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Central Drug Research Institute, CSIR

वार्षिक प्रतिवेदन
ANNUAL REPORT
2010-11

Central Drug Research Institute
(Council of Scientific & Industrial Research)
Chattar Manzil Palace, M.G. Marg, Lucknow-226001
www.cdriindia.org

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 and Energy Metabolism

- Development of novel agents for fertility regulation, management of post-menopausal osteoporosis, type II diabetes mellitus, hyperlipidemic condition and other endocrine disorders through modern drug design, scientific validation of traditional remedies;
- Understanding pharmacological basis of actions of promising agents & existing therapeutics and undertake basic research to generate new knowledge on reproductive endocrinology relevant to fertility regulation, osteoporosis and diabetes.

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 (hypertension, dyslipidemia, atherosclerosis, thrombosis, myocardial infarction, anxiety, psychosis, dementia, stroke, stress, gastric ulcers and inflammation);
- 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 and 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.

वार्षिक प्रतिवेदन
ANNUAL REPORT
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केन्द्रीय औषधि अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)
छत्तर मंजिल पैलेस, महात्मा गांधी मार्ग, लखनऊ - 226 001

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HIGHLIGHTS OF ACHIEVEMENTS

◆ Product Launched for Marketing (2010)	:	Memory Sure (re)launched on 17 February 2010
◆ Publications in SCI Journals (2010)	:	244
- Average Impact Factor	:	2.894
- Publications with Impact Factor >5	:	14
◆ Book Chapters (2010)	:	03
◆ Patents (2010)		
- Filed Abroad	:	10
- Filed in India	:	12
- Granted Abroad	:	06
- Granted in India	:	12
◆ Ph.D. Thesis Submitted (2010)	:	37
◆ Contract Research Undertaken (2010)	:	03
◆ Grant-in-Aid Projects Initiated (2010)	:	20
◆ CSIR EMPOWER Projects Initiated (2010)	:	10
◆ Total External Budgetary Resources (2010-11)	:	₹ 14.42 Crore
◆ Budget 2010-2011 (CSIR Grant-Sanctioned Estimates)	:	₹ 138.56 Crore

Provisional data as on 01/02/2011

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.

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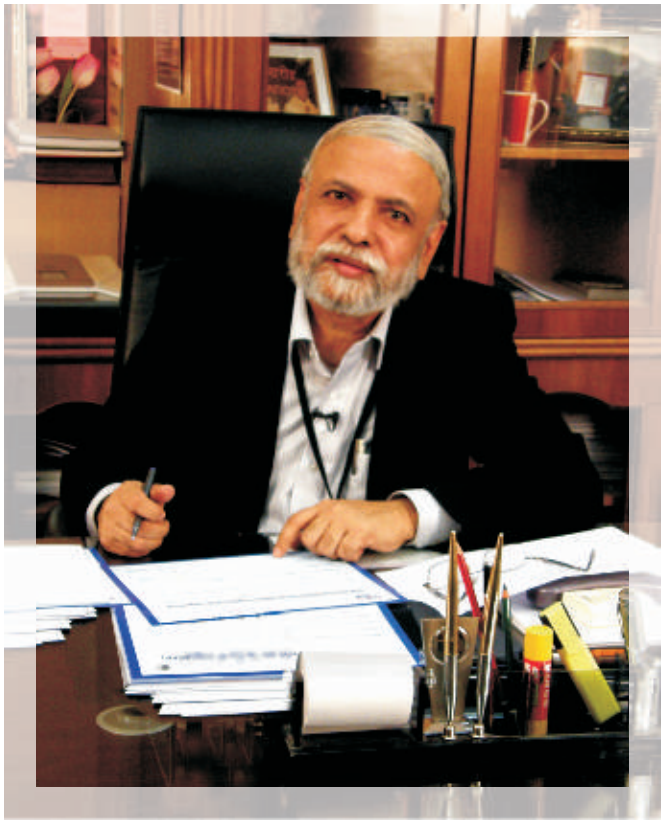
अनुसंधान उपलब्धियाँ

अन्य गतिविधियाँ

निदेशक की कलम से



केन्द्रीय औषधि अनुसंधान संस्थान की स्थापना के हीरक जयन्ती वर्ष की पूर्व संध्या पर आपके समक्ष वर्ष 2010-11 की वार्षिक रिपोर्ट प्रस्तुत करते हुए मुझे अत्यधिक हर्ष का अनुभव हो रहा है। 17 फरवरी, 1951 को भारत के तत्कालीन प्रधानमंत्री पं. जवाहर लाल नेहरू द्वारा विधिवत उद्घाटन के पश्चात् संस्थान ने अपने अस्तित्व के 60 वर्ष पूर्ण किये हैं। सी.डी.आर.आई. की स्थापना एक ऐसी परिकल्पना पर आधारित है जो मानव जाति को बेहतर भविष्य, उन्नत जीवन और मानकों के अनुरूप स्वास्थ्य प्रदान करने के लिये कार्यरत है। हम इस आदर्श के साथ कार्य करते हैं कि सफलता केवल सक्रियता से नहीं प्राप्त की जा सकती है बल्कि भविष्य की रूपरेखा तैयार करते समय कल्पना और दूरदृष्टि को ध्यान में रखना आवश्यक है और इसके लिये हम विज्ञान को व्यवहारिक बनाने और उसे लोगों तक पहुँचाने के लिये नैतिकता और ईमानदारी के उच्चतम स्तर को बनाए रखने के प्रति वचनबद्ध हैं। साथ ही विज्ञान को प्रभावी बनाने, प्रसारित करने, इसकी उत्पादकता और क्षमता में सुधार कर मूल्य-प्रभावी उत्पाद और सेवाएं लोगों तक पहुँचाने, दक्ष एवं सुविधाजनक उपभोक्ता सेवा और उसके द्वारा देश की संपूर्ण उन्नति और विकास में योगदान करने के लिये सक्षम प्रौद्योगिकी को अधिक से अधिक ऊपर लाना है।

रिपोर्टिंग वर्ष में हमारी प्रगति की राह आसान नहीं थी। सुनियोजित विकास और वृद्धि के मुद्दों तक पहुँचने के लिये मूलभूत आवश्यकताओं को पहचानना हमारे लिये एक चुनौतीपूर्ण कार्य था। अपने अनुसंधान क्रियाकलापों पर ध्यान केन्द्रित करने के अतिरिक्त हम नए परिसर में अपनी उत्कृष्टता को नवीन और अत्याधुनिक सुविधा की ओर शीघ्र से शीघ्र स्थानांतरित करने के प्रति वचनबद्ध हैं और कार्य निष्पादन तथा सेवा के श्रेष्ठ मानकों के माध्यम से उपभोक्ताओं की आकांक्षाओं और अपेक्षाओं का सामना करने के लिये उच्च प्रौद्योगिकी को ध्यान में रखकर विधिक, पर्यावरणीय और नैतिक प्रक्रियाओं के विनिर्दिष्ट मानकों में लगे रहकर अपने दायित्व पूरे करते रहेंगे। हमको उच्च प्रौद्योगिकी, अभिकल्पना और अभिरूचि के प्रयोग को ध्यान में रखते हुए कार्य और सेवाओं के श्रेष्ठ मानकों के माध्यम से सबकी आकांक्षाओं और अपेक्षाओं को पूरा करना है। प्रतिभा के लिये अवसर और स्थापित मान्यताओं को चुनौती देते हुए, बिना किसी प्रक्रियात्मक प्रतिबंध के हम रचनात्मकता को प्रोत्साहन देने के लिये वचनबद्ध हैं। इसके अतिरिक्त हम वैश्विक स्तर पर उभरती हुई विज्ञान संबंधी चुनौतियों और राष्ट्रीय आकांक्षाओं के अनुरूप अपनी 12वीं पंचवर्षीय योजना तैयार करने के लिए वचनबद्ध हैं जिसके लिये हमें ईमानदारी और गंभीरतापूर्वक काम करना है जिससे अगले पांच वर्षों के लिये एक ऐसी सफल योजना तैयार किया जाना सुनिश्चित किया जा सके जो संस्थान को नए परिसर में निर्विघ्न ले जाने में मददगार सिद्ध हो सके।

प्रतिवेदन का वर्ष घटना प्रधान रहा है। सी.डी.आर.आई. हीरक जयन्ती समारोह का शुभारंभ योजना आयोग के सदस्य और भारतीय अंतरिक्ष अनुसंधान संगठन के भूतपूर्व अध्यक्ष डॉ. के. कस्तूरीरंगन द्वारा किया गया। तत्पश्चात् बहुत से व्याख्यान, सेमिनार, संगोष्ठी, प्रशिक्षण कार्यक्रम, अन्तर्राष्ट्रीय कार्यशाला इत्यादि का आयोजन किया गया।

चिकित्सा और प्रक्रिया रसायन प्रभाग में 2003 संश्लेषित यौगिकों का संश्लेषण किया गया और उनको जैविक परीक्षण के लिये प्रस्तुत किया गया। जो सक्रिय पाए गए उनको लीड ऑप्टिमाइज़ेशन और अनुवर्ती अध्ययन के लिये प्रस्तुत किया गया। वनस्पति विज्ञान प्रभाग ने देश के विभिन्न भागों से 39 नए पादप सामग्री का एकत्रीकरण किया। इनमें से 27 नमूनों का प्रमाणीकरण और अभिलेखन किया गया गया तथा इनको अनुवर्ती कार्य के साथ-साथ संस्थान के प्राथमिक जैविक परीक्षण कार्यक्रम के लिये प्रस्तुत किया गया। छः पौधों को भारी मात्रा में एकत्र किया गया। समुद्री मूल के नमूनों में 15 सहभागी केन्द्रों से 337 नए नमूने और 164 पुनरावृत्त नमूने प्राप्त हुए और आँकड़ों के प्रलेखन के पश्चात् उनकी चिह्नित क्रिया-कलापों की पुष्टि और सामान्य जैविक परीक्षण के लिये संबद्ध जीव वैज्ञानिकों को वितरित कर दिया गया। हमने सभी मोर्चो पर महत्वपूर्ण उन्नति की है जो अधिक संशोधित प्रभाव तत्व 2.89 सहित 244 प्रकाशनों और 12 भारतीय और 10 विदेशी पेटण्ट फाइल किये जाने और 12 भारतीय और 6 विदेशी पेटण्ट स्वीकृति प्रदान किये जाने से स्पष्ट है। इस वर्ष 39 विश्वविद्यालयों के 178 विद्यार्थियों को विभिन्न विषयों में प्रशिक्षण प्रदान किया गया और विभिन्न विद्यार्थियों ने पी.एच.डी. डिग्री प्रदान किये जाने के लिये अपना शोध प्रबंध प्रस्तुत किया।

रिपोर्टिंग वर्ष के दौरान अनेक सहयोगियों को संपूर्ण विश्व की विभिन्न एजेंसियों से युवा वैज्ञानिक पुरस्कार, प्रतिष्ठित समितियों से फेलोशिप, पदक तथा विदेशी सहायता प्राप्त हुई। राष्ट्रीय तथा अंतर्राष्ट्रीय सम्मेलनों में बहुत से छात्रों को पुरस्कार और सम्मान प्राप्त हुए। मैं उन सभी को बधाई देता हूँ और आशा करता हूँ कि इस प्रकार का मूल्यांकन दूसरों को भी बेहतर उपलब्धि के लिये अंतः प्रेरित करेगा। मैं उन सभी स्टाफ सदस्यों को उनके मूल्यवान सहयोग और योगदान के लिये धन्यवाद देता हूँ और आशा करता हूँ कि वे एक नया विश्वस्तरीय केन्द्रीय औषधि अनुसंधान संस्थान बनाने के लिये अधिकाधिक परिश्रम करना जारी रखेंगे। मैं दुःख के साथ इस वर्ष अपने 4 सहयोगियों के निधन की सूचना दे रहा हूँ। मैं उनकी आत्मा की शांति के लिये प्रार्थना करता हूँ।

मैं उपभोक्ता सेवा में सुधार के द्वारा विकास के लक्ष्य को प्राप्त करने और हर पहलू से संस्थान का कार्य चलाने के लिये मूल्यवान योगदान हेतु अपने वैज्ञानिकों, तकनीशियनों, आधारिक एवं प्रशासनिक स्टाफ के सद्भावनापूर्ण, सहयोगात्मक समर्थन की सराहना करता हूँ। अपनी ओर से हम पारदर्शी, प्रतियोगितात्मक और स्वस्थ अनुसंधान प्रयोगों हेतु कार्य करने की प्रतिज्ञा करते हैं और आशा करते हैं कि हमारे अनुसंधान और विकास से अधिक से अधिक लोग लाभ उठाएंगे। अंत में, मैं अंतःकरण से सी.एस.आई.आर. को उनके सहयोग और सहायता के लिये तथा राष्ट्रीय/अन्तर्राष्ट्रीय अनुदान प्रदाता एजेंसियों, रिसर्च/मैनेजमेंट काउन्सिल के सदस्यों और इलेक्ट्रॉनिक तथा प्रिन्ट मीडिया का उनके मूल्यवान सुझावों और परामर्श हेतु आभार प्रकट करता हूँ।

तुषार चक्रवर्ती

(तुषार कान्ति चक्रवर्ती)

फरवरी 17, 2011

FROM THE DIRECTOR'S DESK

On the eve of Diamond Jubilee Year of this prestigious institution, it gives me immense pleasure in presenting before you our Annual Report 2010-11. The Institute, formally inaugurated on February 17, 1951 by the then Prime Minister of India Pt. Jawaharlal Nehru, has completed 60 years of its existence. CDRI is founded on a vision which seeks to usher in better tomorrow by providing mankind an improved quality of life and health standards. We are committed to work with a motto that success cannot be measured by accomplishments alone but by vision and foresight to chart our path for the future. For that to happen, we maintain the highest level of ethics and integrity in practicing and communicating our science and optimally leverage technology to increase penetration, improve productivity and efficiency, deliver cost-effective products and services, provide faster, efficient and convenient customer service and thereby, contribute to the overall growth and development of the country.

The reporting year was not an easy one; as recognizing the basic needs to approach the issue of planned development and growth was a challenging task before us. Besides concentrating on our research activities, we are committed to shift at the earliest to the world class state-of-the-art facility in the new campus and keep discharging our obligations by adhering to specified norms of legal, environmental and ethical practices. However, we have to keep in mind the use of high-end technology, design and aesthetics that meet aspirations and expectations of all through superior standards of performance and services. We are pledged to foster creativity without procedural restrictions, open to talent and to challenge established ideas. Besides, we are committed to prepare our 12th five year plan in accordance with the emerging global scientific challenges and national aspirations, for which we have to work sincerely and earnestly, ensuring to make infallible plans for the next five years commensurable for smooth transition to the new campus.

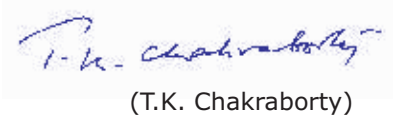
The year under report has been eventful. CDRI Diamond Jubilee Celebrations were initiated by Dr. K. Kasturirangan, Member, Planning Commission and Former Chairman, ISRO. Ever since

then, several lectures, seminars, symposia, training programs, international workshop, etc. were held.

A record number of 2003 synthetic compounds were synthesized in the Medicinal and Process Chemistry Division and submitted for biological screening. Those found active, are being pursued further for lead optimization and follow-up studies. Botany Division collected 39 new plant materials from different parts of the country. Of these, 27 samples were authenticated, documented and submitted for follow-up as well as in primary biological screening program of the Institute. Six plants were collected in bulk quantity. With regard to samples of marine origin, 337 new samples and 164 repeat samples were received from 15 participating centers and after documentation of data; they were distributed to the concerned biologists for confirmation of identified activities and general biological screening. We made significant progress on all fronts which is evident from 244 publications with much improved average impact factor 2.89 and filing of 12 Indian & 10 foreign patents and grant of 12 Indian & 6 foreign patents. This year, 178 students from 39 universities were imparted training in different disciplines and several students submitted their thesis for the award of Ph.D. degree.

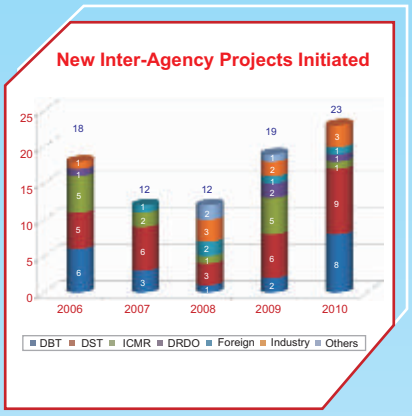
During the reporting period, several colleagues received recognitions from different agencies from all over the globe, including young scientist awards, fellowships from prestigious societies, medals and foreign grants. Number of research scholars received awards and recognitions in national and international conferences. I congratulate all the winners and hope that such appreciations would inspire others to achieve even better. I thank all the staff members for their valuable support and contributions and hope that they would continue to work even harder to build a new world-class CDRI. I report with sorrow the sad and untimely demise of 4 colleagues this year. I pray that their souls rest in peace.

I place on record the sincere appreciation, cooperation and support received from our experienced scientists, technicians, infrastructural and administrative staff for their valuable contributions in every aspect of the Institute's operation and for targeting profitable growth and thereby improve customer services. On our part, we pledge to work for transparent, competitive and healthy research practices and hope that more and more people will be benefited by our R&D works. Last, but not the least, I whole heartedly acknowledge the support, help and guidance from CSIR, all national and international funding agencies, Members of Research/Management Council, electronic and print media for their valuable suggestions and advice.



(T.K. Chakraborty)

February 17, 2011



Performance Report

Performance Report

The year 2010-11 is the **Diamond Jubilee Year** of CDRI. Housed in the historic Chattar Manzil, an old palace of the Nawabs of Awadh, the institute was formally inaugurated on **17 February 1951** by the then Prime Minister of India, Pandit Jawahar Lal Nehru. The institute was set up with the objective to carry out biomedical research in all its aspects and to build a strong scientific and technological base for the development of drug and pharmaceutical industry in the country. Initially, it started with five R&D divisions and a skeletal staff of scientists and technicians. Today, the institute has emerged as an internationally recognized centre for biomedical research and has a distinction of having all the infrastructural facilities for development of new drugs from conceptual to commercialization stage. In the persuit of new drugs and technologies, CDRI has discovered and developed 12 drugs and more than 100 process technologies. Several of its products were commercialized successfully and currently four products are in market. The antimalarial drugs **Arteether** and **Artemether** are being marketed in more than 30 countries of Asia and African continents. **Memory Sure** is being marketed in more than 8 countries. **Centchroman**, the only anti-implantation agent approved for clinical use in the world, is being marketed under a brand name **Saheli**. It is a widely endorsed contraceptive pill in India.

On 14th July, 2010, Dr. K. Kasturirangan, Member Planning Commission and Former Chairman, ISRO inaugurated the CDRI Diamond Jubilee Celebrations by unveiling of Diamond Jubilee Logo and Poster. To commemorate the year, several mini symposia, workshops, lectures by eminent scientists, across the globe, were organized. The institute continued to make steady progress in all aspects during the year. A brief summary of S&T performance of the institute during 2010-11 is presented below:

Memory Sure (re)Launched on 17 February 2010
Bacosides Enriched Standardized Extract of Bacopa (BESEB)

- BESEB – Single plant based natural memory enhancer from *Bacopa monniera*;
- Licensed to Lumen Marketing Co., Chennai for extensive marketing in India through Zaar Distributors Pvt. Ltd., Delhi;
- For the prevention & early treatment of dementia, particularly
  - ➢ Children suffering from Attention Deficit Hyperactivity Disorder,
  - ➢ Elderly persons with Age Associated Memory Impairment,
  - ➢ for those with emotional stress from relationship or stress, tension, anxiety from work/study.
- Clinical Trials on BESEB Conducted by
  - ➢ CDRI-CSIR, Lucknow, India,
  - ➢ Lumen: Australia (Swinburne University of Technology's Brain Sciences Institute & University of Wollongong)
- The product is being exported to following countries:
  - ➢ New Zealand & Australia* - Keenmind, Membac,
  - ➢ Malaysia, Philippines & Singapore - Memo Plus Gold,
  - ➢ France & Germany - Memory Perfect.

*First drug approved by "Therapeutic Goods Authority, Australia" for memory enhancing.

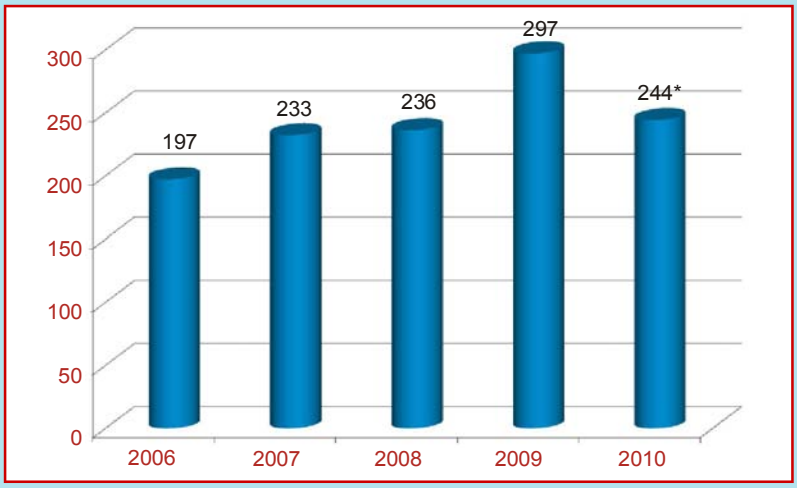
Candidate Drugs under Advance Stages of Development

Diseases / Disorders	Candidate Drugs	Efficacy	Clinical Status	Licensees & Collaborators
Liver Disorder	**Picroliv**	Hepatoprotective	Phase III clinical trial completed at CSSMU, Lucknow and Seth GS Medical College & KEM Hospital Mumbai.	DIL, Mumbai
Dyslipidemia	**80-574 + Atorvastatin**	Anti-dyslipidemic	Permission awaited from DCG(I) for extended phase III clinical trial.	Cadila Pharmaceuticals Ltd., Ahmedabad
Malaria	**97-78**	Antimalarial	Phase-I single dose clinical study completed. DCG(I) approval received for single dose pharmacokinetic study in healthy volunteers as per revised protocol.	IPCA Labs., Mumbai
Diabetes	**CDR 134D123**	Antihyperglycemic	Phase-I single & multiple dose studies completed; Report submitted to AYUSH; and has been referred to Extra Ayurvedic Pharmacopia Committee for inclusion.	TVC Sky Shop Ltd., Mumbai
Diabetes & Dyslipidemia	**CDR 134F194**	Antihyperglycemic	Modified dossier submitted to DCG(I) – IND Committee	TVC Sky Shop Ltd., Mumbai
Osteoporosis	**99-373**	Anti-osteoporotic	Plan and protocol of phase I clinical trial has been approved by DCG(I).	Open for licensing
Malaria	**99-411**	Antimalarial	Pre-clinical data is under compilation for IND submission.	IPCA Labs., Mumbai
Stroke	**Herbal Medicament**	Neuroprotective	IND application is under preparation.	Themis Medicare Ltd., Mumbai

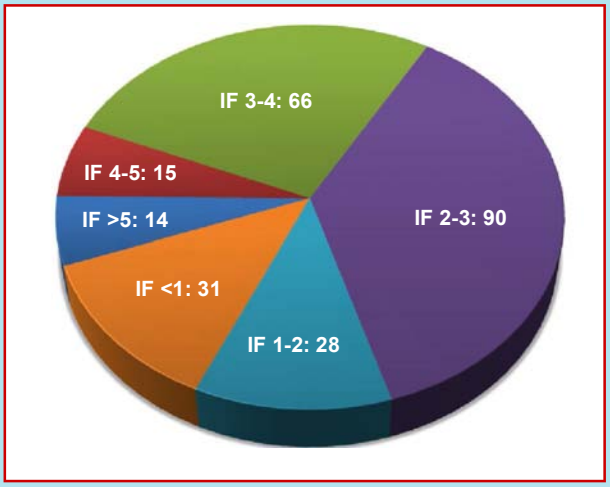
Potential New Leads

Diseases / Disorders	Lead Compound	Efficacy	Status	Licensees & Collaborators
Osteoporosis	**S-007-1500**	Fracture healing	Single dose toxicity study in rat and mice by oral route completed. Compound found safe at 50 and 100 mg/kg body weight respectively.	Under negotiation
Osteoporosis	**914-K058**	Osteogenic	Mode of action elucidated; 5 mg/kg daily oral dose stimulated bone formation comparable to daily injection of parathyroid hormone.	Under negotiation
Bone Fracture Repair	**4669**	Bone anabolic agent	Efficiency established in experimental models (*in vitro / in vivo*).	Open for licensing
Diabetes & Dyslipidemia	**4655-K09**	Antidyslipidemic	Wide dosage range efficacy established.	Open for licensing
Thrombosis	**S-002-333 & S-007-867**	Antithrombotic	Efficacy and mechanism of action established; Single dose toxicity study in rat by oral route completed and both the compounds found safe at 600 mg/kg body weight.	Under negotiation
Contraception	**S-003-296**	Spermicidal	Efficacy established; Indian patent granted.	Open for licensing
Cancer	**S-009-131**	Anti-cancer	IC_{50} < 3 µg/mL for cervical cancer cell line. Non-toxic for normal cell and breast cancer (SI >10).	Open for licensing
Tuberculosis	**S-006-830**	Antituberculosis	MIC < 3 µg/mL for Mtb H37Rv. Efficacy established *in vitro* & *ex vivo*.	Open for licensing

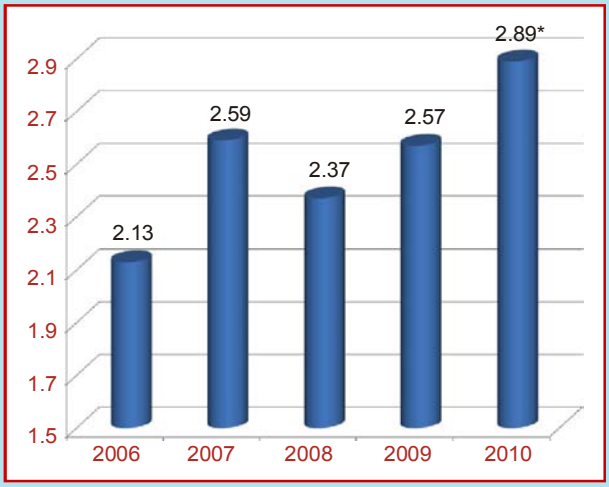
Total No. of Publications



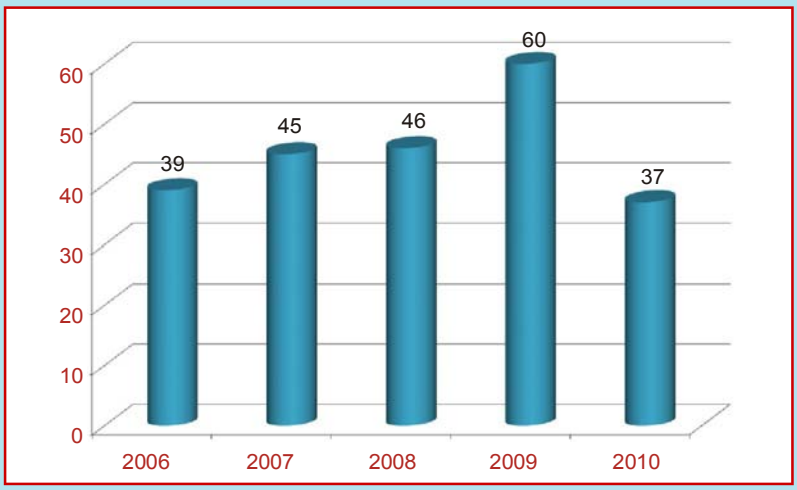
Impact Factor-wise No. of Publications 2010*



Average Impact Factor

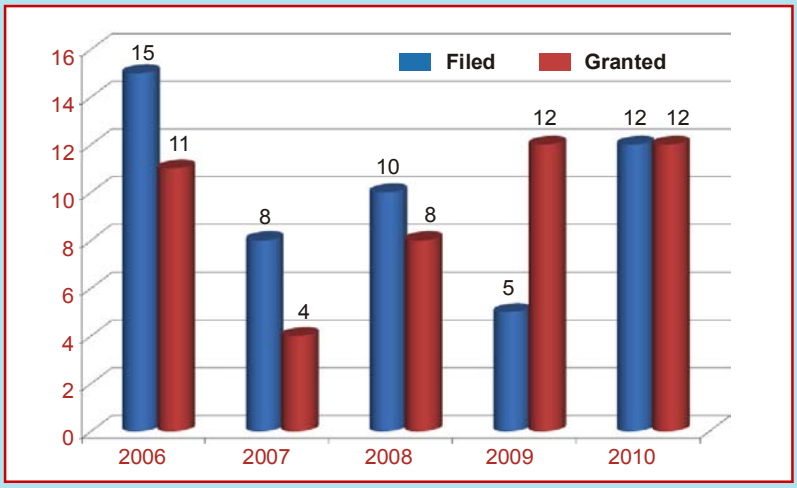


Ph.D. Thesis Submitted

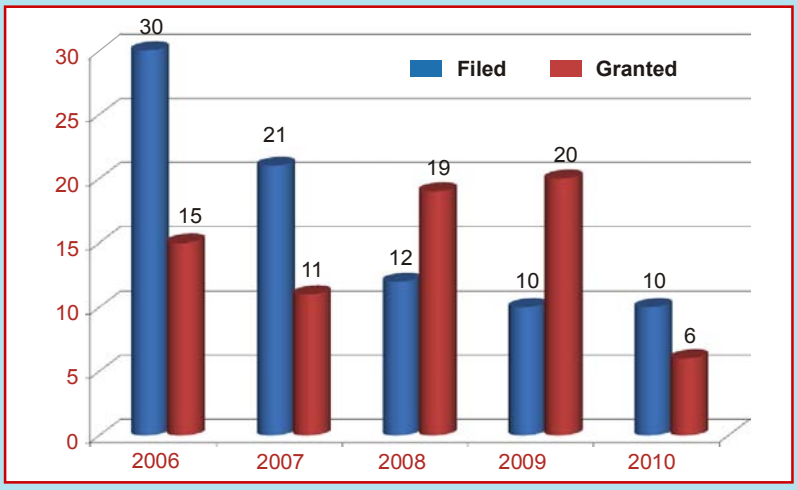


*Provisional data as on 03.02.2011

Indian Patents*



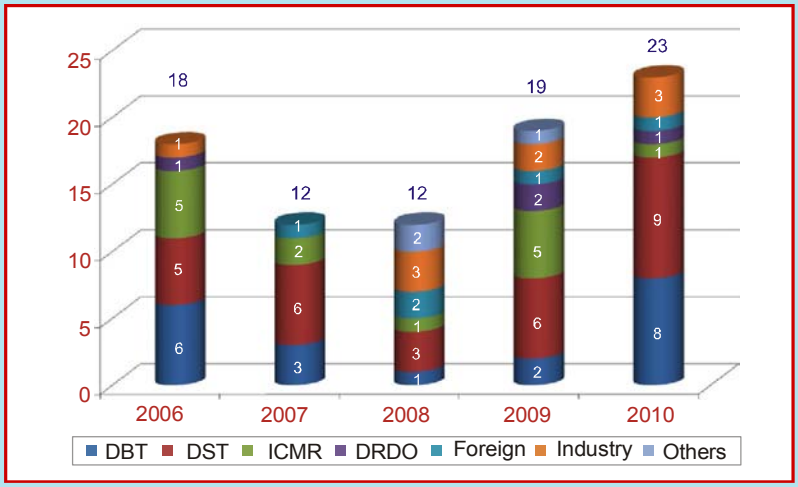
Foreign Patents*



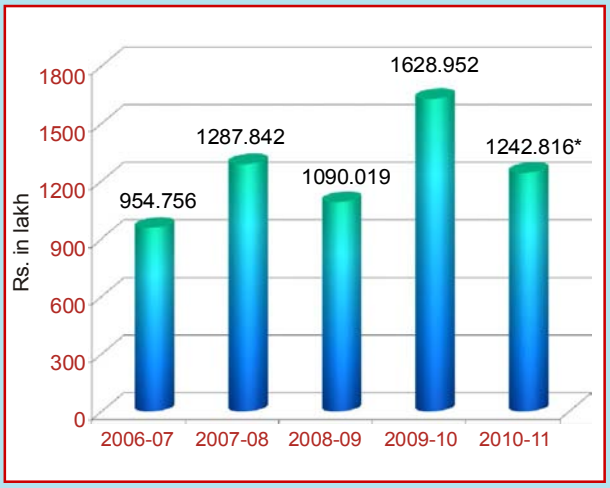
Global Distribution of Granted Patents of CDRI

*Provisional data as on 03.02.2011

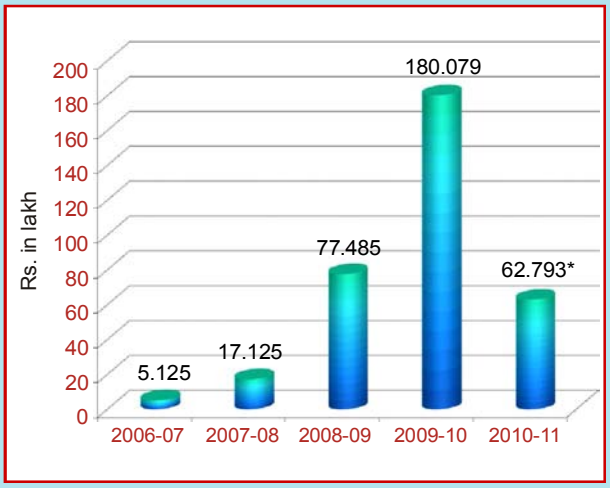
New Inter-Agency Projects Initiated



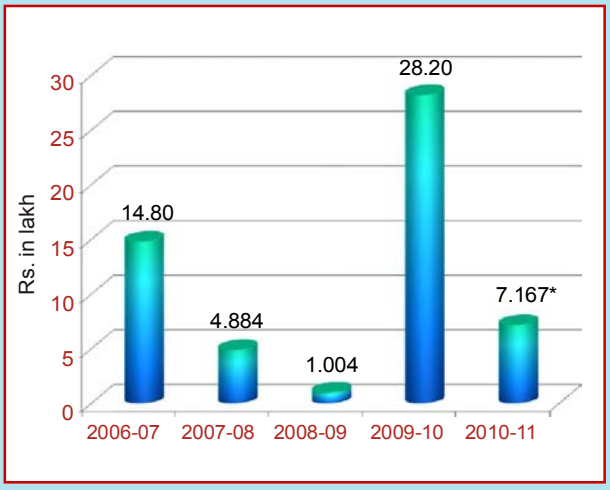
External Cash Flow from Government Agencies



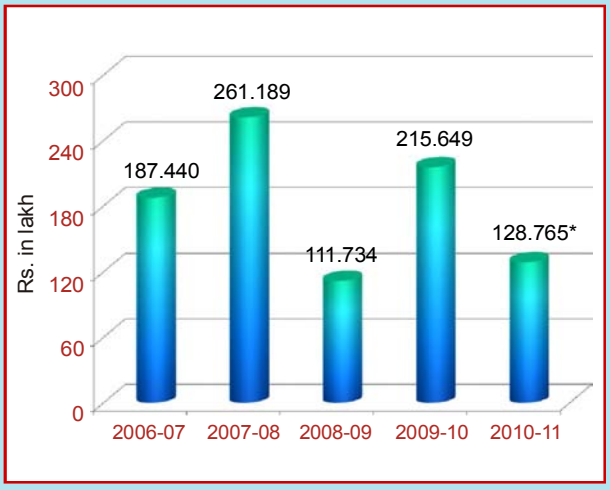
External Cash Flow from Foreign Agencies



External Cash Flow from Industries



Lab Reserve Fund Generated



*Provisional data as on 03.02.2011

BUDGET

(Rs. in lakh)

2010-2011 (Sanctioned Estimates)*

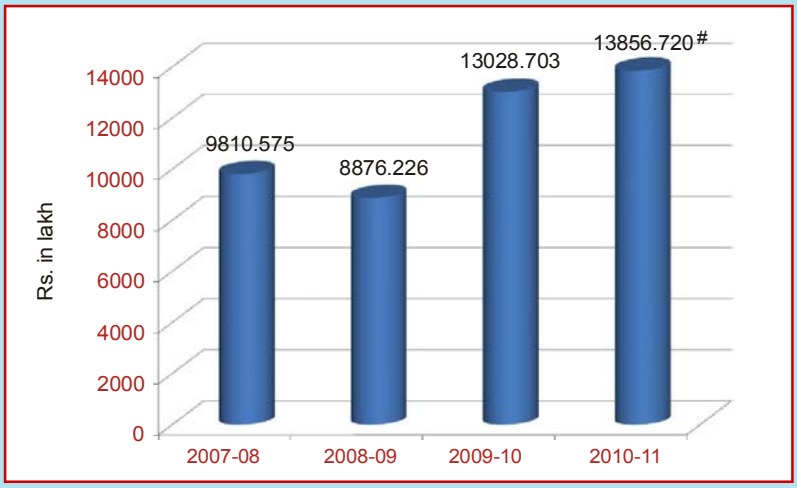
	Heads	CSIR Grant
(A)	**Recurring**	
	Pay and Allowances	3668.400
	Contingencies	254.650
	HRD	4.000
	Lab Maintenance	150.000
	Staff Quarter Maintenance	15.000
	Chemicals and Consumables	501.110
	Sub-Total	**4593.160**
(B)	**Capital**	
	Works and Services	65.000
	Apparatus and Equipments	1000.000
	Office Equipments, Furniture and Fittings	7.000
	Library Books and Journals	225.000
	Staff Quarter (Construction)	25.000
	Sub-Total	**1322.000**
	Total (A+B)	**5915.160**
(C)	**SIP/NWP/IAP/FAC/CMM/SMM Projects**	**7941.560**
	***Grand* Total (A+B+C)**	**13856.720**

* Provisional data as on 03.02.2011

2009-2010 (Actual Expenditure)

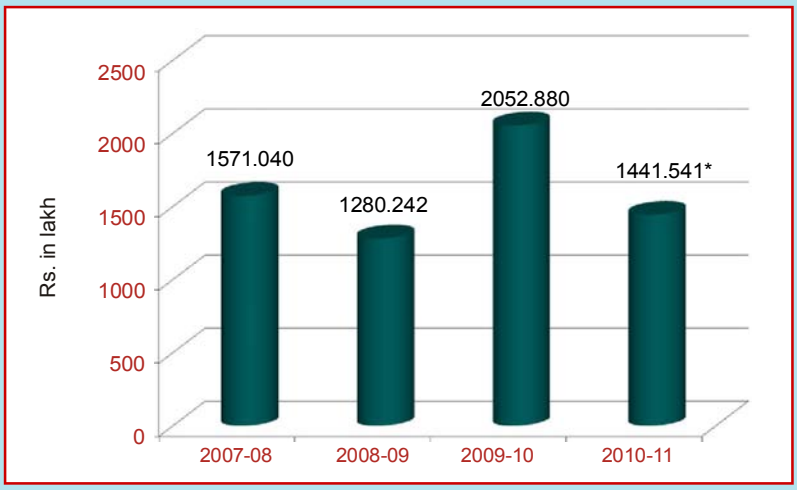
	Heads	CSIR Grant	L.R.F.
(A)	**Recurring**		
	Pay and Allowances	4046.092	
	Contingencies	221.000	35.298
	HRD	4.000	
	Lab Maintenance	150.000	14.112
	Staff Quarter Maintenance	14.000	
	Chemicals and Consumables	405.260	6.439
	Sub-Total	**4840.352**	**55.849**
(B)	**Capital**		
	Works and Services/ Electrical Installations	20.000	34.424
	Apparatus and Equipments/ Computer Equipments	478.000	5.779
	Office Equipments, Furniture and Fittings	9.021	
	Library Books and Journals	215.000	
	Staff Quarter (Construction)	12.258	
	Sub-Total	**734.279**	**40.203**
	Total (A+B)	**5574.631**	**96.052**
(C)	**SIP/NWP/IAP/FAC/CMM/SMM Projects**	**7358.020**	
	Grand Total (A+B+C)	**12932.651**	**96.052**

Total Budget (CSIR Grant)*



*Includes Regular Budget, Plan Projects (CMM/SMM/SIP/NWP/IAP/HCP/OLP/MLP), New CDRI Budget and expenditure against LRF.
Sanctioned Estimates as on 3/2/2011

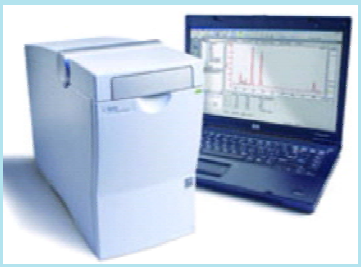
Total External Budgetary Resources



* Provisional data as on 03.02.2011

New Facilities Established

Agilent 2100 Bioanalyzer



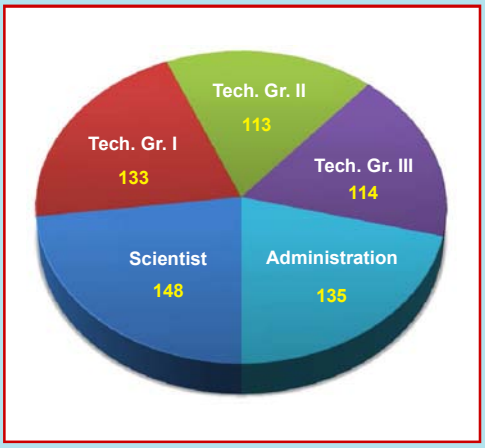
The Agilent 2100 bioanalyzer is a micro fluidics-based platform for sizing, quantification and quality control of DNA, RNA, proteins and cells on a single platform. Results are delivered within 30-40 minutes in automated, high quality digital data.

Agilent 6520, Accurate-Mass Q-TOF Mass Spectrometer LCMS system

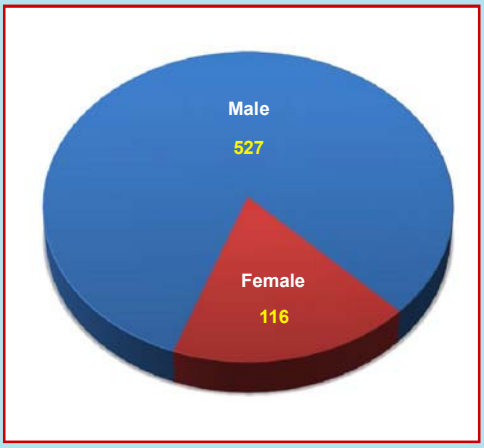
Q TOF LCMS/MS is a high resolution mass spectrometer with ESI and APCI ion source, which provides exact mass up to 3000Da in ESI and 1000 Da in APCI. It also has MS/MS facility for identification and characterization of small molecules. Liquid Chromatography system attached with Q TOF Mass spectrometer is an added facility for separation of molecules.

Manpower

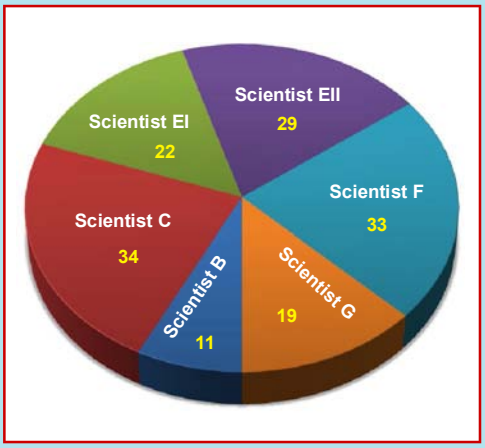
Total Staff



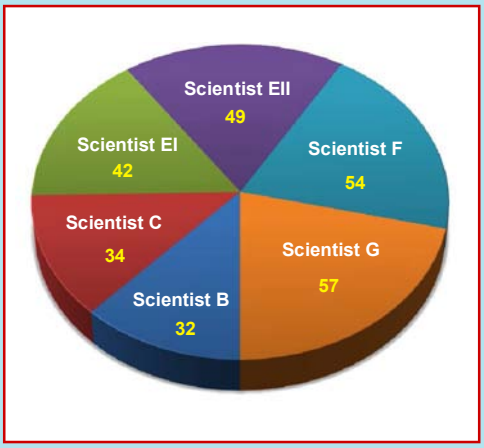
Total Staff: Male - Female Ratio



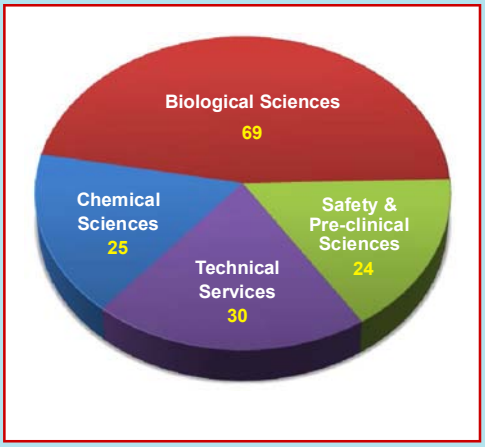
Designation-wise Number of Scientists



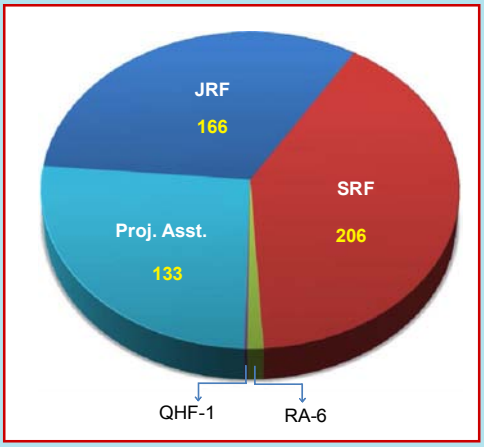
Average Age of Scientists



Area-wise Strength of Scientists



Research Fellows and Project Assistants



Data as on 01.01.2011

We Welcome Newly Recruited Scientists

Ravi Sankar Ampapathi, M.Sc., Ph.D.
Scientist Gr. IV (3)
Sophisticated Analytical Instrumentation Facility

Manjunatha Prabhu, **B.H.,** M.V.Sc.
Scientist Gr. IV (2)
Laboratory Animals Division

Maddi Sridhar Reddy, M.Sc., Ph.D.
Scientist Gr. IV (3)
Medicinal and Process Chemistry

Rajesh Kumar Jha, M.Sc., Ph.D.
Scientist Gr. IV (2)
Endocrinology

Arunava Dasgupta, M.Sc., Ph.D.
Scientist Gr. IV (3)
Microbiology

Vivek Vidyadhar Bhosale, M.B.B.S., M.D.
Scientist Gr. IV (2)
Clinical & Experimental Medicine

Jagadeshwar Reddy Thota, M.Sc., Ph.D.
Scientist Gr. IV (3)
Sophisticated Analytical Instrumentation Facility

Mrigank Srivastava, M.Sc., Ph.D.
Scientist Gr. IV (2)
Parasitology

Surender Reddy, M.Sc., Ph.D.
Scientist Gr. IV (2)
Pharmaceutics

Sanjeev Yadav, M.Sc., Ph.D.
Scientist Gr. IV (1)
S&T Management

Dipankar Koley, M.Sc., Ph.D.
Scientist Gr. IV (2)
Medicinal and Process Chemistry

Himangsu Kousik Bora, M.V.Sc.
Scientist Gr. IV (1)
Lab Animals Division

Vineeta Tripathi, M.Sc., Ph.D.
Scientist Gr.IV (2)
Botany

Abhishek Kumar, M.C.A.
Scientist Gr. IV (1)
Computer Division

Shubha Shukla, M.Sc., Ph.D.
Scientist Gr. IV (2)
Pharmacology

Neha Topno, M.Sc.
Scientist Gr. IV (1)
Microbiology

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 residential 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 by second quarter of 2011.

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 – 110067

Members

Dr. A. Surolia
Director
National Institute of Immunology
Aruna Asaf Ali Marg
New Delhi - 110067

Dr. K. Nagarajan
Corporate Advisor
Hikal Ltd., R & D Centre
Kalena Agrahara Bannerghatta Road
Bangalore – 560076

Dr. Shekhar C. Mande
Staff Scientist
Centre for DNA Fingerprinting and Diagnostics
ECIL Road, Nacharam
Hyderabad- 500076

Prof. K.N. Ganesh
Director
Indian Institute of Science Education and Research
900, NCL Innovation Park
Dr. Homi Bhabha Road
Pune- 411008

Dr. R. Nagaraj
Scientist
Centre for Cellular and Molecular Biology
Uppal Road
Hyderabad- 500007

Dr. Bhaskar Saha
Scientist
National Centre for Cell Science
Ganeshkhind
Pune- 411007

Dr. M.D. Nair
A-11 Sagarika No. 15
3rd Seaward Road, Valmiki Nagar
Chennai - 600041

Agency Representative

Dr. (Ms.) Deepali Mukherjee
Chief ECD
Indian Council of Medical Research
Post Box No. 4911, Ansari Nagar
New Delhi- 110029

DG's Nominee

Dr. Rajesh S. Gokhale
Director
Institute of Genomics and Integrative Biology
University Campus, Mall Road
Delhi- 110007

Sister Laboratory

Dr. Ram Rajsekharan
Director
Central Institute of Medicinal and Aromatic Plants,
P.O. CIMAP
Lucknow – 225015

Cluster Director

Prof. Siddhartha Roy
Director
Indian Institute of Chemical Biology
4, Raja SC Mullick Road, Jadavpur
Kolkata- 700032

Director

Dr. Tushar Kanti Chakraborty
Director
Central Drug Research Institute
Lucknow – 226001

Permanent Invitee

Head or his Nominee
Planning & Performance Division
Council of Scientific & Industrial Research
Anusandhan Bhawan, 2, Rafi Marg
New Delhi - 110001

Secretary

Dr. S.B. Katti
Scientist
Central Drug Research Institute
Lucknow – 226001

Management Council

(January 2010 - December 2011)

Chairman

Dr. T.K. Chakraborty
Director
Central Drug Research Institute
Lucknow – 226001

Members

Dr. K.C. Gupta
Director
Indian Institute of Toxicology Research
Lucknow – 226 001

Dr. B. Kundu
Scientist Gr. IV(6)
Division of Medicinal & Process Chemistry
CDRI, Lucknow – 226001

Dr. S.P.S. Gaur
Scientist Gr. IV(6)
Clinical & Experimental Medicine
CDRI, Lucknow – 226001

Dr. Vinod Bhakuni
Scientist Gr. IV(6)
Molecular & Structural Biology Division
CDRI, Lucknow – 226001

Dr. (Mrs.) Saman Habib
Scientist Gr. IV(4)
Molecular & Structural Biology Division
CDRI, Lucknow – 226001

Dr. Mohd. Imran Siddiqui
Scientist Gr. IV(3)
Molecular & Structural Biology Division
CDRI, Lucknow – 226001

Mr. Karunesh Rai
Technical Officer Gr. III(5)
Division of Laboratory Animals
CDRI, Lucknow – 226001

Controller of Finance & Accounts / Finance & Accounts Officer
CDRI, Lucknow – 226001

Member – Secretary

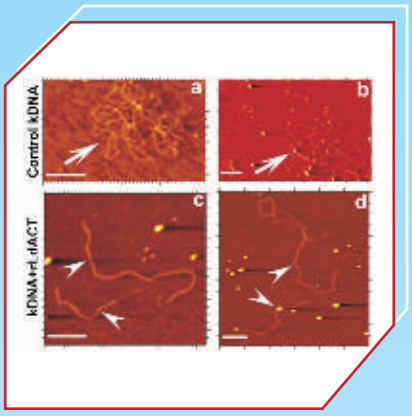
Controller of Administration / Administration Officer
CDRI, Lucknow – 226001

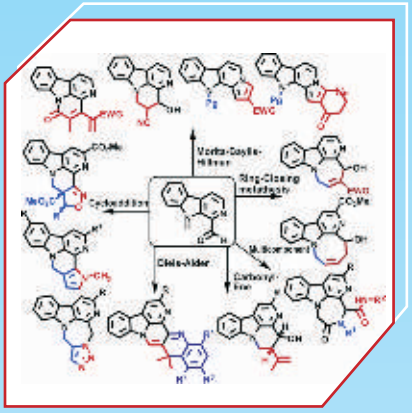
Announcement

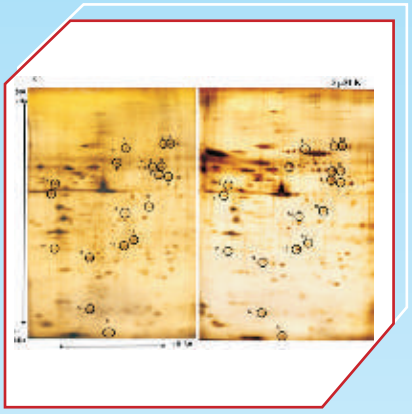
CDRI Award 2011

The prestigious 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*" and 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".

Our heartiest congratulations to both the awardees. The felicitation ceremony will be held on 26th September 2011.







Progress in Research Projects

1 Malaria and other Parasitic Diseases

Coordinator:
Dr. S.K. Puri

Assistant Coordinator:
Dr. Saman Habib

Area Leaders:
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.

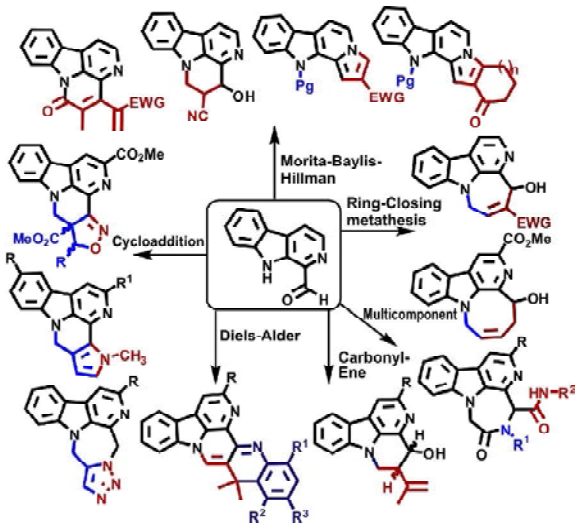
1.1 Malaria

1.1.1 Synthesis and screening

1.1.1.1 Synthesis

Synthesis of nearly 700 novel moieties representing several prototypes including β-carbolines, β-amido carbonyles, β-carboline fused lactams, furanones, urea & thiourea derivatives, 4-amino quinolines, amino acid conjugated 4-amino-quinolines, biphenyl ethers, allyl amides, thiazines, guanidines, pyrimidines, triazoles, glycosyl biphenyl derivatives, pyrazole derivatives of chalcones, cyclopropyl methanones, tetrahydro-acridines, tetrahydrocarbolines, imidazolines, dithiocarbamates, pyrrolidinoaminoalkanes, as well as several hybrid molecules viz. quinoline- oxo-acetamide hybrids, quinoline-imidazoline hybrids, coumarine-chalcone hybrids, piperazine-carboline hybrids, acridine imidazoline hybrids, triazine-chalcones, triazine-pentamidines, azole-cyclopropyl derivatives, febrifugine-chloroquine hybrid was undertaken during the year to identify new lead molecules against malaria.

