from Dr. APJ Abdul Kalam, former president of India.

A glimpse of some important publications of CSIR CDRI during 2011