The synthesis of novel annulated β-carbolines



involved Morita-Baylis-Hillman (*Eur. J. Org. Chem.*, 2010, 19: 3684-3691), cycloaddition (*Eur. J. Org. Chem.*, 2010, 3: 531-539), Diels-Alder (*Eur. J. Org. Chem.,* 2010, 6269-6276), Ring-closing-metathesis (*Tetrahedron Lett.* 2010, 51: 5781-5783) or multicomponent reactions (*Synthesis,* 2010, web released 29th Dec) with 1-formyl-9*H*-β-carboline.

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* for determining concentration response profile employing SYBR green nucleic acid dye based micro-fluorimetric assay. Several compounds, representing diverse prototypes as pyrrolidinoaminoalkane derivatives, guanidines, dithiocarbamates, furanones, cyclopropyl methanones, β-amido carboniles besides some hybrid molecules have been identified with IC_{50} values below 50 ng/ml. Some of the identified series were also screened against chloroquine resistant *P. falciparum* K1 parasites and showed promising response. In addition, more than 800 samples of natural origin comprising extracts from terrestrial plants or marine fauna were also evaluated against *in vitro* model under the network programs and a few leads were identified for follow up studies.

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

Nearly forty 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. Compounds from two prototypes, viz. quinoline-chalcone hybrids and amino acid conjugated quinolines exhibited above 95% parasite clearance after 4-day treatment regimen.

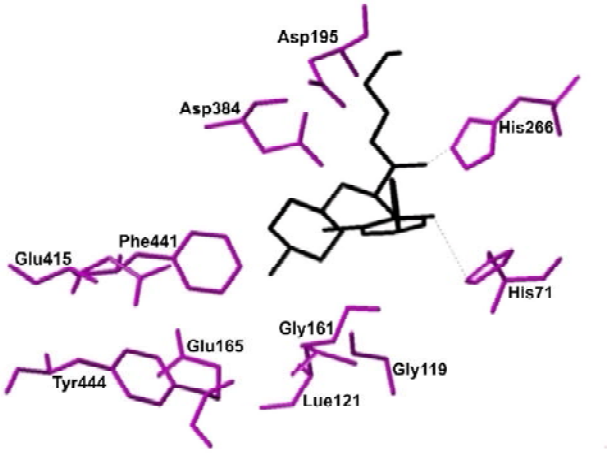
1.1.1.4 Screening against *Plasmodium yoelii* (MDR) – Swiss mice model

Thirty synthetic compounds were evaluated against multi drug resistant *P. yoelii nigeriensis* in Swiss mice. Representative compounds from amongst aridine derivatives, febrifugin hybrids and pyrrolidino-aminoalkanes, exhibited above 90% inhibition after 4 dose regimen and are being optimized for further studies.

1.1.2 Basic studies

1.1.2.1 *P. falciparum* transketolase as drug target

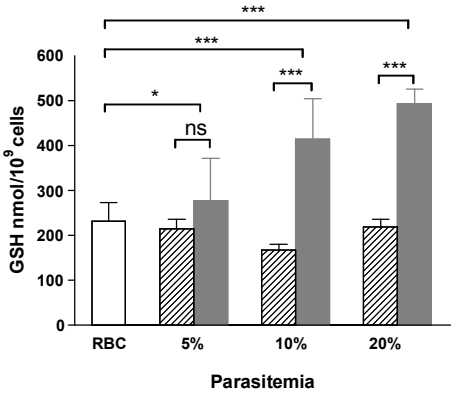
Transketolase the most critical enzyme of the non-oxidative branch of the pentose phosphate pathway has been reported as a novel target in *P. falciparum.* The homology model of *P. falciparum* transketolase was utilized for identification and prioritization of potential compounds targeted against parasites. The compounds, selected after virtual screening on the basis of substrate fructose-6-phosphate and cofactor thiamine pyrophosphate, were tested on purified PfTk. The three compounds in case of fructose-6-phosphate based screening and one compound in case of thiamine pyrophosphate based screening inhibited the PfTk. The docking studies with fructose-6-phosphate and thiamine pyrophosphate showed that His^{31}, Asp^{473}, $Serine^{388}$ and $Arginine^{361}$ formed hydrogen bonds with fructose-6-phosphate while pyrimidine ring of the coenzyme interacted with conserved residues of protein viz., Leu^{121}, Glu^{415}, Gly^{119}. The residues involved in binding of oxythiamine pyrophosphate were similar to cofactor binding site of PfTk. A library of compounds targeted against PfTk fructose-6-P binding sites was designed and virtual screening was carried out. Four of the compounds were synthesized and tested against PfTk *in vitro.* One of these compounds significantly inhibited the PfTk activity.



Binding mode in PfTk model by compound obtained after screening on the basis of Fructose-6-phosphate

1.1.2.2 Studies with arteether resistant parasites

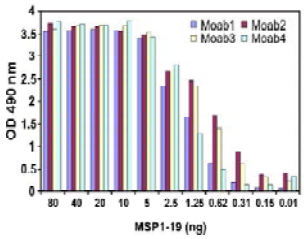
Although the mode of action of artemisinine derivatives remains unclear, the available evidences suggest a role for free radicals in their mechanism of action. A comparison of the intracellular levels of glutathione (GSH) and antioxidant enzymes in arteether sensitive and experimentally selected arteether-resistant *P. vinckei* parasites showed a significant (2.9-fold) increase in the GSH level in arteether-resistant parasites as compared to arteether-sensitive parasites. Simultaneously, significantly increased activities of glutathione reductase, glutathione-S transferase and glucose-6-phosphate dehydrogenase and decreased activity of superoxide dismutase were recorded in resistant parasites. The results suggest that glutathione's antioxidant effects may counteract the drug effect and thereby contribute to the parasites' resistance to arteether and other artemisinin-based antimalarials (*Parasitology Internatinal,* 2010, 60(1): 97-100).



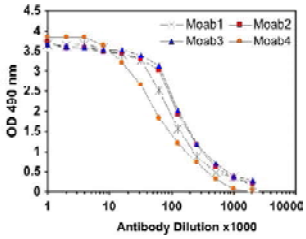
GSH content (nmol/10^9 cells) in normal red blood cells (□) and blood infected with arteether-sensitive (□) and arteether-resistant (■) *P. vinckei*, showing a relationship with the degree of parasitemia (* p<0.0001, ns; non-significant)**

1.1.2.3 Characterization of 19 kD and 42 kD fragments of merozoite surface protein-1 of *P. cynomolgi*

Purified *P. cynomolgi* $MSP1_{19}$ ($PcMSP1_{19}$) recombinant protein showed high reactivity with conformation-dependent monoclonal antibodies (against *P. cynomolgi/P. vivax* $MSP1_{42}$ antigen). The immune monkey sera collected before and



Titration of Moabs with *Pc*$MSP1_{19}$ antigen

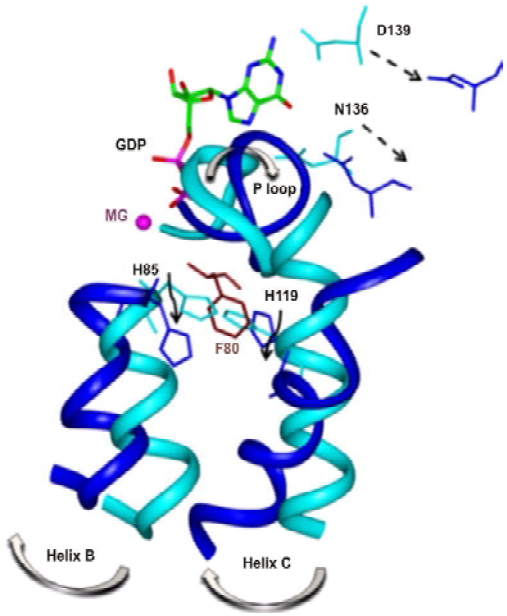


Reactivity of *Pc*$MSP1_{19}$ with Moab

after challenge of monkeys with *P. cynomolgi* parasites (from previous study) showed high antibody titre against $PcMSP1_{19}$ with reduction in parasitaemia. These findings suggest correlation between the antibody titres against $PcMSP1_{19}$ and protection of monkeys to parasite challenge. In order to initiate immunization of mice with $PcMSP1_{42}$ plasmid DNA construct/ recombinant $MSP1_{42}$ antigen, large scale production of *P. cynomolgi* $MSP1_{42}$/ $MSP1_{19}$ protein and plasmid as well as purification and refolding of $PcMSP1_{42}$ was done.

1.1.2.4 Housekeeping functions of the apicoplast as targets for antimalarials

The plastid of the malaria parasite is a target for antibiotics, several of which act on the organelle's replication and translation machinery. The apicoplast DNA replication process involves the activation of several *ori* elements in the IR region of the plastid's circular genome. A DnaJ homolog, imported into the apicoplast, was identified as an *ori*-interacting protein and its biochemical properties provided insights into how apicoplast *ori* activation may be regulated (*Mol. Microbiol.*, 2010, 75: 942-956). Investigation of molecular aspects of the apicoplast translation process has demonstrated the functional interaction of apicoplast-encoded elongation factor EF-Tu and nuclear encoded, plastid-targeted, EF-Ts that results in GDP release from the former and recycling of its active GTP form. The effects of antibiotics on apicoplast EF-Tu and EF-G activities are also under investigation and specific inhibitory effects on factor functions that are reflected in anti-*Plasmodium* activity have been observed.



Dynamic model depicting structural alterations in apicoplast EF-Tu upon binding of EF-Ts

1.1.2.5 Cytokine profiles and clinical immune response to falciparum malaria in regions of high or low disease transmission in India

The immune effector response to *P. falciparum* infection involves a fine-tuned interplay of different cell-types and cytokines. However, the processes by which they mediate the development of clinical immunity in areas with different endemicity are poorly understood. The analysis of circulating levels of pro-inflammatory (TNF, IFNγ, IL12, IL16) and anti-inflammatory (IL4, IL10, IL13) cytokines in control and patient groups drawn from a *P. falciparum* endemic and a non-endemic region of India showed that the endemic region control population exhibited lower pro- to anti-inflammatory cytokine ratio indicating a shift towards high basal Th2 response. Levels of IL10 contributed most towards the region-specific difference in basal cytokine response. IL10 was also the strongest predictor of disease in the endemic region while IL12, along with IL10 and IL6, contributed most to malaria disease outcome in the non-endemic region. Low mean IFNγ/IL10 ratio was associated with disease severity in the endemic region (P<0.0001). In contrast, low mean IL12/IL10 ratio was correlated to disease

outcome in the non-endemic region (P<0.0001). Levels of pro- and anti-inflammatory cytokines and relative balance between the Th1 and Th2 response illustrates how populations residing in areas of varying disease endemicity may respond to *P. falciparum*-induced immune challenge.

1.2 Leishmaniasis

1.2.1 Synthesis and screening

1.2.1.1 Synthesis

Novel synthetic moieties representing several prototypes viz., chalcones, terpenyl prazoles, terpenyl chalcones, terpenyl iso-oxazoles, terpenyl esters, quinolines, aminoquinolines, azoles, quinazolines, quinazoline-triazines, β-carbonyles, imidazolones, miltefosine derivatives and pentamidine-pyrimidine hybrids were synthesized for bioevaluation against experimental models.

1.2.1.2 Screening against *in vitro* model

Two hundred and eighty synthetic compounds, 22 plant extracts and 231 marine extracts were evaluated at 40 µM concentrations against *in vitro* macrophage-amastigote model for lead identification. A total of 147 compounds, showing significant activity at this concentration, were re-evaluated for their IC_{50} and CC_{50} responses to determine the selectivity index and 50 compounds were identified for *in vivo* efficacy evaluation. Likewise, 6 marine extracts/fractions were also identified for *in vivo* trials against hamster model. Besides, several synthetic compounds, representing three prototypes namely oxaboroles, amidothiazoles and nitroimidazoles, evaluated under a DNDi sponsored project, showed promising activity.

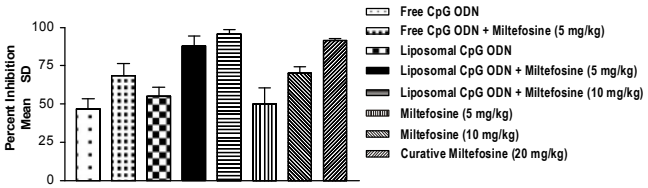
1.2.1.3 Screening against *in vivo* model

Thirty six synthetic compounds identified from the *in vitro* screen, 12 plant extracts and 4 marine samples were evaluated against *L. donovani*/hamster model. Four of the synthetic compounds representing aryl chalcone, terpenyl chalcone and β-amido carbonyle prototypes showed more than 70% inhibition of parasite multiplication. Under DNDI sponsored project, one oxaborole compound, DNDI-VL-4169-00-01 and one nitroimidazole derivative DNDI-VL-2001 have shown more than 90% activity at 50 mg/kg x 5 dose regimen against hamster model and the latter is a potential candidate for preclinical development.

1.2.1.4 Combination therapy using Miltefosine with immunomodulators

A. Miltefosine plus CpG ODN

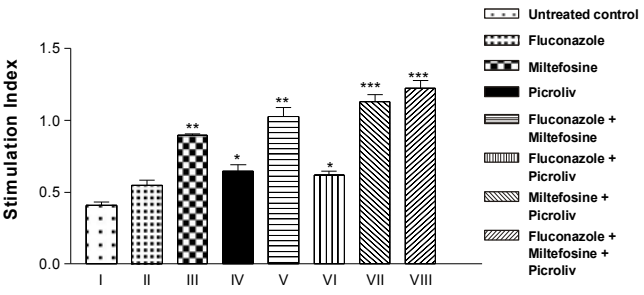
Initial study using fully thioated class B CpG ODN (1826) in free and liposomal form with sub-curative dose of miltefosine have furnished promising results as a therapeutic approach for a safer treatment of VL (*Journal of Antimicrobial Chemotherapy*, 2010, 65: 1448-1454). Further studies have been conducted with another fully thioated class B CpG ODN (2006) which stimulates mainly human primary B cells. Results have shown that co-administration of liposomal CpG-ODN (1 nM) with sub-curative doses of miltefosine showed a better inhibitory effect (90.6% in mice and 88.5% in hamsters) than free CpG-ODN-miltefosine, free CpG- ODN alone or miltefosine alone. This response is comparable with the efficacy of miltefosine alone at 30mg/kg dose.



Combination therapy of free and liposomal CpG ODN 2006 with miltefosine

B. Miltefosine plus Picroliv plus Fluconazole

Immunomodulatory effect of picroliv in combination with fluconazole miltefosine was monitored against *L. donovani* hamster model. The combination showed 88.2% inhibitory effect as compared to 77.4% inhibition in group treated with combination of fluconazole and miltefosine. Upregulation in the lymphocytes' proliferation was also observed in animals of this group. (*Parasitol. Res.*, DOI 10.1007/s00436-010-2230-2).

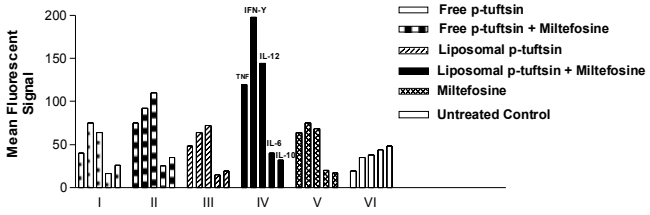


Lymphocyte proliferation response

C. Miltefosine plus Palmitoyl-tuftsin

Tuftsin is known to stimulate white blood cells and perform a wide spectrum of biological activities. Co-administeration of liposomal p-tuftsin and miltefosine showed 81.1% inhibitory effect as compared to 66.5 responses with free p-tuftsin+ miltefosine and 34% efficacy with free p-tuftsin alone. Liposomal encapsulation of p-tuftsin enhanced IL-12, TNF and IFNγ levels. In biochemical

assay, liposomal p-tuftsin combined with miltefosine resulted in marked production of NO, ROS and H_2O_2.



Th1/ Th2 cytokine response in treated and untreated animals

1.2.2 Elucidation of drug resistance mechanism

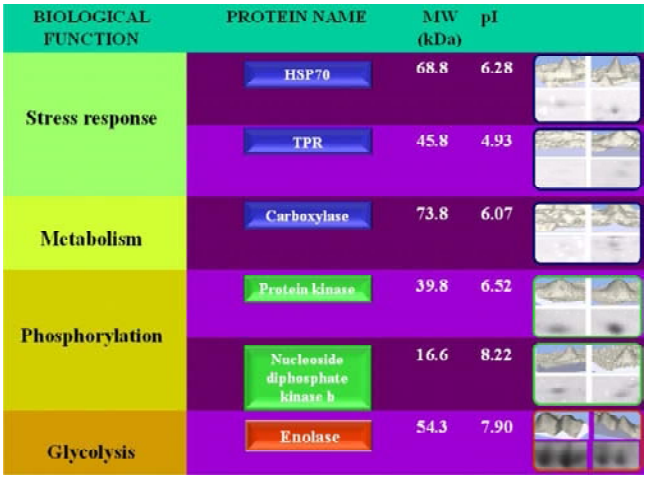
1.2.2.1 Follow-up studies with sodium stibogluconate resistant genes: Cloning and sequencing of differentially expressed drug resistance genes

Using micro array technique, few genes were identified which exhibited down/up-regulation in SAG–resistant field isolates. Three contigs showed consistent down regulation in resistant isolates. Partial sequencing and blast analysis of these contigs revealed their homology with MAP kinase homologue1 of *L. mexicana*. The complete ORF was PCR amplified, cloned and sequenced. An open reading frame of 1074 kb bp was observed, that encodes a polypeptide of 358 amino acids with predicted molecular weight of 40.1kDa, isoelectric point, pH 6.6 and charge +1). The sequence analysis revealed that LdPK homologue is a bonafide MAPK1 hence named as LdMAPK1. The alignment of deduced amino acid sequence of LdMAPK1 with MAP kinase1 homologue of other organisms revealed that LDPK is highly conserved within *Leishmania* spp and clustered in one group. Even MAPK of *T. cruzi* was divergent enough to be clustered with *C. elegance* MAPK and mammalian ERK2. Southern analysis suggested that the gene was present as single copy in parasite genome.

Another contig which exhibited upregulation in resistant isolates was identified as NLI gene (Nuclear LIM Interacting Factor). Complete ORF was PCR amplified, cloned and sequenced. The complete NLI ORF of of *L. donovani* was 870 bp long that encodes for a protein of 290 amino acids 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*.

1.2.2.2 Identification of immuno-dominant drug resistance markers between SAG sensitive and SAG resistant clinical isolates of *L. donovani*

In this study, expression proteomics was used for identification of immuno-dominant drug resistance markers between SAG sensitive and SAG resistant clinical isolates of *L. donovani*. Differentially expressed immuno-stimulatory antigens such as Heat Shock Protein 70 (Hsp70),

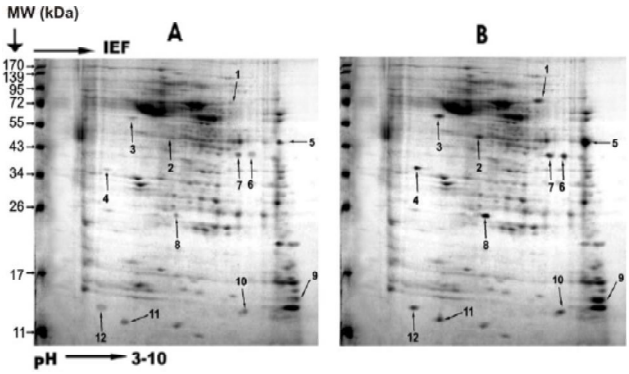


Biological role of identified proteins involved in drug resistance in *L. donovani* clinical solates

Tetratricopeptide repeats (TPR), enolase, carboxylase, nucleoside diphosphate kinase b, protein kinase that may be involved in imparting drug resistance have been identified.

1.2.2.3 Proteome mapping of over-expressed membrane-enriched and cytosolic proteins in sodium antimony gluconate resistant clinical isolate (*British Journal of Clinical Pharmacology* 2010, 70(4): 609–617).

The study was performed in selected clinically relevant field isolates which were either responsive or non responsive to SAG. A comparison of proteome profiles of membrane-enriched as well as cytosolic protein fractions of these isolates has pinpointed the multiple over-expressed proteins in resistant isolates. Six out of 12 over-expressed proteins (> 2.0 folds) were identified in the membrane-enriched fraction of the SAG resistant strain of *L. donovani* whereas 14 out of 18 spots were identified in the cytosolic fraction as compared with the SAG sensitive strain. The major proteins in the membrane-enriched fraction were ABC transporter, HSP-83, GPI protein transamidase, cysteine–leucine rich protein and 60S ribosomal protein L23a whereas



Two dimensional gel electrophoresis separation of membrane enriched protein extracts from SAG sensitive isolate 2001 (A) and SAG resistant isolate 2039 (B) of *L. donovani*.

in the cytosolic fraction proliferative cell nuclear antigen (PCNA), proteasome alpha 5 subunit, carboxypeptidase, HSP-70, enolase, fructose-1,6-bisphosphate aldolase, tubulin-beta chain have been identified. Most of these proteins have been reported as potential drug targets, except 60S ribosomal protein L23a and PCNA which have not been reported to date for their possible involvement in drug resistance against VL. This study has indicated their possible essential role in antimony resistance of the parasite and provides a vast field to be exploited to find much needed novel treatment strategies against VL.

1.2.3 Identification, characterization and validation of novel drug targets

1.2.3.1 Nucleoside diphosphate kinase B (NDKb)

The purified recombinant NDK, localized in *L. donovani* nucleus shows a high specific phosphotransferase activity. Further characterization work for its possible involvement in antiapoptotic activity and other biochemical activities are underway.

1.2.3.2 Dipeptidylcarboxypeptidase

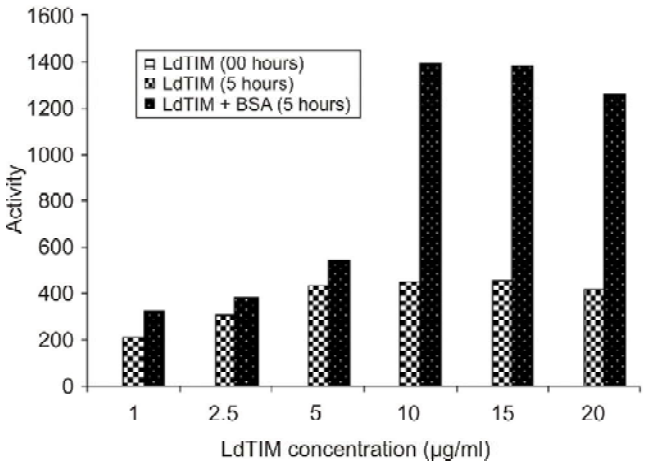
Dipeptidylcarboxypeptidase has been characterized and established as a drug target for antileishmanial drug discovery. A large chemical library of 15,452 compounds was screened against 3D model of dipeptidylcarboxypeptidase to identify novel inhibitors. The initial virtual screening using a ligand-based pharmacophore model identified 103 compounds. 46 compounds were short listed based on the docking scores and other scoring functions. Further, these compounds were subjected to biological assays and 4 of them, belonging to two chemical classes, were identified as lead compounds.

1.2.3.3 Squalene Synthase (*FEMS Microbiol. Lett.*, 2010, 311(1): 82–92)

Squalene synthase (SSN, EC 2.5.1.21), a major enzyme in the sterol biosynthetic pathway, catalyses an unusual head-to-head reductive dimerization of two molecules of farnesyl-pyrophosphate (FPP) in a two-step reaction to form squalene. FPP serves as a metabolic intermediate in the formation of sterols, dolichols, ubiquinones and farnesylated proteins. The catalytically active recombinant squalene synthase of *L. donovani* (LdSSN) has been cloned, expressed and purified. Zaragozic acid A, a potent inhibitor of mammalian SSN, was a competitive inhibitor of recombinant LdSSN, with a Ki of 74 nM.

1.2.3.4 Triose phosphate isomerase (LdTIM)

The cysteine-reactive agent methylmethane thiosulphonate (MMTS) was used as probe to test its effect on enzyme activity and oligomerization. Methylmethane thiosulphonate MMTS dissociates the LdTIM dimer inducing the formation of a monomer. Further the kinetics of LdTIM in presence of MMTS showed no significant change in Km value. The effect of bovine serum albumin on the reactivation of TIM was also investigated.



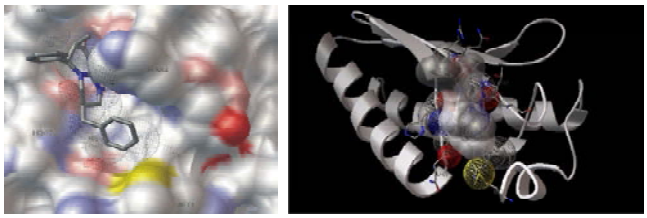
Reactivation of LdTIM with and without BSA

1.2.3.5 Cytosolic serine hydroxylmethyltransferase (cSHMT)

Serine hydroxymethyltransferase (SHMT) catalyses the reversible conversion of serine and tetrahydrofolate to glycine and methylene-tetrahydrofolate. The completion of the genome sequence of *Leishmania major* revealed the presence of two genes coding for two isoforms of this protein. The situation is different in other kinetoplastid parasites with only one SHMT encoding gene in *Trypanosoma cruzi* and no SHMT encoding gene in *Trypanosoma brucei*. Previously the mitochondrial SHMT from *L. donovani* was characterized. The SHMT gene from *L. donovani* was cloned and sequenced to characterize the cytosolic form of SHMT.

1.2.3.6 Pterin 4-alpha carbinolamine dehydratase (PCD)

For the study on this enzyme, the three dimensional model of *L. infantum* PCD (LiPCD) was generated based on the crystal structure of *Toxoplasma gondii* PCD (TgPCD) by means of comparative homology modeling and assessed using PROCHECK and WHATIF. The alignment of the sequences and similarity search with human enzymes showed very less similarity to humans and has ~40% similarity with TgPCD. These differences were exploited to identify selective inhibitors for LiPCD by virtual screening of compound libraries of biopterin, pyrimidone, dihydropyrimidone, aminobenzthiazole, aminobenzimidazole compounds and their derivatives which have previously been studied in our lab and libraries of compounds extracted from databases such as Maybridge and ZINC database has led



LiPCD-ligand fit | LiPCD- ligand molecular interactions

Selective inhibitors for *Li*PCD by virtual screening

to identification of positive hits which can be significant lead compounds.

1.2.4 Immunological studies

1.2.4.1 Identification of Th1 stimulatory proteins for immunoprophylactic potential

Eleven recombinant proteins viz. elongation factor-2, p45, aldolase, enolase, triosephosphate isomerase, protein disulfide isomerase, calreticulin, adenosylhomocysteinase, cofactor-independent phosphoglycerate mutase, dnaK-type molecular chaperone hsp70.4 -Heat shock 70-related protein1 precursor, and a hypothetical protein (2131001), identified in the previous study, were developed and their molecular and immunobiochemical characterization has been carried out. All except Calreticulin exhibited significant cellular response with lymphocytes from cured Leishmania infected hamsters as well as PBMC's from cured patients. Some of these, viz. aldolase, enolase, protein disulfide isomerase, adenosylhomocysteinase, cofactor-independent phosphoglycerate mutase, hypothetical protein (2131001) are also being evaluated and validated as drug targets.

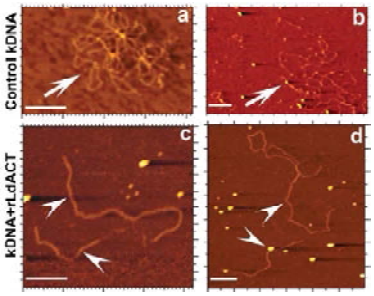
Proteomic and MALDI analysis of potent fraction and sub fraction of amastigotes revealed that 47 spots out of 70 were identified and of these 14 were Th1 stimulatory proteins, 3 drug targets and rest were putative ones. Interestingly almost none except one (Heat shock Protein 83) matched with the TH1 stimulatory proteins of promastigotes.

1.2.4.2 Nucleosomal histone proteins of *L. donovani*: Molecular and immunobiochemical characterization for its potential as vaccine target against visceral leishmaniasis

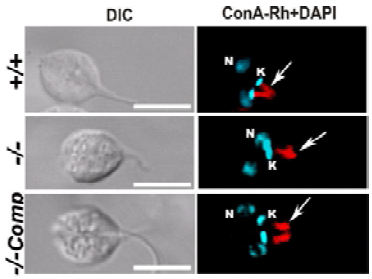
Studies have been initiated to clone and over express nucleosomal histone proteins for their characterization and prophylactic evaluation as purified recombinant protein either individually or in various combinations. Based on gene database of *Leishmania major*, primers were designed for different Histone proteins (H2a, H2b, H3 & H4) and PCR amplification of the genes of these proteins was done using genomic-DNA isolated from *L. donovani* promastigotes. These genes (H2a, H2b, H3 & H4) were further cloned in PTZSR/T T/A cloning vector(s) and sequenced [H2b gene of 330 bp (HM057222), H3 gene of 390 bp (GU066394), H4 gene of 303 bp (GQ845113). H2a gene is being sequenced].

1.2.5 Cell biology studies

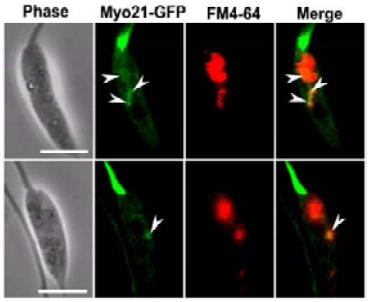
1.2.5.1 Functional characterization of actin and actin-binding proteins in *L. donovani*



A. Actin: Leishmania actin (LdACT) is a highly unconventional form of actin, which has received attention as a potential target for therapeutic intervention against the dreaded human disease leishmaniasis. Recent studies show that LdACT directly binds and nicks double stranded DNA and inhibits decatenation activity of typeII topoisomerase. These properties of LdACT are unique and could be important in kDNA as well as nuclear DNA remodeling (*Nucleic Acids Res.,* 2010, 38(10): 3308-3317).



B ADF/cofilin: Previously it has been shown that Leishmania ADF/cofilin (LdCof) is essentially required for flagella elongation and motility. A detailed investigation of LdCof null mutants has further revealed that LdCof driven actin dynamics plays important role in early events of cell division, especially basal body separation and flagellar pocket division, in Leishmania cells (*J. Cell Sci.,* 2010, 123(11): 1894-1901).



C Myosin XXI: Myosin motors make use of actin-filaments as intracellular tracks for the movement of cargoes. The Leishmania genome encodes only two myosins and it has been observed that only one of them (myosinXXI) is expressed in these cells. This protein localizes predominantly at the proximal region of flagellum. Recent studies on gene knockout mutants of myosinXXI revealed that this protein is involved in trafficking of endocytosed vesicles and this activity is required for the flagella formation. In addition, this protein is found to be essential for the survival of Leishmania cells. (*J. Cell Sci.,* 2010, 123(12): 2035-2044).

1.3 Filariasis

1.3.1. Screening

1.3.1.1 Synthetic compounds

Thirty three synthetic compounds were evaluated against *Brugia malayi* adult worms and microfilariae (mf). Six compounds adversely affected motility and or MTT reduction of adult worms and microfilariae (IC50: <0.63-5.54 µg) *in vitro*. Two out of 6 compounds tested (200mg/kg, sc x 5 days) in jird–*B. malayi* model showed 60% adulticidal activity.

1.3.1.2 Marine extracts

A total of 252 marine samples, including fractions of identified hits, were evaluated *in vitro* on adult *B. malayi* parasites. The antifilarial activity was confirmed in 5 crude samples at 15.6 µg/ml and their IC_{50} and SI values assessed. Of the 38 fractions, 7 were active and with high safety indices thus warranting further *in vivo* evaluation. One of the extract, CSM-476-C004 exerted 74.6% MAF (adulticidal) action against adult *B. malayi* transplanted jird model at a dose of 100 mg/kg, s.c. x 5 days.

1.3.1.3 Plant extracts

Twenty two plant extracts, including fractions, were evaluated *in vitro* against adult *B. malayi*. Several fractions, and single molecules, derived from the plant fractions, have been identified on basis of IC_{50} and selectivity index. Besides, more than 3000 plant preparations were evaluated under a network program for antifilarial activity against adult worms and mf of *B. malayi*.

Nineteen *in vitro* identified plant extracts were further tested *in vivo* in adult *B. malayi* transplanted jird model. Of these, four showed significant adulticidal activity viz. 4464-F015 (64.0%); 895-C002 (65%); 2191-C002 (66.7%) and 55-C002 (71.4%). Follow up studies with samples identified under the network programme continued. A single molecule AN-3 derived from the extract MAP 2443 P01 was identified to be active (IC_{50}: 3.5 mg/ml). Fraction F002 from extract ICB 1851 P01 A001 showed 70% adulticidal activity in jird / *B.malay* model. The isolation of pure compounds from extracts NBR0010P04 and RJM0069P03 is also in progress.

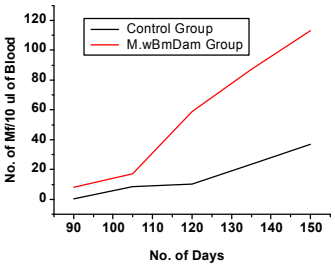
1.3.2 Characterization of *B. malayi* and endosymbiont *Wolbachia* proteins

The important role played by the endosymbiotic bacteria *Wolbachia* in filarial development, fertility, survival and pathogenicity entices to seek functional genomic data. Some filarial and wolbachial proteins were cloned over-expressed and characterized.

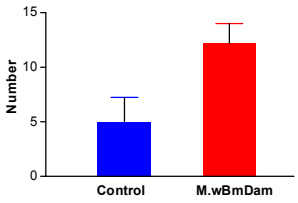
1.3.2.1 Dam methylase of *Wolbachia*

Dam methylase is an essential protein in prokaryotes which is involved in cell cycling, replication, mismatch repair and pathogenicity. Dam methylase gene of *Wolbachia* was amplified, expressed with pET28a/pET41a expression vectors. The soluble form was affinity purified, antibody raised against M.wBmDam reacted with GST-tagged protein.

M.wBmDam down-regulated both Th1 and Th2 cytokines like IFN-y, IL-2, IL-4 in both BALB/c mice and mastomys. The immune down-regulation was accompanied with markedly higher microfilarial (mf) density as well as adult worm burden post infective larval challenge indicating the role of wolbachia enzyme in facilitating establishment of filarial larvae in the host. Targeting of M.wBmDam is therefore likely to have serious adverse effect on bacterial replication thereby controlling filarial infection.



Effect on Microfilaraemia



Effect on adult worm establishment

1.3.2.2 Translation initiation factor-1 of *Wolbachia*

Wolbachia requires translation initiation factor-1 (TI IF-1) for their viability and growth. The *Wolbachia* tl if-1 gene was PCR amplified from the genomic DNA of *B. malayi* and this amplicon was cloned in pET28a vector. A ~13 kDa protein was optimally expressed in rosetta (*E. coli*) host cell which was purified by Ni-NTA column and confirmed in Western blot with anti-6his tag antibody.

1.3.2.3 Filarial acetylcholinesterase

Studies were initiated to develop a microplate pAchE assay for studying the effect of AchE inhibitors using the purified enzyme. To optimize the conditions, plate assay was used for measuring the AchE activity in different extracts prepared from adult female, adult male, microfilariae and embryos of *S. cervi*. The 1.8 kb insert of *B. malayi* AchE was subcloned in pTriEX-4 expression vector. The ligated plasmid was transformed into *E. coli* BL21 (DE3) plysS competent cells and the positive transformants were further confirmed by *Bam*H1 and *Hind*III restriction enzyme digestion. SDS-PAGE analysis showed a fusion protein of 72 kD, but the fusion protein was present in the inclusion bodies and the enzyme was not active.

1.3.2.4 *Brugia malayi* Hexokinase

With the objective of gaining insight into the structural organization of *B. malayi* hexokinase (BmHk), Guanidine hydrochloride and urea-induced unfolding of BmHk, a tetrameric protein, was examined by using various optical spectroscopic techniques, enzymatic activity measurements. Changes in the molecular dimensions of the protein were studied by size-exclusion chromatography. Significantly different pathways of BmHk unfolding were observed with the two denaturants, with GdmCl leading to stabilization of an enzymatically active dimer during unfolding of the protein whereas urea-induced unfolding led to stabilization of an enzymatically inactive dimer.

1.3.2.5 *B. malayi* Glucose-6-phosphate dehydrogenase

The primers for *B. malayi* glucose-6-phosphate dehydrogenase (G6PDH) were designed and enzyme was amplified using cDNA as template. The PCR amplified fragment of 1.6 Kb was cloned in suitable vector and transformed in competent cells. The transformants were screened by colony PCR and restriction digestion. The recombinant *B. malayi* G6PDH was subcloned in expression vector pTriEx 4.

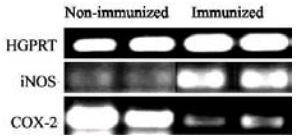
1.3.2.6 *B. malayi* Thymidylate kinase/Guanylate kinase/ Calreticulin

Thymidylate kinase catalyzing phosphorylation of dTMP to form dTDP and Guanylate kinase responsible for phosphrylation of GMP to GDP involved in nucleic and metabolism were selected for cloning and expression from human filarial parasite *Brugia malayi.* The complete ORF for thymidylate kinase and guanylate kinase were amplified by PCR using cDNA as template. The PCR amplified fragments for the enzymes were cloned in pGEMT-easy cloning vector. Further expression and purification of cloned protein is in progress.

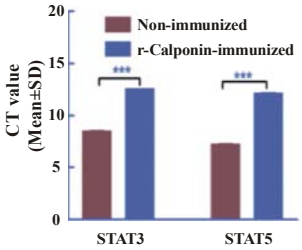
1.3.3. Characterization of inflammation-modulating molecules of *B. malayi*

1.3.3.1 Cloning and characterization of r-Calponin of *B. malayi*

Calponin, one of the identified immunostimulatory protein was cloned expressed and purified. Anti- rCalponin antibody identified the protein in all life stages of *B. malayi*. Immunization with the protein upregulated the specific cellular proliferative response, IFN-γ, NO release, IgG1, IgG2b, iNOS, and suppressed STAT3, STAT5 and COX-2 expression, IL-10 and TGF-β release. Immunization did not affect lymphoid tissues of the host. The results indicate that the r-protein stimulates both Th1 and Th2 type responses.



Expression profile of iNOS and COX-2 in lymph node cells of r-Calponin immunized with *M. coucha*. HGPRT was used as housekeeping control.



STAT3 and STAT5 mRNA expression in the lymph node cells of *M. coucha* immunized with r-Calponin.

1.3.3.2 Characterization of anti-inflammatory fraction BmAFI

Studies were conducted to investigate the role of histamine, IgE response IL-13 release, and H1R and H2R mRNA expression in lymph node cells of the animals sensitized with BmAFI with or without subsequent inoculation of L_3 into peritoneal cavity. Sensitization up-regulated histamine concentration but down-regulated H1R expression. L_3 inoculation to these animals resulted in moderate and immediate increase in H1R for a short period which later disappeared while histamine concentration decreased to normal level. Specific IgE response and IL-13 release remained unaltered in sensitized animals. L_3 exposure to these animals up-regulated the IgE response but not IL-13 release. The L_3 survived and showed normal development in sensitized animals. On the other hand, L_3 exposure in non-sensitized animals produced the opposite effects and failure of L_3 to survive and develop in the peritoneal cavity. The findings suggest that BmAFI has the ability to suppress the inflammatory responses which might have facilitated parasite survival and development.

1.3.4 Vaccination studies with recombinant *B. malayi* proteins in rodent model

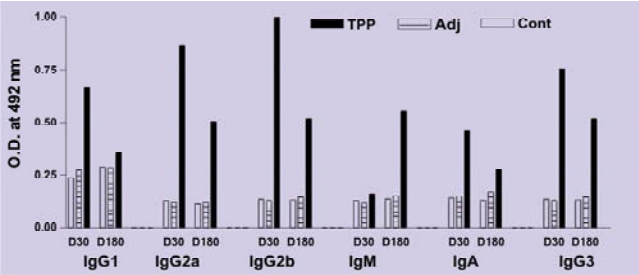
1.3.4.1 *B. malayi* independent phosphoglycerate mutase

Vaccination studies were carried out with Bm-iPGM in *Mastomys coucha* and the animals were euthanized at various time intervals to explore the immune mechanism behind protection. The immunization led to a significant reduction in resulting microfilarial burden (~73%) and adult worm establishment (66-68%), female worm sterilization (~70%) accompanied with increased IgG, IgG1, IgG2a, IgG2b and IgM production, *in vitro* lymphoproliferation, CD4+ T cell expansion with up-regulated Th1/Th2 cytokines, macrophage oxidative burst. The antibodies also induced *in vitro* ADCC to microfilariae and infective larvae causing cytotoxicity and their death. Bm-*i*PGM thus appears to be a

promising vaccine candidate against human lymphatic filarial infection.

1.3.4.2 Trehalose-6-phosphate phosphatase

B. malayi trehalose-6-phosphate phosphatase (Bm-TPP) showed an almost absolute requirement for Mg^{2+} as a metal ion. The Km for substrate trehalose-6-phosphate was found to be around 0.42 mM and the pH optimum was about 7.0 Bm-TPP was found to be expressed in all the life-stages of the parasite. *In vitro* antigenicity analysis of Bm-TPP demonstrated it to be immunogenic. In *M. coucha*, Bm-TPP showed about 72.96% reduced microfilaraemia, 69.62% reduction in adult worm recovery and 70.66% embryostatic activity after L3 challenge. The protective immune responses generated in the resistant host were similar to that of Bm-*i*PGM eliciting both Th1 and Th2 cytokines. Bm-TPP offers promise as a rational drug / vaccine target for developing better control methods against human filariasis.



Isotype antibodies in sera of Mastomys after immunization with Bm-TPP

1.3.4.3 Vaccination with *B. malayi* recombinant protein cocktail

Cocktail of BmAF-Myo, Bm-*i*PGM, Bm-TPP were used in various combination using 12.5 µg of each protein for vaccinating *M. coucha* and challenging the animals with infective larvae. The cocktail antigens provided much higher protection (up to 70%) than any single protein (39-50%) with Bm-TPP providing best protection.

1.3.5 Molecular characterization of diagnostic filarial antigens

To characterize the diagnostically important antigens, *Setaria cervi* adult somatic extract was separated on preparative SDS-PAGE and the fractions eluted from gel were characterized using polyclonal and monoclonal antibodies against filarial excretory-secretory antigens. Six fractions exhibited high reactivity with polyclonal antibody while one showed high ELISA reactivity with monoclonal antibody. Three of these fractions showed strong reactivity with the antibodies present in the human filarial patients' sera in ELISA. These immunoreactive antigen fractions will be characterized further.

1.3.6 Cross-reactive antigens amongst filarial and leishmania parasites

Hamsters were immunized with dominant cross reactive *B. malayi* molecules F6 (54.35-67.8kDa), F7 (48.6-54.35kDa), F9 (41.8-45.2kDa) and F10 (38.4-41.8kDa) identified by sera from leishmania-infected hosts. Live challenge with *L. donovani* amastigotes showed >70% protection in animals immunized with F6 and around 50% protection in F7 and F10 immunized hamsters.

1.3.7 Immunomodulatory activity in Indian medicinal plants

The ethanol extract of *Annona squamosa* twigs was evaluated for its Immunomodulatory activity on the cellular proliferative responses of splenic T and B lymphocytes and activation of peritoneal macrophages. A significant increase in splenic T and B cellular proliferation with increased expansion of CD4+, CD8+ and CD19+ cell populations and accentuation in the peritoneal macrophage function was observed. The extract also regulated the expression of Th1 and Th2 cytokines. The results demonstrated the extract to be a pronounced immunostimulant at all doses tried containing active ingredients which stimulate the host immune response. Of the 5 fractions, 2 possessed immunostimulatory effect and the activity could be located in the two pure molecules.

2 Reproductive Health Research, Diabetes & Energy Metabolism

Coordinator:
Dr. Naibedya Chattopadhyay

Assistant Coordinators:
Dr. Gopal Gupta
Dr. Sabyasachi Sanyal

Area Leader:
Dr. Arvind Srivastava

Reproductive Health Research

Major objectives of the area includes (i) design and synthesize novel molecules/isolates 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; (ii) evaluate traditional remedies for fertility regulation and endocrine disorders; (iii) 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.

Diabetes and Energy Metabolism Research

Objectives of the area are (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.

2.1 Reproductive health research

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

2.1.1.1 Evaluation of anti-implantation activity of natural products

Seventeen extracts of natural origin were evaluated for anti-implantation-cum-early post implantation interceptive activity in adult female rats when administered on days 1-7 post-coitum. Of these, three samples showed upto 80 % activity at 250 mg/kg dose. None of the extracts showed 100% efficacy.

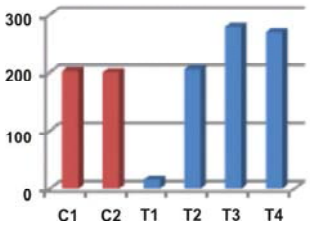
2.1.2 Male reproduction: Contraception, infertility and basic studies

2.1.2.1 Designing dually active molecules for prophylactic contraception

Using rational drug design approach, molecules having carbodithioic acid moiety as the major pharmacophore were created for targeting free thiols on sperm and *Trichomonas*, and discovered some molecules, that were more effective than nonoxynol-9 (the OTC spermicide) in immobilizing sperm and more efficacious than metronidazole in killing *T. vaginalis*. The most promising molecules inhibited cytoadherence of *T. vaginalis* to cervico-vaginal cells *in vitro* and were almost equipotent against both metronidazole-susceptible and metronidazole-resistant strains of the infection. Experimentally, *in vitro*, these compounds did not inhibit growth of normal vaginal flora and appeared safer than nonoxynol-9 for intravaginal use.

2.1.2.2 Male infertility treatment using Indian herbs

The seed powder of *Mucuna pruriens* was administered orally in the fertility compromised rat models. The treatment was given for 30 days and sperm count noted at the end of the experiment. *M. pruriens* improved sperm count in compromised rat and recovered 90% loss of sperm count. Further experiments conducted with L-DOPA which is a major constituent of *M. pruriens*. L-DOPA, *M. pruriens* and placebo were administered to the animals with compromised fertility. It was observed that L-DOPA significantly improved



Sperm count in rat in untreated groups (C1 and C2), fertility compromised rat (T1), auto-recovery group (T2), treatment with *M. pruriens (T3) and L-DOPA (T4)* after fertility compromise

sperm count in comparison to the control group. The recovery was comparable to *M. pruriens*. This indicates the importance of dopamine pathway in male reproduction and fertility. This would provide further avenues of research on this pathway particularly concerning its role in male reproduction and infertility.

2.1.2.3 Withaferin A protects male germ cells from hypoxic stress through the modulation of Nrf2-ARE pathway

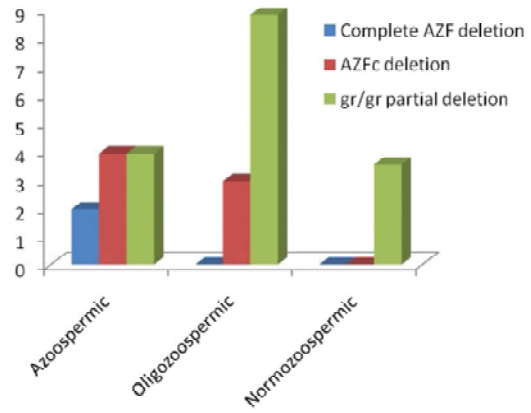
Inhibition of the ubiquitin–proteasome system upregulates antioxidative defence mechanisms and protects cells from oxidative stress. In the present study, it is sought to find, whether the induction of antioxidative enzymes contributes to protection by non-toxic proteasome inhibition by the naturally derived proteasome inhibitor Withaferin A. Pretreatment with 5 μM Withaferin for 2h proved to be non-toxic and protected rat derived male germ cells against hypoxia-mediated oxidative stress in lactate dehydrogenase assays. This correlated with reduced levels of intracellular reactive oxygen species as determined by loading germ cells with dichlorofluorescein. Immunoblots showed significant upregulation of superoxide dismutase 1 (SOD1), haem oxygenase 1, and catalase upon proteasome inhibition. Luciferase assays using a reporter driven by the SOD1 promoter revealed proteasome inhibitor-mediated induction of luciferase activity. SiRNA experiments identified an antioxidant response element (ARE) in the SOD1 promoter to be not only essential but also sufficient for transcriptional upregulation by proteasome inhibition. An essential role for the antioxidative transcription factor NF-E2-related factor 2 (Nrf2)—which was stabilized by proteasome inhibition—in ARE-mediated transcriptional activation was revealed in male germ cells from Nrf2 wild-type and knockout male germ cells. Germ cell proteasome inhibition upregulated antioxidative enzymes and conferred protection against hypoxia mediated oxidative stress in Nrf2 wild-type cells. In contrast, the induction of antioxidative enzymes and cytoprotection were completely abolished in Nrf2 deficient germ cells. In conclusion, the present study showed that non-toxic proteasome inhibition upregulates antioxidative enzymes via an Nrf2-dependent transcriptional activation of AREs and confers protection from hypoxic stress.

2.1.2.4 Y-microdeletions and male infertility

The long arm of the Y-chromosome harbors the region considered very important for spermatogenesis. Deletions to different extents in this region have been reported in infertile male individuals; however, there is no consensus in deletion pattern and infertility. Therefore, study was conducted to assess for the first time the occurrence of Y-chromosomal *AZFc* region partial deletions and *AZF* microdeletions in infertile men from two Indian populations and to correlate them with semen parameters.

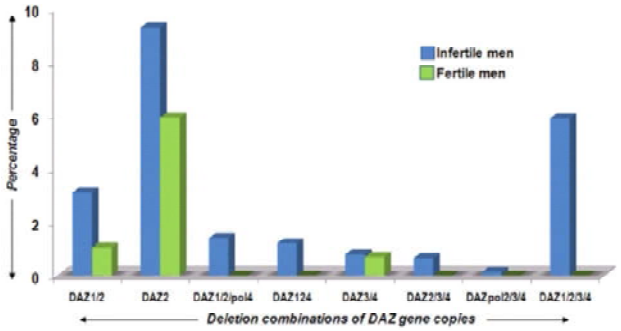
In a retrospective study, 301 infertile men and 100 controls with normal spermatogenesis were analyzed. No *AZFa*, *AZFb* or *AZFc* deletions were found in the control group. Four infertile men were found to have deletions in this region of Y-chromosome. Only one patient had complete *AZFa*bc deleted and three had *AZFc* deleted. The relative distribution of these patterns was different compared with that found in the other populations. Extension analysis confirmed that the deletions occurred according to the current pathogenic model. *Gr/gr* deletions were found to be present in the patients (n = 11) but not in controls as reported by previous studies. These results suggested that the frequency of microdeletions of the Y-chromosome in Uttar Pradesh was lower than other populations, and exhibited a different deletion pattern. The study was further extended as follows:

Group 1: Added another 200 infertile individuals in the total pool from Uttar Pradesh. Y-chromosomal microdeletions were analyzed. Analysis on the total pool of samples has shown gr/gr deletions to be a risk factor for male infertility. Among other deletion types, the number of b1/b3 was not good enough for statistical analysis and b2/b3 deletions were not observed. The gr/gr partial deletions were also observed in 6 out of 150 normo zoospermic infertile individuals. This deletion has been associated with only oligozoospermia and azoospermia till date; however, it is now evident that gr/gr deletion also prevails in normozoospermic infertile individuals. Its absence in the control individuals shows it to be a risk factor for male infertility.

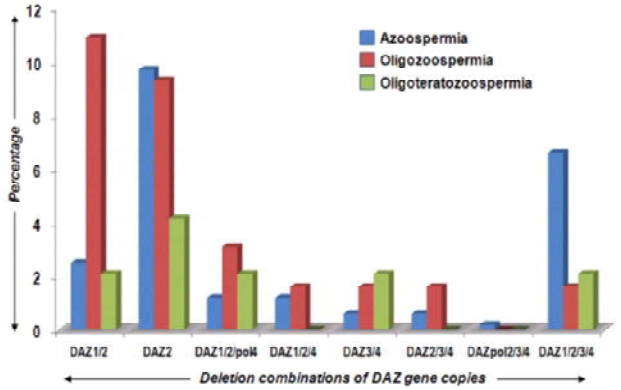


Relative frequency of different deletion events in infertile individuals from Uttar Pradesh.

Group 2: To compare the data with other populations, Y-chromosome partial deletions in 763 infertile and 287 normozoospermic fertile individuals from Kolkata and adjacent regions were analyzed. The analysis on this population also showed gr/gr deletions to be a risk factor for male infertility. gr/gr deletions in these individuals showed strong association with azoospermia, b1/b3 deletions associated strongly with oligozoospermia and azoospermia while b2/b3 deletions were not observed. A higher number of azoospermic and oligozoospermic individuals displayed Y-chromosome deletions in comparison to oligoteratozoospermic individuals. The study also showed a very high frequency of the polymorphic events at the SNV markers, sY581, sY586 and sY587. The presence of these polymorphic events could lead to false impression of deletion. Therefore, Y-micro- and partial-deletions must be analyzed first using STS markers followed by the analysis of SNV markers to further characterize the deletions.



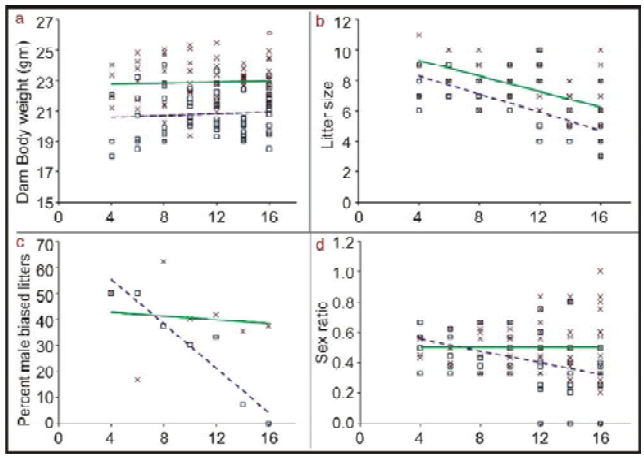
Frequency of different recombination events (deletion combinations of DAZ gene copy) in infertile and fertile men



Frequency of different deletion combinations of DAZ gene copy in azoospermia, oligozoospermia and oligoteratozoospermia

2.1.2.5 Effect of diet on stress and sex ratio (*PLOS ONE*, 2011, 6(1): e16296)

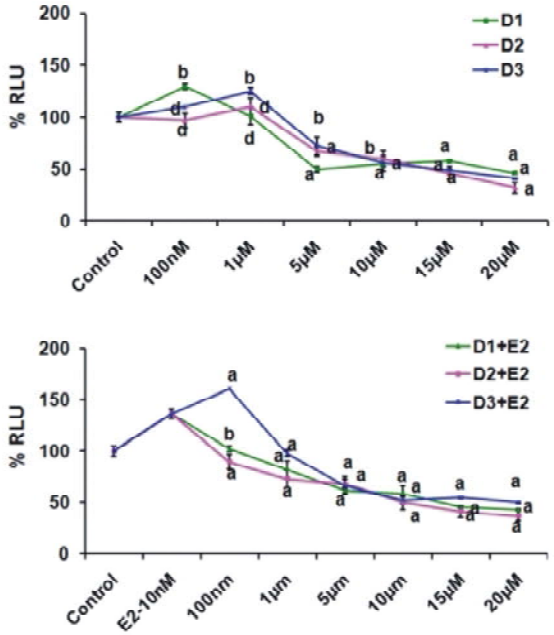
Adaptive theory predicts that mothers would be advantaged by adjusting the sex ratio of their offspring in relation to their offspring's future reproductive success. In the present study, the effect of housing mice under crowded condition on the sex ratio was tested and whether the fat content of the diet has any influence on the outcome of pregnancies. The experiment showed that the average dam body weight at conception, litter size (LS) and SR were significantly higher in high fat diet (HFD) fed dams. Further, male biased litters declined with increasing crowding in control diet (NFD) group but not in HFD. The LS and SR in NFD declined significantly with increasing crowding, whereas only LS was reduced in HFD group. It was concluded that female mice housed under overcrowding conditions shift offspring SR in favor of daughters in consistent with the Trivers-Willard hypothesis and high fat diet reduces this influence of overcrowding.



2.1.3 Experimental chemotherapeutics in malignancies of reproductive system

2.1.3.1 2,3-Diaryl-2H-1-benzopyran derivatives interfere with non-classical ER signaling pathway and induce cell cycle arrest in human Ishikawa endometrial cancer cells

Apart from classical pathway, ERs may also regulate gene expression via non-classical genomic pathway that involves AP-1 sites which governs the expression of genes involved in intercellular communication, amplification and primary pathogenic signals spreading as well as initiation and acceleration of tumorigenesis. Benzopyran compounds (D1, D2 and D3) exposure decreased the E-induced ERE- / AP-1 mediated transcriptional activity and also reduced the transcriptional activation of AP-1 transcription factors viz. c-fos and c-jun in Ishikawa endometrial cancer cells. These compounds decreased the expression of downstream AP-1 target genes, such as cyclinD1 and PCNA which are associated with cell cycle and tumor induction respectively. The decreased AP-1 transcriptional activity appears due to the inhibition of ER action mediated via non-classical AP-1 sites involving protein – protein interaction. In addition, the process involved the cross talk between ER and Akt resulting in alteration of AP-1 factors phosphorylation. The flow



AP1- mediated transcriptional activation in human endometrial cancer Ishikawa cells in the presence of 2, 3-Diaryl-2H-1-benzopyran derivatives

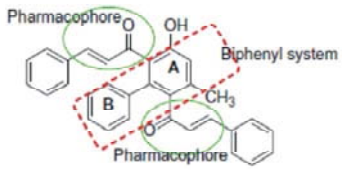
cytometric analysis for cell cycle distribution showed that D1, D2 and D3 treated cells caused a significant inhibition of cell cycle progression in Ishikawa cells, D1 significantly accumulated the cells at G_2 phase whereas D2 and D3 caused accumulation of cells at the G_1 phase. The mRNA expression of cyclin E1 gene was found to decrease after D2 and D3 treatment whereas expression of cdc-2 gene was decreased after D1 treatment in a dose dependent manner. Study suggests that these benzopyran derivatives can serve as lead molecules for use as preventive as well as therapeutic agents for endometrial pathological conditions like hyperplasia or the carcinoma *in situ*.

2.1.3.2 Synergistic chemoprotective mechanisms of dietary phytoestrogens in a select combination against prostate cancer [*J. Nutr. Biochem,* 2010 (Epub ahead of print) PMID 21062672]

Combination of dietary phytoestrogens with diverse molecular mechanisms may enhance their anticancer efficacy at physiological concentrations, as evidenced in epidemiological studies. A select combination of three dietary phytoestrogens containing 8.33 μM each of genistein (G), quercetin (Q) and biochanin A (B) was found to be more potent in inhibiting the growth of androgen-responsive prostate cancer cells (LNCaP) as well as DU-145 and PC-3 prostate cancer cells *in vitro* than either 25 μM of G, B or Q or 12.5+12.5 ìM of G+Q, Q+B or G+B. Subsequent mechanistic studies in PC-3 cells indicated that the action of phytoestrogens was mediated both through estrogen receptor (ER)-dependent and ER-independent pathways as potent estrogen antagonist ICI-182780 (ICI, 5 μM) could not completely mask the synergistic antiproliferative effects, which were sustained appreciably in presence of ICI. G+Q+B combination was significantly more effective than individual compounds or their double combinations in increasing ER-β, bax (mRNA expression); phospho-JNK, bax (protein levels); and in decreasing bcl-2, cyclin E, c-myc (mRNA expression); phospho-AKT, phospho-ERK, bcl-2, proliferating cell nuclear antigen (protein levels) in PC-3 cells. Phytoestrogens also synergistically stimulated caspase-3 activity. The combination mechanism of multiple anticancer phytochemicals may be indicative of the potential of some vegetarian diet components to elicit chemopreventive effects against prostate cancer at their physiologically achievable concentrations, *in vivo*.

2.1.3.3 Screening and identification of a new series of chalcones as anti- breast cancer agent and their molecular mechanism studies (*Bioorg. Med. Chem.,* 2010, 18: 4711-4720)

A series of biphenyl based 1,3-diaryl-2-propen-1-ones, commonly known as chalcones were prepared. A total of 30 new compounds were evaluated for anticancer activity in MCF-7, MDA-MB-231, Hela and HEK-293 cell line using MTT assay to assess cell proliferation. The compounds were found to be active in the range of 10 ± 0.01 to 31.5 ± 0.035 μM in MCF-7 cells. In MDA-MB-231 cell line the compounds showed activity in the range of 4.4 ± 0.02 to 30± 0.045 μM. Similarly, the compounds showed activity in the range of 20 ± 0.02 to 33.5 ± 0.045 μM in Hela cell line and 5 ± 0.04 to 30 ± 0.05 μM in HEK-293 cells.

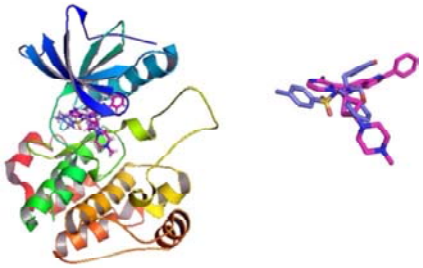


The most active compounds against MDA-MB-231 viz. S-009-898 and S-009-1070 showed activity as low as IC_{50} 4.67 and 4.44 μM respectively in cell growth inhibition assay of MDA-MB-231 cells. Flow cytometric analysis showed that compounds S-009-898 and S-009-1070 significantly increased in the apoptotic fraction in compound treated MDA-MB-231 cell population. Treatment of MDA-MB-231 cells with S-009-898 and S-009-1070 at 5 μM concentration resulted in an increase of sub-G1 phase and decrease of cells in S phase of cell cycle as compared with untreated control. Both the compounds induced Bax, p21 and p53 expression level on treatment and reduction of Bcl-2 expression. Caspases, the serine proteases are involved in downstream of apoptotic pathway which upon activation leads to DNA fragmentation. When measured for activated casapses with DEVD-rhodamine-110 based homogeneous caspase assay, found a significant activation of caspase in comparison to untreated control. Thus, a new series of chalcones, based on biphenyl system with two cinnamoyl moieties, were found to be active against human breast cancer cell lines, MCF-7, and MDA-

MB-231 particularly exhibiting better activity against ER-negative breast cancer have been characterized. Two of the compounds S-009-898 and S-009-1070 appeared to be promising lead against aggressive breast cancer. This inhibition of cell growth is due to significant reduction in cells at S phase of cell cycle and induction of apoptosis in MDA-MB-231 cells.

2.1.3.4 Specific targeting of insulin-like growth factor 1 receptor signaling in human estrogen dependent breast cancer cell by a novel tyrosine-based benzoxazepine derivative

In continuation to the studies with series of new substituted benzoxazepine derivatives, the molecular target and mechanism of action of the lead compound, a tyrosine-based benzoxazepine, 4-[4-(Toluene-4-sulfonyl)-2, 3, 4, 5-tetrahydro-benzo[f][1,4]oxazepin-3-ylmethyl]-phenol) [THBP] in human breast cancer cells was delineated. THBP showed growth inhibitory effect on MCF-7 and MDA-MD-231 cells. At IC_{50} value (~20iM), THBP resulted in G1 arrest, decrease in cyclin D1 levels and induction of apoptosis of MCF-7 cells. Activation of caspase 8 contributes critically to THBP-induced apoptotic cell death in MCF-7 cells. THBP also increased pro-apoptotic protein, Bax; decreased anti-apoptotic protein, Bcl-2; and decreased mitochondrial membrane potential in MCF-7 cells, indicating involvement of intrinsic pathway of apoptosis following caspase 8 activation. Upon screening for a panel of cancer cell promoting growth factors/hormones targets, THBP was found selectively induced loss of viability of MCF-7 cells via insulin-like growth factor 1 (IGF-1) receptor.



Molecular docking: Binding mode of PQIP, known IGF1R inhibitor and the predicted binding mode of THBP in the crystal structure IGF-1R (pdb code 3D94)

Molecular docking studies revealed that THBP occupied the ATP binding pocket of IGF-1 receptor. THBP inhibited IGF-1-induced phosphorylation of IGF-1 receptor and insulin receptor substrate-1 (IRS-1). In athymic nude mice, THBP treatment significantly reduced the growth of MCF-7 xenograft tumors compared with vehicle through. The tumor volume regression correlated with inhibition of cell proliferation, promotion of cell death and reduction of phospho-IGF-1 receptor levels in tumor tissue. This newly identified lead molecule capable of specifically targeting IGF-1 receptor signaling offers possibility to develop novel and selective therapeutic strategy for estrogen receptor-positive, postmenopausal breast cancer patients.

2.1.4 Bone biology and bone anabolic agents [*Menopause 2010* (Epub ahead of print) PMID 20671576]

2.1.4.1 Quercetin-6-*C*-β-D-glucopyranoside, a rare analogue of querecetin, isolated from *Ulmus wallichiana* Planchon is more potent than quercetin in inhibiting osteoclastogenesis and mitigating ovariectomy-induced bone loss in rats

The skeletal effect of quercetin-6-*C*-β-D-glucopyranoside (QCG) isolated from the extract of *Ulmus wallichiana* was determined and compared the effect with quercetin (Q) in a rat model of postmenopausal bone loss. QCG at 1.0 nM significantly inhibited differentiation of multinucleated osteoclasts and expression of osteoclastogenic genes from BMCs whereas Q at 10.0 μM had comparable results. OVx rats treated with QCG exhibited significantly higher bone mass and better microarchitecture in trabecular and cortical bones compared with OVx + vehicle. QCG treatment of OVx rats had better functional impact than Q treated OVx rats, evident from increased bone biomechanical strength. Serum osteocalcin and urinary CTx were significantly lower in QCG treated OVx rats compared with OVx + vehicle group. The protective effect of QCG under OVx-induced bone loss setting was found to be significantly better than Q. Uterine histomorphometry parameters of OVx rats do not change with QCG treatment. QCG more effectively than Q improves bone biomechanical quality through positive modifications of BMD and bone microarchitecture without hyperplastic effect on uterus.

2.1.4.2 QCG promotes peak bone mass achievement and exerts anabolic effect on osteoporotic bone

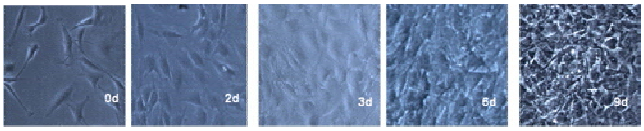
In this study, the effects of QCG on osteoblasts and its bone anabolic effects was investigated. The results show that QCG was much more potent than quercetin (Q) in stimulating osteoblast differentiation and the effect of QCG was not mediated by estrogen receptors. In growing rats, QCG increased BM osteoprogenitors, bone mineral density, bone formation rate and cortical deposition. In osteopenic rats, QCG treatment increased bone formation rate and improved trabecular microarchitecture. Comparison with the sham group (ovary intact) revealed significant restoration of trabecular bone in osteopenic rats treated with QCG. QCG levels in the BM were ~50% of that of the plasma levels. QCG stimulated modeling-directed bone accrual and exerted anabolic effects on osteopenic rats by direct stimulatory effect on osteoprogenitors likely due to substantial QCG delivery at tissue level following oral administration.

2.1.4.3 A novel kaempferol analogue isolated from the stem-bark of *Ulmus wallichaiana* Planchon stimulates osteoblast function and inhibits osteoclast and adipocyte differentiation

(2S,3S)-Aromadendrin-6-C-α-D-glucopyranoside (AG) is a novel analogue of kaempferol isolated from the extract of *Ulmus wallichiana* (Himalayan Elm). Extract of *U. wallichiana* is used for rapid fracture repair in ethno-traditional medicine in India. The cellular mechanism of action of AG in mouse bone cells was characterized by investigating its effect on the precursors of osteoblasts, osteoclasts and adipocytes. At nanomolar concentrations, AG increased differentiation of preosteoblasts obtained from neonatal mouse calvaria. The gene expression of osteogenic markers including runt-related transcription factor 2 (Runx-2), bone morphogenetic protein-2 (BMP-2), type I collagen and osteocalcin were higher in preosteoblasts treated with AG. Extracellular matrix mineralization was higher in preosteoblast and bone marrow cells (BMCs) when AG was present in the medium. Furthermore, in the presence of AG, differentiated osteoblasts were protected from serum deprivation-induced apoptosis and increased the expression of the anti-osteoclastogenic cytokine, osteoprotegerin. While promoting osteoblast differentiation and survival, AG inhibited osteoclast differentiation of bone marrow precursor cells to osteoclasts in the presence of receptor activator of nuclear factor kappa-B ligand (RANKL) and monocyte/macrophage-colony stimulating factor (M-CSF). Furthermore, AG in 3T3-L1 preadipocytes decreased the expression of genes involved in adipogenesis including peroxisome proliferator-activated receptor gamma (PPARγ, sterol regulatory element binding protein (SREBP) and CCAAT/enhancer-binding protein alpha (CEBP/α and also induced apoptosis of differentiated adipocytes. Induction of adipogenic differentiation was also inhibited in the presence of AG. AG exhibited no estrogenic/antiestrogenic effect. Together, our data show that AG has potent osteogenic, anti-osteoclastogenic and anti-adipogenic effects, which may translate to a better skeletal outcome in postmenopausal osteoporosis.

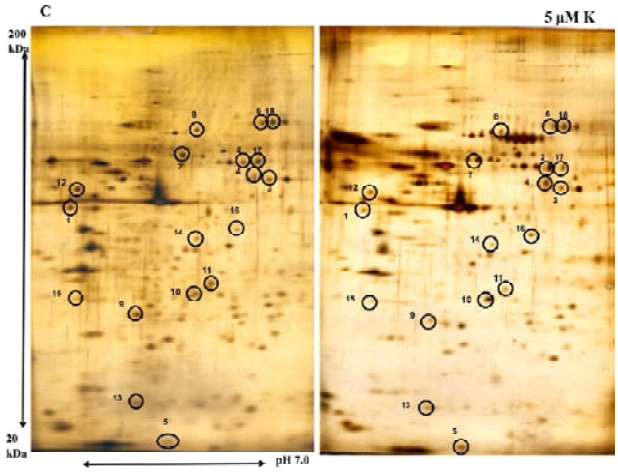
2.1.4.4 Identification of kaempferol-regulated proteins in rat calvarial osteoblasts during mineralization by proteomics (*Proteomics* 2010, 10(9): 1730-9)

The differential effect of kaempferol on the rat calvarial osteoblasts during mineralization was identified by adopting proteomic approach. The primary rat calvarial osteoblasts were treated with kaempferol (5.0 μM) for 9 days under mineralizing condition that resulted in significant increase in alkaline phosphatase activity and mineralization of the cells.



Mineralizing osteoblasts after kaempferol treatment

Further, 2-D analysis of the kaempferol-treated osteoblast lysates revealed 18 differentially expressed proteins (nine upregulated and nine downregulated) on the basis of >/< 2.0-fold as cut-off ($p<0.01$) that were then identified by MALDI-TOF MS. These included: cytoskeletal proteins, intracellular signaling protein, chaperone, extracellular matrix protein, proteins involved in glycolysis and cell–matrix interactions. Proteomics data were confirmed by Western blotting and quantitative real-time PCR by randomly selecting two upregulated and two downregulated proteins. Western blot analysis confirmed upregulation of HSP-70 and cytokeratin-14 levels, and down-regulation of aldose reductase and caldesmon expression. It was further demonstrated that kaempferol treatment inhibits aldose reductase activity in osteoblasts indicating an altered cellular metabolism by decelerating polyol pathway that was associated with the kaempferol-induced osteoblast mineralization. In conclusion, this is a first comprehensive study on the differential regulation of proteins by kaempferol in primary osteoblast, which would further help to elucidate the role of the identified proteins in the process of osteoblast mineralization.

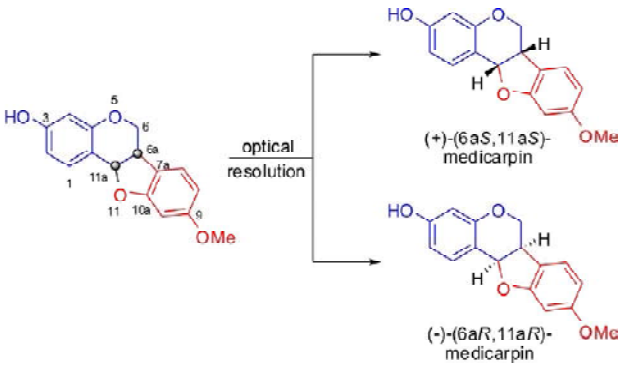


Comparative proteomic analysis after kaempferol treatment

2.1.4.5 Optical resolution of natural medicarpin and new synthetic lead compounds (S-006-1709, S-007-1500 and S-008-399) for osteogenic activity

Recently it was demonstrated that (±)-medicarpin inhibits osteoclastogenesis and has nonestrogenic bone conserving effect in ovariectomized mice. These results prompted to identify new leads possessing interesting osteogenic activity (Goel *et al.* WO/2010/052734 dated 14 May 2010). In order to compare the osteogenic activity profile of *rac*-pterocarpan and its pure enantiomers, an efficient methodology to resolve medicarpin and other new synthetic

pterocarpans was developed and the effect of enantiopure natural and synthetic pterocarpans was examined in osteoblast differentiation. In the succeeding sections, several studies that were carried out using synthetic medicarpin and its derivatives are described.



2.1.4.6 Medicarpin stimulates osteoblast differentiation and promotes peak bone mass achievement in rats: Evidence for estrogen receptor â-mediated osteogenic action of medicarpin [*J. Nutr. Biochem*. 2010 (Epub ahead of print) PMID 20579866]

Osteogenic effect of medicarpin (Med), a phytoalexin that is structurally related to isoflavones and is found in the stem-bark of *Butea monosperma,* was evaluated. Med stimulated osteoblast differentiation and mineralization at as low as 10^{-10}M. Studies with signal transduction inhibitors demonstrated involvement of a p38 mitogen activated protein kinase-ER-bone morphogenic protein-2 pathway in mediating Med action in osteoblasts. Co-activator interaction studies demonstrated that Med acted as an ER agonist, however in contrast to 17β-estradiol (E2) Med had no uterine estrogenicity and blocked proliferation of MCF-7 cells. Med increased protein levels of ERβ in osteoblasts. Selective knockdown of ERα and ERβ in osteoblasts established that osteogenic action of Med is ERβ-dependent. Female *Sprague Dawley* (weaning) rats were administered Med at 1.0- and 10.0 mg.kg^{-1} doses by gavage for 30 days along with vehicle control. Med treatment resulted in increased formation of osteoporgenitor cells in the bone marrow and osteoid formation (mineralization surface, mineral apposition/bone formation rates) compared with vehicle group. In addition, Med increased cortical thickness and bone biomechanical strength. In pharmacokinetic studies, Med exhibited oral bioavailability of 22.34% and did not produce equol. Together, our results demonstrate Med stimulates osteoblast differentiation likely via ERβ, promotes achievement of peak bone mass, and is devoid of uterine estrogenicity. In addition, given its excellent oral bioavailability Med can be potential osteogenic agent.

2.1.4.7 Medicarpin is an estrogen mimic that suppresses production of senescent T cells in the bone marrow of ovariectomized mice by augmenting CD28 expression: A possible mechanism for alleviating bone loss

Objective of this study was to evaluate the effect of Med on Ovx-induced alterations in T cell functions in bone marrow and its mechanism of action. In OVx mice, Med/E2 at their respective osteoprotective doses resulted in thymus involution and reduced BM $CD4^+$ T cells. Med/E2 prevented CD28 loss (a biological marker of senescence) in both $CD4^+$ and $CD8^+$ T cells in BM and increased nucleolin and heterogenous nuclear ribonucleoprotein-D0A mRNA levels. Med/E2 lowered OVx-induced increase in serum TNF-α level and its mRNA levels in the BM T cells. Further, Med abrogated TNF-α induced loss of CD28 expression in the BM T cells via estrogen receptor. Thus, Med may have therapeutic implications in estrogen deficiency induced bone loss by reducing TNF-α producing T cells in BM and delaying T cell senescence by enhancing CD28 expression.

2.1.4.8 Osteogenic effect of S-008-399 in adult osteopenic rats

Using Med scaffold, a chemical series was synthesized. A series of 47 compounds were screened for *in vitro* osteogenic activity. Three compounds (S-006-1709, S-007-1500 and S-008-399) were found to be most active *in vitro* and had no estrogenicity or anti-estrogenicity. Compound S-008-399 was found to have bone anabolic effect in immature female SD rats. *In vivo* efficacy of S-008-399 in adult osteopenic rats was next assessed. Treatment with S-008-399 to adult osteopenic rats led to a significant increase in mineral apposition rate and bone formation rate when compared to ovariectomized control rats. Treatment with S-008-399 also improved femoral and tibial trabecular microarchitecture. Osteopenic rats treated with S-008-399 had significantly high trabecular bone volume, trabecular number and trabecular thickness compared to control ovx rats. Treatment with S-008-399 also led to reduced bone turnover markers like urinary CTx and serum osteocalcin. Mode of action studies on S-008-399 shows that it acts via ER-p38-Smad signaling pathway to enhance bone formation. Altogether, data indicates that S-008-399 has osteogenic effect *in vivo* and therefore, is suitable for use in postmenopausal osteoporosis.

2.1.4.9 Single dose toxicity study of S-007-1500 in rats by oral route

S-007-1500 is one of the active compounds obtained from the synthetic library designed using Med scaffold. Towards preclinical development of S-007-1500 as rapid fracture healing agent, acute toxicity study was performed. Results of the study are as follows: No mortality was seen in any of the groups both treated and control. There was a uniform and comparable gain in body weight among the treated and control groups of animals of each sex, as compared to initial values. No evidence found for effect on water and food consumption of treatment with the test substance. There were no significant differences in the trends of variations seen in the RBC, WBC and platelet parameters of treated and control animals of both the sexes. Among males, cholesterol and creatinine values were significantly increased ($p<0.05$) in group IV animals as compared to controls but within the normal range. However, this change was not seen in highest dose group animals. Similarly, significant difference was seen in creatinine values in animals of group IV and V as compared to controls but values remained within the range of normalcy. Among females, triglyceride values were significantly decreased ($p<0.05$) in treated animals as compared to controls, however, no trend was seen in this. Similarly, BUN was significantly decreased in treated group animals as compared to controls. Irregular variation although, significant, was seen in calcium values of treated group animals of group II, III and IV, however this change was not seen in animals of highest dose group. Mean values of absolute (g) and relative (g/100g b. wt.) weights adrenals, brain, heart, kidneys, gonads (including uterus along with both ovaries in females and testis in males), liver, lungs, spleen showed no significant variations and remained in comparison to the control animals. No gross abnormality was seen in any of the organs and tissues. There was no evidence of treatment-related damage in any organ on gross examination. In conclusion, S-007-1500 was well tolerated up to a dose level of 25 mg/kg. body weight (25 times of the effective dose required for accelerated fracture healing) on single administration.

2.2 Diabetes and energy metabolism research

2.2.1 Design and synthesis of new anti-hyperglycemic agents

In order to develop new chemical entities for antidiabetic activity, focussed libraries for the targets viz. protein tyrosine phosphatase 1b (PTP1b) and dipepeptidyl peptidase IV (DPP-IV) were screened for activity against the targets. The new compounds with code numbers S-007-1723, 1724, S-008-688, S-009-629, 0630, 1412 were identified as PTP 1b and S-007-062, 549 and S-008-0688 as DPP-IV inhibitors. Their IC_{50} values were found in the order of 30-100 nM. These compounds also exhibited glucose lowering activity on streptozotocin-induced diabetic rats provide leads for optimization. In addition, four compounds (S-007-1712, 1713 and S-009-629 and 630) were found active in streptozotocin-induced diabetic rats and further studies are in progress.

2.2.2 Regulation of PPARγ coactivator-1alpha (PGC-1α)

PGC-1α is induced in energy-starved conditions and is a key regulator of energy homeostasis. This makes PGC-1α an attractive therapeutic target for metabolic syndrome and diabetes. It was identified that GW4064 (GW), a synthetic agonist for the nuclear bile acid receptor (FXR/BAR), induces PGC-1α expression, mitochondrial mass and several genes involved in mitochondrial function. It was shown that this effect of GW are not mediated directly by FXR; but occur via activation of estrogen receptor-related receptor alpha (ERRα). Cell-based, biochemical and biophysical assays indicate GW as a bonafide agonist of ERR proteins. Interestingly, FXR disruption alters both basal and GW induction of PGC-1α in a tissue dependent manner. Using FXR-*null* (FXRKO) mice, we determined that basal and GW-induction of PGC-1α is compromised in the liver but enhanced in the oxidative soleus muscle. Mechanistic studies revealed that FXR physically interacts with ERRs and protects them from repression by the atypical corepressor, small heterodimer partner (SHP). Together, this interplay between ERRα-FXR-PGC-1α and SHP offers new insights into the biological functions of ERRα and FXR thus providing a knowledge base for therapeutics in energy balance-related pathophysiology.

3 Tuberculosis and Microbial Infections

Coordinator:
Dr. A.K. Saxena

Assistant Coordinator:
Dr. B.N. Singh

Area Leaders:
Dr. Ranjana Srivastava
Dr. Sudhir Sinha

Aims and objectives of the research area focus on Tuberculosis, Fungal and Viral infections. Using different screening formats *viz*. *in vitro*, *ex vivo*, *in vivo* and BACTEC, 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

3.1.1 Screening

More than one thousand in-house synthesized compounds were screened for anti-TB activity using different screening formats. Seven compounds, S-009-1588, S-009-1591, S-010-361, S-010-910, S-010-912, S-010-658 and S-010-0659 showed activity against *M. tuberculosis* H37Rv at 5.39 µM, 5.62 µM, 6.25 µM, 3.12 µM, 3.12 µM, 6.25 µM, 6.25 µM respectively. All these compounds were found to be non toxic in Vero cells and mouse bone-marrow derived macrophages and are further pursued for *ex vivo* analysis.

Two compounds from earlier series, S-006-830 and S-009-889 showed activity against *M. tuberculosis* H37Rv at = 3.12 µg/ml. They were found to be non-toxic in Vero cells and mouse bone-marrow derived macrophages and screened *ex vivo* using mouse macrophages. S-006-830 was tested in *in vivo* screening in mouse model where it enhanced the mean survival time (MST) by 9 days and enabled nearly 100 fold reductions in viable bacterial counts in lungs. S-009-889 showed 58% decline in bacterial growth in *ex vivo* assays and is undergoing large scale synthesis for *in vivo* analysis.

3.1.2 A dual recombinant *Mycobacterium aurum* strain for screening of primary as well as FASII pathway inhibiting antimycobacterial drugs

To screen both primary as well as target specific compounds, a dual recombinant *Mycobacterium aurum* strain expressing firefly and renilla luciferase genes as reporters under the control of constitutive mycobacterial *hsp60* promoter and *M. tuberculosis kas* operon promoter, respectively has been created. While *hsp60* promoter responds to general inhibition of cell growth by primary line antimycobacterial drugs like INH, rifampicin, ethambutol and streptomycin, *kas* operon promoter selectively induces the reporter gene expression after treatment with FAS-II inhibitors. The double recombinant strain widened the scope of screening and is easily adaptable for high-throughput screening of potential anti-tubercular compounds.

3.1.3 Harvesting the richness of soil microbial diversity for novel antibacterials

A total of 65 colonies were isolated by heat shock method from soil collected from *Ganga* river bank and from partially flooded plain. Selected colonies were studied by disc diffusion method and colonies showing clear zone formation were taken up for growth inhibition studies under submerged conditions. The crude extracts of select bacterial isolates showed good growth inhibition at 50% dilution of culture supernatant against β-lactamase producing *E. coli.* The growth inhibition was monitored upto 52 hr with majority of isolates showing good inhibition till 30 hr under liquid culture conditions. Similarly, growth inhibition of *M. smegmatis* was studied under liquid culture conditions wherein two isolates showed good activity. Further studies are under progress to confirm antimycobacterial activity. The genomic DNA of selected isolates was isolated and PCR with universal 16S rRNA gene primers was performed. The amplicons were cloned in pGEM-T Easy vector and inserts were validated by restriction digestion.

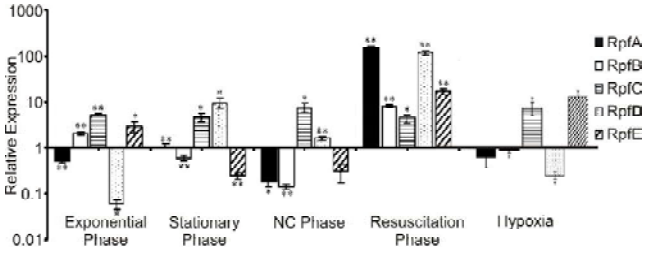
3.1.4 Biochemical and transcription analysis of acetohydroxyacid synthase isoforms in *M. tuberculosis* identifies these enzymes as potential drug targets (*Microbiology* 2010, 157: 29-37)

The acetohydroxyacid synthase (AHAS) is a biosynthetic enzyme essential for *de novo* synthesis of branched chain amino acids. Genome sequence of *M. tuberculosis* revealed four catalytic, *ilvB1* (Rv3003c), *ilvB2* (Rv3470c), *ilvG* (Rv1820) and *ilvX* (Rv3509c) and one regulatory *ilvN* (Rv3002c) subunits of AHAS, of which only IlvB1has been reported to produce active AHAS. A systemic effort was made to clone and over express all five genes in *E. coli* and assay the purified recombinant proteins for AHAS activity. Besides, IlvB1, only two of the subunits, IlvG and IlvB2, showed AHAS activity. Expression analysis and kinetic profiles of the two proteins showed several differences from previously identified IlvB1 enzyme by behaving as catabolic AHAS leading to activation of butanediol fermentation pathway. The upregulation of *ilvB2* and *ilvG* was observed in extended stationary, *ex vivo*, acid stress and hypoxic environments highlighting the significance of AHAS enzymes in *M. tuberculosis* metabolism.

3.1.5 Basic research using *M. tuberculosis* and other mycobacterial species

3.1.5.1 Comparative expression analysis of *rpf*-Like genes of *M. tuberculosis* H37Rv under different physiological stress and growth conditions (*Microbiology,* 2010, 156(9): 2714-22)

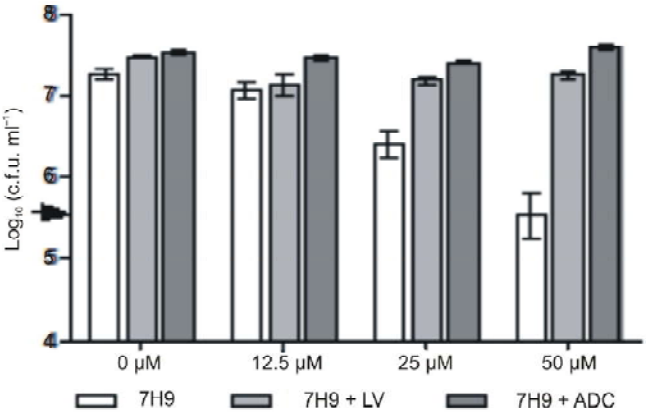
M. tuberculosis H37Rv possess five resuscitation-promoting factors RpfA-E that are required for the resuscitation of dormant mycobacteria induced by prolonged incubation of culture in stationary phase. To understand the role of *rpf* genes during cell growth and cell survival in different physiological stress, their relative expression was examined under acid stress, nutrient starvation and hypoxic conditions by qRT-PCR. Results showed differential relative expression of *rpf* genes during various stages of growth and stress. During early resuscitation, all *rpf* genes were found to be expressed with maximal expression ratio of *rpf*A and *rpf*D. *rpf*C was consistently expressed during all stages of growth and nutrient starvation. Acid stress induced higher relative expression of *rpf*D and *rpf*E and hypoxia of *rpf*C and *rpf*E respectively. Expression profiles conclusively showed that *rpf*-like genes are differentially regulated during growth of *M. tuberculosis*.



Transcriptional profiling of *rpf* genes in *M. tuberculosis*.

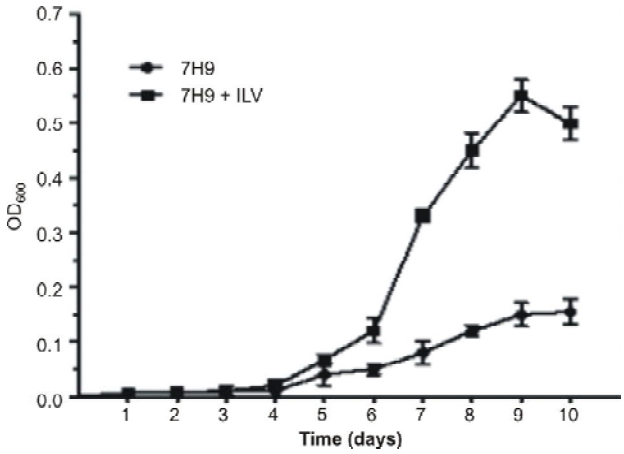
3.1.5.2 Downregulation of *Rv0189c*, encoding a dihydroxyacid dehydratase, affects growth of *M. tuberculosis in vitro* and in mice (*Microbiology,* 2010, 157: 38–46)

Dihydroxyacid dehydratase (DHAD) is a key enzyme involved in branched chain amino acid (BCAA) biosynthesis and catalyses the synthesis of 2-ketoacids from dihydroxyacids. In *M. tuberculosis,* DHAD is encoded by *Rv0189c*, which shares 40% identity in amino acid sequence and conserved motifs with *E. coli* DHAD, *ilvD*. *Rv0189c* after overexpression in *E. coli* was found to exist as a homodimer



Effect of DETA-NO on growth of *M. tuberculosis*

(~155 kDa). Mutation in *ilvD* in *E. coli* resulted in auxotrophy for all the three amino acids. Prototrophy could be restored upon addition of ILV (isoleucine, leucine, valine) or by complementation with Rv0189c. The role of *Rv0189c* in *M. tuberculosis* was elucidated by antisense and sense RNA constructs. Growth of *M. tuberculosis* antisense strain was



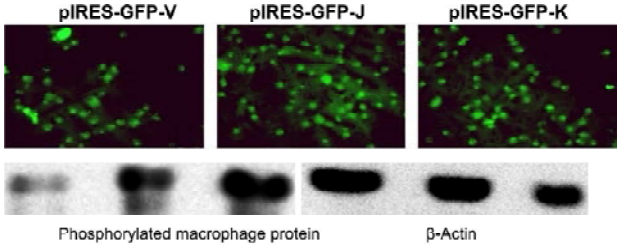
Antisense of *Rv0189c* affected the growth of *M. tuberculosis in vitro*

markedly poor in lungs of infected mice and in Middlebrook 7H9 broth compared to *M. tuberculosis* sense strain and vector alone transformants. It is also observed that the binding of nitric oxide (NO) with the Fe-S cluster of Rv0189c protein similar to IlvD of *E. coli* leading to inactivation of protein and growth arrest. Transient NO exposure by DETA-NO effectively inhibited the growth of *M. tuberculosis* in MB7H9 medium while there was no effect of NO on *M. tuberculosis* growing in 7H9 supplemented with ILV/ADC. As found absent in mammals both AHAS and DHAD could be potential drug targets.

3.1.5.3 Protein kinase K regulates macrophage proteins to exhibit survival

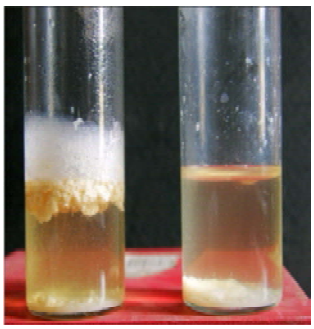
M. tuberculosis serine/threonine protein kinase K (PknK) was identified and characterized for its role in phagocytosis and pathogenesis. It is a large protein (1100 amino acids) whose N-terminal residues are homologous to eukaryotic-like serine/threonine kinase domains and the C-terminal residues show similarity with the regulatory region of *E. coli* transcription regulator MalT. The PknK contains an ATP/GTP-binding site and a putative PDZ domain between amino acids residues 368–375 and 465–533, respectively. It is present in slow growers and in pathogenic mycobacteria (Rv3080c) and has been proposed to play a role as a transcriptional regulator. Rv3080c has been cloned, expressed and purified to homogeneity. Further, a recombinant *M. smegmatis* MC^2 155 strain was created using this gene. The wild type MC^2, MC^2 containing only vectors and MC^2 containing PknK were cultured in different conditions. MS containing PknK slowed down the growth of mycobacteria.

To examine the intracellular role of these recombinant mycobacteria, J774A.1 macrophage cell line was infected with wild type and recombinant MS. MS containing PknK was found to reside in macrophages for longer period of time as compared to MS. The macrophage proteins which were influenced by PknK using western blotting with phosphorylated forms of Ser/Thr antibodies were further analysed, wherein changes in a high molecular weight protein of macrophage was observed. The characterization of this protein is in progress.



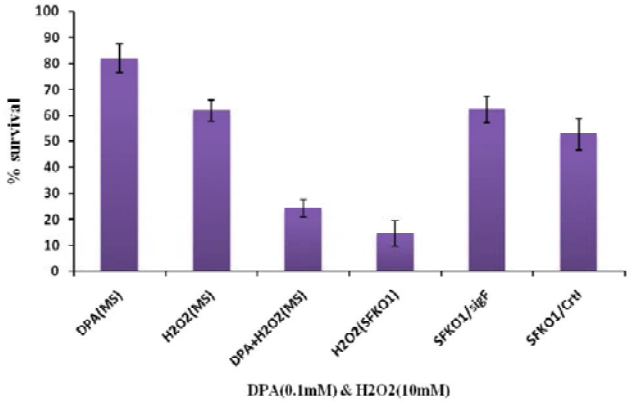
V = J774A.1 cells transfected with Vector
J = J774A.1 cells transfected with *pknJ*
K = J774A.1 cells transfected with *pknK*

3.1.5.4 *M. smegmatis sigF* mutant fails to form biofilm and is susceptible to H_2O_2 mediated oxidative stress


M. smeg$^+$ *M. Smeg/ΔsigF*

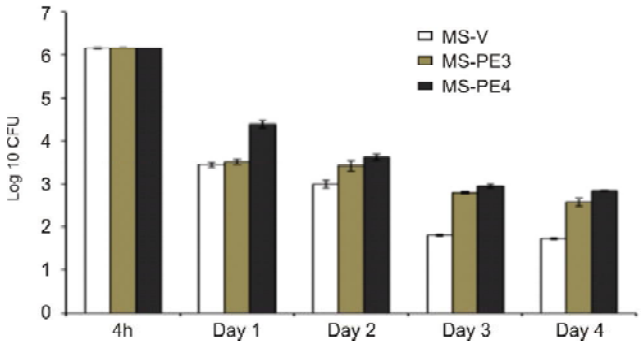
M. smegmatis Δ*sigF* mutants showed similar growth profile as compared to its wild type counterpart, but during extended stationary phase they fail to form biofilm and tend to settle at bottom. Increased expression of *sigF* was noticed in response to cold shock, nutrient starvation and after treatment with anti-mycobacterial agents, like isoniazid and ethambutol, but its absence did not affect the survival of mutants under these conditions. The mutants lacked carotenoid pigmentation and showed an increased susceptibility towards H_2O_2 induced oxidative stress. Since the *sigF* expression was not induced during oxidative stress and the carotenoids are known free radicals scavengers, the role of carotenoid pigments in oxidative stress was examined in *M. Smegmatis* wild type and Δ*sigF* mutant.

M. smegmatis wild type culture when treated with diphenyl alanine (DPA), a known inhibitor of carotenoids synthesis, prior to exposure of H_2O_2, bacteria suffered more stress (~20% survival) than the direct exposure to H_2O_2 (~60% survival). This suggests that the carotenoid pigments rescued the bugs from H_2O_2 mediated oxidative stress. This finding was further confirmed as the *sigF* mutant complemented with carotenoid pigmentation genes showed similar level of recovery after oxidative stress as done by *sigF* complementation. Further, in a microarray analysis the carotenoid pigmentation genes were found to be down regulated, which were revalidated by quantitative real time RT-PCR. Also, a SigF consensus site was found in the upstream region of carotenoid pigmentation genes in *M. smegmatis* genome, which suggests that SigF indirectly regulates the oxidative stress response by transcriptional regulation of carotenoid pigmentation genes.

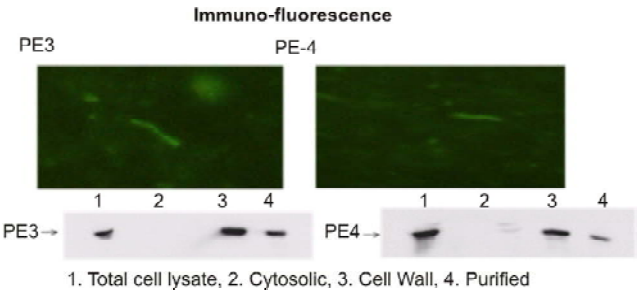


3.1.5.5 Multiple functions of PE3 and PE4 proteins direct mycobacteria/host association

Identification of the novel PE multigene family was an unexpected finding of the *M. tuberculosis* genome. Presently, the biological role of the PE family proteins encoded by this unique family of mycobacterial genes remains unknown. The PE family of *M. tuberculosis* includes 98 proteins which share a highly homologous N-terminus sequence of about 110 amino acids (PE domain). In this study, the cellular localization of two PE proteins was examined by cell fractionation and immunofluorescent microscopy, and demonstrated that PE3 (Rv0159c) and PE4 (Rv0160c) are surface exposed and localized in the mycobacterial cell wall.



Survival of WT and recombinant mycobacteria in macrophages



Localization of PE3 and PE4 Proteins

The PE genes were expressed in a non-pathogenic fast-growing *M. smegmatis* MC^2 strain and demonstrated that it survives better in macrophage cultures, *in vitro* as well as in mice after intra-peritoneal administration, than the parental strain containing the vector only. The data showed a convincing increase in the mean survival time of MS containing PE3 and PE4. It is further established that these proteins are significantly secreted out and influenced host-pathogen interactions.

3.1.5.6 Structure-based identification of virtual library of antitubercular compounds targeting *M. tuberculosis* enoyl acyl carrier protein reductase

Sequential virtual screening, using 2D structural fingerprints, 3D pharmacophore, molecular docking and receptor interaction fingerprint based scoring, was applied to identify a compound collection targeting InhA, validated as important drug target against tuberculosis. This could serve both as a platform for designing further focused libraries as well as crude basis for the initial exploration of InhA inhibitory activity of the identified compounds.

3.1.5.7 Biomolecular modeling studies of *M. tuberculosis* Inosine-5'-monophosphate dehydrogenase (MtIMPDH)

The MtIMPDH guab2 model was constructed using homology modeling and molecular dynamics simulation, and then was critically assessed for stereochemical and energetic aspects. Afterward, molecular docking approach was employed to dock substrate IMP into the active site of the proposed 3D model in order to probe substrate binding modes. The results showed that MtIMPDH guab2 is similar in structure and properties as do the other bacterial IMPDH. Molecular docking of substrate IMP revealed that IMP binds in similar orientation as in case of other bacterial IMPDH and several key residues responsible for the substrate specificity was identified.

3.2 Bacterial and fungal infections

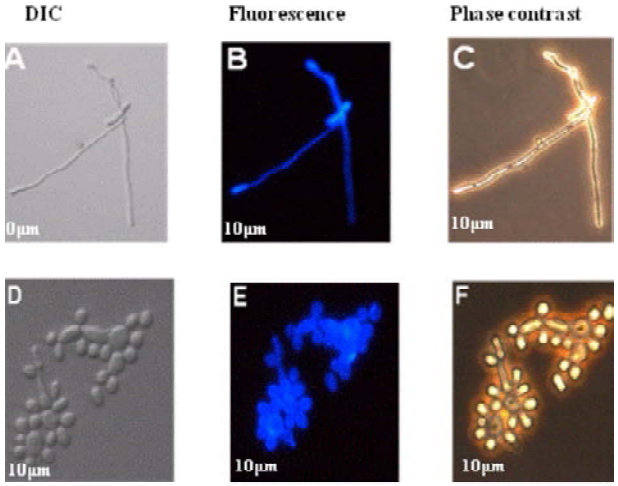
3.2.1 Screening

A total of 1317 compounds/extracts were evaluated for *in vitro* antifungal and antibacterial activity by microbroth dilution method. Synthetic compounds S-009-1843, S-009-1114, S-009-1442, S-009-1444, S-010-0339, S-010-572, S-010-754, S-010-755, S-010-758, S-010-1070, S-009-1050, (MIC 0.78-3.12 mg/ml against bacteria and fungi), marine extracts CSM-509-A001, AU2-498-A001, AU2-507-A001, IIC-974-A001, IIC-917-A001, CSM-517-A003, CSM-522-A001, CSM-506-A003, CSM-509-A003, CSM-512-A001, CSM-512-A003 (MIC 0.9-31.2 mg/ml against bacteria and fungi), plant extracts 4032-F004, 4032-F005, 2191-F003, 3185-C002, 170-C002, 1723-C002, 2191-C002 (MIC 7.8-15.6 mg/ml) were found to be active. One extract NMITLI 118R (with tannins) was evaluated for immunoprophylactic activity against systemic challenge of *Candida albicans* in mouse where mild protection was observed at a dose of 30 mg/kg.

3.2.2 Genetic analysis of amphotericin B strain of *C. albicans*

Resistance to amphotericin B is an emerging phenomenon in *C. albicans*. Amphotericin B-resistant strain of *C. albicans* was developed under laboratory conditions and the stability of acquired resistance was confirmed *in vitro* as well as *in vivo*. Both the strains were grown in hyphal induction medium and subjected to fluorescence microscopy using Calcofluor white. The parent

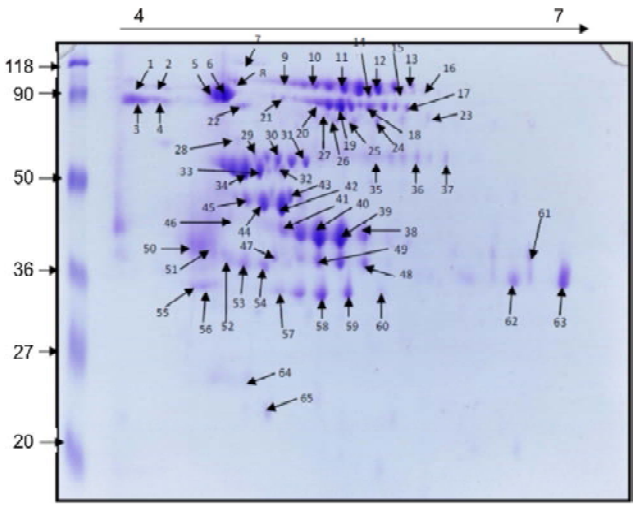
strain of *C. albicans* ATCC10231 exhibited true hyphae morphology whereas AMB-R strain morphology was changed to pseudohyphae. This AMB-resistant strain exhibited reduced germ tube formation as compared to parent strain of *C. albicans* ATCC10231. Enzymatic activity of virulence factors like secreted aspartyl proteinase and phospholipase were found to be significantly high in AMB-R as compared to parent strain whereas ergosterol content of AMB-R was drastically reduced. The behavior of AMB-R strain is an interesting phenomenon and opens up a wide area of research regarding pathways and mechanisms.



Morphological differences in *C. albicans* parent strain and *C. albicans* AMB-R strain in YNB +10%FBS. The Cells were stained with Calcofluor white and observed under fluorescence microscope. A,B,C represent typical hyphae formation in *Candida albicans* ATCC10231, parent strain where as D,E,F show pseudohyphae formation in *C. albicans* AMB-R strain.

3.2.3 Identification of virulence factors and diagnostic markers using immunosecretome of *Aspergillus fumigatus*

Aspergillus fumigatus is a prime causative agent for various allergic and invasive aspergillosis. There has been a dramatic increase of such cases in last three decades, yet the early diagnosis and virulence factor identification remains the challenge. In the present study, secretome analysis of proteins isolated from the culture filtrate was done by 2D gel electrophoresis coupled with MS/MS and the immunosecretome analysis was carried out using immunoblotting of 2D transfer blots, probed with the sera of



2D gel electrophoresis profile of secretory proteins (pl 4-7), No. with arrow represents corresponding spots identified by MS/MS analysis.

patients, immunized rabbit and mice. The identified proteins were analyzed further for homology with human proteins by BLAST search and for secretory signal by SignalP. A total of 65 protein spots from 2D gel resulted in identification of 24 different proteins along with their isoforms and out of which 15 proteins were identified as immunogenic in human. These findings may be helpful in the identification of virulence factors involved in aspergillosis and also useful as diagnostic markers.

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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Dr. Madhu Dikshit

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Area Leaders:
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Dr. Gautam Palit

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 to the above, the area focuses on (i) Development of suitable animal models and *in vitro* tests (isolated cells, cell lines and enzyme assays) mimicking the pathologies of CVS-CNS and related disorders and (ii) Exploration of molecular mechanisms involved in the pathologies of above mentioned disorders 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

Synthetic compounds, plant and marine extracts/ fractions were tested for various activities are listed below :

4.1.1 Cardiovascular pathologies

4.1.1.1 Antihypertensive activity

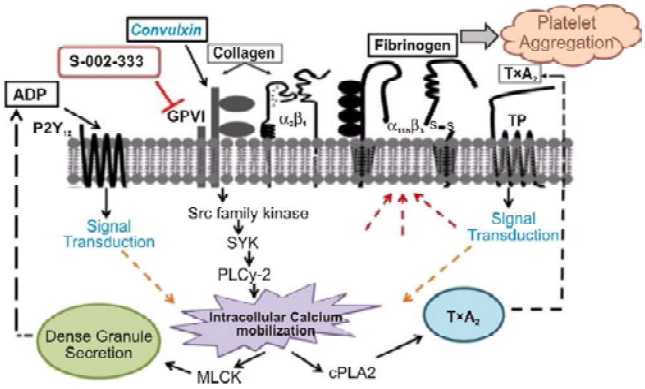
A total of 484 plant and herbal extracts were evaluated for their blood pressure (BP) lowering efficacy. Both anaesthetized as well as conscious normotensive and spontaneously hypertensive rats were used to assess BP lowering effect of crude extracts and active fractions.

4.1.1.2 Antithrombotic activity

During this year, 240 compounds were screened for the antithrombotic activity against collagen and adrenaline induced thrombosis in mice as well as for their effect on bleeding time. Several of them exhibited better or aspirin like effect in this model of thrombosis. Among these, 7 compounds exhibited profound anti-platelet activity, 18 compounds had vasorelaxant action, while 7 compounds showed selective interaction with the coagulation cascade proteins.

A) Mechanism of action and pharmacokinetics of S-002-333 (antithrombotic)

The compound S-002-333 (US Patent US2006142322-A1) seems to possess platelet GPVI antagonistic activity, since it not only selectively reduced convulxin mediated platelet aggregation but also prevented platelet adhesion on fibrillar collagen specifically mediated by platelet GP VI. In the physiological state, GPVI is the primary signaling receptor, responsible for the recruitment and subsequent aggregation of platelets upon vascular injury, and thus, is a major target for development of novel pharmaceuticals that are likely to be highly effective and well tolerated (*Blood* 2003, 102: 449; *Thrombosis Research* 2008, 122: 786). The exposed sub endothelial collagen upon interaction with platelets induces phosphorylation of a cascade of signaling proteins at tyrosine residues including PLC-γ2, which was attenuated by the compound S-002-333, thereby reducing intra-platelet calcium mobilization and further preventing platelet dense granule secretion. Collagen exclusively induces platelet aggregation through a pathway that is primarily mediated by the release of ADP and TxA_2, thereby leading to robust association of collagen with GPVI and further amplifying thrombus formation. The compound



S-002-333 inhibited collagen induced ATP release as well as TxB_2 thereby abrogating both platelet secretion and COX activity. These observations clearly indicated that the compound S-002-333 specifically interacts with platelet collagen receptor GP VI and thus blocked the preliminary step of thrombus initiation following endothelial injury under pathological complications.

The preclinical pharmacokinetic evaluations of compound S-002-333 in male NZ rabbits by oral route of administration at 20 mg/kg body weight provided plasma levels beyond 24h post dose which may have prolonged pharmacodynamic response after single dose of the molecule. The C_{max}, t_{max}, $AUC_{0-\infty}$, and MRT values after oral administration of compound S-002-333 at 20 mg/kg dose were found to be 50.3 ± 15.5 ng/ml, 4.83 ± 2.24 h, 620.0 ± 283.6 ng h/ml, and 17.87 ± 1.57 h respectively.

4.1.1.3 Anti-dyslipidemic activity

A total of 197 samples were evaluated during this period against high fat diet induced dyslipidemia in Golden Syrian hamsters. A series of novel benzocoumarin derivatives were synthesized and evaluated for their *in vivo* anti-dyslipidemic and *in vitro* antioxidant activities. Among various compounds tested, compound S-008-1507 showed potent anti-dyslipidemic and antioxidant activity (*Bioorg. Med. Chem. Lett.*, 2010, 20: 4248). A series of 13 novel benzocoumarin compounds were evaluated for their anti-dyslipidemic activity in hyperlipidemic hamsters. The compound S-009-1387 at 5 mg/kg significantly reduced the plasma triglyceride levels (TG) by 62%, total cholesterol (TC) by 48%, accompanied by an increase in HDL-C/TC ratio by 62% in hyperlipidemic hamsters to a greater degree than statins. Novel coumarin bisindole heterocycles synthesized following an uncommon method were also evaluated for anti-dyslipidemic activity in hyperlipidemic hamsters. Among them, S-009-1773 showed potent anti-dyslipidemic activity and reduced the plasma TG by 55% and total TC by 20% along with 42% increase in HDL-C/TC ratio in the high fat diet fed hamsters (*Bioorg. Med. Chem. Lett.*, 2010, 20: 6504). Crude extract of 4698, fraction F035, K040 and K080 showed promising anti-dyslipidemic activity in high fat diet fed hamster. In addition, 12 synthetic and 6 natural products were evaluated for the anti-adipogenic activity in 3T3-L1 cell lines, while 28 synthetic compounds and 12 natural products were tested for the hypolipidemic activity against triton induced hyperlipidemia in rats. Among the tested samples, 12 exhibited appreciable activity.

4.1.2 Central nervous system pathologies

4.1.2.1 Rotenone induced oxidative stress and anti-stroke activity

18 thiazolidine-4-one derivatives, PPARγ agonists, which regulate inflammatory pathways by the transrepression of NF-kB also modulate oxidative stress, were tested first against rotenone induced oxidative stress in the rat brain. Among these, S-010-188 and S-010-198 were found to reduce brain MDA level by 39 and 46 % and increased GSH by 37 and 55 % respectively. Further S-010-188 at the dose of 50 mg/kg po reduced cerebral infract by 70% and MDA level 40% and augmented GSH by 45% in focal cerebral ischemia model in rat.

4.1.2.2 Anti-dementia activity

By employing the model system *C. elegans,* novel carbamates were screened for acetylcholine esterase (AChE) inhibitory activity (*J. Med. Chem.,* 2010, 53: 6490). This model system was used to assess whether or not, the test compounds affect the release of neurotransmitter acetylcholine (ACh) in the synaptic cleft. The assay employed an Acetylcholine Esterase (AChE) inhibitor Aldicarb to induce paralysis in the exposed *C. elegans* nematodes. AChE present in the synaptic cleft catalyzes the hydrolysis of neurotransmitter ACh to choline and acetate, thus eliminating ACh from the synapse leading to the accumulation of ACh that in turn causes over activation of cholinergic receptors, hypercontraction of muscles and paralysis. This assay helped in testing novel carbamates as potent AChE inhibitors.

Among the 30 compounds tested for AChE inhibitory activity using mice brain homogenate, 4 compounds showed promising AChE inhibitory activity *in vitro*. Rivastigmine was used as standard drug in same concentrations.

4.1.2.3 Scopolamine induced amnesia in mice

Three compounds S-009-073, S-009-074 and S-009-2021, which were identified active *in vitro*, were tested in scopolamine induced model of amnesia in mice and were found active.

4.1.2.4 Anti-anxiety activity

5 compounds were screened for their anti-anxiety effect, 117-A001 and its fraction, 117-F005 showed significant anti-anxiety activity in all the test models of anxiety. Diazepam increased more than 40% time spent in open arm of elevated plus maze in comparison to the control group of mice, while test compounds that increased more than 30% were considered active.

4.1.2.5 Anti-psychotic activity

Two compounds were evaluated for the anti-psychotic activity, which significantly reversed the ketamine (100 mg/kg, i.p.) induced hyper-locomotory response (positive symptom), transfer latency time in passive avoidance test and immobility time in forced swim test (negative symptoms). The activity of the compounds was compared with standard-typical (haloperidol) and atypical (clozapine) drugs.

4.1.2.6 Anti-stress activity

Two extracts were screened for anti-stress activity in acute stress model, and were found inactive.

4.1.2.7 Antidepressant activity

A series of ten 3-phenylcoumarins were synthesized and screened for potential antidepressant activity by tail suspension test in mice. Among the compounds tested, three compounds (S-010-0701, S-010-0705 and S-010-0708) exhibited appreciable antidepressant activity, measured in terms of percentage decrease in immobility duration. These compounds were subsequently studied at the most effective dose in forced swimming test animal model. Significant decrease in the immobility time and exhibited greater efficacy was observed in comparison to fluoxetine and imipramine. These compounds did not show any neurotoxicity in the rotarod test and the preliminary results are promising enough to warrant further studies around this scaffold.

4.1.3 Other related disorders

4.1.3.1 Gastric ulcers

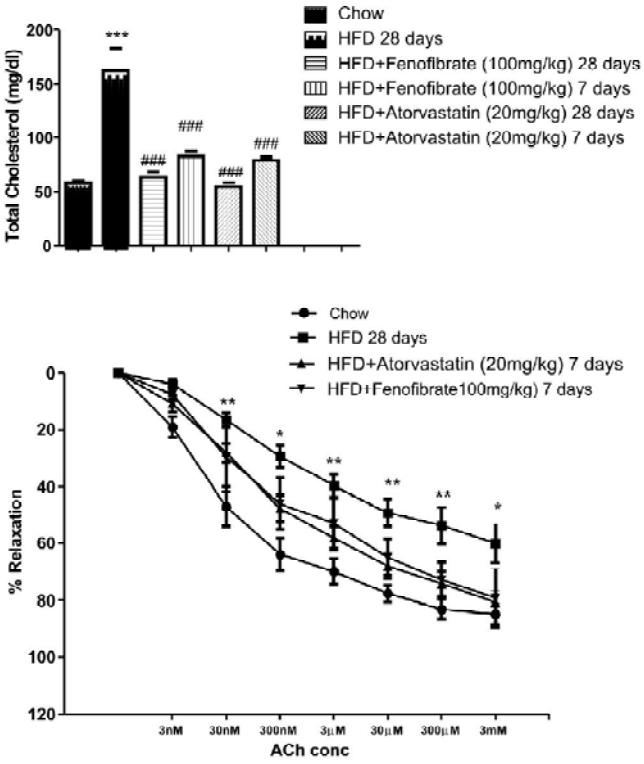
42 compounds were received for screening. All of them were tested and among them 13 were found active against CRU model. Compound S-009-0183 was found active in acute ulcer models other than CRU. Omeprazole was used as a standard drug which showed 77% protection as compared to control group.

4.2 Experimental models of CVS-CNS disorders

During the reporting period, following models were standardized in the labs, which will be used for the secondary or tertiary screening to further delineate the efficacy of the active molecules.

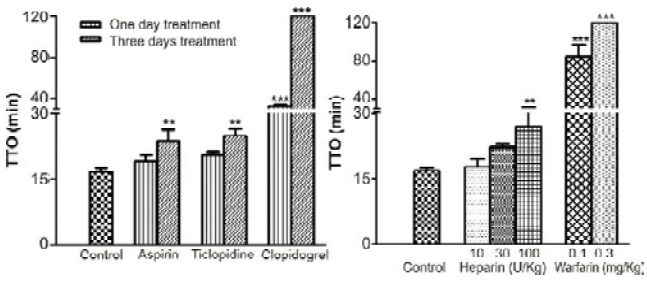
4.2.1 Dyslipidemic guinea pig model: Validation studies with anti-hyperlipidemic molecules like Atorvastatin and Fenofibrate

Male Guinea Pigs were fed with high fat diet (HFD) (normal diet supplemented with 15% fat and 0.08% cholesterol) for 28 days. Atorvastatin 20mg/kg and Fenofibrate 100mg/kg (po) administered daily for 7 days prior to sacrifice. Lipid levels in guinea pigs at 28 days (162.8 mg/dl) was significantly more than the chow fed controls (58.4 mg/dl). Atorvastatin 20 mg/kg (80.4 mg/dl) and Fenofibrate 100 mg/kg (83.5 mg/dl) significantly reduced total cholesterol (TC). Moreover Acetylcholine (Ach) (3 nM to 3 mM) induced relaxation in Phneylephrine (PE) pre-contracted rings were significantly ameliorated in the aortic rings obtained from Guinea pigs on HFD, which exhibited a trend of improvement following Atorvastatin or Fenofibrate treatment.



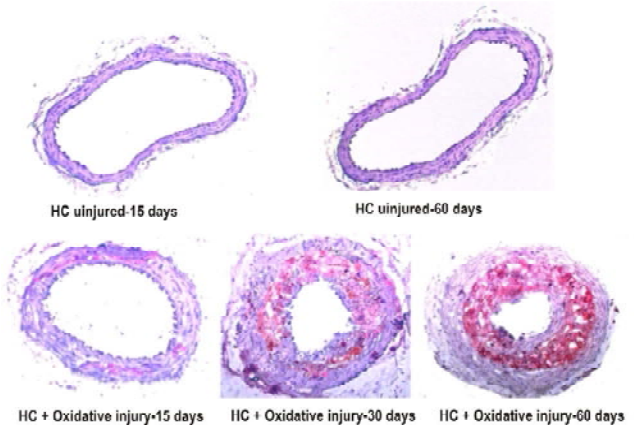
4.2.2 $FeCl_3$ induced thrombosis (*J. Pharmacol. Toxicol. Methods., 2010, 61(3), 287-291).*

$FeCl_3$ induced thrombosis has been considered an appropriate method to validate and identify the importance of the new antiplatelet and antithrombotic targets *in vivo*. The methodology involved exposure of male SD rat (250-300 g) carotid artery, application of a pulsed Doppler Probe (DBF-120A- CPx, CBI-8000, Crystal Biotech, USA) to record the blood flow velocity and patency of artery and to induce thrombosis by placing a presoaked Whatmann Chr paper (1x2mm) in 20% $FeCl_3$ solution for 5 min over the exposed carotid artery. The time at which the blood-flow velocity was decreased to zero was recorded as time to thrombotic occlusion (TTO). The standard drugs and test compounds were given 1hr prior to the application of the $FeCl_3$ soaked filter paper.



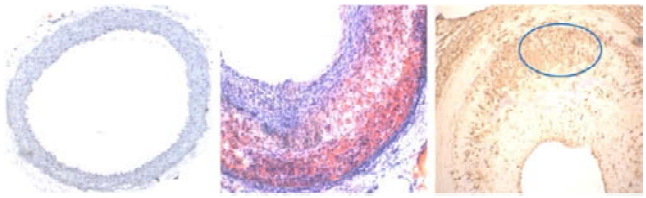
4.2.3 Hamster model of accelerated atherosclerosis

Male Golden syrian hamster were kept for one week on high cholesterol high fat (HCHF) diet consisting of cholesterol and coconut oil prior to injury. Under a dissecting microscope, the left carotid artery was carefully exposed, and injury was induced in by placing a Whatman #1 filter paper strip saturated with 10% $FeCl_3$ on the adventitia of the carotid artery for 2 min. After removal of the filter paper, the incision was washed three times with 0.01 M PBS and monitored for the restoration of blood flow through laser doppler blood flow system (BIOPAC Systems, Inc.) followed by a suture ligation. After surgery, all the experimental animals were maintained on the HCHF diet for for the next 60 days. At the end of study period, the animals were euthanized and assessed for various parameters (plasma lipids, histology of the normal and injured artery and immunohistochemistry). Oil red O staining was used to assess the lipid accumulation in subintimal space (Fig.). Immunostaining and mRNA quantification to identify monocyte/macrophage, smooth muscle cells etc. and/or other important signaling molecules are in progress. This model will be useful to predict the efficacy of lipid lowering, antiinflammatory, antiproliferative as well as for the identification of antithrombotic molecules useful for therapy in atherosclerosis.



4.2.4 Rabbit model of accelerated atherosclerosis

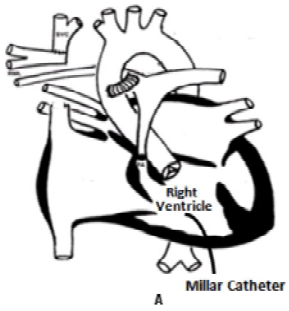
Male New Zealand White rabbits were kept on high cholesterol high fat diet consisting of cholesterol and peanut oil. After seven days, anesthetized animals were subjected to balloon angioplasty injury using Fogarty embolectomy catheter in the iliac artery. These rabbits were maintained on the high cholesterol diet for the next 4 weeks. Acetaminophen and ampicillin were given for 3 to 5 days. At the end of study period (5 weeks), the animals were euthanized and assessment of various parameters (plasma lipids, vasoreactivity, histology of the normal and injured artery and immunohistochemistry) were carried out. Oil red O staining was carried out to assess the lipid accumumulation Immunostaining studies was done to characterize the macrophage laden lipid core. Immunostaining to identify smooth muscle cells, MMPs, tissue factor and/or other important signaling molecules are in progress. This model will be useful to predict the efficacy of lipid lowering, antiinflammatory, antiproliferative as well as for the identification of antithrombotic molecules useful for threapy in atherosclerosis.

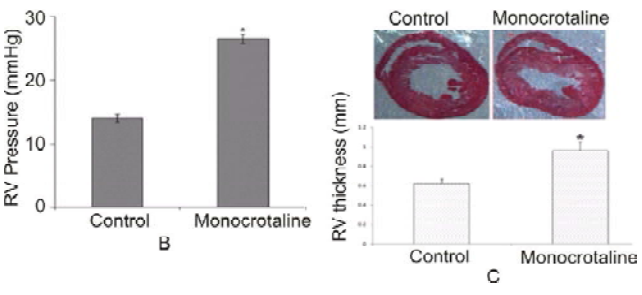


Normal | **Atherosclerotic (oil red O)** | **CD68 (Macrophage marker)**

4.2.5 Development of rodent model of pulmonary hypertension

Monocrotaline (MCT) was used to develop rat model of pulmonary hypertension. Single subcutaneous injection of MCT caused the pulmonary hypertension after three weeks. Millar catheter was inserted directly in right ventricle to measure right ventricular pressure. After three weeks, there was a significant increase in right ventricular pressure due to increased resistance in lung vasculature. Further, there was a significant increase in the thickness of the wall of right ventricle resulting in a decrease in lumen.



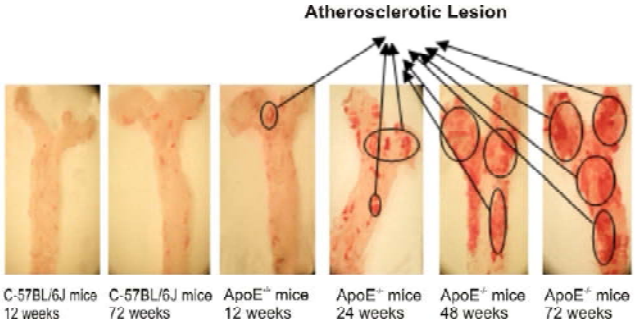


4.3 Basic studies

4.3.1 Cardiovascular system

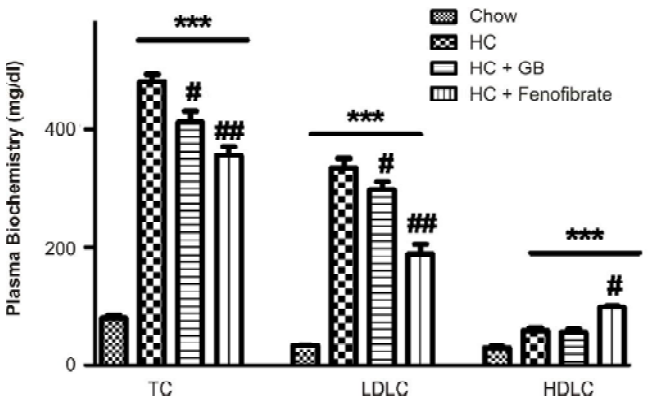
4.3.1.1 Pro-atherothrombotic and inflammatory state in ageing associated with hypercholesterolemia

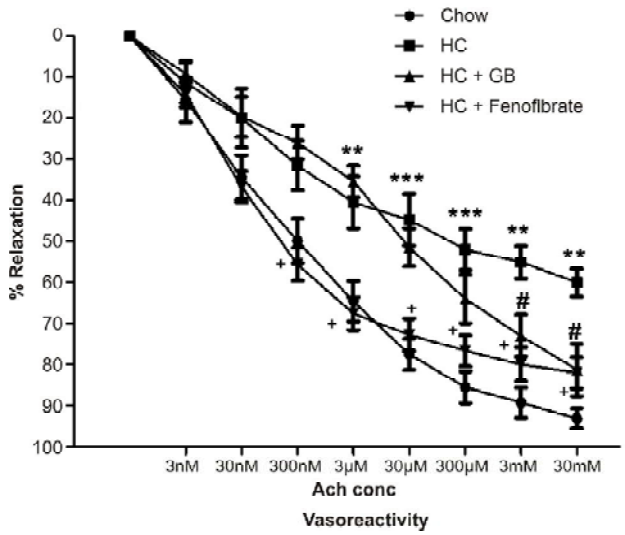
Evaluation of pro-atherothrombotic changes in hyperlipidemic mice during their aging exhibited a time dependent increase in plasma lipid and atherosclerotic lesion in conjunction with vascular dysfunction, inflammation, platelet and coagulation cascade activation. Plasma levels of proinflammatory cytokines IL-1β, TNF, IFN-γ, IL-6 and sCD40L (marker of platelet activation) increased progressively with time in association with hyperlipidemia. Platelets, isolated from hyperlipidemic ageing mice, exhibited enhanced adhesion on collagen coated surface.



4.3.1.2 Studies on dyslipidemic hamsters

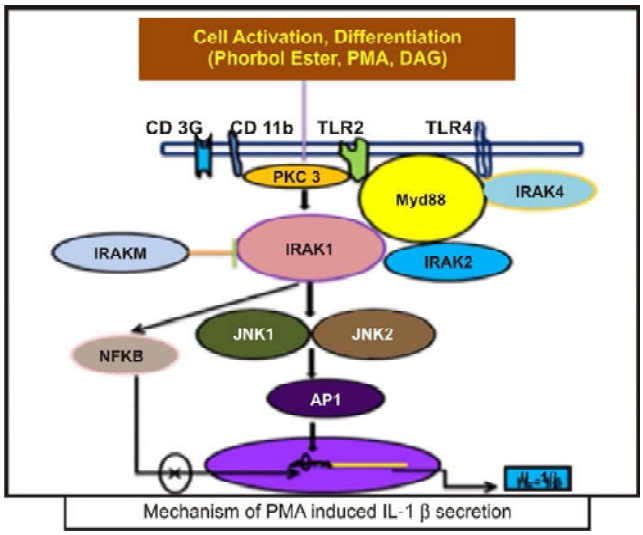
Effect of *Ginkgo biloba* (GB) 150 mg/kg po was evaluated for anti-hyperlipidemic as well as endothelial functionality in a high cholesterol (HC) fed hamsters model developed in the lab. Fenofibrate (200 mg/kg) was used as standard drug. *Ginkgo biloba* exhibited appreciable protection with significant reduction in total cholesterol (TC) and improved endothelial dysfunction.





4.3.1.3 IL-1 receptor-associated kinase-1 mediates protein kinase C-delta induced IL-beta secretion in monocytes

In atherosclerosis IL-1β has been implicated as one of the important pro-atherogenic cytokine that is produced during monocyte differentiation into macrophage. Studies were thus initiated to explore the underlying mechanisms. PMA treatment to THP1 cells induced CD11b, TLR2, TLR4, CD36, IRAK 1, 3 & 4 expression, IRAK1 kinase activity, PKCσ & JNK phosphorylation, AP-1 & NFkB activation and IL-1β secretion. Moreover, PMA induced IL-1β secretion was significantly reduced in the presence of TLR2, TLR4 and CD11b antibodies. Rottlerin, a PKCσ specific inhibitor, significantly reduced, PMA induced IL-1β secretion as well as CD11b, TLR2 expression and IRAK1-JNK activation. In PKCσ W/T over expressing THP1 cells, IRAK1 kinase activity and IL-1β secretion were significantly augmented, while recombinant inactive PKCσ and PKCσ siRNA significantly inhibited basal and PMA induced IRAK1 activation and IL-1β



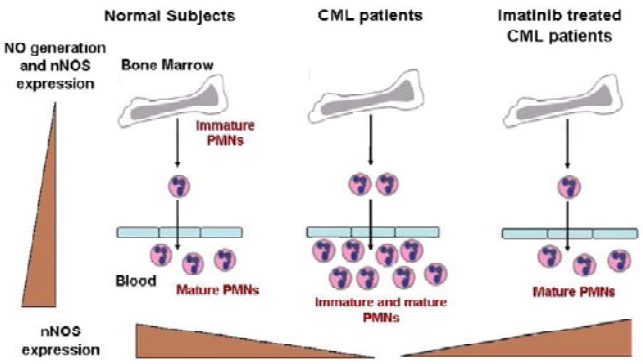
secretion. Endogenous PKCσ-IRAK1 interaction was observed in quiescent cell and this interaction was regulated by PMA. IRAK 1/4 inhibitor, their siRNAs and JNK inhibitor also attenuated PMA induced IL-1β secretion. NFkB activation inhibitor and SN50 peptide inhibitor however failed to affect PMA induced IL-1β secretion. Similar role of IRAK1 in IL-1β secretion and its regulation by PKCσ was evident in the primary human monocytes thus signifying the importance of our finding. Results obtained demonstrate for the first time that IRAK1 and PKCσ functionally interact to regulate IL-1β secretion in monocytic cells. A novel mechanism of IL-1β secretion that involves TLR2, CD11b, PKCσ-IRAK1-JNK-AP1 axis is thus being proposed.

4.3.1.4 Exploration of inter-regulation between IRAK & ERK in IL-1β secretion

Previous findings have shown that in the presence of ERK inhibitor (U0126) there was significant decrease in IL-1β secretion (unpublished data). ERK thus seems to play an important role in inflammatory cytokine secretion. To further confirm inter-regulation of IRAK & ERK, IRAK phosphorylation in the presence of ERK inhibitor (U0126, PD98059) was monitored. A significant inhibition in PMA induced IRAK phosphorylation was observed in the presence of inhibitors of the ERK pathway, indicating a role of ERK pathway in IRAK induced 1β secretion.

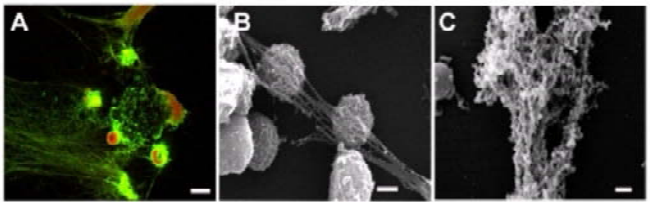
4.3.1.5 Studies on neutrophils/HL60 cell line

A. Neuronal NOS isoform expression and NO formation during human neutrophil maturation: The role of neuronal nitric oxide synthase (nNOS)/Nitric oxide (NO) in neutrophil maturation and migration from bone marrow to blood remains least defined in human neutrophils PMNs. Preliminary data suggests that nNOS was found to possess PDZ domain (Exon-2, N-terminal), as confirmed by RT-PCR using exon-2 specific primer and Western blotting using N-terminal specific antibody. Neuronal exon 1i cluster was found to be present in nNOS. Further studies were undertaken to explore the status of nNOS and NO in immature neutrophils (from bone marrow) and mature neutrophils (from blood) in normal subjects, chronic myeloid leukemic (CML) and imatinib (a tyrosine kinase inhibitor) treated CML patients. Levels of NO was found to be increased significantly during PMNs maturation as measured by DAF-2DA (NO binding dye) in Flow Cytometry (Fig.). RT-PCR and Western blotting revealed upregulation of nNOS during PMNs maturation. In CML patients (having high immature PMNs count) real time PCR demonstrated less copy number of nNOS as compare to control neutrophil (isolated from normal subjects) and imatinib treated CML patients (normal PMNs count). Therefore the present study suggests that nNOS in human PMNs contain PDZ domain, exon 1i and seem to play an important role in the neutrophil maturation and migration from bone marrow to blood.



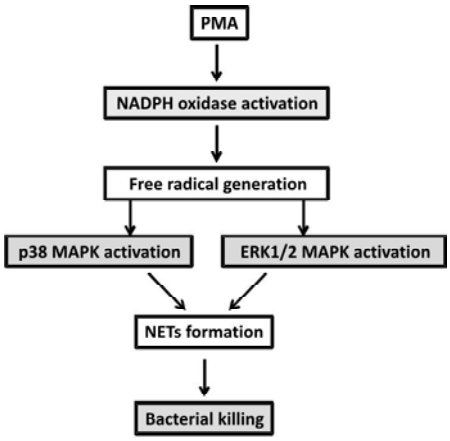
DAF-2DA (Flow Cytometry), RT-PCR, Western blotting & Real time PCR

B. Study on mechanism and signaling involved in neutrophil extracellular traps (NETs) formation: Extracellular traps are expelled from neutrophils to entrap and exterminate the microorganisms. Incubation of human neutrophils (PMNs) with DETA-NONOate (a slow and consistent NO donor) or PMA led to NADPH-oxidase and MPO dependent



(A) PMNs treated with NO donor released NETs as characterized by elastase (green) and DNA (red) staining. (B) Electron microscopic study of NO donor induced NETs. (C) Magnified view of NETs. (bar A 10 µm,B-C 5 µm).

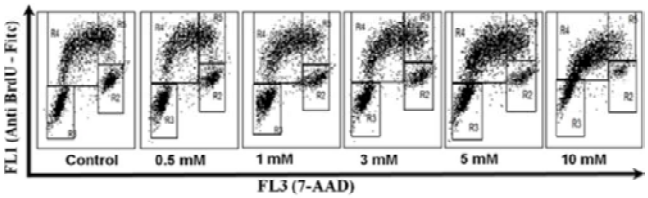
free radical generation and NETs release. DETA-NONOate or PMA induced NETs were made up of both nuclear and mitochondrial DNA as determined by PCR and confocal microscopy using mitochondrial and nuclear DNA binding dye. DETA-NONOate or PMA induced NETs were capable of bacterial killing as was ascertained by colony forming units. PMA induced NETs formation was mediated by phosphorylation of p38 and ERK1/2 MAPK. Pretreatment of PMNs with SB202190 (p38 MAPK inhibitor), U0126 (ERK1/2



Schematic view of PMA induced signaling pathway involved in NETs formation

MAPK inhibitor) did not significantly reduce PMA induced free radical generation, but prevented the formation of NETs. NETs are made up of DNA and elastase, their release was also prevented by DPI (10 μM, NADPH oxidase inhibitor), SB 202190 and U0126. Free radical generation and NETs release, suggesting that p38 MAPK, ERK1/2 activation is downstream to the free radical generation (Flow chart). Moreover, a collaborative study with CSMMU conducted in this lab suggested that circulating levels of nitrite, DNA and MPO were more in systemic inflammatory response syndrome patients (SIRS) in comparison to the healthy controls. PMNs from SIRS patients generated more free radicals.

D. Nitrite mediated proliferation of HL-60 cells: A study was undertaken to investigate the effect of nitrite, a nitric oxide metabolite on promyelocytic cell line HL-60 cell cycle progression. Sodium nitrite (0.5-10 mM) exhibited proliferative effect as confirmed by cell cycle analysis, BrdU and thymidine incorporation. Experiments on synchronized cells further confirmed the proliferative effect of nitrite, which might be dependent on NO release from nitrite as cPTIO, a NO scavenger abolished the nitrite mediated proliferation. Furthermore, proliferative effect was redox sensitive as GSH content of the cells was enhanced and 1mM DTT blocked the proliferative effect. To assess the putative mechanism(s) involved, different cell cycle regulators were evaluated. Upregulation of Cdk2, cyclin E and p21 downregulation was evident. Moreover, Cdk2/cyclin E interaction was more efficient and augmented Cdk2 activity in nitrite treated cells. Indeed proliferative effect of nitrite was blocked by roscovitine, a Cdk2 inhibitor. Thus the results obtained demonstrate the proliferative effect of nitrite through cyclin E and Cdk2 modulation and redox sensitivity.



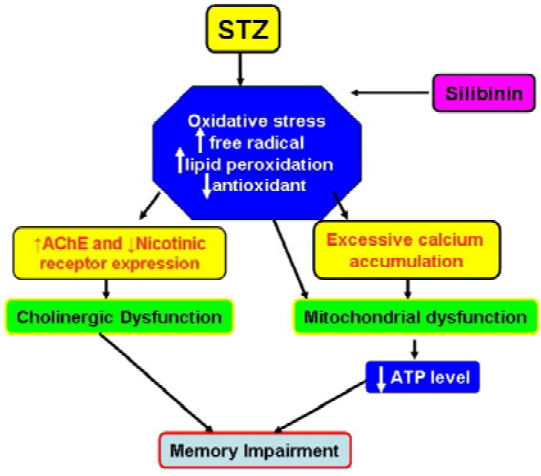
4.3.1.6 Studies on the production of microbial heparinases for heparin depolymerization to produce low molecular weight heparins

Heparinase producing organisms, *Aspergillus flavus* and *Acinetobacter calcoaceticus* were cultivated in various fermentation conditions/bioreactors with an optimized yield of heparinase 1784 and 1424 U/L respectively. Batch heparin depolymerization with free purified enzyme, as fractionated by Sephadex G-50 column, revealed that in initial 16-24 hours of depolymerization, 30-40% of porcine heparin, with an average molecular weight of 12000 Da, to produce middle range (6000-3000 Da) heparin oligosaccharides. As the depolymerization of heparin proceeded to 48 hours, 85-95% of the heparin was cleaved to produce disaccharide as the main product. The plot of initial viscosity versus percent of final absorbance at 232 nm of heparin depolymerization indicated that the heparinases from *A. flavus* and *A. calcoaceticus* cleave the heparin in a random endolytic fashion. Membrane entrapped purified heparinases from the same sources were also used for the generation of LMWHs by incomplete depolymerization (< 30%) of heparin in a bubble column bioreactor for 24 hours, different fractions of oligosaccharides were evaluated for antithrombotic activity in terms of inhibition of blood coagulation factor Xa and IIa (anti-Xa and anti-IIa). The fractions having molecular weight (6000-5000 Da) were found to have anti-Xa:anti-IIa ratio >1.5, which is considered to have optimum antithrombotic efficacy.

4.3.2 Central Nervous System

4.3.2.1 Role of brain energy metabolism and cholinergic function in experimental model of dementia

Evidences suggest that AD and other types of dementia are associated with impairment in brain energy metabolism and cholinergic functions. It is found that intracerebral (IC) administration of streptozotocin (STZ) in mice induces impairment in memory which is associated with reduction in brain ATP levels along with significant increase in oxidative and nitrosative stress. Further, STZ (IC) injection results in increased acetylcholinesterase activity and mRNA expression and decreased nicotinic receptor mRNA expression in mice brain indicating cholinergic dysfunction. Pretreatment with silibinin attenuated STZ induced memory impairment by reducing oxidative and nitrosative stress. Further, silibinin dose dependently restored ATP level indicating improvement in brain energy metabolism. The activity and mRNA expression of AChE was restored by silibinin. Moreover, α-7-nAChR mRNA expression was significantly increased by silibinin in STZ treated mice brain.



Hypothetical mechanism of STZ induced impairment in brain energy metabolism and cholinergic dysfunction: Site of silibinin action.

4.3.2.2 Okadaic acid induced memory impairment and neurodegeneration

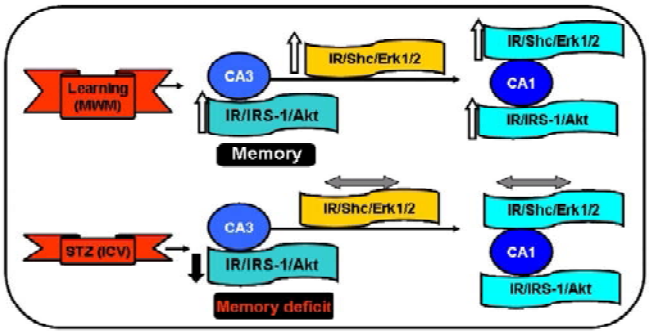
Okadaic acid (OKA) is a potent and selective inhibitor of protein phosphatases, PP2A and PP1. In the present study, effect of intracerebroventricular (ICV) injection of OKA on memory function and oxidative stress in rats was evaluated. ICV injection of OKA produced memory impairment by increasing oxidative stress and mitochondrial calcium ion level. Moreover, histological studies have shown that OKA causes degeneration of hippocampal and cortical neurons in rat brain. Further, the effect of clinically used antidementia drugs, memantine and donepezil, on OKA ICV induced memory impairment, oxidative stress and neurodegeneration was evaluated. Administration of memantine and donepezil for 13 days, starting from the OKA injection, improved performance in memory tests and also significantly reversed biochemical and histological changes induced by OKA. Thus, OKA ICV induced memory impairment in rat appeared as a useful test model to screen anti-dementia drugs (Brain Res. 2010, 66: 1309).

4.3.2.3 NMDA receptor mediated psychosis like effects in mice (*Behavioural Brain Res.* 2011, 216: 247)

Chronic treatment with NMDA receptor antagonist has been successful in inducing the positive, negative and cognitive symptoms of psychosis in mice. Acute treatment with ketamine was found to increase monoamine oxidase A (MAO-A) enzyme activity in cortex and striatal regions and MAO-B activity in striatal regions of mice brain. However, chronic treatment of ketamine shows depletion of MAO-A and MAO-B activity in striatal regions. Acute and chronic ketamine administration showed differential and region specific effects in neurotransmission of Acetylcholine (ACh), Dopamine (DA), Serotonin (5-HT) and Noradrenaline (NA). Acute ketamine increased ACh content in cortex, striatal and hippocampal regions. However, chronic treatment further, increased ACh content in cortex areas only. Also, acute ketamine increased DA and NA levels in cortex and striatal areas. However, chronic administration increased DA, NA and also 5-HT levels in cortex and striatal areas but no change in hippocampal areas. The above results suggest that chronic ketamine treatment induces behavioral and neurochemical abnormalities similar to schizophrenia in mice which can be used to screen novel antipsychotic drugs. This model can be used for further investigation of molecular and neuronal basis of schizophrenia pathophysiology.

4.3.2.4 Brain insulin receptor signaling in memory function

Earlier studies have indicated involvement of hippocampal IR/IRS-1/Akt pathway in memory. Further studies with LY294002, a PI3 kinase inhibitor, showed delayed learning in memory function and decrease in Akt phosphorylation in CA1 and CA3 regions of hippocampus.



The study suggested that IR/IRS-1/Akt pathway in hippocampus might be playing a significant role in memory function.

4.3.2.5 Role of central angiotensin converting enzyme in experimental models of memory impairment

Experimental and clinical studies indicated involvement of Renin Angiotensin System (RAS) in memory. The previous study showed involvement of AT1 receptor in STZ model of memory deficit as candesartan, an AT1 receptor blocker, ameliorated memory impairment (Behav. Brain Res., 2009, 199: 235) However, role of angiotensin converting enzyme (ACE) in cognition is still ambiguous. Ongoing studies revealed that STZ induced memory deficit is associated with significant increase in activity and mRNA expression of ACE in cortex and hippocampus of rat brain suggesting involvement of central ACE in memory deficit. Pretreatment with perindopril attenuated STZ induced increase in ACE expression and activity.

4.3.2.6 Neuroprotective role of nicotinic acetylcholine receptor against STZ induced memory impairment

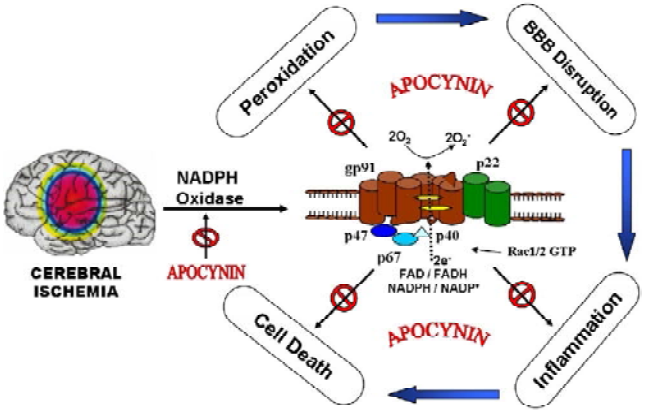
Intracerebroventricular (ICV) streptozotocin (STZ) induced memory impairment in rodents is a well established experimental model of dementia. The previous study demonstrated protective effect of antidementia drug on STZ induced neurodegeneration and memory impairment in rats (*Pharmacol. Biochem. Behav*., 2010, 94: 397). Further study showed a significant increase in reactive oxygen species, Ca^{++} ion influx and caspase 3 activities in rat brain regions following STZ injection. Acetylcholinesterase inhibitors tacrine and donepezil significantly prevented ROS generation, Ca^{++} influx and caspase 3 activity induced by STZ. However, carbachol, a muscarinic agonist, did not show any significant effect on ROS generation, Ca^{++} ion influx and caspase 3 activity in STZ injected rat brain regions. While nicotinic cholinergic agonist nicotine significantly attenuated the ICV STZ induced mitochondrial dysfunction and caspase 3 activity. The results indicate that instead of muscarinic receptors, nicotinic receptors may be involved in neuroprotection by maintaining mitochondrial functions. Thus, from this study neuroprotective role of nicotine can be suggested.

4.3.2.7 Studies on cerebral stroke

The studies were undertaken in the focal cerebral ischemia model to assess some downstream signaling pathways to understand the survival and death mechanisms so as to identify novel therapeutic target(s).

A) NF-kB in cerebral ischemic injury: Central administration of IKK-NBD, the NF-kB specific peptide inhibitor, significantly reduced neurological deficit and damage to the blood brain barrier, in rats. Moreover, the peptide also reduced apoptotic cell death in the ipsilateral brain parts of ischemic rats as assessed by TUNEL staining. The reduction in inflammation in treated rats was also inferred by the significant decrease in OX-42 staining, a marker of microglial cells. Thus, our research indicates that NF-kB inhibition by IKK-NBD peptide has a protective effect in cerebral stroke (*Neurochem. Int.,* 2010, 57: 876-883).

B) NADPH oxidase in cerebral ischemia reperfusion injury: Previous study from this lab proposed that the activation of NADPH oxidase mediates oxidative injury to the brain as administration of apocynin even after ischemic insult offered neuroprotection. However, recently conducted studies in the lab support a dual role in stroke. Results obtained suggest after 12hr post ischemic injury, ROS generated seem to support angiogenesis and neuro-vascular remodeling during the recovery phase after stroke. Figure shows the NADPH oxidase induced pathophysiology in stroke. The drugs used for the inhibition/scavenging of free radicals thus need to be carefully used in stroke.



A cascade of events following ischemic injury leading to activation of NADPH oxidase resulting in cell death.

C) Neuroprotective effects of NMDA antagonist, Ifenprodil and ASIC1a inhibitor, Flurbiprofen in focal cerebral ischemia (*Neuropharmacology*, 2010, 59: 582): In the present study, effect of an NR2b selective NMDA antagonist, Ifenprodil was analyzed in combination with flurbiprofen, a selective ASIC1a inhibitor on rat model of focal cerebral ischemia. Significant neuroprotective effect was observed with ifenprodil alone or at higher doses which was evident by reduction in the infarct volume, neurological deficit and brain MDA level. Further, histopathological studies revealed that the combination not only attenuated the necrotic cell damage in brain striatal regions of ischemic brain but also significantly reduced apoptotic cell death, which were more pronounced than monotherapy with ifenprodil. Thus it appears that the combination therapy may be more efficacious in offering neuroprotection on one hand and also lower the risks associated with high doses of mono-therapy with ifenprodil.

D) Role of glutamate transporter in cerebral ischemia reperfusion injury (*Eur. J. Pharmacol.,* 2010, 65: 638): In the present study, the role of rosiglitazone in neuroprotection mediated by Glutamate transport (GLT-1), following focal cerebral ischemia/reperfusion (I/R) injury *in vivo*, was investigated. Rosiglitazone (2 mg/kg i.p.) administered pre or post ischemia significantly improved behavioral outcome and reduced infarct volume and cerebral oedema. However, no significant changes were observed in GLT-1 mRNA and protein expression in rosiglitazone treated rats following 1/24 h of I/R injury. Further, rosiglitazone neither enhanced ^{3}H-glutamate uptake in glial enriched preparations nor changed glutamine synthetase activity. However, a significant ($P<0.05$) reduction was observed in the gene expression of TNFα and IL1β, and PGE2 level which was more pronounced in post treatment group. It is therefore suggested that the neuroprotective effect of rosiglitazone was not mediated by the modulation of GLT-1 protein expression/activity in focal cerebral ischemia model.

E) Role of in HIF cerebral ischemia reperfusion injury: Hypoxia inducible factor (HIF) is an essential mediator of O_2 homeostasis, and upregulates a number of genes such as VEGF & EPO so as to regulate the adaptation of neuron for survival under hypoxic conditions. We hypothesized that induction of HIF1α during cerebral stroke may have protective effect. Cobalt chloride was therefore used in various doses to prevent the degradation of HIF1α via inhibition of PHD prior to ischemic insult. The cobalt chloride treated groups had elevated levels of HIF1 as revealed by Western blotting. It also significantly reduced cerebral infarction and neurological deficit of ischemic rats. These preliminary studies suggest the neuroprotective effect of HIF in cerebral stroke.

4.3.3 Other Related Disorders

4.3.3.1 Gastric ulcers

A) Differential response of A 68930 and sulpiride in stress-induced gastric ulcers

The detailed study revealed that acute and chronic unpredictable stress significantly increased the gastric ulcer severity, adrenal hypertrophy and corticosterone levels, while

gastric mucosal dopamine levels were decreased. Pretreatment of sulpiride (60 mg/kg) significantly reverted the acute stress-induced alterations whereas quinpirole (0.1–0.5 mg/kg) failed to do so. It was also observed that sulpiride (10–50 µg/ml) had no effect on the gastric H^+ K^+-ATPase activity compared to positive control omeprazole thus denying its role in the mechanism of gastric acid secretion. Thus, study suggested that D2 receptors are involved in the mechanism of ulcerogenesis under acute stress conditions.

B) Effect of melatonin against experimental reflux oesophagitis (RE)

In the present study, role of L-tryptophan in the present esophageal pathology was evaluated, as several studies indicate that GIT loading of L-tryptophan increases the levels of circulating melatonin in the day time. It was noted that L-tryptophan significantly decreased the RE-induced esophageal mucosal damage, without altering the levels of melatonin. Simultaneously, L-tryptophan significantly increased the RE repressed expression of AA-NAT with insignificant effect on HIOMT gene expression. In contrast, L-tryptophan *per se* caused a significant elevation in the esophageal melatonin level, with no significant effect on the expression of AA-NAT and HIOMT enzymes. Results thus suggested that protective functions of L-tryptophan against RE is independent of its conversion into melatonin and a number of factors, possibly governing through L-tryptophan, are involved.

5 Cancer and Related Areas

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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.

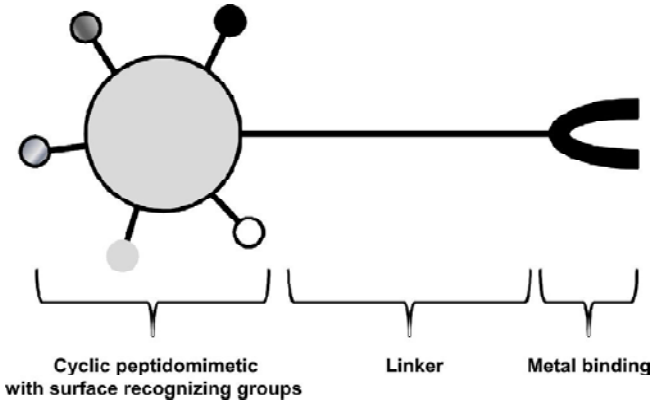
5.1 Screening for anticancer activity

Two hundred twelve synthetic compounds of CDRI were screened for anticancer activity using the sulpho-rhodamine B (SRB) based cell viability/multiplication assay. Solubility of compounds in aqueous medium was determined by laser nephelometry and the soluble ones were bioevaluated against 5 cell lines: MCF7 (breast cancer), C33A (cervical cancer), KB (oral cancer), A549 (lung cancer) and NIH3T3 (non-cancer control). Molecules showing ≥ 80% cell growth inhibition at 50 µM concentration were screened subsequently using serial dilutions to determine the IC_{50} values. Compounds with IC_{50} of ≤ 10 µM were considered as 'hits' and categorized according to their selective cytotoxicity. The anticancer drugs, used as controls, were: Paclitaxel, Nocodazole, Doxorubicine, Centchroman, 5-Fluorouracil, Campto-thecine and Staurosporine. 18 compounds, belonging to 5 different chemical classes, were selected as 'hits'. Of particular interest were two compounds of same chemical class which showed selective activity against C33A (IC_{50} <3.5 µM) and KB (IC_{50} <7.5 µM) and not against MCF7 (IC_{50} >30 µM) or NIH3T3 (IC_{50} >50 µM). They have been selected for further development including the study of mechanism of action and *in vivo* activity in mice.

5.2 Basic research in cancer biology

5.2.1 Design, synthesis and biological evaluation of novel histone deacetylase inhibitors

Research program on design and synthesis of cyclic peptidomimetic compounds to inhibit Histone deacetylase (HDAC) enzymes has been initiated. As the catalytic domain of all HDAC isoforms is highly conserved, different functional varieties of cyclic peptidomimetic fragments are aimed to be employed to target the periphery of the channel leading to the catalytic center. The essential features of the designed substrate are shown graphically.

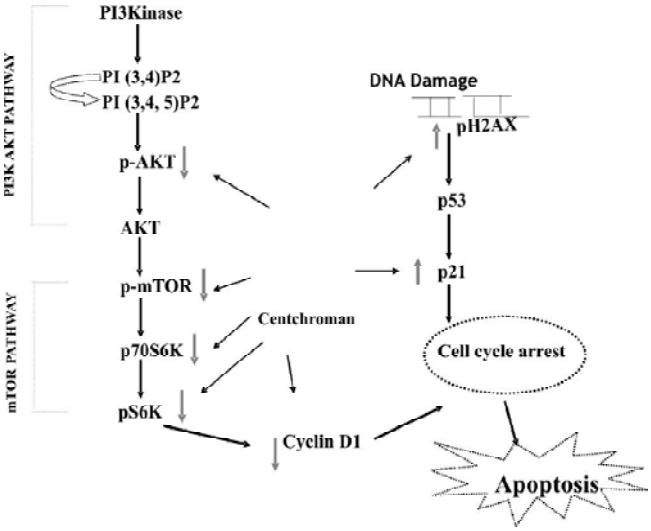


Few conformationally constrained peptidomimetic fragments have been prepared. The present effort is dedicated to standardize the cyclic peptidomimetic part and to make a library of cyclic compounds.

5.2.2 Centchroman inhibits proliferation of head and neck cancer cells through the modulation of PI3K/mTOR pathway

Centchroman (CC; 67/20; INN: Ormeloxifene) is a non-steroidal anti-estrogen extensively used as a female contraceptive in India. In the present study, the antiproliferative effect of CC in head and neck squamous cell carcinoma (HNSCC) cells has been reported. CC inhibited cell proliferation in a dose dependent manner at 24h of treatment. Further studies showed that CC treatment induced apoptosis, inhibited Akt/mTOR and signal transducers and activators of transcription protein 3 (STAT3) signaling, altered proteins associated with cell cycle regulation and DNA damage and inhibited colony forming

efficiency of HNSCC cells. In addition, CC displayed anti-proliferative activity against a variety of non-HNSCC cell lines of diverse origin. The ability of CC to serve as a dual inhibitor of Akt/mTOR and STAT3 signaling warrants further studies into its role as a therapeutic strategy against HNSCC (*Biochem. Biophys. Res. Commun*., 2010 [Epub ahead of print]).



Schematic diagram of Centchroman mediated modulation of cellular signaling in head and neck squamous cell carcinoma.

5.2.3 Alpha-solanine induced cell death in oral cancer cell line KB

Alpha solanine is a glycol-alkaloid, found in potatoes, has been shown to have anti-tumor activity in oral cancer cell line KB. To understand the mechanism of cell death induced by this natural compound, electron microscopic (EM) studies were carried out for a detailed sub-cellular assessment. Studies showed that cell death is mediated by both autophagic and apoptotic pathways.

5.2.4 Sub-cellular alterations in resveratrol treated human breast explants

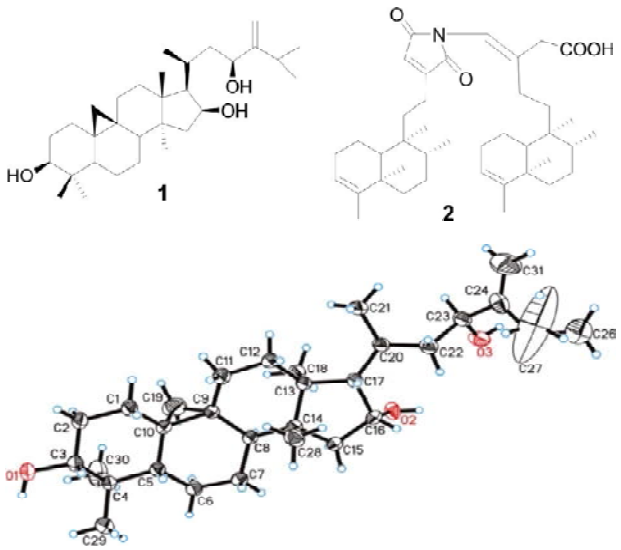
It is known that combined treatment of Resveratrol (RES; naturally occurring dietary compound) and Cyclophosphamide (CPA; cytotoxic drug) shows maximal cytotoxic effect in human MCF-7 cells which is almost equivalent in effect to that when either drug was given in double doses. The effect of this treatment was studied in explants derived from breast cancer patients on treatment with 100 µM RES, alone or in combination with 10 mM CPA. After sample preparation, it was found that the combination treatment and CPA treatments showed only stroma with none or negligible number of cells for thin sectioning. Due to experimental limitations, TEM studies were done on control and the reseveratrol (100 µM) treated explants. RES treated explants revealed morphological features characteristic of apoptosis. Sub-cellular alterations in Centchroman treated human prostate cancer cell line PC3 are being studied using electron microscopy.

5.2.5 Synthesis of coumarin-chalcone hybrids

A series of coumarin-chalcone hybrids have been synthesized and evaluated for *in vitro* cytotoxicity against a panel of four human cancer cell lines and normal fibroblasts (NIH3T3). Among 21 compounds screened, three compounds (S-009-0131, S-009-0132 & S-009-0133) showed IC_{50} range in between 3.59 to 8.12 µM. The most promising compound S-009-0131 showed around 30 fold more selectivity towards C33A (cervical carcinoma) cells over normal fibroblast NIH3T3 cells with an IC_{50} value of 3.59 µM (*Bioorg. Med. Chem. Lett*., 2010, 20: 7205).

5.2.6 Isolation of anticancer compounds from *Polyalthia longifolia* leaves

A 24-methylenecycloartane named Longitriol (**1**), and rare bisclerodane imides, Longimide A (**2**) were isolated from ethanolic extract of the leaves of *Polyalthia longifolia* var. pendula. This is the first example of isolation of any cycloartane triterpene (**1**) from this plant source (*Bioorg. Med. Chem. Lett*., 2010, 20: 5767).



ORTEP diagram with atomic numbering scheme showing molecular structure of Longitriol, 1 at 30% probability.

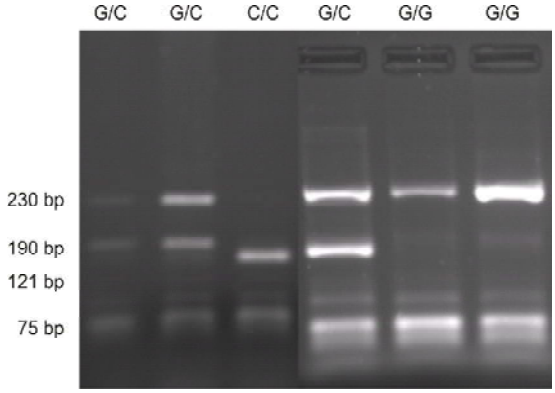
In vitro cytotoxic activity (IC_{50} µM) of **1** and **2** on different cell lines are shown in table below:

Cell lines	Doxorubicin	Longitriol (1)	Longimide A(2)
KB	0.22	50.08	14.34
MCF-7	0.83	65.42	14.96
A549	0.61	27.95	16.41
C33A	0.52	21.25	6.68
NIH3T3	nd*	>100	72.45

*not detected

5.2.7 Genetic polymorphism studies in breast cancer patients

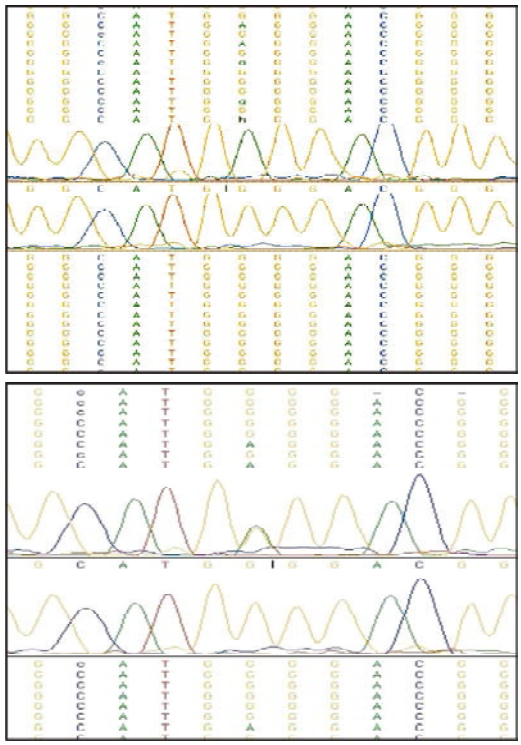
In the ongoing studies to identify possible association of cytokine gene polymorphic variants of few selected cytokine SNP with risk of breast cancer, studies with IL-6 gene polymorphism was conducted. IL-6, a phosphorylated glycoprotein containing 185 amino acids, is a pleiotropic cytokine involved in different physiologic and pathophysiologic processes such as inflammation, bone metabolism, synthesis of C-reactive protein, and carcinogenesis. IL-6 has also been shown to inhibit the growth of various breast cancer cell lines and modulates the estrogen receptor and progesterone receptor content of these cells. We characterized -174 G/C IL6 polymorphism profile in breast cancer patient (n=100) and healthy control subjects (n=100).



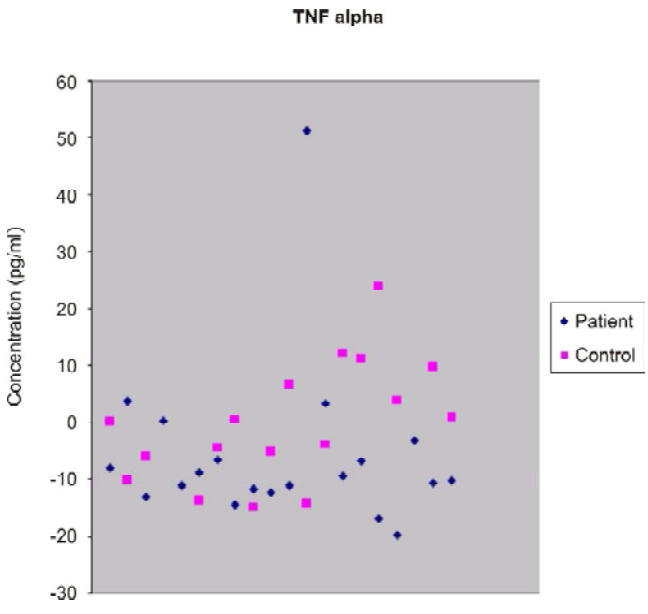
PCR-RFLP variants -174 G/C polymorphism of IL-6.

GG genotype was found in 26% control and 40% of patients, 70% GC in control and 55% in patient and 4 and 5% CC in control and patient population. Upon analysis, not found any significant difference in genotype and allele frequency among patient and control subjects. Results indicate that -174 G/C polymorphism of IL-6 gene is not associated with risk of breast cancer and the polymorphic variants may not be suitable genetic marker for estimation of breast cancer risk.

In another study, selected genetic polymorphisms in TNF-α promoter (rs1800629, -308 G>A and rs361525, -238 G>A) and TNF-β intron 1 (rs909253, +252 A>G) was investigated in ethnically two different case-control groups from India. The study included 200 cases and 200 controls from Indo-European (North Indian) group, and 265 cases and 237 controls from a Dravidian (South Indian) group. Genotyping of a total of 902 individuals was done by direct DNA sequencing. None of the polymorphisms showed significant association with breast cancer in the Indo-European group; however, all the three polymorphisms showed strong association with breast cancer in the Dravidian group. Further, sub-group analysis in Indo-European group showed no significant difference between pre-menopausal cases and controls or between post-menopausal cases and controls at any of the loci analyzed. However, all the polymorphisms in Dravidian group were significantly associated with pre-menopausal but not with post-menopausal breast cancer. In conclusion, TNF-α and -β polymorphisms are strongly associated with breast cancer in Dravidian but not in Indo-European group (*Breast Cancer Res. Treat., 2010 DOI: 10.1007/s10549-010-1175-6*).



Homozygous mutant of rs361525 polymorphism and heterozygous mutant of rs1800629 polymorphism of TNF-α



TNF- α level in breast cancer patients and healthy control subjects

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

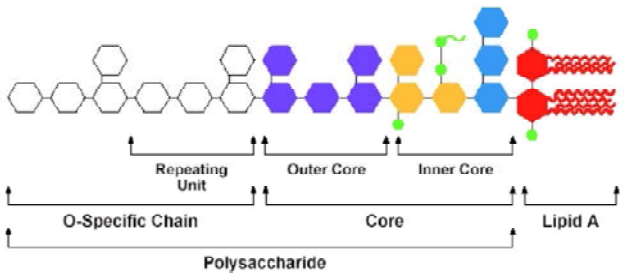
6.1.1 Quality control and stability studies

New HPLC method for compounds S-006-1712, S-006-626, withanone, S-008-1315, S-008-1643, S-010-0861, S-010-0863, S-010-0864, S-010-0885, S-010-0886, S-009-0889, S-009-1588 and S-009-1589, with proper resolution of the starting materials, has been developed. Compound S-006-830 has been purified by preparative HPLC. Stability studies on CDR134F194, CDR267F018, Ormeloxifene-HCL, Saheli, Herbal Medicament, RJM0035/P10/K002A and compounds 99-373, S-007-867, 99/411, 99/78, S-002-333, S-001-469, S-007-1500 are continuing.

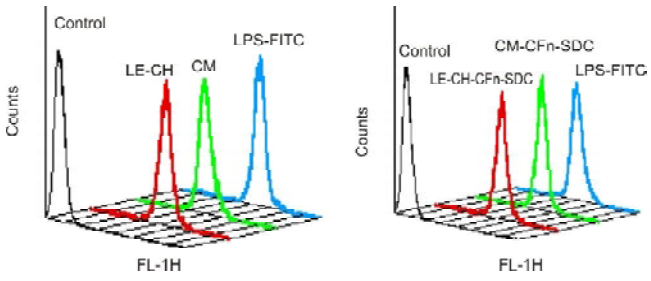
6.1.2 Delivery system for septic shock

An attempt is being made to develop nano-structured delivery systems having potential to mop up lipopolysaccharide (LPS) from the blood circulation for the better management of sepsis. Novel polymeric capped formulations (LE-CH) have been developed by incorporating cationic charge inducers.

When *E. coli* was exposed to ciprofloxacin (CFn), dose dependent killing was observed in CFn loaded formulation. The developed formulation, significantly decreased (P<0.05) free endotoxin release in dose dependent manner. The results suggests that LE-CH suppress the binding of FITC-labeled LPS to the cells, probably due to electrostatic and/or hydrophobic interaction, which would subsequently have inhibitory effects on NO and TNF-α production.



General architecture of Lipopolysaccharide

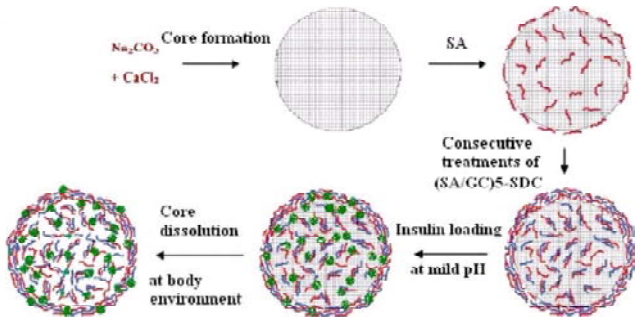


Effect of formulations on cellular binding in LPS J774 ϕ

LPS, a potent activator for macrophages also stimulates ROS (reactive oxygen species) such as H_2O_2, superoxides and NO as well as inducing a battery of signal transductions leading to gene expression. Macrophage cells, treated with LPS, showed an increased level of ROS [Mean stimulatory index (SI): 21.40 ± 0.57] as compared to control cell (mean SI: 5.20±0.62). However, CFn at concentration level of 1, 2 and 4 µg/ml caused no significant changes in LPS induced ROS generation. The developed formulations (LE-CH and LE-CH-CFn-SDC) at CFn concentration 1, 2 µg and 4 µg /ml containing equivalent to 62.5, 125 and 250 µg/ml total lipid respectively decreases, LPS induced ROS generation in dose dependent manner. This provides evidences for efficacy of developed formulation in animals against septic shock.

6.1.3 Development of LBL based nanoreservoir for delivery of insulin

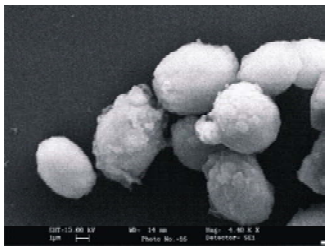
In the present study, the multilayer films were comprised of five bilayers each of oppositely charged PEs of natural origin. The technique was usually performed in the aqueous solution at room temperature, and thus it was suitable for encapsulating protein or other bio-therapeutics of poor stability. Among the decomposable cores, porous $CaCO_3$ drives interest due to its wide industrial, technological and drug delivery applications. LBL based ultrathin polyelectrolyte nanoreservoir has also been developed for the delivery of insulin.



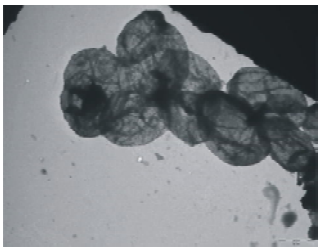
Modified scheme of UPC fabrication and encapsulation of insulin into capsules

These polymorphs are perfectly spherical, non-aggregated and mono-disperse in the size range of 3-5 µm as demonstrated by SEM. The process of encapsulation at mild pH and release altogether did not affect the integrity (% active protein/secondary structure) of insulin, ensuring biological activity. The activity of insulin in both the UPC formulation was found to be ~99%.

The percent residual insulin contents of formulations were found to be 96.71±3.83%, 94.82±1.22% at 4±1°C and 89.8±4.53%, 86.5±5.38% at room temperature after 90 days for UPC-1 and UPC-2, respectively.

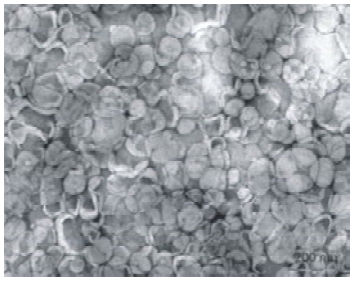


SEM photomicrographs of group of fabricated UPC



UPC after core removal

6.1.4 Development and performance evaluation of Amphotericin B transfersomes against resistant and sensitive clinical isolates of visceral leishmaniasis (*J. Biomed. Nanotechnol.*, 2010, 6 (3): 1-10)



Visualization of optimized transfersomes (TF-3) by TEM Scale bar = 200 nm.

The present study was aimed to assess the efficacy of developed transfersome (TF-3) formulation bearing Amphotericin B (AmB) against sensitive and resistant clinical isolates of *L. donovani* and compared with conventional liposomal formulation (F-2) and free AmB (F-1). The skin permeation of AmB from TF-3 was performed using Franz diffusion cell using rat skin which showed fickian diffusion across the skin. When tested against *L. donovani* (intramacrophagic amastigotes), it has been observed that TF was more effective than F-1 and F-2 formulation in sensitive and resistant clinical isolates. The data provides evidences that the TF formulation owing to its fluidized behavior imparted by sodium deoxycholate, enables to penetrate well in the infected cells and thus provide enhanced activity.

The permeation study also supports this data as the flux value of AmB through TF formulation was 1.5 fold higher compared to conventional liposomes suggesting improved penetration and better partitioning in skin layers. Implicit to this preliminary data, it is evident that the AmB loaded TF formulation has potential as alternate chemotherapeutic approach to control of VL.

6.1.5 Nanomaterials and nanodevices in health and disease

Under CSIR's Networked Project on 'Nanomaterials and nanodevices in health and disease' nanoparticle formulations containing CDRI compound 97-78, chloroquine or quinine (antimalarial), amphotericin B (antileishmanial) and tetanus toxoid (vaccine for oral delivery) were prepared from inexpensive, biodegradable excipients and evaluated.

6.1.6 CSIR-Royal Society (UK) joint project

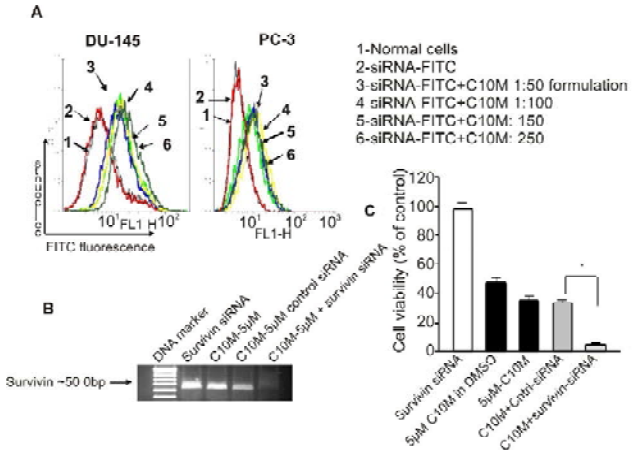
Under the CSIR-Royal Society (UK) joint project, biodegradable micro-particles using supercritical fluid techniques, and co-crystals of anti-tuberculosis agents were prepared.

6.1.7 OSDD project on genome-wide transcript profiling of macrophages exposed to TB drug microparticles

An OSDD project on genome-wide transcript profiling of macrophages exposed to TB drug microparticles, was completed. More than 3000 genes were observed to be differentially regulated as a result of treatment with microparticles versus the drugs alone.

6.1.8 Development of a bifunctional lipo-benzamide antiproliferative agent that delivers siRNA and induces synergistic cell death

This study was aimed at exploring novel cationic bifunctional molecules that are comprised of both targeted anti proliferative activity and siRNA transfection ability for siRNA based combinational therapies for cancer. Series of di-alkyl-[2-(4-methoxy-benzoylamino)-ethyl]-methyl-ammonium chloride molecules were synthesized by varying alkyl chain lengths from seven to ten and investigated their antiproliferative effects on different cancer and normal cells. The results demonstrated that the molecule with ten carbon chain length (C10M) could not only inhibit the growth of sigma receptor over expressing cells but also delivers anticancer siRNA with synergistic effect.



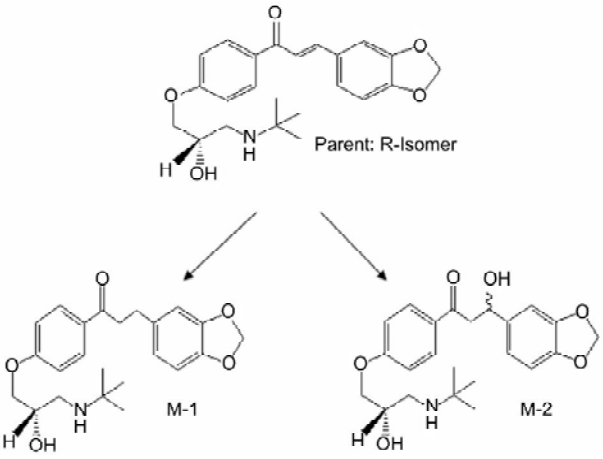
6.2 Pharmacokinetics and Metabolism

6.2.1 Compound S-001-469: Protein binding and pharmacokinetic studies

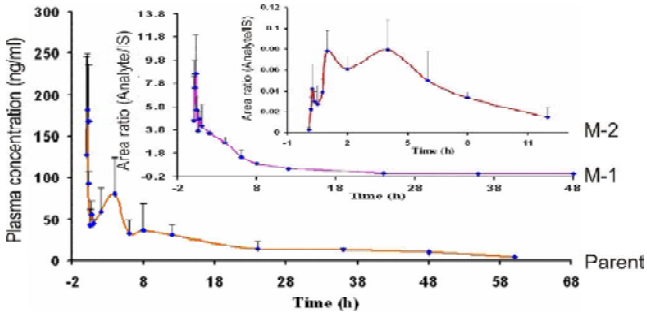
Protein binding assays revealed that S-001-469 (racemic mixture) exhibits very low plasma protein (1.38%) binding.

The preclinical pharmacokinetic evaluations of compound S-001-469 (R-isomer) were performed separately in rats by intravenous (10 mg/kg) and oral (40 mg/kg) route of administration. Two *in vivo* metabolites (M-1 and M-2) were identified. After oral administration the parent molecule is slowly absorbed (t_{max} 1.94 ± 0.74 h) and exhibits prolonged systemic exposure with an elimination half life of 17.77 ± 2.47 h and 8.92% oral bioavailability.

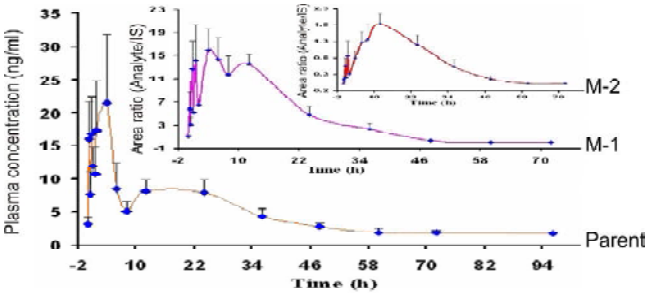
S-001-469 (R-isomer)



Metabolites



Intravenous

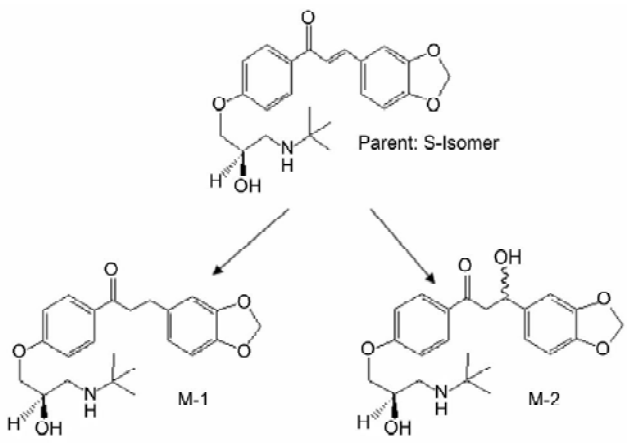


Oral

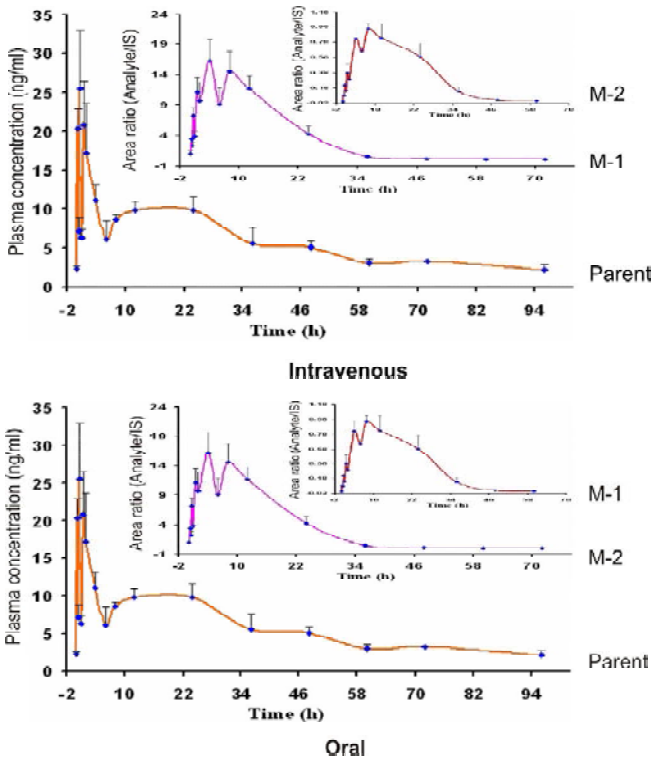
The preclinical pharmacokinetic evaluations of compound S-001-469 (S-isomer) were performed in rats by intravenous (10 mg/kg) and oral (40 mg/kg) route of

administration. Two *in vivo* metabolites (M-1 and M-2) were identified. After oral administration the parent molecule is absorbed slightly faster than R-isomer (t_{max} 0.83 ± 0.24h) and exhibits prolonged systemic exposure with an elimination half life of 19.48 ± 1.75 and 6.98% oral bioavailability.

S-001-469 (S-isomer)



Metabolites

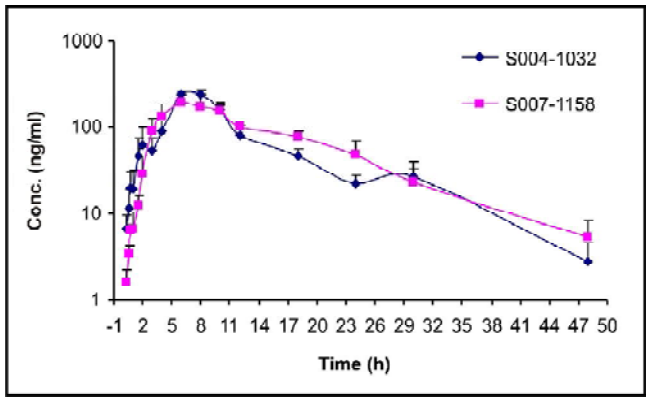


Concentration -Time Profile

6.2.2 Compound S-002-333 (antithrombotic)

Sensitive and selective bioanalytical LC-MS/MS assay method has been developed for simultaneous estimation of its isomer S-004-1032 and S-007-1558 in NZ rabbit plasma.

Pharmacokinetic studies of S-004-1032 and S-007-1558 were carried out in male NZ rabbit by oral (Fig) and intravenous routes of administration. Both the isomers show comparable concentration time profile which is indicative of fast absorption, prolonged systemic exposure and long plasma elimination half life.



6.2.3 Studies on fractions and pure compounds from plant 1020

6.2.3.1 LC-MS/MS procedure for simultaneous quantification of formononetin (K080) and its metabolite daidzein

A new, simple, rapid, sensitive and accurate quantitative detection method was developed using liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS) for the determination of formononetin and its metabolite daidzein levels in rat plasma. The method was accurate and precise in linearity range of 5–100 ng/ml. The lowest quantitation limit for FMN and DZN were 5.0 ng/ml in 0.1 ml of rat plasma.

6.2.3.2 Pharmacokinetic study of formononetin

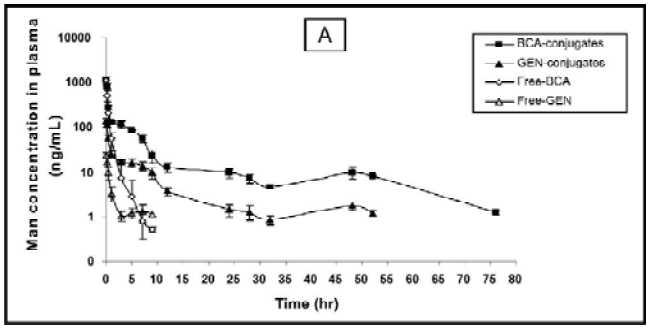
The pharmacokinetic study of formononetin was carried out by intravenous (10 mg/kg) and oral (50 mg/kg) routes in female SD rats. Daidzein, major metabolite of formononetin, was also simultaneously quantified. Circulating conjugates (glucuronides/sulfates) of formononetin were quantified using enzymatic hydrolysis of plasma samples. The levels of glucuronide/sulfate conjugates were found to be much greater than the free circulating levels of formononetin and daidzein.

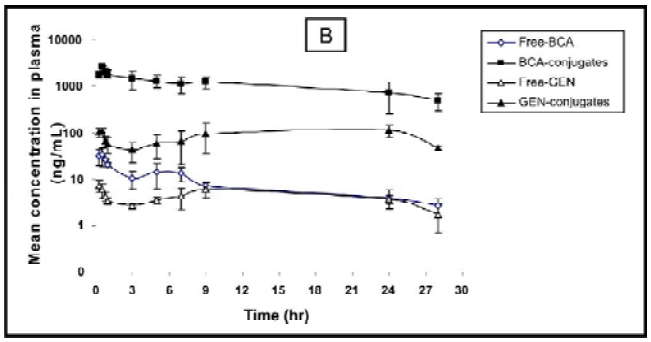
6.2.3.3 High-throughput quantification of isoflavones, biochanin A and genistein, and their conjugates in female rat plasma using LC-ESI-MS/MS

A sensitive high throughput method based on LC-ESI-MS/MS was developed for the quantification of isoflavones biochanin A (BCA), genistein (GEN), and their conjugates in rat plasma. The lowest quantitation limit for BCA and GEN was 0.5 ng/mL in 0.1 mL of rat plasma.

6.2.3.4 Pharmacokinetic study of biochanin

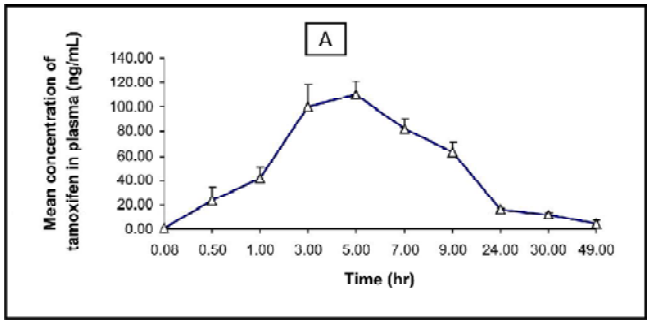
The pharmacokinetic study of biochanin was carried out by intravenous (5 mg/kg) and oral (50 mg/kg) routes in female SD rats. Circulating conjugates (glucuronides/ sulfates) of biochanin and genistein were quantified using enzymatic hydrolysis of plasma samples. The levels of glucuronide/sulfate conjugates were found to be much greater than the free circulating levels of biochanin and genistein (Fig. A and B).

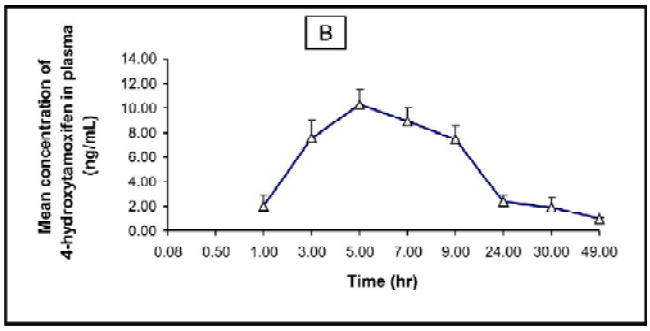




6.2.3.5 LC-MS/MS procedure for simultaneous quantification of tamoxifen and its metabolite 4-hydroxy tamoxifen in rat plasma

A sensitive and specific LC-ESI-MS/MS method was developed and validated for the estimation of tamoxifen and its metabolite 4-hydroxytamoxifen with 100 µL rat plasma. This method will be useful in carrying out drug-drug and food-drug interaction studies. Plasma levels of tamoxifen and its metabolite 4-hydroxytamoxifen were successfully quantified after per-oral administration of tamoxifen at a dose

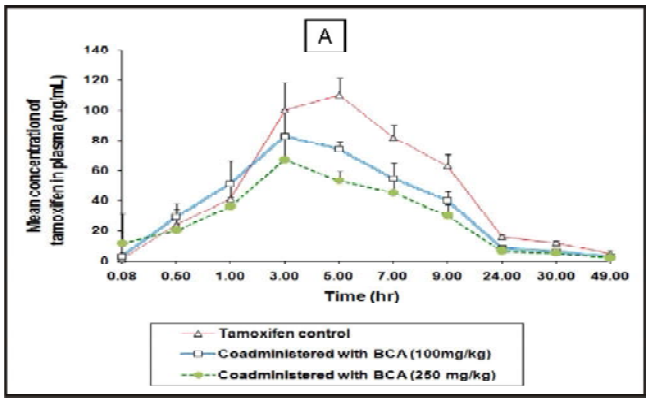


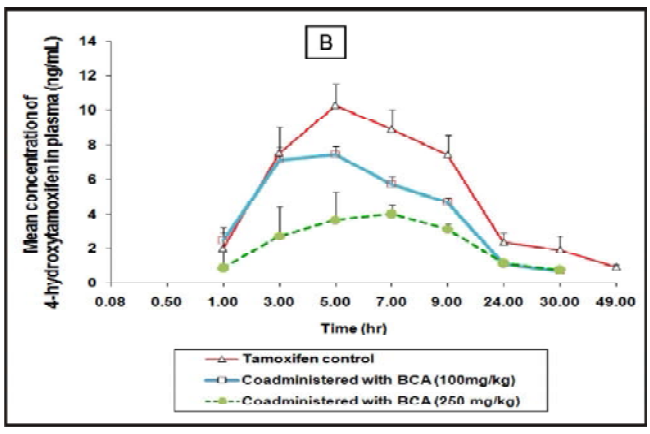


of 10 mg/kg in female SD rats. The plasma concentration versus time profiles of tamoxifen and 4-hydroxy tamoxifen are indicative of slow absorption with a t_{max} of ~5h for both the parent and metabolite. The blood levels were detectable beyond 48 hours.

6.2.3.6 Effect of biochanin-A co-administration on bioavailability of tamoxifen and its metabolite, 4-hydroxytamoxifen

The effect of biochanin A co-administration at the dose of 100 and 250 mg/kg on the pharmacokinetics of tamoxifen (at 10 mg/kg) was studied in rats after oral administration. The co-administration of BCA significantly decreased the bioavailability of tamoxifen and its metabolite 4-hydroxytamoxifen. The effect was more pronounced at higher doses of biochanin-A i.e. at 250 mg/kg (Fig A & B).





6.2.3.7 Pattern profiling and absolute quantification of bio-active constituents of multi-component osteogenic fraction F147 from *Butea monosperma* using liquid chromatography tandem mass spectrometry

Chromatographic fingerprinting analysis has been developed and validated for osteogenic herbal preparation F-147 using LC-MS/MS. The method is quite sensitive and highly selective for simultaneous determination of eight marker compounds in terms of linearity, accuracy and precision. The limit of detection for the marker compounds range from 0.975 n/ml to 3.9 ng/ml. This method was applied to determine the percentage content of active markers in F147.

6.2.3.8 Liquid chromatography tandem mass spectrometry method for simultaneous determination of seven marker components in rat plasma, useful for pharmacokinetic evaluations of osteogenic fraction F147 from *Butea monosperma*

A simple, rapid, selective and sensitive LC-MS/MS method has been developed and validated for the simultaneous analysis of seven markers (six isoflavones and one pterocarpan); cajanin, cladrin, formononetin, medicarpin, daidzein, genistein and prunetin of F147 in female rat plasma. The limit of detection (LOD) for these seven bioactive components ranged from 0.487 to 1.95 ng/ml, while the dynamic concentration for linearity was ranging from 0.975 ng/ml-250 ng/ml. The validated LC-MS/MS assay is useful for conducting the pharmacokinetic studies of F147 in female S.D. rats.

6.2.4 Other accomplishments

6.2.4.1 RJM035/P10/K002

A simple, sensitive and selective HPLC-UV assay method was developed and validated for the quantification of K002 in rat serum with LOD of 10 ng/ml, linearity of 10-1000 ng/ml and recovery of >95%. The method was useful for performing following studies with the pure compound K002 from RJM 035:

- Stability of RJM035/P10/K002 was studied at a concentration of 10 µg/ml in rat serum. It was observed that the compound was stable for 2 h at 37 ± 2ºC.
- Stability of RJM035/P10/K002 was studied in simulated gastric fluid at pH 1.2. The results indicated that the compound is unstable in acidic pH.
- Stability of RJM035/P10/K002 was studied in simulated intestinal fluid at pH 6.8 and the results indicated that the compound is stable in basic pH.

6.2.4.2 Development of high-throughput cocktail procedure for *in vitro* CYP450 profiling of NCEs

A high throughput LC MS/MS based cocktail method has been established for CYP450 reaction phenotyping of NCEs and drugs. The method is based on CYP450 specific substrates and *in situ* formation their metabolites on incubation with liver S-9 fraction or microsomes from rat/human. The method has the merits of shorter time and reduced cost of study for determining role of CYP450 metabolizing genes involved in metabolism of NCEs and drugs.

6.2.4.3 Centchroman

LC-MS/MS assay method has been developed for simultaneous determination of centchroman and its 7-demethylated metabolite using dried blood spots method. The method utilizes few drops of blood and will be highly useful in conducting clinical studies for establishing drug-drug interactions in human volunteers. This method was successfully applied to perform interaction studies of centchroman with carbamazepine. No alterations in PK parameters of centchroman were observed.

6.2.4.4 Compound S-007-972 for prostate hyperplasia

A simple, sensitive and selective HPLC-UV assay method was developed for the quantification of S-007-972 in rat plasma and tissues (prostate and hypothalamus). The method was useful for performing Pharmacokinetic study and tissue distribution studies in prostate and hypothalamus to establish PK-PD correlations in rats.

6.3 Safety Pharmacology

6.3.1 Compound AP20am15

Safety pharmacology studies completed. No adverse effects were observed.

6.3.2 S-007-867 (antithrombotic)

Safety pharmacology studies have been initiated.

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 and mice by oral route completed. Compound found safe at 50 and 100 mg/kg body weight respectively.

6.4.1.2 S-002-333 (antithrombotic): Single dose toxicity study in rat by oral route completed. Compound found safe at 600 mg/kg body weight.

6.4.1.3 S-007-867 (antithrombotic): Single dose toxicity study in rat by oral route completed. Compound found safe at 640 mg/kg body weight.

6.4.1.4 99-411 (antimalarial): Conducted 28 day repeat dose toxicity study in rhesus monkey with reversal. The whole study did not reveal any abnormality related to nature or dose of compound upto 100 mg/kg under the conditions of exposure employed in this study. *In vivo* micronucleus assay at MTD dose (1500 mg/kg p.o.) in mice completed. Compound found nongenotoxic.

6.4.2 Toxicity studies of external compounds

AP20am16 (Memory enhancer): Male fertility study in rats completed and data analysis is in progress.

6.4.3 Experimental toxicology (Basic studies)

6.4.3.1 Neurotoxicity: Rotenone induced neuro-toxicity in rat brain

In the present study, rotenone induced neuronal histopathological changes were investigated in the brain areas of adult male SD rats. Significant neuronal degeneration was indicated by distorted neuronal cells, shrinkage of nuclei, dark staining [HE (Hematoxylin and Eosin) and CV (Cresyl Violet)] in the striatum (STR) and substantia nigra (SN) regions of rotenone treated rats. Significant impairment in motor coordination was seen by rotarod test. Oxidative stress, as indicated by decreased GSH and increased MDA in STR and mid brain (MB), was also observed after 14 days of treatment. The study provides histopathological evidences for rotenone induced neuronal damage in rat brain areas which correlates with oxidative stress and impaired neuromuscular coordination.

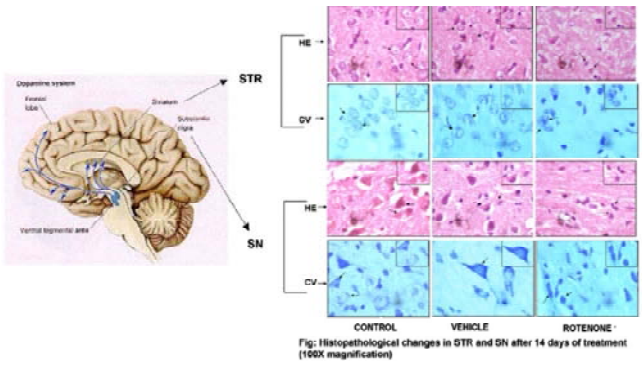


Fig: Histopathological changes in STR and SN after 14 days of treatment (100X magnification)

***In vitro* studies: Glial toxicity induced by different neurotoxins**

Other neurotoxins viz. 6-hydroxydopamine, Lipopolysaccharide and Glutamate induced toxicity on glial cells (C6) was assessed. Significant neurotoxins induced glial cell toxicity was found though the extent of toxicity was different.

6.4.3.2 Studying toxicity mechanisms

For studying toxicity mechanisms and its reduction by small dose of phytoestrogens, a hepatotoxicity model with Lithocholic acid (LCA) was developed in Swiss mice. To elucidate the protective mechanisms of different compounds against LCA induced hepato-toxicity, Apigenin, a common dietary flavonoid was tested at different doses for its therapeutic potential. The results suggest that Apigenin protects liver against LCA induced hepatotoxicity and oxidative stress in mice.

6.4.3.3 Single nucleotide polymorphisms in human and their disease association

Single nucleotide polymorphisms in human p53 pathway and their disease association was studied in carcinoma of head, neck and breast in selected Indian subpopulations. SNPs (rs 1801270, rs1059234) in p21 gene were found to be associated in head and neck carcinoma. The other SNPs were studied in p53, Bcl2, NQO1, 14-3-3sigma and VDR, genes in breast and head and neck carcinoma. Single nucleotide polymorphisms at IL-1β+3954 and VDR 1056 was also studied in chronic periodontitis patients and their relatives in 15 North Indian families.

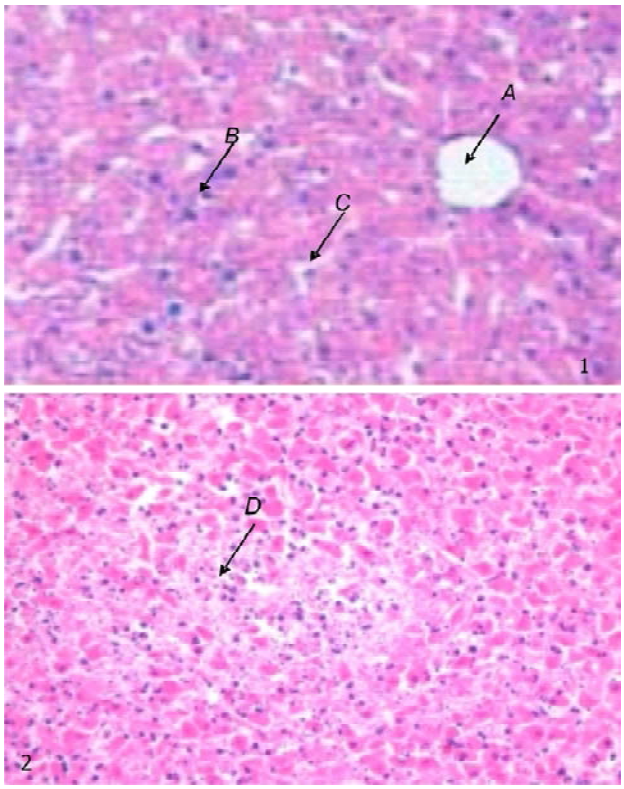
6.4.3.4 Functional genomics studies

Employing model system *Caenorhabditis elegans*, high throughput methodologies have been established for studying effect of pharmacological / toxicological agents on excitatory neurotransmission. Novel carbamates were screened for their biological activity as acetylcholine esterase (AChE) inhibitors. The studies, provided evidence that the model system *C. elegans* could successfully be employed for large scale screening campaigns of pharmacological / toxicological agents. (J. Med. Chem. 53(17): 6490-6505).

Transient *C. elegans* model of HIV-1 Nef induced pathogenesis has been established. The model is first such effort that creates an *in vivo* environment in the genetically accessible model system towards studying the effect of HIV protein Nef (*PLoS ONE doi: 10.1371/journal.pone.0015312)*. The creation of the model is an important step forward as it could be utilized for studying protein-protein interactions and for testing potential inhibitors.

6.4.3.5 Testing hepatotoxicity and damage using bio-fluids (urine) at the platform of metabonomics using NMR

In the present study, an attempt was made to develop a non-invasive hepatotoxicity testing system which should not be time and cost intensive. ^{1}H nuclear magnetic resonance (NMR) spectra of urine from rats, was evaluated for the haepatotoxicity of acetoaminophen at 0, 110, 225 and 450 mg/kg body wt. dose levels respectively when administered by oral route for 5 consecutive days. The results revealed dose dependent haepatotoxicity of acetoaminophen which is in conformity of the reports of previous workers who, by conventional testing procedure, has reported it as hepatotoxic compound in dose dependent



Microphotograph of Liver Showing 1-Normal Histological organization (Cont. Gp. Rat # 4) and 2-Focal areas of necrosis with very little inflammatory cells (High Dose Gp. Rat # 5) (H&E x100)

A= Central Vein; B= Hepatic Cells; C= Sinusoids; D= Necrotic cells with little infiltrating inflammatory cells

manner. The study reports that NMR spectroscopy is a sensitive tool which detects toxicity by gathering information on the concerned endogenous metabolites which get altered due to the attrition between the xenobiotics and the whole body system.

6.5 Clinical Trials

6.5.1 Compound 99/373 (anti-osteoporotic)

Plan and protocol of phase I clinical trial has been approved by DCG(I).

6.5.2 Picroliv (hepatoprotective)

Phase III clinical trial of picroliv in patients of tuberculosis on multi drug therapy (MDT) has been completed at two centers. 260 patients (Placebo = 124 and Picroliv = 136) completed the trial at Department of Pulmonary Medicine, CSM Medical University, Lucknow while 113 patients (Placebo = 57 and Picroliv = 56) at Seth G. S. Medical College and KEM Hospitals, Mumbai. The final clinical trial report of both centers has been compiled.

6.5.3 Herbal medicament (anti-stroke)

Themis Medicare Ltd., Mumbai has undertaken the responsibility of preparing IND document in collaboration with Safety and Clinical Development Group, CDRI. Additional information required is being provided to Themis Medicare Ltd., Mumbai.

6.5.4 Arteether (antimalarial)

The dossier on arteether in paediatric patients of *P. falciparum* malaria, submitted to the Drugs Controller General of India, was reviewed by expert committee of DCG(I). Participating trial centers are being contacted by CDRI and Themis Medicare to verify and reformat report as per Schedule Y, along with raw data as required by DCG(I).

6.5.5 Compound 97/78 (antimalarial)

Phase I clinical trial, to assess safety and tolerability, completed at PGIMER, Chandigarh and subsequently data analyzed and report submitted to DSMB. Compound 97/78 was found to be safe in 80 to 700 mg single oral dose in healthy male volunteers. DCG(I) has approved single dose pharmacokinetic study in healthy volunteers as per revised protocol.

6.5.6 Compound 99/411 (antimalarial)

The preclinical data is under compilation for IND submission in collaboration with IPCA, Mumbai.

6.5.7 CDR 134 D123 (antidiabetic)

The clinical trial data of CDR134 D123 compiled and submitted to AYUSH and has been referred to Extra Ayurvedic Pharmacopia Committee for inclusion.

6.5.8 CDR 134 F194 (antihyperglycaemic)

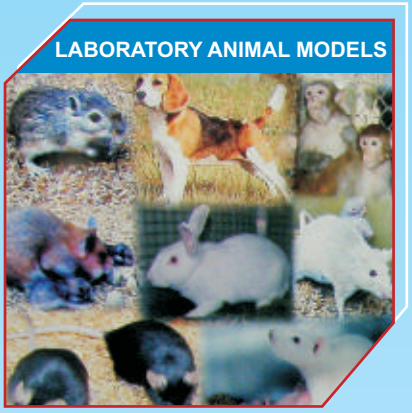
Modified dossier has been submitted to DCG(I) – IND Committee.

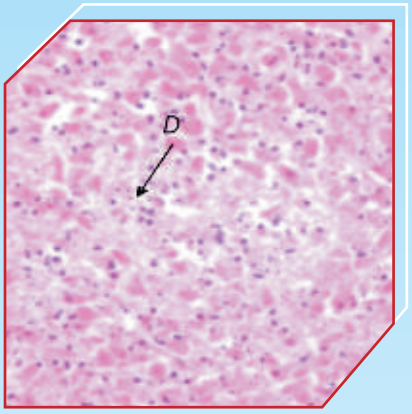
6.5.9 Compound 80/574 (antihyperlipidemic)

Permission to carry out the phase III clinical trial of compound 80/574 in combination with atorvastatin versus Atorvastatin alone is awaited.

6.5.10 Puffer fish oil (antihyperlipidaemic)

The experiments regarding preclinical data, especially identification and standardization of biomarkers of PFO, are being generated at Calcutta University in response to the comments of IND Committee of DCG(I).





Technical Services & Facilities

Technical Services & Facilities

1 Business Development

The Business Development Division takes care of establishing liaison with national and multinational industries, academia, government organizations, funding agencies and foreign bodies, and publicity and interaction with media. Apart from the above, during the year, the division assisted in planning, coordination and organisation of healthcare section in the Techno-fest Event, held at New Delhi. As a part of ongoing CDRI Diamond Jubilee Celebrations, the division organised a mini symposium on **Memory Sure**. Various agreements, executed during the year, are as follows:

	Title	Industry	Signing Date
Sponsored Project Agreements			
1	Anti-platelet effect of clopidogrel salts in rats after single dose oral administration	Zydus Research Centre, Ahmedabad	19/03/2010
2	For evaluating a DPP IV inhibitor developed by ORLL under its code name “OCID 3570" in OGTT model in rhesus monkey	Orchid Research Laboratory, Chennai	09/08/2010
3	Identification and quantification of bioactive marker(s) from *Cissus quadrangularis* extract	Supreem Pharmaceuticals, Mysore	29/10/2010
Consultancy Agreement			
4	To create a facility for polypeptide synthesis	Ranbaxy Laboratory Ltd., Gurgaon	29/06/2010
Memorandum of Understanding for Joint R&D			
5	Aggregation studies on *Salmon calcitonin* in presence of metal ion promoters	Centre of Biomedical Magnetic Resonance, Lucknow	22/02/2010
6	Association of certain genetic factors with susceptibility and severity of periodontal diseases, alveolar bone loss, postcranial BMD and outcome of periodontal therapy in Indian population	Saraswati Dental College & Hospital, Lucknow	23/03/2010
7	To understand the reactivity of formyl group for the Baylis-Hilman Reaction in heterocyclic aldehydes	Indian Institute of Technology, Kanpur	26/3/2010
8	Development of nanocarrier based Curcumin, Amphotericin B and Curcumin–Amphotericin B combination formulations as immune-modulators and evaluation of their antileishmanial and antifungal efficacy	Institute of Chemical Technology, Mumbai	30/04/2010
9	Molecular and functional characterization of nef gene isolated from HIV-1 patients at different stages of pathogenesis	CSM Medical University, Lucknow	27/05/2010
10	Chemical biology approach for generation of knowledgebase and therapeutics in breast cancer	National Centre for Cell Sciences, Pune	31/05/2010
11	Investigation of molecular mechanisms of antidiabetic action of Swertiamarin and its semi-synthetic derivatives	M.S. University, Baroda	22/06/2010
12	Acetylcholenesterase and cuticular collagen as potential vaccine targets for human lymphatic filariasis	Madurai Kamaraj University, Madurai	31/08/2010
13	To create centre of excellence in flow cytometry at CDRI by installing new two laser models of BD FACSCalibur	Becton Dickinson India, Pvt, Ltd., New Delhi	24/112010
14	Comparative proteomic analysis of human receptive versus non-receptive and defective endometrium	CSM Medical University, Lucknow	03/12/2010
15	Study on promoter gene polymorphism of Interleukin-10, Interleukin-18 and assessment of GATA transcriptional factor expression in ovarion carcinoma in North Indian population	CSM Medical University, Lucknow	07/12/2010
16	Protective immunogenicity of Centrin KO live attenuated Leishmania parasite in the animal models and in the human cells	Institute of Pathology, New Delhi & Institute of Molecular Medicine, New Delhi	09/12/2010

Memorandum of Agreement			
17	Cloning and over expression of Th1 stimulatory polyproteins identified through proteomics for their prophylactic potential against experimental visceral leishmaniasis	Department of Biotechnology, New Delhi	13/08/2010
Research Agreements			
18	Design, synthesis and biological evaluation of SIRT-1 activators for the treatment of type-II diabetes	DST, New Delhi & Cadila Healthcare Ltd., Ahmedabad	26/07/2010
19	Cloning and over expression of Th1 stimulatory polyproteins identified through proteomics for their prophylactic potential against experimental visceral leishmaniasis	DBT, New Delhi	13/08/2010
Secrecy Agreements			
20	Compound S-007-1500 (osteogenic)	Eli Lilly, Indianapolis, USA	19/05/2010
21	Compound 4655-K009 (lipid lowering agent)	Charak Pharma Pvt. Ltd., Mumbai	03/06/2010
22	Improving the solubility and further development of S-007-867 (antithrombotic)	Crystalin Research, Hyderabad	02/08/2010
23	Designing and developing a tandem mass spectrum based database of previously isolated flavonids	MARG Software Solutions, Lucknow	30/11/2010
24	Preparation of formulation of pharmacological agents capable of synergizing with innate immune responses of the host macrophage in tuberculosis infection	Lifecare Innovations Pvt. Ltd., Gurgaon	16/12/2010
Material Transfer Agreements			
25	BB19 cell lines	Oregon Health & Science University, USA	05/04/2010
26	GFP-Leismania strain	University of Antwerp, Belgium	07/05/2010
27	pIR1SAT	Washington University, USA	16/11/2010

2. S&T Management Activities

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

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 information system/ surveillance;
- Organizing international workshop on 'Recent Trends in IP Practice and Management' in collaboration with USPTO.

PME Activities

- Preparation of Annual Plan 2011-12 of the Institute;
- Compilation of concept notes for 12th five year plan projects;
- Planning, monitoring and reporting of budget for in-house and external projects;
- Monitoring of network and in-house projects through quarterly/ six monthly/annual meetings;
- Responding to CSIR/CAG audit queries;
- Centralized project file management;
- Framing new guidelines for project management;
- Processing of indents;
- Preparation of monthly reports.

HR Activities

- Streamlining sponsored training programs to post graduate students;
- Framing new guidelines for participation of research fellows of CDRI in conferences/symposia/seminar/ workshops held in India and abroad;
- Organizing CSIR Program on Youth for Leadership in Science-2010;
- 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

- CDRI Annual Report 2010-11;
- CDRI Newsletters (2nd & 3rd issues).

ISTAG

- Coordination of Institute scientists' deputation abroad under different programs;
- Coordination of visits by distinguished foreign visitors.

Societal Activities

- Faculty Training, motivation and Adoption of Schools & Colleges;
- Health education programme for rural schools.

Database Management

- CDRI chemical library, synthetic compounds, natural products and marine samples;
- Projects, patents, staff, research fellows, budget, ECF, projects, awards, conferences / symposia / seminar / 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;
- Respond to queries from various corners (Govt./non-Govt. agencies);
- Biological screening services provided to the external users.

RTI

- Respond to queries on scientific and technical matters.

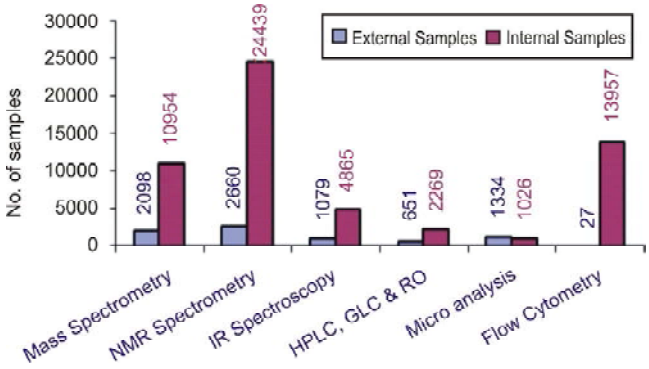
3. Sophisticated Analytical Instrument Facility

Sophisticated Analytical Instrument Facility is more than 30 years old and is one of the first four such facilities set up by the Department of Science & Technology, Government of India for fulfilling 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.

Services provided during reporting period:

During December 2009 to November 2010, a total of 65359 samples were tested/analysed of which, 7849 samples were from external users and 57510 samples were internal. External users were from Universities, Colleges, National Laboratories and industries.

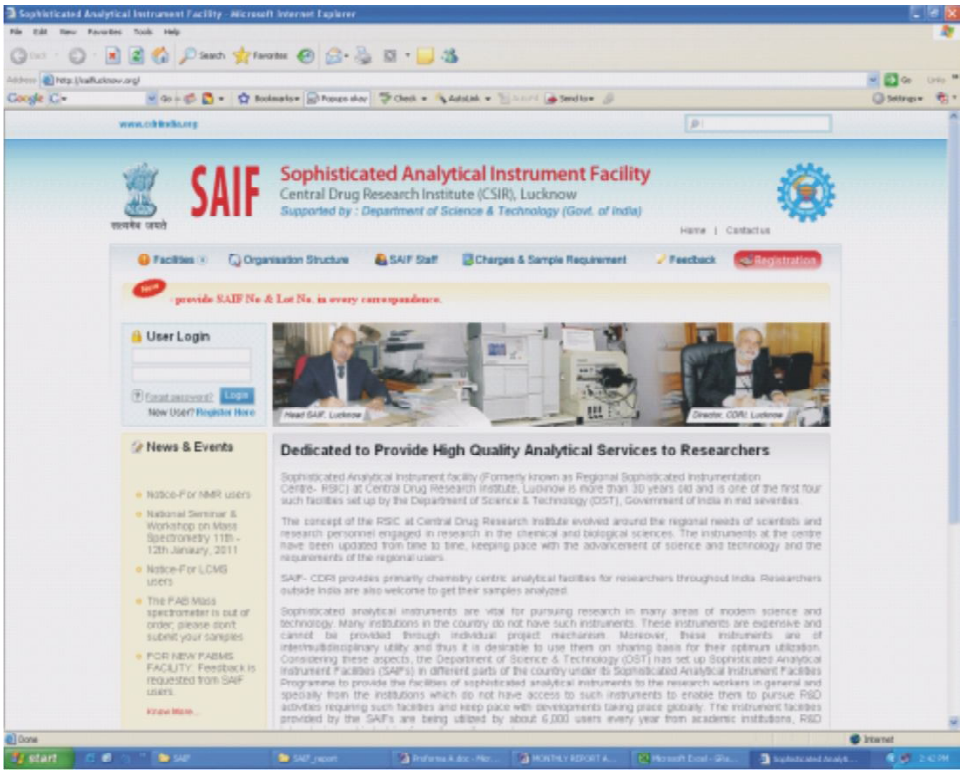


Total samples analysed during December 2009 to November 2010

4 Electron Microscopy

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

Instrument	Internal samples	External samples	Total No.
Electron Microscopy	474	130	583
Confocal Microscopy	1889	42	1931



SAIF-CDRI website http:/saiflucknow.org

5 National Laboratory Animal Centre

National Laboratory Animal Centre is involved in the breeding and maintenance of different kinds of laboratory animals for use in biomedical research. During the year of report, Centre ensured the supply of defined and healthy animals for in-house and sponsored research projects, supply of quarantined and tested Rhesus monkeys obtained from recognized animal suppliers, supply of tissues, organs, blood, sera samples of laboratory animals for research, health monitoring of laboratory animals through microbiological, parasitological, pathological screening, radiological monitoring of monkies, nutritional monitoring of laboratory animal feed, feed trial studies, production of special research diet like, high sucrose diet, high fat diet, high cholesterol diet, high fat and high cholesterol diet, etc. The facility is also involved with the HRD programme in laboratory animal science through conducting training courses in laboratory animal sciences including care, breeding and management, health monitoring and quality control, nutritional monitoring, diagnosis and management of lab animal diseases. Technical services provided are as follows:

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

Species	Strains	Status
Mouse	Swiss & Park's strain (PS)	Out-bred
	BALB/C, AKR, NZB, AJ, C57BL/6, NOD, db/db, Apo e, & DBA/1J	In-bred
Rat	Sprague Dowley, Druckrey & Charles Foster	Out-bred
	Wistar, SHR & F344	In-bred
Hamster	Golden hamster	Out-bred & In-bred
	White hamster (Mutant of Golden Hamster)	In-bred
Gerbil	Mongolian strain	Out-bred
Mastomys Rat	Coucha strain	Out-bred
Guinea Pig	English albino	Out-bred
Rabbit	New Zealand White	Out-bred
	Belgian	Out-bred
Sheep	Indian /Desi breed	Farm-bred
Monkey	Rhesus species	Wild

b) Supply of experimental animals for research purposes

Total 47637 animals were supplied for research studies. Of these, 6139 animals were supplied to outside institutions, including pharmaceutical companies and research organizations.

	Services Details	Total Numbers
a)	Supply of research animals to CDRI in-house projects	23166
b)	Supply of animals to extramural projects in CDRI	18332
c)	Supply of animals to CPCSEA registered institution:	
	Government sector	3065
	Private sector	3074
	Total	**47637**

c) Other technical services rendered

- Microbiological screening: 1560
- Parasitological screening: 268
- Nonhuman primates purchased: 40
- Nonhuman primate in rehabilitation: 20
- Tuberculin testing of monkeys performed: 192
- Chest radiography of monkeys undertaken: 69

6 Tissue & Cell Culture Facility

This facility was established with an objective of development and upkeep of central tissue culture facility including maintenance, propagation, cryopreservation and revival of cell lines. Training in cell and tissue culture techniques to aspirants from within and outside the Institute is also being imparted. During the reporting period, T-25 Cell Culture Flasks (numbering 155) of various cell lines were made available to the user scientists including outside users on payment basis. A new cell line Neuro-2A (Mouse Neuroblastoma) was included to the repository. Various cell lines, available in the facility, are:

1.	**MCF-7**	Human breast cancer ER +ve
2.	**MDA MB 231**	Human breast cancer ER –ve
3.	**THP 1**	Human monocyte
4.	**HEK 293**	Human embryo kidney
5.	**Hep G2**	Human liver carcinoma
6.	**Hep 3B**	Human liver carcinoma
7.	**SHSY 5Y**	Human neuroblastoma
8.	**hGF**	Human gingival fibroblast- primary culture
9.	**Vero C 1008**	African green monkey kidney fibroblasts
10.	**L 929**	Mouse connective tissue fibroblasts
11.	**3T3 L1**	Mouse embryo fibroblasts
12.	**J774 A.1**	Mouse macrophage
13.	**Neuro-2A**	Mouse neuroblastoma
14.	**H9c2**	Rat myoblasts
15.	**C 6**	Rat glioma
16.	**L 6**	Rat muscle

7 S&T Knowledge Resource Centre (KRC)

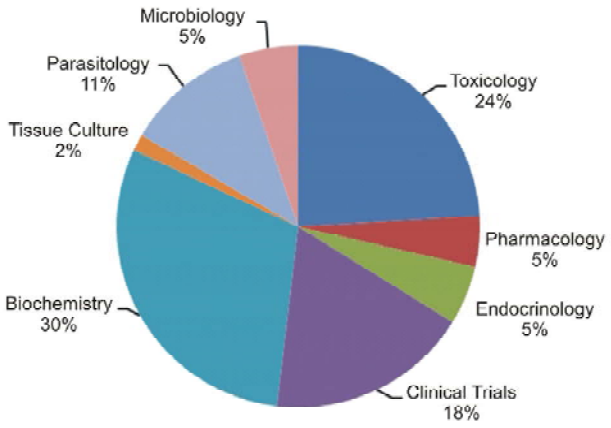
This state of art centre has been established with an objective to provide biomedical information services for the scientists and entrepreneurs involved in biomedical research and pharmaceutical industry.

KRC continued to provide information services to its users and a total of 668 outside users utilized these services during the year. The centre is fully computerized and conforms to the norms of e-governance. Its present collection comprises of 22,290 books and 72,116 bound volumes of journals. Besides, the centre manages, maintains and updates the institute website & institutional repository. The centre publishes three periodicals viz. 'Drugs & Pharmaceuticals - Industry Highlights' (Monthly), 'Drugs & Pharmaceuticals - Current R & D Highlights' (Quarterly), and a new title 'Recent Patents on Bioinformatics In Drug Research' (Online bi-monthly) during the year. The topics covered in four issues of Current R&D Highlights published during the year include (i) Organometallic compounds in drug research; (ii) Carbohydrate based drug; (iii) Natural products as templates for drug development and (iv) Biology oriented synthesis.

In addition, centre provides services to the scientists of Institute and other scientific organizations in photography, power point presentations, exhibition 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.



9 Information Technology Services

The computer division provided following services during the reporting period:

- Systems and network administration;
- Management and operation of CDRI mail services;
- Maintenance of about 800 PCs and its peripherals, LAN, server and its up-gradation;
- Planning and implementation of LAN infrastructure for new campus of CDRI;
- Management of online software for Store and Purchase;
- Development of following softwares:
  - Digital knowledge repository database for CDRI candidate drugs, which is a online service for the privileged users;
  - Online compounds code register;
  - MoES database application software for designated laboratories;
  - On-line software for Budget Monitoring System;
  - IP- Manager software for tracking IP assignment;
  - System inventory and user's activity in CDRI LAN/WAN;
  - Alumni online database.

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

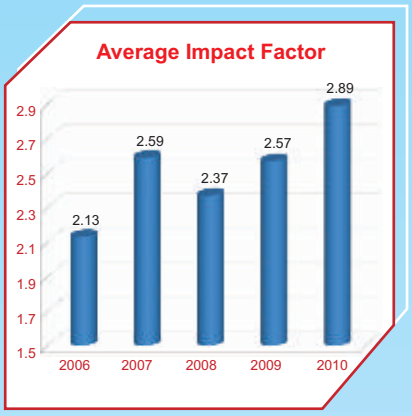
The unit continued to serve as liaison centre for the award of Ph.D. degree to the research students who are registered with the Jawaharlal Nehru University, New Delhi. The activities carried out during the period include:

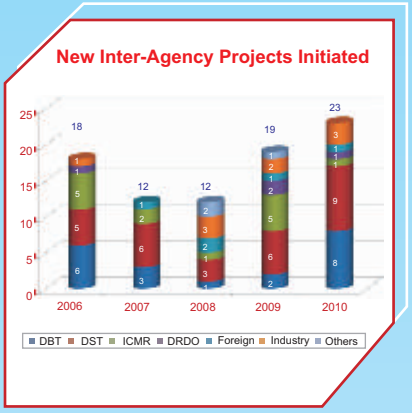
- Selection of students for CDRI- JNU Ph.D. program through examination / interview;
- Coordinated the pre-Ph.D. course work as prescribed by Jawaharlal Nehru University;
- Liaised with Jawaharlal Nehru University for timely registration, synopsis approval, thesis submission etc;
- Coordinated CSIR academy activities at CDRI.

12 Laboratory Engineering Services

The division provided engineering services to the institute. Major works carried out are as follows:

- Coordinated the planning towards establishment of new CDRI at Sitapur Road;
- Renovation and maintenance of laboratories;
- Fabrication of wooden tables and renovation of the canteen;
- Renovation of wiring and electric distributions in various divisions and installation of solar street lights at CSIR scientist apartments, Aliganj;
- Renovation of first floor of Guest House, Aliganj, renovation of boundary wall and kitchen of quarters;
- Waterproofing of all the buildings.





Research Output

1 Publications

2009

(Papers published in 2009 which were not included in the Annual Report of 2009-10)

1. Deo AD, Venkateshvaran K, Raghubir R and Devaraj M. Wound healing activity in crude mucus extract of marine catfish, *Osteogeneiosus militaris* (Linnaeus) of Mumbai coast.
Indian Journal of Fisheries, 56(4), 297-300

2. Gupta GK, Kansal S, Misra P, Dube A and Mishra PR. Uptake of biodegradable gel-assisted LBL nanomatrix by *Leishmania donovani* infected macrophages.
Aaps Pharmscitech, 10(4), 1343-1347

3. Gupta GK, Gupta VK, Shukla P, Pant AB, Mishra PR. Investigations on cellular interaction of polyelectrolyte based nano-walled reservoir using MCF-7 cell lines: A novel chemotherapeutic approach.
Journal of Pharmacy and Pharmacology, 61(12), 1601-1607

4. Kumar V, Singh P, Chander R, Mahdi F, Singh S, Singh R, Khanna AK, Saxena JK, Mahdi AA, Singh VK and Singh RK. Hypolipidemic activity of *Hibiscus rosasinensis* root in rats.
Indian Journal of Biochemistry & Biophysics, 46(6), 507-510

5. Raj K, Sharma M and Misra N., Clausmarin-C: A novel terpenoid coumarin from *Clausena pentaphylla*.
Natural Product Research, 23(18), 1671-1676

6. Tripathi R, Mishra DP and Shaha C. Male germ cell development: Turning on the apoptotic pathways.
Journal of Reproductive Immunology, 83(1-2), 31-35

7. Trivedi R, Mithal A and Chattopadhyay N. Pharmacological manipulation of calcium-sensing receptor: Prospect as anabolic therapy for postmenopausal osteoporosis.
Drugs of the Future, 34(10), 803-809

8. Varghese R, Gajula PK, Chakraborty TK and Wagenknecht HA. Thieme Chemistry Journal Awardees - Where are they now? Synthesis and optical properties of nile red modified 2 '-deoxyuridine and 7-deaza-2 '-deoxyadenosine: Highly Emissive Solvatochromic Nucleosides.
Synlett, 2009(20), 3252-3257

2010

Number of Publications in SCI Journals	**:**	**244**
Average Impact Factor	**:**	**2.89**
Number of Publications with Impact Factor >5	**:**	**14**
Book Chapters	**:**	**3**

1. Adaramoye, OA, Singh N, Meena S, Changkija B, Konwar R, Sinha S and Sarkar J. Mechanism of antiproliferative action of *Xylopia aethiopica* (Annonaceae) dried fruits extract on human cervical cancer C33a cells.
European Journal of Clinical Investigation, 40, 64-64

2. Agarwal PK, Saifuddi, Mohammad and Kundu Bijoy. Regioselective intramolecular electrophilic substitution reactions involving pi-deficient pyridine substrates: A new entry to pyridoquinazolines and benzo[h][1,6] naphthyridines.
Tetrahedron, 66(4), 862-870

3. Agarwal Tani, Roy Saumya, Chakraborty TK and Maiti Souvik. Selective targeting of G-Quadruplex using furan-based cyclic homo-oligopeptides: Effect on c-MYC expression.
Biochemistry, 49(38), 8388-8397

4. Agarwal Tani, Roy Saumya, Chakraborty TK and Maiti Souvik. Furan based cyclic homo-oligopeptides bind G-Quadruplex selectively and repress c-MYC transcription.
Bioorganic & Medicinal Chemistry Letters, 20(15), 4346-4349

5. Agrawal Rahul, Mishra Bhanvi, Tyagi Ethika, Nath Chandishwar and Shukla Rakesh. Effect of curcumin on brain insulin receptors and memory functions in STZ (icv) induced dementia model of rat.
Pharmacological Research, 61(3), 247-252

6. Ahmad Ausaf, Rasheed Naila, Banu Naheed and Palit Gautam. Alterations in monoamine levels and oxidative systems in frontal cortex, striatum and hippocampus of the rat brain during chronic unpredictable stress.
Stress - The International Journal on the Biology of Stress, 13(4), 355-364

7. Ahmad MK, Mahdi AA, Shukla KK, Islam Najmul, Rajender Singh, Madhukar Dama, Shankhwar SN and Ahmad Sohail. *Withania somnifera* improves semen quality by regulating reproductive hormone levels and oxidative stress in seminal plasma of infertile males.
Fertility and Sterility, 94(3), 989-996

8. Akanksha, Srivastava AK and Maurya Rakesh. Antihyperglycaemic activity of compounds isolated from Indian medicinal plants.
Indian Journal of Experimental Biology, 48(3), 294-298

9. Arya Ajay, Singh Vandana, Singh Shubhra, Pandey Swaroop, Gunjan, Sarika, Dubey Divya, Sinha SK, Singh BN, Chaturvedi Vinita, Tripathi Renu, Ramchandran Ravishankar and Tripathi RP. Synthesis and bio-evaluation of alkylaminoaryl phenyl cyclopropyl methanones as antitubercular and antimalarial agents.
Bioorg Med Chem, 18(23), 8289-8301

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Expert Opinion on Investigational Drugs, 19(8), 995-1005

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Neurochemistry International, 56(1), 135-142

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Arkivoc, 9, 1-11

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Eur J Pharmacol, 638(13), 65-71

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2 Patents

Patents Granted Abroad in 2010	**:**	**06**
Patents Granted in India in 2010	**:**	**12**
Patents Filed Abroad in 2010	**:**	**10**
Patents Filed in India in 2010	**:**	**12**

Patents Granted Abroad:

2010

1. **Title**: Oxy substituted chalcones as antihyperglycemic and antidyslipidemic agents.
US Patent No.: 7807712 **Date of Grant:** 05-Aug-10
Inventors: Ram Pratap, Mavurapu Satyanarayan, Chandishwar Nath, Ram Raghubir, Anju Puri, Ramesh Chander, Priti Tiwari, Brajendra Kumar Tripathi & Arvind Kumar Srivastava

2. **Title:** A process for heterologous expression and large scale production of functionally active enzyme trypanothione reductase of *Leishmania donovani* in prokaryotic system.
US Patent No.: 7785850 **Date of Grant:** 31-Aug-10
Inventors: Neena Goyal & Mukul Kumar Mittal

3. **Title:** Novel substituted bis and tris 1,2,4-trioxanes, useful as antimalarial agents and a process for the preparation thereof.
Nigerian Patent No.: NG/C/2009/442 **Date of Grant:** 10-Mar-10
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri
Supporting Staff: Shashi Rastogi, Akhilesh Srivastava & Kamlesh Singh

4. **Title**: Substituted carbamic acid quinolin-6-yl esters as acetylcholinesterase inhibitors.
US Patent No.: 7655801 **Date of Grant:** 02-Feb-10
Inventors: Neeraj Shakya, Zeeshan Fatima, Chandishwar Nath & Anil Kumar Saxena
Supporting Staff: Zahid Ali & Bishambhar Nath

5. **Title**: Novel herbal composition for the treatment of gastric ulcer.
US Patent No.: 7651705 **Date of Grant:** 26-Jan-10
Inventors: Janaswamy Madhusudhana Rao, Upparapally Sampathkumar, Boggavarapu Subrahmanya Sastry, Jhillu Singh Yadav, Kondapuram Vijaya Raghavan, Gautam Palit, Dwarka Nath Bhalla, Deepak Rai, Panniyampally Madhavankutty Varier, Trikovil Sankaran Muraleedharan & Kollath Muraleedharan
Supporting Staff: Dwarka Nath Bhalla & Tarun Lata Seth

6. **Title:** Substituted 1,2,4-trioxanes, useful as antimalarial agents and a process for the preparation thereof.
Sri Lankan Patent No.: 13041 **Date of Grant:** 25-Jan-2010
Inventors: Chandan Singh, Pallvi Tiwari & Sunil Kumar Puri
Supporting Staff: Shashi Rastogi & Akhilesh Kumar Srivastava

2009

(not included in the Annual Report 2009-10)

1. **Title:** Oxy substituted flavones as antihyperglycemic and antidyslipidemic agents.
US Patent No.: 7635779 **Date of Grant:** 22-Dec-09
Inventors: Ram Pratap, Mavurapu Satyanarayan, Chandishwar Nath, Ram Raghubir, Anju Puri, Ramesh Chander, Preeti Tiwari, Brajendra Kumar Tripathi & Arvind Kumar Srivastava
Supporting Staff: Ashok Kumar Khanna

2. **Title:** Substituted mercapto phenyl naphthyl methane derivatives as SERM for the prevention and treatment of osteoporosis, other estrogen dependent or independent disorders and for regulation of fertility.
Chinese Patent No.: ZL2003801103 **Date of Grant:** 16-Dec-09
Inventors: Sangita, Atul Kumar, Man Mohan Singh, Suprabhat Ray, Puvvada Sri Ramachandra Murthy & Girish Kumar Jain.
Supporting Staff: Vasi Ahmad, A.H. Ansari, Mohini Chhabra & Govind Keshri

3. **Title**: Substituted 1,2,4-trioxanes, useful as antimalarial agents and a process for the preparation thereof.
Korean Patent No.: 10-0932997 **Date of Grant:** 11-Dec-09
Inventors: Chandan Singh, Pallvi Tiwari & Sunil Kumar Puri
Supporting Staff: Shashi Rastogi & Akhilesh Kumar Srivastava

4. **Title**: Biodegradable, inhalable microparticles containing antitubercular drugs.
South African Patent No.: 2006/3256 **Date of Grant:** 25-Nov-09
Inventors: Himadri Sen, Surya Kumar Jayanthi, Rakesh Sinha, Rolee Sharma & Pavan Muttil

5. **Title**: Novel (3R,4R)- trans 3,4-diaryl chroman derivatives useful in fertility regulation and the prevention or treatment of estrogen related diseases or syndromes.
Chinese Patent No.: 10054158C **Date of Grant:** 30-Sep-09
Inventors: Sangita, Atul Kumar, Man Mohan Singh, Suprabhat Ray & Girish Kumar Jain
Supporting Staff: Vasi Ahmed, Mohini Chhabra & Rukmani Agarwal

2008

(not included in the Annual Reports 2008-09 & 2009-10)

1. **Title**: α substituted naphthyloxy-ω- substituted alkyl/aryl amino substituted alkane derivatives as agents for the treatment or prophylaxis of diabetes and related metabolic disorders.
Chinese Patent No.: ZL200380110723 **Date of Grant:** 31-Dec-08
Inventors: Devdutt Chaturvedi, Atul Kumar, Reema Rastogi, Arvind Srivastava, Priti Tewari, Rehan Ahmed, Ramesh Chander, Anju Puri, Geetika Bhatia, Ferhan Rizvi, Anil Kumar Rastogi & Suprabhat Ray
Supporting Staff: Vasi Ahmad, Ashok Kumar Khanna & Suresh Yadav

2. **Title**: Method of treating hyperlipidemic and hyperglycemic conditions in mammals using pregnadienols and pregnadienones.
Georgian Patent No.: 1020191 **Date of Grant:** 24-Dec-08
Inventors: Ram Pratap, Ram Chandra Gupta, Ramesh Chander, Ashok Kumar Khanna, Arvind Kumar Srivastava, Deepak Raina, Savita Srivastava, Anil Kumar Rastogi, Omkar Prasad Asthana, Swarna Nityanand, Sukh Dev, Nitya Anand, Narendra Kumar Kapoor, Ashim Ghatak & Satyawan Singh

3. **Title**: Novel (3R,4R)- *trans* 3,4-diaryl chroman derivatives useful in fertility regulation and the prevention or treatment of estrogen related diseases or syndromes.
US Patent No.: 7427686 **Date of Grant:** 23-Sep-08
Inventors: Sangita, Atul Kumar, Man Mohan Singh, Suprabhat Ray, Girish Kumar Jain, Surojeet Sengupta, Shikha Sharma, Rekha Ghosh, Md. Arshad, Anila Dwivedi & Anil K Balapure
Supporting Staff: Vasi Ahmed, Mohini Chhabra & Rukmani Agarwal

4. **Title**: Herbal medicaments for treatment of neurocerebrovascular disorders.
Uzbekistani Patent No.: IAP03621 **Date of Grant:** 30-Apr-08
Inventors: Madhur Ray, Raghwendra Pal, Satyawan Singh & Nandoo Mal Khanna
Supporting Staff: Jharna Arun & Madhuri Chaudhari

5. **Title**: Biodegradable, inhalable microparticles containing antitubercular drugs.
Eurasian Patent No.: 86600 **Date of Grant:** 28-Apr-08
Inventors: Himadri Sen, Surya Kumar Jayanthi, Rakesh Sinha, Rolee Sharma & Pavan Muttil

6. **Title**: Substituted 1,2,4-trioxanes, useful as antimalarial agents and a process for the preparation thereof.
Peru Patent No.: 4960 **Date of Grant:** 15-Apr-08
Inventors: Chandan Singh, Pallvi Tiwari & Sunil Kumar Puri
Supporting Staff: Shashi Rastogi & Akhilesh Kumar Srivastava

Patents Granted in India:

1 **Title**: *Mycobacterium tuberculosis* specific DNA fragments, a set of oligonucleotide primers and a kit thereof useful for rapid diagnosis of *Mycobacterium tuberculosis* infection in clinical samples.
Indian Patent No.: 244289 **Date of Grant:** 29-Nov-10
Inventors: Ranjana Srivastava, Deepak Kumar & Brahm Shanker Srivastava

2 **Title**: Synthesis of secondary amino alkoxy derivatives of substituted diaryl 5,6,7,8- tetrahydro napthyl methane.
Indian Patent No.: 243701 **Date of Grant:** 01-Nov-10
Inventors: Neeta Srivastava, Man Mohan Singh & Suprabhat Ray

3 **Title**: A novel combinatorial library of 3- and 30-substituted Lup-20(29)-ene useful as antimalarial agents.
Indian Patent No.:243559 **Date of Grant:** 26-Oct-10
Inventors: Misbah Alam Farooq Biabani, Thangathirupathi Srinivasan, Sunil Kumar Puri, Kanwal Raj & Bijoy Kundu
Supporting Staff: AK Srivastava

4 **Title**: 2-Alkyl/aryl sulphonyl-1,2,3,4-tetrahydro-9H-pyrido (3,4-b) indole-3-carboxylic acid esters /amides as antithrombotic agents.
Indian Patent No.: 243415 **Date of Grant:** 15-Oct-10
Inventors: Stuti Gaur, Zeeshan Fatima, Anshuman Dixit, Zahid Ali, William Rascan Surin, Kapil Kapoor, Kanta Bhutani, Mohd. Salim Ansari, Madhu Dikshit & Anil Kumar Saxena
Supporting Staff: Arimardan Singh Kushwaha & Dayanand Vishwakarma

5 **Title**: Novel 6-(naphthyl vinyl)-1,2,4-trioxanes, useful as antimalarial agents.
Indian Patent No.: 242317 **Date of Grant:** 23-Aug-10
Inventors: Chandan Singh, Rani Kanchan, Subhash Chandra & Sunil Kumar Puri

6 **Title**: Synthesis of secondary amino alkoxy derivatives of substituted diaryl 1,2,3,4-tetrahydro napthyl methane.
Indian Patent No.: 242166 **Date of Grant:** 17-Aug-10
Inventors: Neeta Srivastava, Man Mohan Singh & Suprabhat Ray

7 **Title**: Novel 1-(4-aryl/heteroarylpiperazin/piperazin/piperidine-1-yl)-n-(quinoloxy-6/7/8-yl/4-(un)substituted -pyrolidin-2-oxo-1-yl) alkanes/ alkanones and their salts.
Indian Patent No.: 242145 **Date of Grant:** 16-Aug-10
Inventors: Suresh Kumar Pandey, Alpana Srivastava, Keshav Kishor Awasthi, Ravish Chandra Tripathi, Shekar Srivastava, Jharna Arun, Ram Mohan Saxena, Madhur Ray, Rakesh Shukla, Mangal Prasad Dubey & Anil Kumar Saxena

8 **Title**: A novel combinatorial library of 3-substituted amino-3-glycosylated propanoates, useful as antifungal and antibacterial agents.
Indian Patent No.: 242121 **Date of Grant:** 12-Aug-10
Inventors: Rama Pati Tripathi, Bijoy Kundu, Praveen Kumar Shukla, Sudhir Sinha, Ranjana Srivastava, Kishore Kumar Srivastava, Vinita Chaturvedi, Anil Srivastava & Brahm Shankar Srivastava
Supporting Staff: Vinod Kumar Maurya

9 **Title**: Novel amino functionalized 1,2,4-trioxanes, useful as antimalarial agents and a process for the preparation thereof.
Indian Patent No.: 240677 **Date of Grant:** 26-May-10
Inventors: Chandan Singh, Heetika Malik & Sunil Kumar Puri

10 **Title**: Substituted carbamic acid quinolin-6-yl esters as acetylcholinesterase inhibitors.
Indian Patent No.: 241999 **Date of Grant:** 08-May-10
Inventors: Neeraj Shakya, Zeeshan Fatima, Chandishwar Nath & Anil Kumar Saxena
Supporting Staff: Zajid Ali & Bishambhar Nath

11 **Title**: A one pot synthesis of carbamate esters using Mitsunobu's reagent.
Indian Patent No.: 239942 **Date of Grant:** 13-Apr-10
Inventors: Devdutt Chaturvedi & Suprabhat Ray
Supporting Staff: Vasi Ahmed

12 **Title**: Novel mercapto phenyl naphthyl methane derivatives and preparation thereof.
Indian Patent No.: 237915 **Date of Grant:** 12-Jan-10
Inventors: Sangita, Atul Kumar, Man Mohan Singh, Girish Kumar Jain, Puvvada Sri Ramchandra Murthy & Suprabhat Ray

2008

(not included in the Annual Report 2008-09 & 2009-10)

1 **Title**: An improved process for the synthesis of guggulsterones: A pharmacologically active constituent of gugulipid.
Indian Patent No.: 226206 **Date of Grant:** 11-Dec-08
Inventors: Ram Pratap, Dharmendra Pratap Singh, Raghwendra Pal & Satyawan Singh

Patents Filed Abroad:

1 **Title**: Novel donor-acceptor flurene scaffolds: A process and uses thereof.
Korean Application No.: 10-2010-7024460 **Date of Filing:** 29-Oct-10
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

2 **Title**: Novel donor-acceptor flurene scaffolds: A process and uses thereof.
Australian Application No.: 2009233324 **Date of Filing:** 01-Oct-10
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

3 **Title**: A bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for treatment of osteo-health disorders.
Korean Application No.: 2010-7021933 **Date of Filing:** 30-Sep-10
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**: Novel donor-acceptor flurene scaffolds: A process and uses thereof.
Japanese Application No.: 0053NF2008/JP **Date of Filing:** 30-Sep-10
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

5 **Title**: Novel donor-acceptor flurene scaffolds: A process and uses thereof.
Canadian Application No.: 0053NF2008/CA **Date of Filing:** 29-Sep-10
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

6 **Title**: Novel hydroxy functionalized 1,2,4-trioxanes and their derivatives.
Phillipines Application No.: 1-2010-502187 **Date of Filing:** 24-Sep-10
Inventors: Chandan Singh, Ved Prakash Verma & Sunil Kumar Puri

7 **Title**: An improved process for preparation of *trans*-3,4-diarylchroman.
Brazilian Application No.: P10820944-8 **Date of Filing:** 17-Jun-10
Inventors: Devi Prasad Sahu

8 **Title**: An improved process for preparation of *trans*-3,4-diarylchroman.
South African Application No.: 2010/04272 **Date of Filing:** 17-Jun-10
Inventors: Devi Prasad Sahu

9 **Title**: Combination of BAR antagonist and HMG-CoA reductase inhibitor for treatment of dyslipidemia.
PCT Application No.: PCT/IB2010/000898 **Date of Filing:** 21-Apr-10
Inventors: Indravadan Ambalal Modi, Bakulesh Mafatlal Khamar, Chhitar Mal Gupta, Anju Puri, Rabi Sankar Bhatta, Ram Pratap, Girish Kumar Jain, Smrati Bhadauria, Ashok Kumar Khanna, Omkar Prasad Asthana & Ashim Ghatak

10 **Title**: Polymeric nanomatrix associated delivery of Kaempferol in rats to improve its osteogenic action.
PCT Application No.: PCT/IN2010/000115 **Date of Filing:** 26-Feb-10
Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay & Anil Kumar Dwivedi

2009

(Not included in the Annual Report 2009-10)

1 **Title**: Novel donor-acceptor flurene scaffolds: A process and uses thereof.
European Application No.: 09728598.5 **Date of Filing:** 31-Mar-09
Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & Raghubir Singh Anand

2008

(Not included in the Annual Report 2008-09 & 2009-10)

1 **Title**: A process for isolation of 16 α-hydroxycleroda-3,13(14)Z-dien-15,16-olide from *Polyalthia longifolia*.
US Application No.: 12/323156 **Date of Filing:** 25-Nov-08
Inventors: Koneni Venkata Sashidhara, Anju Puri & Jammikuntla Naga Rosaiah
Supporting Staff: Suriya Pratap Singh, Jai Kumar joshi, Noor Jehan, Krishna Kant Yadav, Devidutt & Ram Jivan

2 **Title**: Naturally occurring coumarins and their precursors as acetycholineesterase inhibitors.
Chinese Application No.: 200780016176.00 **Date of Filing:** 04-Nov-08
Inventors: Janaswamy Madhusudana Rao, Chinna Raju Bhimapaka, Venkata Srinivas Pullela, Suresh Babu Katragadda, Jhillu Singh Yadav, Vijaya Raghvan Kodapuram, Hemant Kumar Singh & Chandiswar Nath

3 **Title**: Naturally occurring coumarins and their precursors as acetycholineesterase inhibitors.
European Application No.: 7734021.40 **Date of Filing:** 23-Sep-08
Inventors: Janaswamy Madhusudana Rao, Chinna Raju Bhimapaka, Venkata Srinivas Pullela, Suresh Babu Katragadda, Jhillu Singh Yadav, Vijaya Raghvan Kodapuram, Hemant Kumar Singh & Chandiswar Nath

4 **Title**: Naturally occurring coumarins and their precursors as acetycholineesterase.
Japanese Application No.: 2009-500954 **Date of Filing:** 19-Sep-08
Inventors: Janaswamy Madhusudana Rao, Chinna Raju Bhimapaka, Venkata Srinivas Pullela, Suresh Babu Katragadda, Jhillu Singh Yadav, Vijaya Raghvan Kodapuram, Hemant Kumar Singh & Chandiswar Nath

5 **Title**: Pharmaceutical composition for the prevention/treatment of bone disorders and a process for the preparation thereof.
US Application No.: 12/281098 **Date of Filing:** 28-Aug-08
Inventors: Rakesh Maurya, Geetu Singh, Pandruvada Subramanyam Narayana Murthy, Sandhya Mehrotra, Divya Singh, Biju Bargavan & Man Mohan Singh
Supporting Staff: JK Joshi

6 **Title**: Pharmaceutical composition containing *Butea* isoflavones for the prevention/treatment of bone disorders and a process for the preparation thereof.
Canadian Application No.: 2643973.00 **Date of Filing:** 27-Aug-08
Inventors: Rakesh Maurya, Geetu Singh, Pandruvada Subramanyam Narayana Murthy, Sandhya Mehrotra, Divya Singh, Biju Bargavan & Man Mohan Singh
Supporting Staff: JK Joshi

7 **Title**: Pharmaceutical composition containing *Butea* isoflavones for the prevention/treatment of bone disorders and a process for the preparation thereof.
Japanese Application No.: 2008-556868 **Date of Filing:** 28-Aug-08
Inventors: Rakesh Maurya, Geetu Singh, Pandruvada Subramanyam Narayana Murthy, Sandhya Mehrotra, Divya Singh, Biju Bargavan & Man Mohan Singh
Supporting Staff: JK Joshi

Patents Filed in India:

1 **Title**: (E)-5-(2-nitrophenyl)-1-phenyl-3-[2-(2,6,6-trimethylcyclohex-2-enyl)vinyl]-4,5-dihydro-1H-pyrazole and its analogs.
Indian Application No.: 2175DEL2010 **Date of Filing:** 14-Sep-10
Inventors: Shivaji Narayanrao Suryawanshi, Suman Gupta, Neena Goyal, Avinash Tiwari, Monika Mittal & Preeti Vishwakarma
Supporting Staff: Manju

2 **Title**: (E)-5-(4-chlorophenyl)-1,1-bis(methylthio)penta-1,4-dien-3-one and its analogs.
Indian Application No.: 2174DEL2010 **Date of Filing:** 14-Sep-10
Inventors: Shivaji Narayanrao Suryawanshi, Suman Gupta, Neena Goyal, Santosh Kumar, Monika Mittal & Preeti Vishwakarma
Supporting Staff: Manju

3 **Title**: A phyto-pharmaceutical preparation useful for the treatment of filaria especially as a macrofilaricidal agent.
Indian Application No.: 1695DEL2010 **Date of Filing:** 20-Jul-10
Inventors: Rakesh Tuli, Ajay Kumar Singh Rawat, Sayyada Khatoon, Sharad Srivastava, Subha Rastogi, Madan Mohan Pandey, Kiriti Saxena, Vikash Kushwaha & Puvvada Kalpana Murthy

4 **Title**: Novel coumarin-chalcone hybrids as anticancer agents.
Indian Application No.: 1843DEL2010 **Date of Filing:** 08-May-10
Inventors: Koneni Venkata Sashidhara, Abdhesh Kumar, Manoj Kumar, Jayanta Sarkar & Sudhir Kumar Sinha
Supporting Staff: Sanjeev Meena

5 **Title**: Combination of BAR antagonist and HMG-CoA reductase inhibitor for treatment of dyslipidemia.
Indian Application No.: 1052MUM2009 **Date of Filing:** 22-Apr-10
Inventors: Indravadan Ambalal Modi, Bakulesh Mafatlal Khamar, Chhitar Mal Gupta, Anju Puri, Rabi Sankar Bhatta, Ram Pratap, Girish Kumar Jain, Smrati Bhadauria, Ashok Kumar Khanna, Omkar Prasad Asthana & Ashim Ghatak

6 **Title**: Improved process for a preparation of Bivalirudin.
Indian Application No.: 0671DEL2010 **Date of Filing:** 12-Mar-10
Inventors: Wahajul Haq

7 **Title**: Thiophene containing trisubstituted methanes (TRSMs) as antitubercular agents.
Indian Application No.: 0685DEL2010 **Date of Filing:** 12-Mar-10
Inventors: Gautam Panda, Maloy Kumar Parai, Priyanka Singh, Vinita Chaturvedi & Sudhir Sinha
Supporting Staff: Ajay Singh Verma, Shyam Singh & Hori Lal

8 **Title**: A process for the isolation of an antileishmanial fraction from a marine algae.
Indian Application No.: 0317DEL2010 **Date of Filing:** 10-Feb-10
Inventors: Vijai Lakshmi, Sunil Kumar Mishra, Shishir Srivastava, Mahendra Nath Srivastava, Prashant Khare, Pragya Mishra & Anuradha Dubey
Supporting Staff: Hriday Ram Mishra, Naveen Prakash Mishra, Jai Kumar Joshi & Ram Chandra

9 **Title**: Novel indane derivatives for treatment of mycobacterial infections.
Indian Application No.: 0130DEL2010 **Date of Filing:** 15-Jan-10
Inventors: Ranjana Srivastava, Devi Prasad Sahu, Kishore Kumar Srivastava, Shailesh Kumar, Atma Prakash Dwivedi & Garima Yadav
Supporting Staff: Sandeep Kumar Sharma & Dinesh Kumar Tripathi

*Three patents filed in India in 2010 have been reported in the Annual Report 2009-10

3 Papers Presented in Conferences

2009

(Not included in the Annual Report 2009-10)

3rd CIG Symposium on DNA repair and Human Health, Laussane, Switzerland (10-11 June)

p53 Arg72Pro (rs1042522) gene polymorphism and the risks of head neck squamous cell carcinoma (HNSCC) and breast cancer among north Indians, S.V. Singh, A.K. Mitra, Neetu Singh, V.K. Garg, Rashmi Chaturvedi, Mandira Sharma & S.K. Rath.

5th Annual Conference of Indian Society of Bone and Mineral Research, Udaipur (8 October)

A naturally occurring and orally active small molecule, 6-glucopyranosyl-3,3',4',5,7-pentahydroxyflavone promotes peak bone mass and have non-estrogenic osteo protective effect, Jawed A. Siddiqui, G. Swarnkar, K. Sharan, P. Rawat, R. Maurya, V. Gupta, A. K. Dwivedi & N. Chattopadhyay.

X- International Symposium on Vectors and Vector Borne Diseases, Goa (4-6 November)

Transcriptomic analysis of murine host liver following exposure to *Plasmodium vinkei*, S.K. Mishra, P. Singh, P. Mishra, A.K. Verma, S. Kumar, S.K. Puri & S.K. Rath.

International Symposium on Cancer Chemoprevention and Translation Research, New Delhi (21 December)

Role of soluble Fas in the diagnosis of urinary bladder cancer, A.K. Srivastava, P.K. Singh, S.K. Rath, D. Singh, P. Singh, S. Singh, D. Dalela, M.M. Goel, & M.L.B. Bhatt

2010

2nd National Symposium on Modern Trends in Differential Geometry and Mathematical Modeling in Bio-sciences, Lucknow (9-10 January)

A multivariate method for the parameter estimation of biorhythms, Mukesh Srivastava & M. Abbas.

International Conference on Advances in Free Radical Research, Hyderabad (11-13 January)

PMA induced neutrophil extracellular traps release is mediated by p38 MAPK activation, Ravi Shankar Keshari, S. Kumar, A. Jyoti, S. Patel, M.K. Barthwal, A. Verma, V.K. Bajpai & M. Dikshit.

Expression, biochemical and localization study of nitric oxide synthase in human neutrophil: Effects on nitric oxide production, A. Jyoti, R. Saluja, S. Kumar, M. Chatterjee, A. Verma, M.K. Barthwal & M. Dikshit.

14th ISCBC International Conference on Chemical Biology for Discovery; Perspectives and Challenges, Lucknow (15-18 January)

Bioanalytical method validation: A tool for pharmacokinetic studies, Nidhi, Priya Jain, & J. Lal.

Pharmacokinetics of an arylpiperazine derived SARM for benign prostatic hyperplasia management, S.K. Pandey, A. Saraswat, & J. Lal.

Simultaneous estimation of furosemide along with phenol red and naproxen using RP-HPLC, Kushalkumar Patel, Divyesh Tewari, S.P. Singh, Wahajuddin & G.K. Jain.

Method development and validation of nobiletin in rat plasma, D. Tewari, K. Patel, S.P. Singh, Wahajuddin & G.K. Jain.

Development and validation of a HPLC method for the preformulation studies of candidate drug 99-411, B. Chourasia, M. Srivastava, P. Kushwaha, S.D. Pachauri, V. Gupta & A.K. Dwivedi.

Cloning and expression of *Plasmodium yoelii* phosphoribosyl pyrophosphate synthetase, M.K. Suthar, Anita, P.K. Doharey, S.V. Singh & J.K. Saxena.

Cloning and expression of *Brugia malayi* glucose-6-phosphate dehydrogenase, Anita, M.K. Suthar, P.K. Doharey, S.V. Singh & J.K. Saxena.

Design, synthesis and antimalarial activity of the hybrid triazine thiosemicarbazones, Moni sharma, Kumkum Srivastava, S.K. Puri & P.M.S. Chauhan.

Synthesis and antimalarial activity of hybrid 4-aminoquinoline triazine derivatives, Kuldeep Chauhan, Moni Sharma, Kumkum Srivastava, S.K. Puri & P.M.S. Chauhan.

Design and synthesis of new 4-aminoquinoline-based satin derivatives as antimalarial agents, Rashmi Sharma, Kumkum Srivastava & P.M.S. Chauhan.

$SnCl_2.2H_2O$: An efficient reagent for direct conversion of 2-thiohydantoins to corresponding hydrations, Shashi Pandey, Ravi Kumar & P.M.S. Chauhan.

Design and synthesis of new pyranone-derived antihyperglycemic agents, Amrita Parihar, S. Chaurasia, F.V. Singh & Atul Goel.

Synthesis of privileged N-hetrocyclic compounds through novel bridged annulations, Salil P. Singh, Amit Kumar, Ruchir Kant, P.R. Maulik & Atul Goel.

An efficient one pot synthesis of 4-aroyl-2-pyrones, Mohd. Imran Ansari, Ravi Shankar, Mohd. Kamil Hussain, Nisha Yadav, Ruchir Kant, P.R. Maulik, K. Ravi Kumar & K. Hajela.

Oligosaccharides present in mares' milk modulate the immunological responses of Balb/c mice, Nasreen Bano, Manisha Pathak, V.K. Soni, Amit Srivastava, Desh Deepak & Shailja Misra-Bhattacharya.

The recombinant trehalose phosphate phosphatase of *Brugia malayi* provides protection against infective larval challenge in rodent via mixed Th1/Th2 response, Susheela Kushwaha, Prashant Kumar Singh & Shailja Misra-Bhattacharya.

Altered expression of *Brugia malayi* proteome pattern and the host inflammatory immune reactions in response to prolonged tetracycline treatment, Preeti Bajpai, Anil Dangi, S.K. Kar & Shailja Misra-Bhattacharya.

Isonaamine C and its analogues: Development of an expeditious, highly versatile, protecting group free synthesis and discovery of their antileishmanial potential, Ravi Kumar, Shahnawaz Khan, S. Srivastava, S. Gupta & P.M.S. Chauhan.

Designing and synthesis of pentamidine-aplysinopsin hybrid molecules as antileishmanial agents, Shikha S. Chauhan, Sharad Porwal, P.M.S. Chauhan, Nishi Shakya, Aditya Verma, & Suman Gupta.

Augmentation of leishmanial chemotherapy in animal model using CpG-ODN in combination with Miltefosine, Sane Shraddha A., Nishi, W. Haq & Suman Gupta.

Synthesis of chloroquine-aplysinopsin hybrids as novel antimalarial agents, Shahnawaz Khan, Ravi Kumar, Vikas Tyagi, Kumkum Srivastava & P.M.S. Chauhan.

Synthesis and biological activity of amino acid conjugates of 4-aminoquinoline as antimalarial agents, Manish Sinha, W. Haq, K. Srivastava, S.K. Puri & S.B. Katti.

4th RBF Symposium on Current Trends in Pharmaceutical Sciences Advances in Cardiometabolic Research – Basic Science and Clinical Aspect, Ahmedabad (2-5 February)

Platelet and coagulation activation in high fat high fructose diet fed hyperlipidemic hamsters, V. Singh, V. Khanna, T. Santosh, Anju Puri, S. Bhadauria, M.K. Barthwal & M. Dikshits.

BioAsia 2010: The Global Biobusiness Forum, Hyderabad (4 February)

Some healthy cynicism regarding nanometer-sized drug and antigen delivery system, Amit Misra

International Symposium on Endocrinology and Reproduction, New Delhi (4-6 February)

Antiproliferative effect of benzopyran derivatives, R. Saxena, I. Fatima, V. Chandra, K. Hajela & A. Dwivedi.

12th CRSI National Symposium in Chemistry, Hyderabad (4-7 February)

Synthesis and quantum chemical analysis of partially reduced 8-Oxa[5]helicenes, Gaurav Taneja, Deepti Verma, V.J. Ram, Yasmin Hemberger, Gerhard Bringmann & Atul Goel.

Synthesis of aza-heterocycles using Baylis-Hillman chemistry, A. Mishra & Sanjay Batra.

2nd International Congress of World Heart Failure Congress, Chandigarh (5-7 February)

Effect of antithrombotic agents against myocardial ischemia-reperfusion injury in the rat, Prem Prakash, Ankita Misra, M.K. Barthwal & Madhu Dikshit.

Atorvastatin reduces inflammatory load and restores endothelial function in hypertriglyceridemic, insulin resistant rat, Prem Prakash, Vishal Singh, Anupam Jyoti, Manish Jain, Vivek Khanna, M.K. Barthwal & Madhu Dikshit.

Long term fructose diet feeding aggravates myocardial reperfusion injury and is ameliorated by atorvastatin treatment in rats, Prem Prakash, Vivek Khanna, Anupam Jyoti, Vishal Singh, Manish Jain, M.K. Barthwal & Madhu Dikshit.

Clopidogrel causes partial reversion of atherothrombotic events in hyperlipidemic hamsters, Manish Jain, Vishal Singh, Vivek Khanna, Ankita Misra, Prem Prakash, Madhu Dikshit & M.K. Barthwal.

The Indian Virtual Conference on Bioinformatics (12-13 February)

Bioinformatics approaches in identification of plant derived lead molecules for antitrypanothione activity in leishmaniasis, Stuti Gupta & R.K. Sharma

4th International Symposium on Current Trends in Drug Discovery Research, Lucknow (17-21 February)

Determination and pharmacokinetic study of biochanin A and its metabolite genistein in rat plasma by liquid chromatography–mass spectrometry, Wahajuddin, S.P. Singh & G.K. Jain.

Effect of carbamazepine - an antiepileptic on pharmacokinetics profile of an antimalarial trioxane in rats, H.N. Kushwaha, N. Gautam & S.K. Singh.

Excretion study of a novel antidiabetic S-002-853 in rat urine and feces quantified by LC-MS/MS method, N. Gautam, H.N. Kushwaha & S.K. Singh.

HPLC-PDA method for quantitative analysis of active markers of osteogenic herbal preparations of *Ulmus wallichiana*, M. Lakshmi, R. Maurya, N. Chattopadhyay & G.K. Jain.

LC-MS-MS method for simultaneous analysis of cladrin and equol in rat plasma and its application in pharmacokinetics study of cladrin, M. Lakshmi, S. Gupta, S. Mishra, R. Maurya, N. Chattopadhyay & G.K. Jain.

Bio-analytical method development and validation for simultaneous estimation of diastereomers of S-002-333, a potent anti-thrombotic agent, using LC-MS/MS, R.S. Bhatta, Y.S. Chhonker, D. Kumar, A.K. Saxena & G.K. Jain

Chloroform fraction of *Xylocarpus granatum* fruit protects the gastric mucosa through inhibition of H+K+ATPase activity, Neetu Singh, Pratibha Singh, Vijai Lakshmi & Gautam Palit.

Amelioration of mucosal inflammation in experimental reflux esophagitis by selective COX-2 inhibitor, Pratibha Singh, Neetu Singh & Gautam Palit.

Block copolymer self-assembled micelles as nanaocarriers for amphotericin, B. Bholenath, Vivek Patel, P.R. Mishra & A.K. Dwivedi.

Development of human cytokines based reporter cell line: *In vitro* model for immunotoxicity testing of drugs, Dharamsheela, Pankaj Singh, Balawant Kumar, Poonam Singh & R.K. Tripathi.

Toxicoinformatics in drug design, Poonam Singh.

Application of plant bioinformatics in the prediction of medicinal properties of marine organisms for anti-parasitic properties, Stuti Gupta, M. Sharma, G. Singh & R.K. Sharma.

Antidyslipidemic and antioxidant activity of *Pinus roxberghee* needles, Anju Puri, A.K. Srivastava, Barkha S., S.K. Mishra, S. Srivastava & V. Lakshmi.

Design and synthesis of piperazine derived antispermatogenic agents, Nand Lal, Vikas Verma, J.P. Maikhuri, G. Gupta & V.L. Sharma.

Synthesis and *in vivo* antihyperglycemic activity of functionalized teraryls and quateraryls in STZ-S model, Vijay Kumar, Sumit Chaurasia, Pankaj Nag, A.K. Srivastava & Atul Goel.

Synthesis and antileishmanial activity of novel aryloxy/benzyloxy tetrahydronaphtyl azoles, V.K. Marappu, N. Srinivas, Nishi, M. Mittal, S. Gupta & K. Bhandari

Application of 7-endo trig Pictet-Spengler cyclization leading to the synthesis of novel benzoazepinoindole and naturally occurring skeleton pyrrolo[2,1-c][1,4] benzodiazepin-5-one and their derivatives, S.K. Sharma, V.K. Harit, Sahaj Gupta & Bijoy Kundu.

A new entry to phenanthridine ring systems via sequential application of Suzuki and the modified Pictet-Spengler reactions, A.K. Mandadapu, Mohd. Saifuddin, P.K. Agarwal & Bijoy Kundu.

Regioselective intramolecular electrophilic substitution reactions involving p-deficient pyridine substrates, Mohd. Saifuddin, P.K. Agarwal & Bijoy Kundu.

3,4,6-Triaryl-2-pyranones as a potential new class of anti-breast cancer agents, Mohd. Imran Ansari, M. Kamil Hussain, Harsha Shukla, NishaYadav, R. Shankar, B. Chakravarty, U.S. Singh, S. Deshpande, S.K.D. Dwivedi, H.K. Bid, R. Konwar, G. Kharkwal, V. Chandra, A. Dwivedi & K. Hajela.

3D-QSAR ComFA and ComSIA on protein tyrosine phosphatase 1β-inhibitors, V. Shukla, S. Gupta and A.K. Saxena.

16α-Hydroxycleroda-3, 13(14)z-dien-15, 16-olide, a natural lead from *Polyalthia longifolia* against leishmaniasis, K.V. Sashidhara, S.P. Singh, Pragya Misra, A. Kumar, R. Gupta, S.S. Chaudhaery, S.S. Gupta, H.K. Majumder, A.K. Saxena & Anuradha Dube.

Design and synthesis of bmp-2 agonists as potent antiosteoporotic agents, V.M. Balaramnavar, Imran Ahmd Khan & A.K. Saxena.

Design, synthesis and docking studies of phenoxy-3-piperazin-1-yl-propan- 2-ol derivatives as inhibitors of protein tyrosine phosphatases 1B, Swati Gupta, Gyanendra Pandey & A.K. Saxena.

In silico development and validation of quantitative pharmacophore model on heat shock protein 90 (HSP90) inhibitors as anti-cancer agents, Supriya Singh, Kuldeep K. Roy & A.K. Saxena.

3D-QSAR pharmacophore modeling and docking studies on benzimidazole derivatives as activators of the AMP-activated protein kinase (AMPK), Sugandha Sharma, V.M. Balaramnavar & A.K. Saxena.

Design, synthesis and 3D-QSAR molecular modeling studies of novel DNA- gyrase inhibitors as antitubercular agents, Chandra S. Azad, Anisha Thomas & A.K. Saxena.

3D-QSAR studies on anthranilamide derivatives as factor XA inhibitors, S.S. Bhunia & A.K Saxena.

Three-dimensional common-feature hypotheses and docking studies on isoindolinone based P53-MDM2 inhibitors, S. Saxena & A.K. Saxena.

Development of 3D-pharamacophore model as virtual screening tool for novel bradykinin receptor antagonists, S.S. Chaudhaery & A.K. Saxena.

Substituted hydrazinecarbothioamide as potent antitubercular agents: Synthesis and structure-activity relationship (QSAR), Nagendra Singh, Supriya Singh & A.K. Saxena.

Design, syntheses and modelling of antihistamines H1, Mridula Saxena, Stuti Gaur, S.S. Chaudhaery, Imran A. Khan, Supriya Singh, Ram Raghubir & A.K. Saxena.

In silico virtual screening, synthesis and evaluation of novel carbamates as acetylcholinesterase (AChE) inhibitors for alzheimer's disease (AD), K.K. Roy, S.S. Chaudhaery, Neeraj Shakya, Gunjan Saxena, C. Nath & A.K. Saxena.

Structure-based discovery and molecular docking studies of small molecule inhibitors targeted to protein tyrosine phosphatases 1b, Kanika Varshney, Swati Gupta, Nagendra Singh & A.K. Saxena.

Pyrido (3,4-b) indole-2-sulphonyl derivatives as potential antithrombotic agents, I.A. Khan, Stuti Gaur, S.K. Pandey, Yogendra Pal, Madhu Dixit & A.K. Saxena.

Pharmacophore modelling of diverse classes of EGFR (HER1) tyrosine kinase inhibitors, A.K. Gupta, Kapil Dev & A.K. Saxena.

Three-dimensional *in silico* pharmacophore and comfa, comsia studies on α1a –adrenergic receptor antagonists, A.K. Gupta, P.B. Doguparthy, Sucheta Das & A.K. Saxena.

Novel 2-Aryl-Naphtho 1,2-d oxazole derivatives as antihyperglycemic agents, T.A. Ansari, P. Ahmad, S.P. Srivastava, A.K. Srivastava & A. Kumar.

Bioactive constituents from fruits of *Cupressus sempervirens*, M.F. Khan, P. Rawat, M. Kumar, A.K. Srivastava & R. Maurya

Antihyperglycemic constituents of *Dodecadenia grandiflora*, M. Kumar, P. Rawat, A.K. Srivastava & R. Maurya

Pyranocoumarins: A new class of anti-hyperglycemic and anti-dyslipidemic agents, P. Kumar, P. Ahmad, G. Bhatia, A.K. Srivastava & A. Kumar

Synthesis and *in vivo* antihyperglycemic activity of functionalized teraryls and quateraryls in STZ-S model, V. Kumar, S. Chaurasia, P. Nag, A.K. Srivastava & A. Goel

Design and synthesis of 3,5-diarylisoxazole derivatives as novel class of anti-hyperglycemic and lipid lowering agents, S. Sharma, R.A. Maurya, G. Bhatia, A.K. Srivastava & A. Kumar

Chalcone-based aryloxyethylamine as antihyperglycemic agents, P. Shukla, J. Tiwari, P.C. Verma, Neha, A.K. Srivastava & R. Pratap

Vaccination with recombinant independent phosphoglycerate mutase against challenge infection with *Brugia malayi* confers protective immunity in rodent, Prashant Kumar Singh, Susheela Kushwaha & Shailja Misra-Bhattacharya.

In vivo immune-suppressant activity of plant extract in Balb/c mouse model, Manisha Pathak, Nasreen Bano, Vishal Kumar Soni, Priti Dixit, Aakanksha, Rakesh Maurya & Shailja Misra-Bhattacharya.

Improvement in the antifilarial efficacy of antiwolbachial antibiotic formulations of doxycycline and rifampicin when combined together and with diethylcarbamazine, Meenakshi Verma, Anil Dangi, V. Dwivedi, S. Vedi, Md. Owais, Shailja Misra-Bhattacharya

Cloning, expression and characterization of repetitive infective larval antigen BML3 R15 of lymphatic filarial *Brugia malayi*, Vishal Kumar Soni, Prashant Kumar Singh, Susheela Kushwaha, Shailja Misra-Bhattacharya.

Development of axenically growing *Leishmania donovani* amastigotes expressing gfp as an *in vitro* model for drug screening, A.K. Jaiswal, Reema Gupta & Anuradha Dube.

Proteomic analysis of a clinical isolate of *Leishmania donovani* promastigotes for identification of drug targets from membrane-enriched fraction, Pragya Misra, Awanish Kumar, Rati Tandon, Sanchita Das & Anuradha Dube.

Enolase (2-phospho-glycerate hydrolase): A potential antileishmanial drug target, R. Gupta, P.K. Kushawaha, M. Samant & A. Dube

Cloning and over-expression of elongation factor 2 – A possible drug target from *Leishmania donovani*, P.K. Kushawaha, Reema Gupta, Rajendra Baharia & Anuradha Dube.

Localisation of aldolase, a potential drug target, in glycosomes and flagella of *Leishmania donovani*, Reema Gupta, P.K. Kushawaha, Mukesh Samant & Anuradha Dube.

Synthesis and *in vitro* antimalarial activity of novel 4-anilinoquinoline mannich base derivatives, Bhupendra Singh, Dipak Chetia, Kumkum Srivastava, S.K. Puri & Anil Prakash.

Antimalarial activity in *Xylocarpus granatum* (Koen), V. Lakshmi, S. Srivastava, S.K. Mishra, M.N. Srivastava, K. Srivastava & S.K. Puri.

International Symposium on Current Status and Opportunities in Aromatic & Medicinal Plants, Lucknow (21-24 February)

Ulmus wallichiana: An ethnomedicinal plant for osteogenic drug from western himalaya, K.R. Arya

International Conference & Humboldt Kolleg, Frontiers of Environmental and Health Sciences Useful to Mankind: A Multidisciplinary Approach, Lucknow (24-27 February)

Lactones methodology in the construction of poly aromatic hydrocarbons, O- and N-heterocyclic scaffolds, Amit Kumar, Vijay Kumar, Salil Pratap Singh & Atul Goel

Novel concept of inhibiting 'green emission defect': 2-Pyranone derived new π-conjugated arenes for OLEDs, Sumit Chaurasia, Vijay Kumar, R.S. Anand, S.S. Manoharan & Atul Goel.

Pharmacophore identification and docking studies on the HSP90 inhibitors, Shalini Saxena, S.S. Chaudhaery, Kanika Varshney & A.K. Saxena

Common feature hypothesis for protein tyrosine phosphatases 1B inhibition, Swati Gupta & A.K. Saxena

Pharmacophore modeling and virtual screening studies for the design of potent P53-MDM2 inhibitors, Supriya Singh, Keshav Prasad, S.S. Chaudhaery, Konwar Rituraj & A.K. Saxena

Homology modeling and binding site characterization of adrenoreceptor, Kuldeep K. Roy & A.K. Saxena

2nd International Symposium on Drug Metabolism and Pharmacokinetics: Applications toward Drug Discovery and Development, Mohali (27-28 February)

Optimization and validation of RP-HPLC method with protein precipitation for determination of nobiletin in rat plasma and brain tissue, Divyesh Tewari, Kushal Patel, S.P. Singh, Wahajuddin & G.K. Jain.

PAMPA permeability study of test compounds along with approved markers, Kushalkumar Patel, Divyesh Tewari, Sheelendra P. Singh, Wahajuddin & G.K. Jain.

Pharmacokinetic and excretion studies of a novel antidiabetic S-002-857 in rats, N. Gautam, H.N. Kushwaha, H. Kumar, R. Pratap & S.K. Singh

Effect of gabapentin - An antiepileptic on pharmacokinetics profile of 97-78, an antimalarial trioxane in rats, H.N. Kushwaha, N. Gautam, H. Kumar, R. Pratap & S.K. Singh.

Oral pharmacokinetic, *in situ* absorption and SGF/SIF stability studies of S-002-857: A novel antidiabetic compound synthesized by CDRI, N. Gautam, H. Kumar, H.N. Kushwaha & S.K. Singh.

Assay method for centchroman, a selective estrogen receptor modulator in rat dried blood spots, Nidhi & J. Lal.

Identification of metabolic pathway of novel lipid lowering agent 16-DHP in human liver microsome using LC-MS/MS, D. Kumar, C. Rathi, H. Chandasana, Y.S. Chhonker, R.S. Bhatta & G.K. Jain

Estimation of *in vitro* human intestinal permeability and metabolism of novel anti-hyperlipidemic agent 16-dehydropregnenalone (DHP, 80/574), D. Kumar, H. Chandasana, C. Rathi, Y.S. Chonker, S. Meena, S. Nitu, J. Sarkar, R.S. Bhatta & G.K. Jain

Symposium on DNA Repair Genomic Instability and Cancer, Varanasi (4-5 March, 2010)

Gene polymorphisms in squamous cell carcinoma of head & neck and breast cancer- Our experience, S.V. Singh, A.K. Mitra, Neetu Singh, V.K. Garg, Rashmi Chaturvedi, Mandira Sharma & S.K. Rath

35th Annual Conference of the Indian Society of Human Genetics, Lucknow (6-8 March)

Polymorphism in the *IL-10* gene does not associate with breast cancer in North Indian population.

Pooja Singh, Sandeep Kumar, Hemant Kumar Bid, Naibedya Chattopadhyay, Rituraj Konwar

14th Annual National Conference of Breast Cancer Foundation of India, Lucknow (7-8 March)

Responsiveness of molecular predictive biomarkers in breast cancer chemotherapy: An innovative idea, A.K. Srivastava, P.K. Singh, P. Singh, S. Nayak, S. Singh, P. Shilpi & M.L.B. Bhatt

Apigenin, Is it fit for breast cancer treatment?, P. Singh, S.K. Mishra, P.K. Singh, A.K. Srivastava, A.K. Verma, S.K. Maurya, S. Sharma & S.K. Rath

Single nucleotide polymorphisms (SNPs) in p53, p21 and Cox-2 genes and breast cancer risk in North Indian women- Case control study, S.V. Singh, Neetu Singh, V.K. Garg, Rashmi Chaturvedi, Mandira Sharma & S.K. Rath

Single nucleotide polymorphisms (SNPs) and breast cancer risk-Our experience, S.V. Singh, A.K. Mitra, Neetu Singh, V.K. Garg, Rashmi Chaturvedi, Mandira Sharma & S.K. Rath

International Conference on Advances in Electron Microscopy and Related Techniques, Mumbai (8-10 March)

Structural studies on the largest known virus by cryo-electron microscopy, Kalyan Mitra and Michael G. Rossmann.

National Seminar on the Structure and Function of Coastal Vegetation & its Relevance to the Society, Purba Medinipur (17-18 March)

Coastal vegetation of West Bengal and its importance in new drug development, D.K. Mishra

2nd NIPER-CDRI Symposium on Medicinal Chemistry and Pharmaceutical Sciences, Lucknow (25 -27 March)

Chitosan coated poly-caprolactone nanoparticle for ocular delivery of amphotericin-B, C. Rathi, H. Chandasana, D. Kumar, Y.S. Chhonker, P.K. Shukla, K. Mitra, R.S. Bhatta & G.K. Jain

In situ rat permeability: A predictive tool for human intestinal permeability, Kushalkumar Patel, Divyesh Tewari, S.P. Singh, Wahajuddin and G.K. Jain

A new paradigm in bioanalysis, G.K. Jain

Pre-formulation studies of CDRI compound S-000-20, Varsha Gupta, Neeti Rawat, D.K. Dikshit & A.K. Dwivedi.

UGC National Seminar on Technological Advances in Pharmaceutical Education and Research, Lucknow (26 April)

Technology in pharmaceutics research: A case study of the advantages of *jugaad*, Amit Misra

Regional Experts Meeting on Herbal Medicine Processing Including Extraction, Standardization, Processing, Formulation, Packaging and Commercialization, Tehran, Iran (19-21 June)

Isolation, structure determination, chemical transformation and synthesis of natural products, Rakesh Maurya

Brain Research Institute, Zurich, Switzerland (11-16 July)

Animal models for spinal cord and brain injuries, Nilendra Singh

6th Annual Conference of the Indian Society for Bone and Mineral Research, New Delhi (13-14 August)

CDR S-007-1500 has potential as an osteoprotective and fracture repair agent, Rashmi Pandey, Haushila Prasad Pandey, Naibedya Chattopadhyay & Divya Singh

CPhI Meeting on Novel Drug Delivery Systems, Mumbai (19 August)

Utilising advanced drug delivery approaches for complex respiratory therapies, Amit Misra

International Research Meeting on Pulmonary Hypertension Associated with High Altitude and Hypoxia, Leh (27-30 September)

Endothelial dysfunction, insulin resistance, oxidative stress and myocardial ischemia/reperfusion injury in long term fructose fed rats, P. Prakash, V. Khanna, M. Jain, A. Jyoti, V. Singh, R.S. Keshari, M.K. Barthwal & M. Dikshit

Effect of aqueous extract of *Punica granatum* on monoctotalione induced pulmonary hypertension in rats, K. Hanif & M. Dikshit.

InCOFIBS 2010: International Conference on Frontiers in Biological Science, Rourkela (1-3 October)

Approaches to tuberculosis drug development, V. Singh & R. Srivastava

Asia-Pacific Society of Neurochemistry, Phuket, Thailand (18-20 October)

Exploration glutamate transporter-1 (GLT-1) as a potential therapeutic target for neuroprotection, R. Verma, V. Mishra & R. Raghubir.

International Symposium on Alternate Animal Models in Biological Research: Present and Future Perspective in Toxicology, Lucknow (29-31 October)

Protective effect of apigenin against lithocholic acid induced-oxidative stress and toxicity in hepatic cell lines, P. Singh, P. Mishra, A.K. Verma, P. Srivastava, S. Sharma & S.K. Rath.

22nd Congress of Parasitology, Kalyani (30 October - 1 November)

Cloning and expression of *Brugia malayi* thymidylate kinase, P.K. Doharey, Anita, M.K. Suthar, S.V. Singh & J.K. Saxena

Synthesis and biological evaluation of indolyl glyoxylamides as a new class of antileishmanial agents, Monika Mittal, S.S. Chauhan, Leena Gupta, Preeti Vishwakarma, P.M.S. Chauhan & S. Gupta

Effect of combinations of sub-curative doses of antibiotic(s) on mycoplasma contamination and survival of *in vitro Plasmodium falciparum*, Pooja Agarwal, Saqib Kidwai, S.K. Puri & Kumkum Srivastava.

Plasmodium yoelii sporozoite induced infection elicits varied mRNA expression of IFN-γ and IL-10 in liver and spleen from infected mice, Arif J. Siddiqui, Jyoti Bhardwaj & S.K. Puri

High IFN-γ mRNA expression correlates to protection against non lethal murine malaria infection, Jyoti Bhardwaj, A.J. Siddiqui & S.K. Puri

Comparative gene sequence analysis of heme detoxification protein (HDP) from arteether sensitive and arteether resistant strains of *Plasmodium vinckei,* Awakash Soni, Santosh Kumar & S.K. Puri

International Conference on Multidisciplinary Approaches to Diabetes Research & Health, Jaipur (14-16 November)

Multi-model QSAR of N-sulfonyl-2-indole carboxamides as PPAR-γ agonists: Topological features in explaining the activity, S. Deshpande, S.B. Katti & Y.S. Prabhakar

FIP Pharmaceutical Sciences World Congress 2010, New Orleans, USA (14-18 November)

Pharmacokinetics and bioavailability of lumefantrine: A highly protein bound antimalarial in rats, Wahajuddin S.P. Singh & G.K. Jain

Simultaneous determination of four isoflavones in rat plasma by LC-ESI-MS/MS: Assay development, validation and application to pharmacokinetic study, Sheelendra Pratap Singh, Wahajuddin & G.K. Jain

Pulmonary delivery of microspheres that activate lung macrophages infected with *Mycobacterium tuberculosis,* Amit Misra.

Impact of Environment Changes on Human Life, Allahabad (20-21 November)

Effect of deltamethrin on protein content of gonad of fresh water fish *Channa punctatus*, A. Kumar, Y. Devi & R.K. Singh.

Hematological disorder in rice mill workers of district Sultanpur, Uttar Pradesh, R.K. Singh, F.W. Bansode & A. Tripathi

27th Annual Convention & Conference on Open Access: Gateway to Open Innovation, Kolkata (24-26 November)

CDRI MoES project web portal: A platform to achieve high throughput in collaborative drug research, Stuti Gupta, Neelu Singh & R.K. Sharma

Designing & development of "Leish-Net": A web based server for microarray data on leishmaniasis, Neelu Singh, S. Gupta. Neeloo Singh, Ashis SenGupta, & R.K. Sharma

International Conference on Folk and Herbal Medicine, Udaipur (25-27 November)

In vitro cell line for the production of osteogenic compounds: An ethnobotanical lead from *Ulmus wallichiana* Planch, K.R. Arya, Deepty Sharma & Brijesh Kumar

Identification and comparative study of chemical compounds of different parts (bark, stem and leaves) of *Ulmus wallichiana* using high resolution liquid chromatography-mass spectrometry (HR-LCMS) technique, Deepty Sharma, K.R. Arya & Brijesh Kumar

Profiling of *Piper betle* Linn. cultivars by high resolution mass spectrometric (HRMS) techniques, Brijesh kumar

Gender specific chemical differentiation of bioactive compounds of *Tinospora cordifolia* plant using direct analysis real time mass spectrometric technique, Brijesh Kumar, Vikash & Nikhil Kumar

Plant derived modulator of Glut-4 translocation for the treatment of insulin resistance, A.K. Tamrakar, N. Jaiswal, R. Maurya, T. Narendra, & A.K. Srivastava

5th Congress of Federation of Asian-Oceanic Neuroscience Societies, Lucknow (25-28 November)

Evaluation of melatonin against DNA damage and nuclear condensation along with GFAP expression in rotenone treated rat C6 astrocytoma cells, Swarnkar Supriya, S. Singh, P. Goswami & C. Nath.

Involvement of oxidative stress and nitric oxide, P. Goswami, Swarnkar Supriya, S. Singh & C. Nath.

Revisiting ketamine induced experimental psychosis: Mice model to explore the relationship between N- acetylasparate metabolism and behavioural deficits, S. Ganguly, M. Chatterjee, C. Chandola, R. Thakur, M.A. Namboodiri & G. Palit

Melatonin modulated inflammatory cytokine genes expression and inhibited NF-kB and CHOP activation in LPS stimulated rat astrocytoma cells-C6, Rakesh Shukla, R. Niranjan & C. Nath

International Meeting on Recent Developments in Malaria Research, New Delhi (1-3 December)

Deciphering the role of apicoplast-targeted proteins in organellar DNA replication and translation, Subir Biswas, Ankit Gupta, EVS Raghu Ram, Ambrish Kumar & Saman Habib

Frontiers in Chemical Sciences, Guwahati (3-4 December)

1-Formyl-9H-β-carboline: A valuable precursor to the synthesis of β-carboline-fused cyclic frameworks of biological importance, Samiran Hutait & S. Batra

All India Cell Biology Conference, Kolkata (4-6 December)

Housekeeping functions of the *Plasmodium falciparum* apicoplast as sites for drug intervention against malaria, Subir Biswas, Ankit Gupta, EVS Raghu Ram, Ambrish Kumar & Saman Habib.

3rd Indo-Japanese International Symposium on Overcoming Intractable Infectious Diseases, Tokyo (13-14 December)

Preclinical safety, efficacy and mechanisms of action of inhaled microparticles containing anti-tuberculosis agents, Amit Misra

International Conference on Stem Cells & Cancer: Proliferation, Differentiation and Apoptosis, Pune (11-14 December)

Cdkn1a (p21) and tp53 gene snps and risks of squamous cell carcinomas of upper aero digestive tract (UADT) in north Indian sub-populations, S.V. Singh, A.K. Mitra, Amrita Wadhwani, V.K. Garg, R. Chaturvedi, M. Sharma & S.K. Rath.

79th Meeting of Society of Biological Chemists, Bangalore (13-15 December)

Nitric oxide donor induced neutrophil extracellular traps formation: Implications for the inflammatory disease conditions, Ravi Shankar Keshari, Anupam Jyoti, Sachin Kumar, Nikhil Kothari, Jaishree Bogra, Anupam Verma, M.K. Barthwal & Madhu Dikshit.

Molecular cloning, expression, purification and immune characterization of translation initiation factor-1 of *Wolbachia*, the endosymbiont of *Brugia malayi*, Jeetendra Kumar Nag, Nidhi Srivastava, Jyoti Gupta & Shailja Misra-Bhattacharya

Cloning, expression and characterization of lactate dehydrogenase of *Plasmodium knowlesi*, Vandana Singh, D.C. Kaushal & Nuzhat A. Kaushal

Isolation and characterization of immunoreactive proteins of *Setaria cervi* adults, Priyanka Priyadarshi, D.C. Kaushal & N.A. Kaushal

Immunochemical characterization of acetylcholinesterase from adult and microfilarial stages of *Setaria cervi*, Sunita Saxena & N.A. Kaushal

43rd India Pharmacological Society Meeting, Hyderabad (13-16 December)

Insulin catalyzes the curcumin induced wound healing: Novel, *in vitro* b model for periodontal repair, Neetu Singh, Deeba Zaidi, Aparna Singh, Divya Lodha, Ramesh Sharma, Umesh Verma, Jaya Dixit & A.K. Balapure

Synergy between curcumin and centchroman in human breast cancer cells *in vitro,* Deeba Zaidi, Neetu Singh, Ramesh Sharma & A.K. Balapure

Dopamine D1 receptor mediates gastroprotection by inhibiting H^+K^+ATPase activity and gastrin elicited increase in cytosolic Ca^{2+} level, Neetu Singh, Pratibha Singh & Gautam Palit

Comparative evaluation of the effects of L-tryptophan and melatonin on the reflux esophagitis induced oxidative load and inflammation, Pratibha Singh, Neetu Singh & Gautam Palit

Involvement of gastrin and histamine in the antiulcer potential of herbal compounds-gedunine and photogedunine, Nishant Rai, Neetu singh, Pratibha Singh, Vijai Lakshmi & Gautam Palit

Protective effect of perindopril on cerebral blood flow and memory impairment induced by ICV streptozotocin in rats, Rakesh Shukla, S. Tota, K. Hanif & C. Nath.

Appetite suppressant activity of CDRI compound S-006-1591, A. Nath, P.K. Kamat, A.K. Srivastava, C. Nath & R. Raghubir

51st Annual Conference of Association of Microbiologists of India, Ranchi (14-17 December)

Production and purification of cholesterol oxidase from *Penicillium* Spp, Akanksha Srivastava & C.K.M. Tripathi

Mining the TB genome for drug targets, Ranjana Srivastava

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

Genes express during infection as a key to diagnosis of TB, Ranjana Srivastava

Comparative expression analysis of rpf-like genes of *Mycobacterium tuberculosis* H37Rv under different physiological stress and growth conditions, Ravi Kumar Gupta, S. Srivastava & Ranjana Srivastava.

Role of BCAA pathway enzymes in growth and survival of mycobacterium tuberculosis *in vitro*, *ex vivo* and in mice, Vinayak Singh, B.S. Srivastava & Ranjana Srivastava.

Over expression of Rv3097c of *Mycobacterium tuberculosis* in *Mycobacterium bovis* BCG down regulates immune response elicited by BCG vaccine, Vipul Kumar Singh, Ranjana Srivastava & B.S. Srivastava

Identification of PKnJ as a role molecule in the intracellular survival of mycobacteria, D.K. Singh, Ruma Kumari, Susmita Kumari, P.K. Singh & K.K. Srivastava

Protein kinase K regulates macrophages proteins to exhibit survival, Ruma Kumari, Susmita Kumari, D.K. Singh & K.K. Srivastava.

Multiple functions of PE3 and PE4 proteins direct mycobacterium / host association, Susmita Kumari, Ruma Kumari, D.K. Singh, Sameer Tiwari & K.K. Srivastava.

62nd Indian Pharmaceutical Congress 2010, Manipal (17-19 December)

Protective effect of silibinin against intracerebral streptozotocin induced memory impairment in mice, S.K. Tota, R. Shukla & C. Nath

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, CDRI
Ministry of Health & Family Welfare, Government of India	
Antifertility research program	Director, CDRI
To supply the phytochemical references standard (PRS) to Indian pharmacopoeia Commission	Dr. A.K. Saxena
Technological innovations for commercial exploitation of *Morinda citrifolia* (Noni) as livelihood option for islands farmers	Dr. J.K. Saxena
World Health Organization, Geneva, Switzerland	
Development of new macrofilaricidal and/or embryostatic agents	Dr. S. Bhattacharya
Drug for Neglected Diseases *initiative*, Geneva	
Lead identification for antileishmanial compounds	Dr. S.K. Puri
Alexander von Humboldt-Foundation, Germany	
Efficient synthesis of novel axially chiral biaryl compounds and their optical resolution by HPLC technique	Dr. Atul Goel
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, CDRI
J.C. Bose Fellowship	Dr. T.K. Chakraborty
Synthesis of small ring saturated heterocycles and cycloalkanes from 2,3-epoxy alcohols containing acrylic moiety by conjugate radical additions triggered by epoxide ring opening with Cp2TiCl: Application in the synthesis of natural products	Dr. T.K. Chakraborty
Structural characterization of gamma glutamylcysteine synthetase (gamma GCS) and glutathione synthetase (GS) from *Leishmania spp*.	Dr. J.V. Pratap
Polymeric nano-matrix associated *in vivo* delivery of Kaempferol in rats for bone anabolic action	Dr. Ritu Trivedi
Effect of cancer chemotherapeutic drugs on spermatogonial stem cell niche, chromatin remodeling and epigenetic programming in male germ cells	Dr. D.P. Mishra
Design, synthesis and biological evaluation of SIRT-1 activators for the treatment of type-II diabetes	Dr. Bijoy Kundu
Characterization of natural antimony resistance related gene(s) of *Leishmania donovani*	Dr. Neena Goyal
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 agents	Dr. Gautam Panda
Chiron approach synthesis of natural products and natural product like molecules from carbohydrate based building blocks	Dr. A.K. Shaw
Expansion of facilities in National centre for pharmacokinetic and metabolic studies	Dr. G.K. Jain
Identification and elucidation of novel signaling pathways involved in monocyte /macrophage activation, migration, differentiation, proliferation and death during dyslipidemia and atherosclerosis	Dr. M.K. Barthwal
Osteogenic actions of a naturally derived NP-1 pure compound on bone	Dr. Divya Singh
Proteomic analysis of drug resistance in *Leishmania donovani* clinical isolates	Dr. Neeloo Singh
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 development of novel antileishmanial agents	Dr. T. Narender
A systematic RNAi screen for identification of genetic modulators of HIV-NEF induced pathogenesis in a novel *Caenorhabditis elegans* model	Dr. Aamir Nazir
Molecular diversity oriented synthesis of aromatic scaffolds through ring transformation strategy (Ramanna Fellowship)	Dr. Atul Goel
Human cytochrome P450 1B1: Implications in centchroman treated hormone-mediated MCF-7 tumor cell metabolism as a novel target for therapeutic intervention (Women Scientist Scheme)	Dr. Neetu Singh
Polymeric nanomatrix associated *in vivo* delivery of Kaempferol in rats for bone anabolic action	Dr. Ritu Trivedi
DST & KAPL, Bangalore	
Development of antimicrobial agents from soil microflora	Dr. A.K. Saxena

Title of the Project	Principal Investigator
Department of Biotechnology, Government of India	
Cloning, expression and characterization of filarial acetylcholine esterase	Dr. N.A. Kaushal
Studies on neutrophil nitric oxide synthase: Isolation, molecular characterization and identification of interacting proteins	Dr. Madhu Dikshit
New inhibitor design/drug development using novel protein targets: NAD+ dependent DNA ligases and feast/famine regulatory proteins from *M. tuberculosis*	Dr. R. Ravishankar
Studies on the structure and functions of actin cytoskeletal network in *Leishmania donovani*	Dr. C.M. Gupta
Understanding the mechanism of mitotic/spindle checkpoint using genetics approaches in fission yeast *Schizosachromyces pombe*	Dr. Shakil Ahmed
Anti-osteoclastogenic effect of 99/373 and its mode of action	Dr. N. Chattopadhyay
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
Investigation on involvement of adipose tissue in persistence of pathogenic mycobacteria	Dr. Y.K. Manju
Design and development of database and analytical tools for microarray data on *Leishmania donovani* parasite.	Dr. Neeloo Singh
Understanding mechanism of action of the anti-osteoporotic activity of compounds K095 & 1709	Dr. S. Sanyal
Schizophrenia: Developing animal models, translational markers and a possible treatment strategy	Dr. Gautam Palit
The birth of the first Indian leishmania genome sequence	Dr. Neeloo Singh
Identification of ER alpha interacting proteins from tamoxifen induced and uninduced MCF7 cells: A mass spectrometry based proteomics approach	Dr. A.K. Trivedi
Structural analysis of bacterial peptidyl-t RNA hydrolase enzymes & 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
Indian Council of Medical Research, Government of India	
Target based design and synthesis of novel compounds for treating diabetes and dyslipidemia	Dr. Atul Goel
Syntheses of antimalarial agents and their combinatorial chemistry	Dr. P.M.S. Chauhan
Design, synthesis and bio-evaluation of novel hybrid compounds for antimalarial activity	Dr. Sanjay Batra
Design, synthesis and evaluation of new chemical entities against a typical *Mycobacterium-2-fortuitum*	Dr. R. Srivastava
Cytokine gene polymorphism in breast cancer patients	Dr. Rituraj Konwar
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 endometrial cell proliferations and uterine hyperplasic formation	Dr. Anila Dwivedi
Design, synthesis and biological evaluation of HIV-1 RT inhibitors-4-thiazolidinone compounds	Dr. S.B. Katti
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. K. Srivastava
Development of antiulcer drug from Indian medicinal plant *Tectona grandis*	Dr. Gautam Palit
Defense Research & Development Organization	
Effect of monoisoamyl 2,3-dimercaptosuccinic acid on cardiovascular and respiratory parameters in the rat	Dr. Madhu Dikshit
Synthesis of biologically active molecules from carbohydrates based ligands for potential applications in defense	Dr. R.P. Tripathi
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
AYUSH	
Mass spectrum fingerprinting of Indian medicinal plants (a special reference to antidiabetic aspect)	Dr. Brijesh Kumar
INDUSTRY SPONSORED PROJECTS	
Stability and formulation development studies of ormeloxifene and authentification of *cis* and *trans* standards (HLL Life Care, Thiruvananthapuram)	Dr. A.K. Dwivedi
DPP IV inhibitor (coded OCID 3570) in Rhesus monkeys (Orchid Research Laboratory Limited, Chennai)	Dr. S.K. Puri
Identification of bioactive marker(s) from *Cissus quarangularis* extract (Supreem Pharmaceuticals Mysore Pvt. Ltd., Mysore)	Dr. N. Chattopadhyay

5 Human Resource Development

1 Training programmes attended by CDRI Staff

Dr. Gautam Palit

- ICMR-FERCAP human subject protection course, SGPGI, Lucknow, 6-8 Aug., 2010.

Dr. J.S. Srivastava

- ICMR-FERCAP human subject protection course, SGPGI, Lucknow, 6-8 Aug., 2010;
- National Workshop on Ethics, Tata Memorial Hospital, Mumbai, 6 Oct., 2010;
- ICMR-FERCAP standard operating procedure course, SGPGI, Lucknow, 17-19 Dec., 2010.

Dr. Rakesh Shukla

- ICMR-FERCAP human subject protection course, SGPGI, Lucknow, 6-8 Aug., 2010;
- R & D Project Management, HRDC, Ghaziabad, 20-24 Sept., 2010;
- ICMR-FERCAP standard operating procedure course, SGPGI, Lucknow, 17-19 Dec., 2010.

Mr. Vinay Tripathi

- IPR & WTO issues, TIFAC, DST, Gurgaon, 27-31 Dec., 2010.
- Workshop on IP protection and management issues, HRDC, Ghaziabad, 22-23 Feb., 2010.

Dr. R.K. Singh

- Training programme on crafting effective S&T communication, HRDC, Ghaziabad, 07-09, Apr., 2010;
- Entrepreneurship development programme, HRDC, Ghaziabad, 26-31 July, 2010.

Dr. Kumkum Srivastava

- Entrepreneurship development programme, HRDC, Ghaziabad, 26-31 July, 2010.

Dr. Anand P. Kulkarni

- MDP on financial management in scientific organisations, National Institute of Financial Management, Faridabad, 28 June - 2 July, 2010.
- Development of technology commercialization and transfer specialists, Consultancy Development Centre, New Delhi, 24-26 Feb., 2010.

Dr. Kashif Hanif

- Workshop on research methodology, AIIMS, New Delhi, 16-21 Aug., 2010.

Mr. Naseem A. Siddiqui

- Development of technology commercialization and transfer specialists, Consultancy Development Centre, New Delhi, 24-26 Feb., 2010.

Mr. Wahajuddin

- National workshop on application of chromatography and mass spectrometry in clinical research, Jadavpur University, Kolkata, 20-24 Sept., 2010;
- Workshop on research methodologies, AIIMS, New Delhi, 16-21 Aug., 2010;
- International short course and workshop on applied pharmaceutical analysis, Hyderabad, 21-25, Feb., 2010;
- Advanced workshop on patent strategies, HRDC, Ghaziabad, 1-4 Feb., 2010.

Dr. Sripathi Rao Kulkarni

- Advanced workshop on patent strategies, HRDC, Ghaziabad, 1-4 Feb., 2010.
- Workshop on IP protection and management issues, HRDC, Ghaziabad, 22-23 Feb., 2010.

Dr. Sanjeev Yadav

- Induction training programme for newly recruited scientists B & C, HRDC, Ghaziabad, 4-13 Jul., 2010.

Dr. H.K. Bora

- Training programme on recent advances in disease diagnosis, IVRI, Izatnagar, 1-21 Oct., 2010.

Ms. Neha Topno

- Training on techniques in virology, NIV, Pune, 13 Sept. – 01 Oct., 2010.

Dr. Mukesh Srivastava

- A short course in bio-statistics on multilevel modelling and generalized estimating equations, CMC, Vellore, 6-10, Dec., 2010.

Mr. A.S. Kushwaha

- Crafting effective S&T communication, HRDC, Ghaziabad, 7-9 Apr., 2010.

Mr. Varun Kumar Pathak

- CSIR orientation programme for newly promoted Sr.PS/PS/PA, HRDC, Ghaziabad, 24-26 May, 2010.

Mr. Jitendra Patel

- CSIR orientation programme for newly promoted Sr.PS/PS/PA, HRDC, Ghaziabad, 24-26 May, 2010.

International Workshop on Recent Trends in IP Practice and Management, CDRI, Lucknow, 5-6 Oct., 2010

About 45 scientists from CDRI attended the International Workshop on Recent Trends in IP Practice and Management, organized at CDRI in collaboration with the United States Patent & Trademark Office (USPTO) during 5-6 Oct., 2010.

2 Ph.D. Thesis Submitted

	Name of the Research Fellow	Title of the Thesis/*Supervisor*
Jawaharlal Nehru University, New Delhi		
1	**Mr. Abhishek Desai**	Studies on the role of nuclear factor-kB in cerebral stroke/ ***Dr. Ram Raghubir***
2	**Ms. Akansha**	Phytochemical investigation of Indian medicinal plants and chemical transformation of bioactive compounds/ ***Dr. Rakesh Maurya***
3	**Mr. Brijesh Kumar Pandey**	Studies on the structure–function relationships of membrane-active segments derived from pore forming toxin and antimicrobial peptides/ ***Dr. J.K. Ghosh***
4	**Ms. Dimpy Sikriwal**	Design and synthesis of some antitubercular compounds and studies in C-C bond forming reactions/***Dr. D.K. Dikshit***
5	**Mr. Gaya Prasad Yadav**	Structural and functional studies on molecules of biological importance/ ***Dr. Ravishankar R.***
6	**Mr. Manmeet Kumar**	Phytochemical investigation of Indian medicinal plants in search of bioactive natural products/ ***Dr. Rakesh Maurya***
7	**Mr. Nagsen Gautam**	Pharmacokinetics of novel antidiabetic agents and a highly effective antimalarial trioxane (99-411) / ***Dr. S.K. Singh***
8	**Ms. Nidhi Sethi**	Design and synthesis of DPP-IV inhibitors as anti-diabetic agents/ ***Dr. S.B. Katti***
9	**Mr. Rajeev Kumar**	Novel therapeutic strategies for the management of prostatic hyperplasia and the molecular mechanisms involved in these therapies/ ***Dr. Gopal Gupta***
10	**Mr. Ravi Kumar Gupta**	Studies on autocrine growth factors involved in the resuscitation of dormant mycobacteria/ ***Dr. Ranjana Srivastava***
11	**Mr. Rituraj Niranjan**	Study on the role of molecular and cellular mediators involved in neuro-inflammation/ ***Dr. Rakesh Shukla***
12	**Mr. S.V.S.R. Krishna Pulavarti**	Solution structure dynamics of peptidyl-tRNA hydrolase from *Mycobacterium tuberculosis* H37Rv/ ***Dr. Ashish Arora***
13	**Ms. Satinder Kaur**	Molecular characterization of *Mycobacterium tuberculosis* H37Rv protein(s) involved in persistence/latency/ ***Dr. Ranjana Srivastava***
14	**Ms. Shraddha A. Sane**	Antileishmanial treatment using chemotherapy in combination with immune-modulators in experimental visceral leishmaniasis/ ***Dr. Suman Gupta***
15	**Mr. Shrawan Kumar Mishra**	Study of toxicity and differential gene expression in mice following exposure to selected antimalarial drugs/ ***Dr. S.K. Rath***
16	**Mr. Shreekant Deshpande**	Synthesis, biological evaluation and QSAR studies of novel antimalarial agents/ ***Drs. S.B. Katti & Y.S. Prabhakar***
17	**Mr. Sidharth Shankar Jha**	Studies on Erp (Exported Repetitive Protein Rv3810) of *M. tuberculosis* H37Rv/ ***Drs. Charu Sharma & Amit Misra***
18	**Mr. Somnath Nag**	Exploration of the synthetic utility of substituted 1,3-amino alcohols and allylamines for generating biodynamic agents/ ***Dr. Sanjay Batra***
19	**Mr. Subir Biswas**	Analysis of nuclear-encoded proteins putatively involved in translation of *Plasmodium falciparum* apicoplast DNA/ ***Dr. Saman Habib***
20	**Mr. Surendra Kumar Bisht**	Synthesis of new antitubercular agents based on carbohydrates, aromatics and heterocycles / ***Dr. R.P. Tripathi***
21	**Ms. Uzma Saqib (nee Saeed)**	Molecular modeling and structural bioinformatics studies on protein drug targets of type II diabetes and anti-diabetic agents/***Dr. M.I. Siddiqi***
22	**Mr. Vikas Kumar**	Synthesis of derivatives of monosaccharides for drug discovery/ ***Dr. A.K. Shaw***
23	**Mr. Virender Singh**	Design and synthesis of nitrogen containing medium ring and annulated heterocycles of biological interest/ ***Dr. Sanjay Batra***
Chhatrapati Sahu Ji Maharaj University, Kanpur		
24	**Ms. Amber Rizvi**	Role of drug metabolizing enzymes and glutathione system in development of drug resistance in *Plasmodium yoelii*/ ***Dr. Renu Tripathi***
25	**Ms. Prachi Bhargava**	Molecular cloning, expression and characterization of *Leishmania donovani* squalene synthase/ ***Dr. Uma Roy***
26	**Mr. Saman Raja**	Design synthesis and evaluation of thiazolidines as novel peroxisome proliferator activated receptor (PPAR-gamma) modulators/***Dr. S.B. Katti***

	Name of the Research Fellow	Title of the Thesis/*Supervisor*
27	**Mr. Sujith Kurian Joseph**	Parasitological and immunological studies on the effect of immunization with filarial worm fraction on subsequent infection in rodent host/***Dr. P.K. Murthy***
Lucknow University, Lucknow		
28	**Mr. Amit Kumar**	Synthesis and biological properties of 2-pyranone derived molecular scaffolds/ ***Dr. Atul Goel***
29	**Mr. Vinayak Singh**	Molecular characterization of *Mycobacterium tuberculosis* protein(s)/***Dr. Ranjana Srivastava***
Dr. Ram Manohar Lohia Avadh University, Faizabad		
30	**Mr. Kailash Chand**	Phytochemical investigation of medicinal plants and chemical transformation of bioactive compounds/***Dr. Rakesh Maurya***
31	**Ms. Preeti Rawat**	Chemical investigation of Indian medicinal plants in search of bioactive compounds/ ***Dr. Rakesh Maurya***
Jamia Hamdard University, New Delhi		
32	**Mr. Girish Kumar Gupta**	Ultra-thin polyelectrolyte capsules for non-invasive delivery of proteins and peptides/ ***Dr. A.K. Dwivedi***
Jiwaji University, Gwalior		
33	**Ms. Gunjan Saxena**	Role of cholinergic system and mitochondria in caspase mediated apoptotic cell death in the experimental models of dementia/***Dr. C. Nath***
Aligarh Muslim University, Aligarh		
34	**Mr. Ausof Ahmad**	Development of anti-stress agents and establishing their mechanism of action/ ***Dr. Gautam Palit***
Gautam Budh Technical University, Lucknow		
35	**Ms. Jaspreet Banga**	Purification and characterization of microbial heparinase for production of low molecular weight heparins (LMWHs) acting as antithrombotic agents/***Dr. C.K.M. Tripathi***
Integral University, Lucknow		
36	**Mr. Shailendra S. Chaudhaery**	Synthesis, QSAR and molecular modeling studies on anti-alzheimer agents/ ***Dr. A.K. Saxena***
Dr. B.R. Ambedkar University, Agra		
37	**Mr. Ashok Kumar**	Synthesis of possible antiparasitic agents and their combinatorial chemistry/ ***Dr. P.M.S. Chauhan***

3 Sponsored trainings provided to external aspirants

Under the above program, the institute imparts training to the post-graduate students, fellows from foreign countries and aspirants from academia and industries across the India on various aspects of drug & pharmaceutical research, techniques in laboratory animals, tissue & cell culture, instrumentation, sophisticated analytical instruments and other laboratory techniques.

3.1 Training to post graduate students

During the calendar year January to December 2010, a total of 178 postgraduate students from 39 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.

3.2 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 20 M.S. Pharm students.

3.3 Training on tissue culture techniques

Training on tissue culture techniques was imparted to students from C.S.M. Medical University, Lucknow (4), Baba Saheb Bhimrao Ambedkar University, Lucknow (1); Amity Unversity, Lucknow (1) & B.G. College, Jaipur (1).

3.4 Training on breeding and management of laboratory animals

Training on breeding and management of laboratory animals was imparted to one student from Kanak Manjri Institute of Pharmaceutical Sciences, Rourkela and two students from Saraswati Dental College, Lucknow.

3.5 Short-term training on basics & application of sophisticated analytical instruments

Fifteen students from different universities/colleges were imparted training on the above subject at SAIF, CDRI.

6 Honours and Awards

Dr. Madhu Dikshit

Vigyan Ratna Samman 2009-10 (Council of Science & Technology, Uttar Pradesh)

Dr. Ram Raghubir

Brain Research Award, 2009 (Elsevier Publications)

Dr. Ravishankar R.

National Bioscience Award for Career Development 2010;

NASI Scopus Young Scientist Award 2010 in Biological Sciences

Dr. C. Nath

Fellow of National Academy of Medical Sciences, India

Dr. Smrati Bhadauria

Young Scientist Award In Medical Sciences 2010, Indian Science Congress Association

Dr. J.S. Srivastava

Dr. B.B. Sethi Oration Award, 2010 (Indian Psychiatric Society - Central Zone)

Dr. Sanjay Batra

Chemical Research Society of India Bronze Medal, 2010;

Chief-Co-Editor: Anti-infective Agents in Medicinal Chemistry

Dr. Rakesh Shukla

Fellow, Indian Academy of Neurosciences;

Fellow, Indian Pharmacological Society

Dr. Ashish Arora

Prof. B.K. Bachhawat Memorial Young Scientist Lecture Award, 2010 (National Academy of Sciences, India)

Dr. J.K. Saxena

Dr. B.N.Singh Memorial Oration Award, 2009 (The Indian Society of Parasitology)

Dr. A.K. Saxena

Fellow of Royal Society of Chemistry, Cambridge, UK

Dr. R.P. Tripathi

Excellence in Carbohydrate Research Award, 2009 (XXV Carbohydrate Conference, Shimla)

Dr. Neeraj Sinha

Fellow of the Association of Biotechnology and Pharmacy, India - 2010

Dr. Sanjeev Kumar Shukla

BOYSCAST Fellowship

Dr. P.M.S. Chauhan

Rashtriya Gaurav Award, 2010 (India International Friendship Society, Delhi)

Dr. Jayanta Sarkar

BOYSCAST Fellowship

Dr. Atul Goel

Alexander von Humboldt Fellowship

Dr. Kalyan Mitra

Best Electron Micrograph Award (International Conference on Advances in Electron Microscopy and Related Techniques, Mumbai)

Dr. Manoj Barthwal

IUSSTF Research Fellowship - 2010

Mr. Amit Kumar

Eli Lilly and Company Asia Outstanding Thesis Award - 2010 First Prize

Dr. Aamir Nazir

India Distinguished Visiting Fellowship University of Nottingham, UK

Mr. Prabodh Kapoor

Dr. M.M. Dhar Memorial Award, 2009 for Best Thesis in Biological Sciences

Dr. Akhilesh Kumar Tamrakar

BOYSCAST Fellowship

Mr. Mohammad Saquib

Dr. M.M. Dhar Memorial Award, 2009 for Best Thesis in Chemical Sciences

Mr. Rajkumar Verma

The Tokuji Ikenaka Gold Award for Best Poster (10th Biennial Meeting of the Asian Pacific Society for Neurochemistry, Phuket, Thailand)

Mr. Manish Kumar Suthar

Best Poster Award (International Conference of Indian Society of Chemists and Biologists - 2010)

Ms. Ruchi Saxena

Prof. N.J. Chinoy Award for Best Oral Presentation (International Symposium on Endocrinology and Reproduction: Molecular Mechanism to Molecular Medicine, New Delhi)

Ms. Jyoti Bhardwaj

Best Poster Award (22nd National Congress of Parasitology, 2010)

Dr. Neetu Singh

Gufic Prize for the Best Paper (43rd Indian Pharmacological Society Meeting, NIN, Hyderabad)

Mr. Ravi Shankar Keshari

Appreciation Award for Poster (79th meeting of Society of Biological Chemists, India)

Dr. Antima Gupta

UNESCO L'OREAL International Fellowship

Ms. Neetu Singh

Appreciation Award for Poster (79th meeting of Society of Biological Chemists, India)

Mr. Sarvendra Vikram Singh

Best Poster Award (14th Annual Conference of Breast Cancer Foundation of India - 2010, Lucknow)

Ms. M. Lakshmi

Selected for Biocamp, 2010 (Novartis, Hyderabad)

Mr. Vikram Khedgikar

Best Poster Award (6th National Conference of Indian Society for Bone and Mineral Research, New Delhi)

Other Activities

1 Major Events Organized

CDRI Annual Day

The Institute celebrated its 59th Annual Day on 17 February 2010. The function started with the annual prize distribution ceremony of CDRI Club, in which, its President, Dr. T.K. Chakraborty presided over. Dr. (Mrs.) Shusmita Chakraborty graced the occasion as Chief Guest. She presented prizes to the winners of different sport and field events, organized at the institute during a month long sports activities.

Dr. Shusmita Chakraborty felicitating the winners

The main function was organized in the afternoon in which Dr. Swaminathan Sivaram, Director, National Chemical Laboratory, Pune was the Chief Guest. Prof. Manoj Kumar Mishra, Vice Chancellor, Lucknow University presided over the function. Dr. T.K. Chakraborty presented a detailed account of the achievements made by CDRI during the reporting period. Dr. Sivaram in his address stressed upon the need to redefine the role of CSIR laboratories in the context of "emerging India". He congratulated CDRI for being instrumental in identifying the health needs of human beings and delivering world class drugs for the cure of different diseases and being ranked as both "innovative and entrepreneurial". Later, the dignitaries released the Annual Report 2009-10, followed by the launching of Memory Sure, a single plant based unique natural memory enhancer formulation. Appreciation Awards – 2010, under different categories, were announced and awardees were honored with a plaque, certificate and cash prize. Dr. M.M. Dhar Memorial Award for Best Thesis - 2009 was given to 2 research fellows. The employees, who completed 25 years of their continuous service in CDRI/CSIR, were also felicitated during the function.

(Top) Dr. Manoj Kumar Mishra felicitating Dr. Swaminathan Sivaram
(Bottom) Release of Memory Sure on 59th Annual Day functions

Mellanby Memorial Lecture

In memory of Sir Edward Mellanby, Founder Director, CDRI, the 35th Mellanby Memorial Lecture was organized on 17 February 2010. The lecture was delivered by Prof. Herbert Waldmann, Director, Max Plank Institute of Molecular Physiology, Germany. The topic of his presentation was *Biology Oriented Synthesis*. Prof. Waldmann gave a detailed account of compound classes being used for chemical biology and medicinal chemistry research. According to him, underlying frameworks of natural products provide evolutionary selected chemical structures, encoding the properties, required for protein binding. Biology oriented synthesis, build on these arguments, offers a conceptual alternative for guiding strategies for library design and chemical diversity. Mr. Felix Kahle, Max Plank Society, Munich, Germany presided over the function.

Dr. T.K. Chakraborty felicitating Prof. Herbert Waldmann

Dr. T.K. Chakraborty felicitating Mr. Felix Kahle

4th International Symposium on Current Trends in Drug Discovery Research (CTDDR)

An International symposium on CTDDR was organized during 17-21 February, 2010. The event was sponsored by CSIR, ICMR, DBT, DST, DOD and Novo Nordisk. About 500 researchers from India and around 50 experts from abroad participated in the symposium.

During the inaugural session, while welcoming the delegates, Dr. T.K. Chakraborty, Director, CDRI said that India has now become self-sufficient in the field of drug discovery and health-care, more

after the GATT agreement which brought forward the patent era of the drug molecule.

The inaugural lecture was delivered by Prof. Johann Gasteiger (Germany) who received the *ACS Award for Computers in Chemical and Pharmaceutical Research* for his outstanding achievements in research and education in the field of cheminformatics. He recalled his earlier visits of Lucknow, a city known for its cultural heritage and presented a book on Lucknow to Dr. A.K. Saxena, the Organizing Secretary of the Conference. Dr. Nitya Anand, Former Director, CDRI, delivered the presidential address.

The symposium focussed on the innovative approaches, being applied world-wide in the field of drug discovery and development for infectious and tropical diseases, aging, genetic, metabolic, endocrine and reproductive disorders. Deliberations were held on wide range of topics including the computational endeavours, innovative drug discovery approaches and in-depth analysis of structure activity relationships, new drug targets and state-of-art techniques for synthesis of organic molecules.

FP7 Health Info Day and Training

European Union and India Enhanced Cooperation Framework for Improved Bilateral Dialogue in the Field of Science and Technology (EUINEC) is a BILAT project funded by the European Commission via the Seventh Framework Programme for Research and Technological Development (FP7), Capacities Specific Programme, International Co-operation (INCO). Comprehensive one day programme on **FP7 Health Info Day and Training** was organized in the Institute on 12 March 2010. The event was designed to provide Indian stakeholders with the skills needed to successfully develop FP7 proposals, get informed about research priorities and be guided through the entire process of research proposal development; from call identification to proposal submission, including budget preparation, IPR and on methods, to be adopted for European funding.

More than 100 researchers, from various Lucknow based institutes and universities, participated in the programme. Dr. T.K.

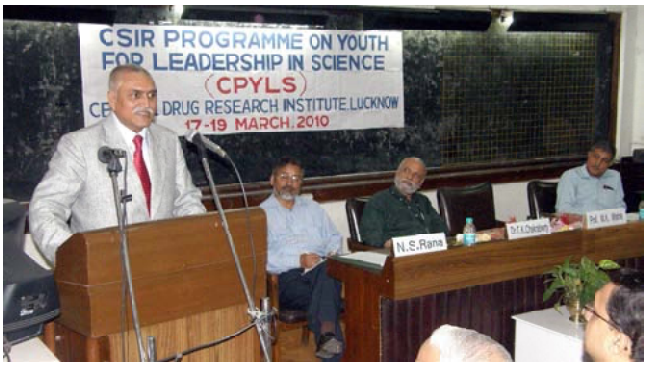
Dr. Sudeep Kumar delivering the opening remarks

Dr. Stephan Hogan addressing the audience

Chakraborty, Director, CDRI and Dr. Sudeep Kumar, Head, PPD, CSIR, New Delhi delivered welcome address and opening remarks. Dr. Stephan Hogan, Directorate for Health DG Research – European Commission and Dr. B. Kundu, Scientist G, CDRI, delivered keynote speeches.

CSIR Program on Youth for Leadership in Science-2010 (CPYLS)

The three-day CPYLS program was organized during 17-19 March 2010. The event was aimed to inculcate interest in science amongst the meritorious students right from the High School level. Dr. T.K. Chakraborty, Director, CDRI welcomed the students selected for the program. Prof. Manoj Kumar Misra, Vice Chancellor, Lucknow University was the Chief Guest. Fifteen meritorious students from Uttar Pradesh participated and eminent scientists from CDRI delivered lectures. Students visited different laboratories and interacted with bench scientists about the excitements associated with science and discoveries.



(Top) Dr. M.K. Mishra addressing the youth during CPLYS program and (Bottom) Students interacting with bench scientists.

National Seminar on Laboratory Animal Ethics, Technology and Alternatives

The National Laboratory Animal Centre (NLAC) organized a one day **National Seminar Laboratory Animal Ethics, Technology and Alternatives** on 19 March 2010 in collaboration with the Laboratory Animal Science Association of India (LASAI). Major focus of the seminar was scientific and ethical subjects on care, management and use of laboratory animals in biomedical research, education and testing programmes, providing an opportunity to discuss the topics of common interests, for science as well as animals' welfare.

At the outset, Dr. D.S. Upadhyay, Head, NLAC and the Organizing Secretary of the seminar presented a brief view of the objectives and genesis of this meeting. Inaugurating the seminar, Dr T.K. Chakraborty, Director, CDRI emphasized upon judicious use of animals in research. Addressing the meeting, he highlighted the significance of healthy animal models, required to generate authentic, repeatable and homogeneous research data. He emphasized upon implementing and practicing the norms of good laboratory practice (GLP) in the animal facility so as to maintain the quality and standards of animals. On the occasion, he released a 'Souvenir' and the 'LASAI Newsletter'.

Delivering the presidential guest speech, Dr. K.R. Bhardwaj, President, LASAI stated the fabulous performances made by the NLAC in the field of laboratory animal science, especially in management and production of defined animal models, conducting training programmes, organizing scientific meetings, seminars and symposia to upgrade and disseminate the knowledge in the relevant area.

Workshop on Basics and Application of Mass, NMR, IR, Flowcytometry and Elemental Analysis

The Sophisticated Analytical Instrument Facility, CDRI organized a training programme on the above subject during 21-25 June 2010. The program was attended by 15 aspirants from different universities and colleges and provided basics and hands on training on different techniques.

2nd CDRI-NIPER (RBL) Symposium on Medicinal Chemistry and Pharmaceutical Sciences

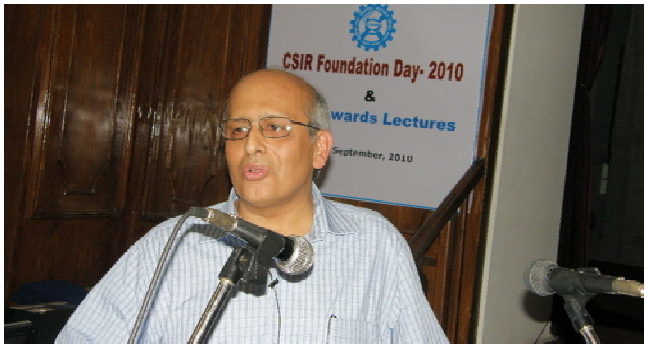
The 2nd CDRI-NIPER(RBL) Symposium on Medicinal Chemistry and Pharmaceutical Sciences was organized during 25-27 March 2010 at Central Drug Research Institute, Lucknow. This symposium was held to expose students of NIPER (RBL) and several other pharmacy colleges of the country, to recent developments in the frontier areas of drug discovery and development including the delivery systems. The symposium was successful with 170 registered participants attending the same. The inaugural keynote address *"Understanding the virulence and pathogenicity of*

infectious micro-organisms" was delivered by Padma Shree Prof. Seyed E. Hasnain, Vice Chancellor, University of Hyderabad and Member of the Scientific Advisory Committee to the Prime Minister. The inaugural function was presided over by Prof. Manoj Mishra, Vice Chancellor, Lucknow University, Lucknow. Eminent speakers, both from pharma-industry and academia, delivered a total of sixteen lectures during two days of scientific deliberations. Several current topics such as (i) *in silicio* and structure-based drug design, (ii) nano-medicine, (iii) biological control of diseases such as cancer and diabetes, (iv) industry perspective of drug discovery, (v) cocrystals as new API, (vi) role of chirality, (vii) metabolomics through NMR and (viii) drug delivery systems were presented and discussed by the speakers.

CSIR Foundation Day

The Institute celebrated the 68th CSIR Foundation Day on 26 September 2010. During the day, a Science Exhibition was organized in the CDRI Museum which was inaugurated by the Dr. Shahid Jameel, Scientist, ICGEB, New Delhi. The exhibition remained open for students and general people throughout the day.

A function was organised in the forenoon, in which, Dr. Jameel delivered Foundation Day Lecture on ***Evasion of Host Immunity by HIV***. Dr. V.P. Kamboj, Former Director, CDRI, presided over the function.



The main function was organised in the afternoon. Dr. Shahid Jameel felicitated CDRI staff members who completed 25 years of their service in CSIR and also presented a certificate, wrist watch and a shawl to the employees who superannuated between September 2008 and August 2009. Besides, studentship and cash awards were given to children of staff members for winning essay/ quiz competitions by Dr. (Mrs.) Shusmita Chakraborty.

CDRI Award-2010

The CDRI Award for Excellence in Drug Research – 2010 was announced in favor of Prof. Dulal Panda (Indian Institute of Technology, Mumbai) and Prof. G. Mugesh (Indian Institute of Science, Bangalore) in the areas of life sciences and chemical sciences respectively. On CSIR Foundation Day, 26 September 2010, Prof. G. Mugesh was honoured with CDRI Award-2010 for Chemical Sciences. He delivered award oration on ***Metalloprotiens as Drug Targets: Inhibition of Peroxidase-catalysed Iodination by Antithyroid Drugs.*** Prof. Dulal Panda was honoured with CDRI Award-2010 on 16 November 2010. He delivered award oration on ***Inhibition of FtsZ assembly dynamics: A promising approach for antibacterial therapy.***

(Top) Prof. G. Mugesh and (bottom) Prof. Dulal Panda receiving the CDRI AWARD-2010.

Prof. B.K. Bachhawat Memorial Young Scientist Lecture Award - 2010

The National Academy of Sciences, India (Lucknow Chapter) organized a function on September 29, 2010 to honor Dr. Ashish Arora, Scientist, CDRI with Prof. B.K. Bachhawat Memorial Young Scientist Lecture Award-2010. Dr. Arora delivered award lecture on *Understanding the Soft-Skills of Drug Target Proteins using NMR Spectroscopy.* Dr. T.K. Chakraborty, Chairman, NASI (Lucknow Chapter) presented the Citation, Prof. Krishna Mishra, General Secretary, NASI presented Gold Medal and Dr. K.C. Gupta, Advisor, NASI presented the cash award to Dr. Arora.

Vigilance Awareness Week

In accordance with the guidelines of Central Vigilance Commission, Vigilance Awareness Week was organised during 25 October to 1 November 2010. 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, CDRI.

Communal Harmony Week

In accordance with the guidelines of National Foundation for Communal Harmony, the Institute celebrated Communal Harmony Week during 19-25 November 2010. All staff members of the CDRI took a pledge on this occaison to effectively promote the values of communal harmony and national integration amongst the people.

CSIR Technofest-2010

CDRI, Lucknow participated in CSIR Technofest-2010 at Hall No. 11 in Pragati Maidan which was inaugurated by our Hon'ble Minister (Science & Technology) Shri Kapil Sibal ji and was also visited by Shri Prithviraj Chavan, presently Chief Minister of Maharashtra, which is a partner State in IITF. Our hall in CSIR Technofest-2010 has got overwhelming response. The whole CSIR team put forward its best efforts to showcase CSIR's contributions in a 'unexhibition' manner, that is, where industry and other partners speak about us. On this occasion, CDRI's Memory Sure and other products were the center of attraction for all the visitors.

Glimpses of CSIR Technofest-2010

First Convocation of NIPER, Raebareli

More than 15 years ago, Government of India, recognizing the need to create a state-of-the-art teaching and research institute in pharmaceutical sciences to keep pace with the rapid strides being made by ever expanding Indian Pharma Industry, created the first "National Institute of Pharmaceutical Education & Research" at Mohali, Punjab. The institute was created by an act of the Parliament under the aegis of Ministry of Chemicals and Fertilizers. Encouraged by the significant role played by NIPER, Mohali in meeting the demands of Indian Pharma Industry, Government of India decided to create six new NIPERs at Ahmedabad, Hyderabad, Kolkata, Hazipur, Guwahati and Raebareli to function as centres of excellence for higher education, research and development in pharmaceutical sciences. Each of these newly created NIPERs were put under mentorship of an established proximal scientific institution.

The **National Institute of Pharmaceutical Education and Research (NIPER), Rae Bareli** started functioning from 14th November 2008 under the mentorship of the Central Drug Research Institute, Lucknow. NIPER, Raebareli offers M.S. (Pharm.) courses in Medicinal Chemistry and Pharmaceutics. Students of NIPER complete their project work (2nd year) at CDRI under supervision of CDRI scientists.

The first batch of students has successfully completed their M.S. Pharm. in 2010. The first convocation of NIPER was held at CDRI, Lucknow on 15th December 2010 where Prof. Lal Ji Singh, Former Director, CCMB, Hyderabad was the chief guest. The degrees were awarded jointly by Prof. Lal Ji Singh and Mr. Arun Jha, Joint Secretary, Department of Pharmaceuticals, Govt. of India.

Holistic Health Education Programme for Rural Schools

CDRI organized a two days **Health Awareness Programme** on 1-2 December 2010 at **Govt. Inter College Baroli-Jata**, District Barabanki (U.P.). The inaugural function was presided by Dr. S.K. Puri, Scientist 'G', CDRI. Dr. A.K. Dube, District Inspector of Schools, Barabanki and Dr. Uday Mohan, CSJM Medical University, Lucknow graced the occasion as Chief Guests. On the occasion, the winners of the health quiz, essay & drawing competitions, held on 26 November 2010, were presented with attractive prizes.

Continuing the programme, CDRI, in collaboration with Chief Medical Officer, Barabanki and CHC Baroli, organized a two days **"Health Camp"** on 23-24 December 2010 at the above college. The camp was inaugurated by Dr. S.K. Puri. In the camp, 4 specialized doctors including 2 lady doctors, deputed by CMO Barabanki, thoroughly investigated about 600 students. In the camp, free medicines were distributed. The camp concluded with a brief valedictory function presided by Mr. N.S. Rana, Senior Scientist, CDRI. On behalf of the Director, CDRI, Mr. Rana presented mementos to all doctors, paramedical staff, principal and staff of the college in recognition of their contributions in holding the Health Camp very successfully. In his concluding remarks Mr. S.P. Mishra, Principal of the college, expressed his gratitude towards Director, CDRI and other team members for such wonderful programme which has immensely benefitted all the students of the college.

Rajbhasha Events

Six Monthly Meeting of Nagar Rajbhasha Karyanvayan Samiti, Lucknow

The six monthly meeting of *Nagar Rajbhasha Karyanvayan Samiti (NRKS), Lucknow* was organized in HAL auditorium Lucknow on 28th July 2010. On this occasion, Joint Secretary Rajbhasha Vibhag, Home Ministry, Govt. of India, Mr. D.K. Pandey inaugurated and Dr T.K. Chakraborty, Director, CDRI chaired the meeting. During the meeting, Dr. V.N. Tiwari, Senior Hindi Officer, CDRI and Secretary NRKS presented the report of all 120 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. Mr. D.K. Pandey also delivered a speech and launched the website of NRKS on this occasion. Meeting was

completed with vote of thanks by Mr. C.K. Vishwakarma, Chief of Production, HAL Lucknow.

Hindi Pakhwara

CDRI, Lucknow organised a "*Hindi Pakhwara*" from 14-28 September 2010. The session was inaugurated by Honourable Governor's Chief Secretary Mr. G. Patnayak. On this occasion, the Chief Guest expressed his views on the "Determination for work in Hindi language". During this session, various competitions were organized in which employees of CDRI as well other member offices participated. The closing ceremony was organized on 28 September 2010, where, Chief Guest, Prof. Manoj Kumar Mishra, Vice Chancellor, Lucknow University delivered his lecture and honoured the winners of various competitions. The session was concluded with the vote of thanks by Dr. V.N. Tiwari.

Hindi Karyashala

A two days workshop on *Hindi Bhasha* was organized in CDRI from 24-25 June 2010, in which the employees and officers of Institute and NRKS participated. During his inaugural speech, Chief Guest, Mr. G.K. Goswami (IPS), expressed his thoughts on **"Cyber Crime"**. On this occasion Institute's Senior Hindi Officer Dr. V.N. Tiwari delivered a lecture on, "***Vyagaynik/Prashasnik Paribhashik Shabdavali"***. The workshop was concluded with the vote of thanks by Mr. A.P. Rai, Senior Geologist, Lucknow.

Further, a two days workshop on *Hindi Bhasha* was organized in CDRI during 29-30 December 2010, in which Mr. Anil Agrawal, Inspector General of Seema Shashtra Bal (SSB) was 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.

2 Diamond Jubilee Celebrations

Inaugural Ceremony

The inaugural ceremony of CDRI Diamond Jubilee Celebrations (1951-2011) was held on 14 July 2010. Dr. K. Kasturirangan, Member Planning Commission and Former Chairman, ISRO was the Guest of Honour. Dr. T.K. Chakraborty, Director, CDRI welcomed the dignitaries. He recalled contributions made by the ISRO under the leadership of Dr. K. Kasturirangan. Who later inaugurated the CDRI Diamond Jubilee Celebrations by unveiling of Diamond Jubilee Logo and Poster. Dr. Kasturirangan, in his address, expressed his gratitude to be a part of the inaugural ceremony of Diamond Jubilee Celebrations of an institute which has a very remarkable productive past. He appreciated achievements made by CDRI in the field of health and pharmaceutical research in India. He suggested younger generation to take lead from the foundation, established by the elder generations and lead India towards technology led inclusive growth. The ceremony concluded with vote of thanks by Dr. B. Kundu, Scientist G and Convener, Organizing Committee.



To commemorate the Diamond Jubilee Celebration several Mini Symposia were organized and Lectures were delivered during this year.

Diamond Jubilee Mini Symposium (19th July 2010)

Name, Address & Title of Lecture	
	**Prof. S. Chandrasekaran** IISc, Bangalore *Studies on lysine based peptide conjugates as inhibitors of Sir2 activity*
	**Prof. Santanu Bhattacharya** IISc, Bangalore *How can we disrupt telomerase function?*
	**Dr. G. Vijay Nair** NIIST, Trivandrum *Some novel C-C bond forming reactions involving NHC catalysis and related chemistry*
	**Dr. Arabinda Chaudhuri** IICT, Hyderabad *Cationic transfection lipids on targeted cancer therapy and DNA vaccination*

Diamond Jubilee Mini Symposium on Cardiovascular Diseases (11th August 2010)

Name, Address & Title of Lecture	
	**Dr. Rodger Paul McEver** Oklahoma Medical Research Foundation, USA *Leukocyte adhesion to vascular surface underflow*
	**Dr. Florea Lupu** Oklahoma Medical Research Foundation, USA *Pathophysiology and therapeutics of sepsis-induced organ failure in non-human primates*
	**Dr. Sanjay Banerjee** IICT, Hyderabad *SGLT1: A novel target for drug development in cardiomyopathy*

Diamond Jubilee Mini Symposium (18th August 2010)

Name, Address & Title of Lecture	
	**Prof. K.N. Ganesh** IISER, Pune *From peptide nucliec acid to PUNE nucleic acid*
	**Dr. Shekhar C. Mande** CDFD, Hyderabad *The changing paradigm of Mycobacterium tuberculosis heat shock proteins*
	**Dr. Rajesh S. Gokhale** IGIB, Delhi *Decoding biological systems diversity and metabolic networks*
	**Dr. R. Nagaraj** CCMB, Hyderabad Host-defence antimicrobial peptides: Do they have therapeutic potential?
	**Dr. Bhaskar Saha** NCCS, Pune *Dual CD40 signalling in immunity*

Diamond Jubilee Mini Symposium on Bone Biology and Metabolic Bone Disorders (12th November 2010)

Name, Address & Title of Lecture	
	**Dr. Mohan R. Wani** NCCS, Pune *Role of interleukin-3 in bone modelling*
	**Dr. Amitabha Bandyopadhyay** IIT, Kanpur *Role of BMP signalling in vertebrates: exceeding the brief?*
	**Dr. Sabyasachi Sanyal** CDRI, Lucknow *Estrogen regulation of osteoblast function: Can phytoestrogens be effective estrogen Mimic in osteoblast?*
	**Dr. Ravinder Goswami** AIIMS, New Delhi *Hypocalcemic disorders in India.*

Diamond Jubilee Mini Symposium on Bacosides Enriched Standardised Extract of *Bacopa* as Memory Enhancer (26th November 2010)

Name, Address & Title of Lecture	
	**Dr. Gautam Palit** CDRI, Lucknow *Neuropharmacological studies of Bacopa monniera*
	**Dr. Con Stough** Brain Science Institute, SU, Australia *On recent clinical trials being done in Australia.*
	**Dr. Subhas Kannan** Oze Marketing, Malaysia *Marketing experience in Malaysia since 1996*
	**Mr. Leonard Miguel** Daveben Enterprises Corp., Philippines Marketing experience in Philippines
	**Mr. Nigel Pollard** SFI, Australia Strategy on international marketing of Memory Sure

Diamond Jubilee Mini Symposium on Therapeutic Interventions for Malaria/Parasitic Diseases (2nd December 2010)

Name, Address & Title of Lecture	
	**Dr. Jeremy Burrows** Medicines for Malaria Venture, Geneva *Antimalarial medicinal chemistry challenges and opportunities*
	**Dr. Stephen A. Ward** Liverpool School of Tropical Medicine, Liverpool, UK *Ndh 2 as a potent drug target*

Diamond Jubilee Lectures

Name, Address, Title of Lecture & Date		Name, Address, Title of Lecture & Date	
	**Dr. Ganesh Pandey** NCL, Pune Adventure with the total synthesis of structurally complex biologically active alkaloids 29 July 2010		**Prof. Pinakpani Chakrabarty** Bose Institute, Kolkata Effect of protein structure due to the binding of ZnO nanoparticle 16 November 2010
	**Prof. Manoj K. Mishra** Lucknow University, Lucknow Dynamics of laser assisted selective bond dissociation 28 September 2010		**Dr. Lalji Singh** CCMB, Hyderabad Genetic diversity in Indian Population and its Health implications 15 December 2010
	**Prof. Harjinder Singh** IIIT, Hyderabad Computational studies of structure and dynamics of natural systems 28 September 2010		**Prof. Albrecht Berkessel** Cologne University, Germany Organocatalysis by hydrogen bonding networks 23 December 2010
	**Dr. Lluis Ribas de Pouplana** Institute for research in biomedicine, Spain Beyond tRNA recognition: New functions and biomedical applications related to the genetic code 10 November 2010		**Dr. N. Sukumar** Rensselaer Polytechnic Institute, NY, USA Cheminformatics and bioinformatics: From graphs to DIXELS to network topology 12 January 2011

International Workshop on Recent Trends in IP Practice and Management

As a part of ongoing CDRI Diamond Jubilee Celebrations 1951-2011, an international workshop on "Recent Trends in IP Practice and Management" was organized in collaboration with the United States Patent & Trademark Office (USPTO) during 5-6 October, 2010.

The workshop was inaugurated by lighting of the lamp and a brief talk by the dignitaries including Prof. Dr. (Mrs.) Saroj C. Gopal, Vice-Chancellor, CSMMU, Lucknow; Mr. R.K. Gupta, Head, IPMD-CSIR', Ms. Kalpana Reddy, First Secretary to Intellectual Property, US Embassy at New Delhi; Dr. A.K. Saxena, Acting Director, CDRI and Mr. Vinay Tripathi, Organizing Secretary of the workshop.

The principal objective of the workshop was to impart first hand exposure of current IP practices in US and India to research scientists and those involved in IP filing etc. The focus of deliberations were on patenting pharmaceuticals and biological materials encompassing the aspects of prior art search, documentation, establishing patentability, attending office actions, claims drafting and interpretation, comparative IP practices, technology transfer and portfolio management. About 100 aspirants from various universities, research institutes and industries participated in the Workshop.

3 Distinguished Visitors and Lectures

Name of Visitor	Title of Lecture	Date
Dr. S.R. Narhari Director, Institute of Applied Dermatology, Kasargod	Integrated management of lymphadenopathy in filariasis and other conditions	**08.01.2010**
Dr. John Watson Director, Cellular Analysis and Pharma/Biotech, Promega Corporation, USA	Using bioluminescent technologies to screen small molecule modulator of cell signaling pathways	**09.02.2010**
Dr. K. Swaminathan Associate Professor, Department of Biological Science, National University of Singapore, Singapore	Cell signaling and gene regulation: A structural address	**22.02.2010**
Prof. Tariq M. Haqqi Research Director, Department of Rheumatology Medicine, Metro Health Medical Centre, Ohio, USA	Natural products for use in arthritis	**08.03.2010**
Dr. Keshav K. Singh Professor of Oncology, Roswell Park Cancer Institute, New York, USA	Intergenomic crosstalk and its role in cancer	**10.03.2010**
Dr. Helen Parkes LGC, Teddington, Middlesex, UK	Comparable precise measurements: Under-pinning innovation in bioscience and healthcare	**18.03.2010**
Dr. Amarnath Mukherjee John Hopkins School of Medicine, USA	Targeting cancer: From the perspective of a chemist	**14.05.2010**
Dr. Megha The Welcome Trust/DBT India Alliance, Hyderabad	Empowering the best scientists to succeed in India	**11.06.2010**
Dr. Chandra Deb School of Medicine, Loma Linda University, USA	Role of T-cells in neuro-inflammatory disease	**30.08.2010**
Dr. Syed Qasim Mehdi Centre for Human Genetics & Molecular Medicine, Karachi, Pakistan	Genetic diversity in Asia	**27.10.2010**
Dr. Shozeb Haider The London School of Pharmacy, Sutton, UK	Molecular modelling on inhibitor complexes and active-site dynamics of cytochrome P450 C17: A target for prostate cancer therapy	**28.10.2010**
Rajesh Pandey Institute of Genomics & Integrative Biology, Delhi	REPETITIVE responses in stress	**19.10.2010**
Dr. B.N. Singh Lillehei Heart Institute, Minneapolis, USA	Molecular mechanism of stress, differentiation and regeneration in muscle cells.	**18.11.2010**
Prof. Suresh Rattan Laboratory of Cellular Ageing, Aathus University, Denmark	Healthy ageing: From molecular biology to hormesis	**19.11.2010**
Dr. Prasenjit Guchhait Department of Medicine, Baylor College of Medicine, Texas, USA	New mechanism for the hemolysis-induced thrombosis and vascular occlusion in patients with sickle cell disease and thalassemia and development of anti-thrombotic therapeutic agents	**23.11.2010**
Dr. R. Padmanabhan Professor, Georgetown University School of Medicine, Washington DC, USA	Molecular targets for dengue virus drug discovery	**20.12.2010**
Dr. Srinivas Pentyala Director, Translational Research, Health Sciences Center, Stony Brook, USA	Translational approach to drug discovery	**29.12.2010**

4 Visits by Distinguished Delegates

Dr. Thaw Zin, Director (Research), Department of Medical Research (LM), Yangon, Myanmar

Dr. Thaw Zin, Director (Research) and Dr. Khin Thay Yar Myint, Research Officer, Department of Medical Research, Yangon, Myanmar visited CDRI on 21-22 May 2010. The purpose of the visit was to explore the possibilities of R&D collaboration, sharing of infrastructure and knowledge base and exchange of scientific staff and research scholars for mutual S&T benefits. They visited various divisions and interacted with the scientists and research scholars.

Dr. Thaw Zin, in his concluding meeting the Director, CDRI, expressed his satisfaction over the expanse of learning and hospitality extended to them. Further, he expressed his optimism in development of cordial relationship between the two institutes in strengthening the infrastructure and knowledge base.

Vietnamese delegation

A five member Vietnamese delegation in the area of drug discovery visited the Institute on 24 June 2010. The objective of the visit was to observe the future research and development opportunities in the area of phytopharmaceutical products. The delegation was led by Mr. Nguyen Trong Binh, Executive Director, National R&D Program for Rural Area, Deputy DG, Department of Planning and Finance, Ministry of Science and Technology. The delegation visited various labs and discussed about the major facilities of CDRI for scientific collaboration.

Visit of Prof. Torsten N. Wiesel, Nobel Laureate (Physiology Medicine)

Prof. Torsten Nils Wiesel, a Swedish Nobel Laureate in Physiology or Medicine visited CDRI on 26 November 2010. CDRI organized an interactive session of Prof. Wiesel with young scientists of different scientific institutes of Lucknow. Several scientists from CDRI, IITR, KGMU and Lucknow University were present in this session and interacted with him. Prof. Wiesel is presently the Director of Shelby White and Leon Levy Centre for Mind, Brain and Behavior at Rockefeller University, New York, USA. He received Nobel Prize in 1981 for discoveries concerning information processing in the visual system.

5 Lectures Delivered by Institute Scientists

Dr. T.K. Chakraborty

- Drug discovery in academic and research institutes, AstraZeneca India Pvt. Ltd., Bangalore, 14 October 2010;
- Challenges in drug discovery : From natural products to designer molecule, (1) 2nd INDIGO Conference, Universitat Regensburg, Germany, 3-5 October 2010; (2) MSM-2010, IIT, Kanpur, 1-3 October 2010; (3) OSHWB, IICT, Hyderabad, 1-4 August 2010.

Dr. A.K. Saxena

- Computer-aided drug design tools in the identification of novel carbamates as potential alzheimer therapeutics, Technische Universität Dresden, Germany, 9 December 2010;
- Chemistry and biology of octa/deca hydropyrazino-pyridoindoles and related heterocyclics: A novel class of antipsychotic agents, Universität Regensburg, Germany, 3 December 2010;
- Role of CADD in current drug discovery and development, NRC, Cairo, Egypt, 30 November 2010;
- Application of QSAR and molecular modeling in drug design: A case study of β_3-adrenergic receptor agonists, University of Hyderabad, 5 August 2010;
- Computer aided modeling in the design and synthesis of PTP1B inhibitors as antidiabetic agents, Universität Erlangen-Nürnberg, Germany, 14 April 2010;
- Antithrombotic activity of substituted pyridoindoles, Universität Rostock, Germany, 12 April 2010;
- Approaches towards the design of antitubercular agents, Universität Klinikum Düsseldorf, Germany, 11 April 2010;
- Application of QSAR and molecular modeling in antihistamines (H1), Biotech Park, Lucknow, 25 February 2010;
- Molecular modeling studies on antialzheimer agents, University of Delhi, New Delhi, 6 January 2010.

Dr. Ranjana Srivastava

- Persistence and latency: A survival strategy for pathogens, BHU, Varanasi, 19 February 2010;
- Biosafety issues related to recombinant DNA technology and disposal, CDRI, Lucknow, 26 February 2010;
- Mining of the TB genome for drug targets, Rourkela, Orissa, 1 October 2010.

Dr. Gautam Palit

- Drug discovery based on natural products: Identification and evaluation of functional leads for peptic ulcer disease, University of Delhi, New Delhi, 7 January 2010;
- Neuropharmacological studies of *Bacopa monniera,* CDRI, Lucknow, 26 November 2010;
- Identification and evaluation of functional leads from Indian medicinal plants for peptic ulcer disease, Amity University, Lucknow, 27 August 2010;
- Development of NMDA receptor modulated experimental model of psychosis in mice, NIN, Hyderabad,15 December 2010.

Dr. S.B. Katti

- Thiazolidine-4-ones: A new scaffold as antihyperglycaemic agents, University of Rajasthan, Jaipur, 15 November 2010.

Dr. C. Nath

- Neuropharmacology and molecular mechanisms of memory disorders, Jiwaji University, Gwalior, 15 April 2010;
- Animal models for CNS disorders, Jiwaji University, Gwalior, 16 April 2010;
- Intracerebroventricular administration of streptozotocin in rat: Memory impairment and hippocampal insulin receptors, Lucknow, 27 November 2010.

Dr. R.K. Sharma

- An overview of bioinformatics: Tools, technologies and opportunities, Kusmaur, U.P., 2 September 2010;
- Database and data mining technologies and their application in bioinformatics, Kusmaur, U.P., 2 September 2010;
- Drug designing for parasitic diseases: A bioinformatics approach, Biotech Park, Lucknow, 23 June 2010;
- Bioinformatics applications: An introduction to drug design, Biotech Park, Lucknow, 8 October 2010.

Dr. J.S. Srivastava

- (1) Inducement and compensation; (2) Informed consent process, SGPGI, Lucknow, 6 August 2010;
- Introduction of bioethics, CSMMU, Lucknow, 21 September, 2010.

Dr. K. Awasthi

- Supramolecular chemistry: Role of crystal engineering and molecular recognition, Dr. B.R. Ambedkar University, Agra, 25 October 2010.

Dr. A.K. Dwivedi

- HPLC technique in pharmaceutical research, Dr. B.R. Ambedkar University, Agra, 25 October 2010.

Dr. Madhu Dikshit

- Use of flow-cytometry in neutrophil function assessment in functional flow-cytometry and invited faculty at advanced clinical applications of flow-cytometry KEM Hospital, Mumbai, 23 February, 2010;
- Role of neutrophils, free radicals and nitric oxide in the various physiological and cardiovascular pathological conditions, RGCB Thiruvananthapuram, 6 August 2010;
- Endothelial dysfunction, insulin resistance, oxidative stress and myocardial ischemia/reperfusion injury in long term fructose fed rats, Leh, Ladakh, 29 September 2010;
- Status of neutrophil nitric oxide/nitric oxide synthase in neurological disorders, CSMMU, Lucknow, 24, November 2010.

Dr. Rakesh Shukla

- The mechanism of neuroinflammation and its modulation by melatonin, Jiwaji University, Gwalior, 30 November 2010.

Dr. J.K. Saxena

- Hexokinase and transketolase: Potential drug targets of filarial and malarial parasites, Kalyani University, West Bengal, 31 October 2010;
- Identification and molecular characterization of novel drug targets of malarial parasite, Allahabad University, 10 December 2010.

Dr. Sudhir K. Sinha

- Challenges in anti-TB drug discovery and the CDRI initiative, Bangalore, 12 October 2010.

Dr. W. Haq

- New Approaches to diabetes therapy, Dr. B.R. Ambedkar, University, Agra, 25 October 2010.

Dr. Neeraj Sinha

- Birth defects: Meeting the challenge, Thapar University, Patiala, 12 November 2010;
- NMR based metabonomics – A platform for early diagnosis, IVRI, Izatnagar, 18 October 2010.

Dr. D.S. Upadhyay

- Animal welfare: Significance and implications, BHU, Varanasi, 4 October 2010.

Dr. P.M.S. Chauhan

- Nitrogen heterocycles a versatile class for antiparasitic chemotherapy, Delhi University, New Delhi, 5 March 2010;
- Design and synthesis of nitrogen heterocycles as novel therapeutic agents, Varshney college, Aligarh, 9 October 2010;
- Perspectives and challenges in drug research, Dr. B.R. Ambedkar University, Agra, 25 October 2010.

Dr. R.K. Singh

- Environmental toxicology of commonly used fertilizers in fresh water fishes, S.S.K. Girls Degree College, Allahabad, 21 November 2010;
- Hematological disorder in rice mill workers of Barabanki district, Uttar Pradesh, C.S.J.M. University, Kanpur, 22 November 2010.

Dr. Neena Goyal

- Microarray: differential gene expression studies and its application in microbiology, CFTRI, Mysore, 9 March 2010;
- DNA microarray of leishmania: A tool for drug discovery and development, University of Allahabad, 23 January 2010.

Mr. Pradeep Kumar Srivastava

- DNA technology and human genome, Shobhit University, Meerut, 24 April 2010;
- Nanotechnology and drug research, (1) NBRI, Lucknow, 11 May 2010, (2) Lucknow, 25 May 2010, (3) IIT, Kharagpur, 10 September 2010, (4) IIT, Kanpur, 25 September 2010, (5) MNIT, Jaipur, 22 October 2010;
- DNA technology and crime, DNA Research Center, Hyderabad, 29 October 2010;
- Chemical education and scientoonics, Homi Bhabha Center for Science Education, Mumbai, 13 November 2010;
- Nanotechnology and scientoonics, NASC Complex, Pusa, New Delhi, 6 December 2010.

Dr. Jawahar Lal

- Standardization of herbal drug preparations using LC-MS, Hyderabad, 2 March 2010;
- Biological methods validation for pharmacokinetic studies, KIET School of Pharmacy, Ghaziabad, 13 November 2010.

Dr. S.K. Rath

- Gene polymorphisms in squamous cell carcinoma of head and neck and breast cancer: Our experience, BHU, Varanasi, 5 March 2010;
- Single nucleotide polymorphisms (SNPs) and breast cancer risk: Our experience, CSMMU, Lucknow, 7 March 2010;
- SNPs: Bioinformatics and translational medicine, CSMMU, Lucknow, 22 July 2010;
- Antimalarials, NIMR EMBO Global Exchange, New Delhi, 29 November 2010;
- Toxicity of antimalarials, NIMR EMBO Global Exchange, New Delhi, 30 November 2010.

Dr. Amit Misra

- Route, timing, payload and size: Drug delivery systems in infectious diseases and contraception, IIT, Kanpur, 11 May 2010;
- Preclinical development of inhalable microparticles containing anti-tuberculosis drug combination, NIPER, Rae Bareli, 23 October 2010.

Dr. Gautam Panda

- Synthesis of natural products and natural product-like privileged molecules from amino acids in drug discovery research, IICT, Hyderabad, 3 August 2010.

Dr. Jimut Kanti Ghosh

- Structure-function studies in antimicrobial peptides and pore-forming toxin, Bose Institute, Kolkata, 8 January 2010;
- Synthetic peptide model to understand structure-function relationships in *E. coli* toxin, Hemolysin E, KPC Medical College & Hospital, Kolkata, 12 December 2010.

Dr. T. Narender

- Natural products in drug discovery: New technologies and approaches, Allan College of Pharmacy and ZVM Medical College, Pune, 14 Janaury 2010;
- Application of biotechnology tools in natural products drug discovery, University of Pune, 8 March 2010;
- Recent advances in antimalarial drug development, Biyani Girls College, Jaipur, 20 September 2010;
- Development of lead molecules from the Indian medicinal plants for metabolic and infectious diseases, Belonia College, Tripura, 12 November 2010;
- Natural products in drug discovery: New technologies and approaches in lead discovery, Satavahana University, Karimnagar, 15 November 2010;
- Lead molecules from the Indian medicinal plants for metabolic and infectious diseases, NIPER, Mohali, 24 November 2010.

Dr. Ravi Sankar Ampapathi

- NMR structural studies on the NTD- of STAT4 and on the CT enzymatic domain, Aligarh Muslim University, 25 February 2010.

Dr. Anil Gaikwad

- High content screening approaches for natural products in diabetes, Assam University, Silchar, 2 December 2010.

Dr. A.K. Tamrakar

- NOD protein-induced muscle cell-autonomous innate immune response causes insulin resistance, Laval University Hospital Research Center, Quebec, Canada, 14 March 2010.

Dr. Arun Kumar Trivedi

- Role of proteomics, bioinformatics and micro array in translational research, CSMMU, Lucknow, 23 July 2010;
- Role of C/EBP alpha in myelopoiesis and myeloid leukemia, IIIT, Pune, 13 December 2010.

Dr. Ritu Trivedi

- Translation of nutraceutical to efficient anti-osteoporotic agent: Use of nanotechnology, NDRI, Karnal, 19 February 2010.

Dr. Kalyan Mitra

- Applications of TEM in drug discovery and structural biology, IHBT, Palampur, 6 October 2010.

Dr. Dipankar Koley

- Drug discovery: A chemist's perspective, Hooghly Mohsin College, Chinsurah, West Bengal, 25 September 2010.

Mr. Wahajuddin

- Recent trends in drug discovery and development, Ghaziabad, 27 March 2010;
- Endeavors at CDRI, Princeton, NJ, USA, 19 November 2010.

6 Visits Abroad

Name of Scientist	Country	Purpose of Visit (Period of Deputation)
Dr. T.K. Chakraborty	Germany	To participate in a conference (03-06 Oct., 2010)
Dr. A.K. Saxena	Germany	To deliver invited lectures (07-15 Apr., 2010 & 3-9 Dec., 2010)
	Egypt	To participate in a conference (30 Nov.- 2 Dec., 2010)
Dr. C. Nath	Germany	INSA-International collaboration/bilateral exchange program (21 Jul.- 22 Aug., 2010)
Dr. S. Bhattacharya	Geneva	To attend a project monitoring meeting (28-30 Jun., 2010)
Dr. A.K. Dwivedi	UK	To carry out the project work (29 Aug.-6 Sept., 2010)
Dr. Rakesh Maurya	Iran	To attend a regional experts meeting (19-21 Jun., 2010)
Dr. A.K. Srivastava	Poland	INSA-Bilateral scientist exchange program (22 Mar.-14 Apr., 2010)
Dr. Saman Habib	UK	To attend a meeting (06-07 Sept., 2010)
Dr. Amit Misra	UK	To carry out the project work (29 Aug.-4 Sept., 2010)
	USA	To participate in a conference (14-18 Nov., 2010)
	Japan	To participate in a symposium (13-14 Dec., 2010)
Dr. Neeloo Singh	Australia	To attend a conference (15-20 Aug., 2010)
	USA	To attend a meeting (03-07 Nov., 2010)
Dr. Atul Goel	Germany	To carry out the advance research (01 Oct- 31 Dec., 2010)
Dr. P.R. Mishra	UK	To carry out the project work (29 Aug.-6 Sept., 2010)
Dr. Manoj Barthwal	USA	To carry out the advance research (15 Nov., 2010 -14 Nov., 2011)
Dr. Ritu Trivedi	Singapore	To attend a meeting (10-13 Dec., 2010)
Dr. Aamir Nazir	UK	India Distinguished Visiting Fellowship (01 May-10 July, 2010)
Dr. Rajender Singh	USA	To undertake a pilot (exploratory) study (04 Jun.-04 Aug., 2010)
Mr. Wahajuddin	USA	To participate in a conference (14-18 Nov., 2010)

7 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) Program Advisory Committee (Organic Chemistry), DST, (4) Steering Committee, National Bio-resource Development Board, DBT, (5) Sub-committee of Sponsored Schemes Research Committee, CSIR, (6) Expert Committee, Drugs and Pharmaceuticals Research Programme, DST, (7) Drugs Technical Advisory Board, (8) Technical Advisory Committee, Technology Development and Utilization Programme for Women, DSIR, (9) Senate, IIT Kanpur 2010-2011, (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**, The American Chemical Society, USA;
- **Permanent Representative** of CDRI, Recruitment & Assessment Board, CSIR;
- **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. Ranjana Srivastava

- **Editor**, Indian Journal of Microbiology;
- **DBT Nominee**, IBSC, (1) IITR, Lucknow, (2) IIT, Kanpur

Dr. S.K. Puri

- **Vice President**, The Indian Society for Parasitology;
- **Member**, (1) Scientific Advisory Committee, Vector Control Research Centre, Pondicherry, (2) Academic Council, JNU, New Delhi.

Dr. Shailja Bhattacharya

- **Member**, Scientific Advisory Committee, Vector Control Research Centre, Pondicherry.

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.

Dr. R.K. Sharma

- **Member**, (1) International Society for Computational Biology, (2) Indian Phytopathological Society, (3) Computer Society of India;
- **Member, Editorial Board**, (1) International Journal of Advanced Bio informatics, (2) Online journal Biotechnology Research.

Dr. S.P.S. Gaur

- **Member, Editorial Board**, Journal of Pharmaceutical & Biomedical Sciences.

Dr. Vinod Bhakuni

- **Member**, (1) Board of Governors, IIT, Roorkee, (2) Committee for Centre for Excellence, DBT, (3) Council of National Academy of Sciences, India, (4) Sectional Committee IX, INSA, (5) Technical Screening Committee of Small Business Innovation Research Initiative, DBT, (6) Program Advisory Committee, Life Sciences, DST, (7) DBT-PDF Fellowship, Biochemistry Department, IISc. Bangalore;
- **Member, Editorial Board**, International Journal of integrative Biology.

Dr. A.K. Dwivedi

- **Life Member**, Indian Pharmaceutical Association;
- **Member**, Drugs Panel for New Drugs Manufacturing Licenses, Directorate of Medical & Health Services, U.P.

Dr. Madhu Dikshit

- **Member**, Council, The National Academy of Sciences (NASI) 2008-2010;
- **Vice President**, The Cytometry Society;
- **Member**, (1) DST (WOS-A) PAC, (2) Indian Council of Medical Research (Medical Sciences) PAC, (3) NAAC Committee.

Dr. Anuradha Dube

- **Member**, **Editorial Board**, (1) Journal of Biomedical Research, (2) BioMed Central, Infectious Diseases (Open Access).

Dr. Rakesh Shukla

- **Member**, Editorial Board, Indian Journal of Pharmacology;

Dr. J.K. Saxena

- **Secretary**, The Indian Society for Parasitology;
- **Vice President**, Society of Biologists and Chemists.

Dr. Naibedya Chattopadhyay

- **Member**, **Editorial Board**, (1) American Journal of Physiology (Endocrinology Metabolism), (2) Biochemical Pharmacology, (3) The Open Physiology Journal.

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, Bureau of Indian Standards, New Delhi, (3) Veterinary Council of India;
- **CSIR Nominee**, National Institute of Animal Welfare.

Dr. P.M.S. Chauhan

- **General Secretary**, Indian Society of Chemists and Biologists;
- **Executive Member**, Indian Council of Chemists.

Dr. Renu Tripathi

- **Life Member**, Zoological Society of India, Bodh Gaya.

Dr. D.N. Upadhyay

- **Life Member**, Society for Advancement of Electrochemical Science & Technology.

Dr. A.K. Srivastava

- **Life Member**, Indian Society of Parasitology.

Dr. Neena Goyal

- **Member, Executive Committee**, The 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. Srikanta Kumar Rath

- **Joint Secretary-Elected**, Indian Society for Chemical Biologists;
- **Member**, Indian Society of Cell Biology.

Dr. Amit Misra

- **Life Member**, Indian Pharmaceutical Association.

Dr. Kum Kum Srivastava

- **Member, Executive Committee**, The Indian Society for Parasitology.

Dr. R.K. Tripathi

- **Life Member**, Society of Toxicology, India.

Dr. K.R. Arya

- **Member, Executive Council,** Society of Ethnobotanists.

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.

Dr. Dhananjoy Hansda

- **Member**, **Indian** Association of Veterinary Microbiologists, Immunologists & Specialists in Infectious Diseases;
- **Member**, West Bengal Veterinary Council;

Dr. Kalyan Mitra

- **Life Member**, Electron Microscopy Society of India (EMSI).

Dr. Aamir Nazir

- **Life Member**, Indian Society of Cell Biology;
- **Member**, Genetics Society of America;
- **Research Editor**, (1) Molecular Toxicology, (2) Journal of Environmental Biology.

Dr. Poonam Singh

- **Life Member**, Society of Toxicology, India;
- **Member**, Editorial/Advisory Board, International Journal of Comprehensive Pharmacy.

Dr. Jayanta Sarkar

- **Associate Member**, American Association for Cancer Research.

Mr. Wahajuddin

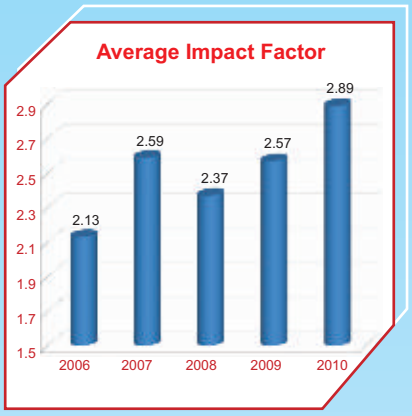
- **Member**, **Editorial Board**, Journal of Bioequivalence & Bioavailability;
- **Life Member**, (1) Indian Society for Mass Spectrometry, (2) Indian Pharmacological Society.

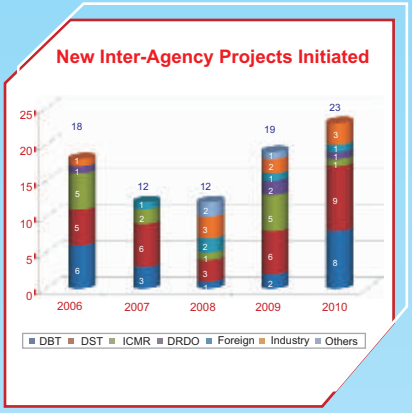
Dr. Sripathi Rao Kulkarni

- **Life Member**, (1) Association of Microbiologists of India, (2) Society for Information Science, India.

Dr. Sanjeev Yadav

- **Life Member**, (1) Indian Science Congress Association, Kolkata (2) Society for Science & Environment, India.





अनुसंधान उपलब्धियाँ

1 पेटेण्ट्स

विदेशों में स्वीकृत पेटेण्ट्स 2010	:	**06**
भारत में स्वीकृत पेटेण्ट्स 2010	:	**12**
विदेशों में आवेदित पेटेण्ट्स 2010	:	**10**
भारत में आवेदित पेटेण्ट्स 2010	:	**12**

विदेशों में स्वीकृत पेटेण्ट्स

2010

1. **शीर्षक** : ऑक्सी सब्सटिट्युटेड चाल्कोन्स एज़ एण्टीहाइपरग्लाइसेमिक एण्ड एण्टीडिसलिपिडेमिक एजेण्ट्स।
यू.एस. पेटेण्ट नं.: 7807712 **डेट ऑफ ग्रांट** : 05–अगस्त–2010
अन्वेषक : राम प्रताप, मवुरापु सत्यानारायण, चण्डीश्वर नाथ, राम रघुबीर, अंजु पुरी, रमेश चन्द्र, प्रीति तिवारी, बृजेन्द्र कुमार त्रिपाठी एवं अरविन्द कुमार श्रीवास्तव।

2. **शीर्षक** : ए प्रोसेस फॉर हिट्रोलॉगस एक्सप्रेसन एण्ड लार्ज स्केल प्रोडक्शन ऑफ फंक्शनली एक्टिव एंजाइम ट्राईपैनोथाइन रिडक्टैज ऑफ *लीश्मैनिया डोनोवनी* इन प्रोकैरियोटिक सिस्टम।
यू.एस. पेटेण्ट नं.: 7785850 **डेट ऑफ ग्रांट:** 31–अगस्त–2010
अन्वेषक : नीना गोयल एवं मुकुल कुमार मित्तल।

3. **शीर्षक** : नॉवेल सब्सटिट्युटेड बिस एण्ड ट्रिज़ 1,2,4–ट्राईआक्जेन्स यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड प्रोसेस फॅर द प्रिपैरेशन दिअरआफ।
नाईजिरियन पेटेण्ट नं.: एनजी/सी/2009/442 **डेट ऑफ ग्रांट** : 10–मार्च–2010
अन्वेषक : चन्दन सिंह, वेद प्रकाश वर्मा एवं सुनील कुमार पुरी।
सहायक सदस्य : शशि रस्तोगी, अखिलेश श्रीवास्तव एवं कमलेश सिंह।

4. **शीर्षक** : सब्सटिट्युटेड कार्बामिक एसिड क्यूनोलिन–6–यिल एस्टर्स एज़ एसिटाइलकोलिनएस्टेरज इन्हिब्टिर्स।
यू.एस. पेटेण्ट नं. : 7655801 **डेट ऑफ ग्रांट** : 02–फरवरी–2010
अन्वेषक : चन्दन सिंह, वेद प्रकाश वर्मा एवं सुनील कुमार पुरी।
सहायक सदस्य : जाहिद अली एवं बिशम्भर नाथ।

5. **शीर्षक** : नॉवेल हर्बल कम्पोजिशन फॉर द ट्रीटमेंट ऑफ गैस्ट्रिक अल्सर।
यू.एस. पेटेण्ट नं. : 7651706 **डेट ऑफ ग्रांट** : 26–जनवरी–2010
अन्वेषक : जनास्वामी मधूसुदना राव, उप्परापल्ली सम्पथ कुमार, बोग्गावारपु सुब्रामाण्यम शास्त्री, झिल्लू सिंह यादव, कोण्डपुरम विजय राघवन, गौतम पालित, द्वारका नाथ भल्ला, दीपिका राय, पन्नियामपल्ली माधवन कुट्टी वारियर, त्रिकोविल शंकरन मुरलीधरन एवं कोल्लथ मुरलीधरन।
सहायक सदस्य : द्वारका नाथ भल्ला एवं तरूण लता सेठ।

6. **शीर्षक** : सब्सटिट्युटेड 1,2,4– ट्राईआक्जेन्स, यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड ए प्रोसेस फॉर द प्रिपेरेशन दिअरआफ।
श्रीलंकन पेटेण्ट नं.: 13041 **डेट ऑफ ग्रांट** : 25–जनवरी–2010
अन्वेषक : चन्दन सिंह, पल्लवी तिवारी एवं सुनील कुमार पुरी।
सहायक सदस्य : शशि रस्तोगी एवं अखिलेश कुमार श्रीवास्त्व।

2009

(वार्षिक प्रतिवेदन 2009–10 में सम्मिलित नहीं)

1. **शीर्षक** : ऑक्सी सब्सटिट्युटेड फ्लेवोन्स एज़ एण्टीहाइपरग्लाइसेमिक एण्ड एण्टीडिस्लिपिडेमिक एजेण्ट्स।
   यू.एस. पेटेण्ट नं. : 7635779 **डेट ऑफ ग्रांट** : 22–दिसम्बर–2009
   अन्वेषक : राम प्रताप, मवुरापु सत्यानारायणन, चण्डीश्वर नाथ, राम रघुबीर, अंजु पुरी, रमेश चन्द्र, प्रीति तिवारी, बृजेन्द्र कुमार त्रिपाठी एवं अरविन्द कुमार श्रीवास्तव।
   सहायक सदस्य : अशोक कुमार खन्ना।

2. **शीर्षक** : सब्सटिट्युटेड मरकेप्टो फिनाइल नेथिल मीथेन डेरीवेटिव्स एज़SERM फॉर दी प्रीवेंशन एण्ड ट्रीटमेण्ट ऑफ अस्टियोपोरोसिस, अदर इस्ट्रोजन डिपेन्डेन्ट ऑर इण्डिपेण्डेण्ट एण्ड फॉर रेग्युलेशन ऑफ फर्टिलिटी।
   चाईनिज़ पेटेण्ट नं. : जेडएल2003801103 **डेट ऑफ ग्रांट** : 16–दिसम्बर–2009
   अन्वेषक : संगीता, अतुल कुमार, मनमोहन सिंह, सुप्रभात रे, पुव्वाडा श्री रामचन्द्र मुर्ति एवं गिरिश कुमार जैन।
   सहायक सदस्य : वसी अहमद, ए.एच. अन्सारी, मोहिनी छाबड़ा एवं गोविन्द केसरी।

3. **शीर्षक** : सब्सटिट्युटेड 1,2,4–ट्राईआक्जेन्स, यूजफुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड प्रोसेस फॉर दी प्रिपेरैएशन दिअरऑफ।
   कोरियन पेटेण्ट नं. : 10–0932997 **डेट ऑफ ग्रांट** : 11–दिसम्बर–2009
   अन्वेषक : चन्दन सिंह, पल्लवी तिवारी एवं सुनील कुमार पुरी।
   सहायक सदस्य : शशि रस्तोगी एवं अखिलेश कुमार श्रीवास्तव

4. **शीर्षक** : बायोडिग्रेडेबल इन्हेलेबल माइक्रोपार्टिकल्स कन्टैनिंग एण्टीट्युबर्क्युलर ड्रग्स।
   साउथ अफ्रीकन पेटेण्ट नं. : 2006/3256 **डेट ऑफ ग्रांट** : 25–नवम्बर–2009
   अन्वेषक : हिमाद्रि सेन, सूर्या कुमार जयन्ती, राकेश सिन्हा, रोली शर्मा एवं पवन मुत्तिल।

5. **शीर्षक** : नॉवेल (3आर,4आर)–ट्रांस 3,4–डाइएरिल क्रोमेन डेरीवेटिव्स यूज़फुल इन फर्टिलिटि रेग्युलेशन एण्ड द प्रिवेन्शन ऑर ट्रीटमेण्ट ऑफ इस्ट्रोजन रिलेटेड डिज़ीजेज ऑर सिन्ड्रोम्स।
   चाईनिज़ पेटेण्ट नं. : 1005418सी **डेट ऑफ ग्रांट** : 30–सितम्बर–2009
   अन्वेषक : संगीता, अतुल कुमार, मनमोहन सिंह, सुप्रभात रे, एवं गिरिश कुमार जैन।
   सहायक सदस्य : वसी अहमद, मोहिनी छाबड़ा एवं रूक्मणि अग्रवाल

2008

(वार्षिक प्रतिवेदन 2008–09 तथा 2009–10 में सम्मिलित नहीं)

1. **शीर्षक** : α सब्सटिट्युटेड नेथाइलॉक्सी–ω–सब्सटिट्युटेड अल्काइल/एरिल अमिनो सब्सटिट्युटेड अल्केन डेरीवेटिव्स एज़ एजेण्ट्स फॉर द ट्रीटमेंट आर प्रोफिलेक्सिस ऑफ डायबिटिज़ एण्ड रिलेटेड मेटाबोलिक डिस्आर्डस।
   चाईनिज़ पेटेण्ट नं. : जेडएल200380110723 **डेट ऑफ ग्रांट** : 31–दिसम्बर–2008
   अन्वेषक : देवीदत्त चतुर्वेदी, अतुल कुमार, रीमा रस्तोगी, अरविन्द श्रीवास्तव, प्रीति तिवारी, रेहान अहमद रमेश चन्दर, अंजु पुरी, गीतिका भाटिया, फरहान रिज़वी, अनिल कुमार रस्तोगी एवं सुप्रभात रे।
   सहायक सदस्य : वसी अहमद, अशोक कुमार खन्ना एवं सुरेश यादव।

2. **शीर्षक** : मैथड ऑफ ट्रीटिंग हाईपरलिपिडिमिक एण्ड हाइपरग्लाइसेमिक कण्डीशन इन मैमल्स यूजिंग प्रेग्नाडायइनोल्स एण्ड प्रेग्नाडायइनोन्स।
   जिर्योजियन पेटेण्ट नं. : 1020191 **डेट ऑफ ग्रांट** : 24–दिसम्बर–2008
   अन्वेषक : राम प्रताप, राम चन्द्र गुप्ता, रमेश चन्द्र, अशोक कुमार खन्ना, अरविन्द कुमार श्रीवास्तव, दीपक रैना, सविता श्रीवास्तव, अनिल कुमार रस्तोगी, ओमकार प्रसाद अस्थाना, स्वर्णा नित्यानन्द, सुखदेव नित्यानन्द, नरेन्द्र कुमार कपूर, असीम घटक व सत्यवान सिंह।

3. **शीर्षक** : नॉवेल (3आर,4आर)–*ट्रांस* 3,4–डाइएरिल क्रोमेन डेरिवेटिव्स यूज़फुल इन फर्टिलिटी रेग्युलेशन एण्ड दी प्रिवेन्शन ऑर ट्रीटमेंट ऑफ इस्ट्रोजन रिलेटेड डिज़िजेज आर सिण्ड्रोम्स।
यू.एस. पेटेण्ट नं. : 7427686 **डेट ऑफ ग्रांट** : 23–सितम्बर–2008
अन्वेषक : संगीता, अतुल कुमार, मनमोहन सिंह, सुप्रभात रे, गिरिश कुमार जैन, सुरोजीत सेनगुप्ता, शिखा शर्मा, रेखा घोष, मोहम्मद अरशद, अनिला द्विवेदी एवं अनिल बालापुरे।
सहायक सदस्य : वसी अहमद, मोहिनी छाबड़ा एवं रूक्मणि अग्रवाल।

4. **शीर्षक** : हर्बल मेडिकामेण्टस फॉर ट्रीटमेंट ऑफ न्यूरोसेरेब्रोवस्कुलर डिस्आर्डर्स।
उज्बेकिस्तान पेटेण्ट नं. : आईएपी03621 **डेट ऑफ ग्रांट** : 30–अप्रैल–2008
अन्वेषक : मधुर रे, राघवेन्द्र पाल, सत्यवान सिंह एवं नन्दू मल खन्ना।
सहायक सदस्य : झरना अरूण एवं माधुरी चौधरी।

5. **शीर्षक** : बायोडिग्रेडेबल, इनहेलेबल माइक्रोपर्टिकल्स कंटेनिंग एण्टीट्युबर्क्युलर ड्रग्स।
यूरेशियन पेटेण्ट नं. : 86600 **डेट ऑफ ग्रांट** : 28–अप्रैल–2008
अन्वेषक : हिमाद्रि सेन, सूर्या कुमार जयन्ती, राकेश सिन्हा, रोली शर्मा व पवन मुत्तिल।

6. **शीर्षक** : सब्सटिट्युटेड 1,2,4–ट्राईआक्जेन्स, यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड प्रोसेस फॉर दी प्रिपेरेशन दिअरऑफ।
पेरू पेटेण्ट नं. : 4960 **डेट ऑफ ग्रांट** : 15–अप्रैल–2008
अन्वेषक : चन्दन सिंह, पल्लवी तिवारी एवं सुनील कुमार पुरी
सहायक सदस्य : शशि रस्तोगी एवं अखिलेश कुमार श्रीवास्तव।

भारत में स्वीकृत पेटेण्ट्स

1. **शीर्षक** : *माइकोबैक्टीरिअम ट्युबर्क्युलोसिस* स्पेसिफिक DNA फ्रेगमेण्ट्स, ए सेट ऑफ ओलिगोन्युक्लोटाइड प्राइमर्स एण्ड ए किट दिअरआफ यूज़फुल फॉर रेपिड डायग्नोसिस ऑफ *माइकोबैक्टीरिअम ट्युबर्क्युलोसिस* इंफेक्शन इन क्लीनिकल सैम्पल्स।
इण्डियन पेटेण्ट नं. : 244289 **डेट ऑफ ग्रांट** : 29–नवम्बर–2010
अन्वेषक : रंजना श्रीवास्तव, दीपक कुमार एवं ब्रह्म शंकर श्रीवास्तव।

2. **शीर्षक** : सिंथेसिस ऑफ सेकण्डरी अमिनो एलकॉक्सी डेरीवेटिव्स ऑफ सब्सटिट्युटेड डाइएरिल 5,6,7,8– टेट्राहाइड्रो नेप्थइल मीथेन।
इण्डियन पेटेण्ट नं. : 243701 **डेट ऑफ ग्रांट** : 01–नवम्बर–2010
अन्वेषक : नीता श्रीवास्तव, मन मोहन सिंह एवं सुप्रभात रे।

3. **शीर्षक** : ए नॉवेल कॉम्बिनेटोरियल लाइब्रेरी ऑफ 3–एण्ड 30–सब्सटिट्युटेड ल्यूप–20(29)–ईन यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स।
इण्डियन पेटेण्ट नं. : 243559 **डेट ऑफ ग्रांट** : 26–अक्टूबर–2010
अन्वेषक : मिस्बाह आलम फारूक बियाबानी, थंगातिरूपति श्रीनिवासन, सुनील कुमार पुरी, कंवल राज एवं बिजोय कुण्डू।
सहायक सदस्य : ए.के. श्रीवास्तव

4. **शीर्षक** : 2–अल्काइल/एरिल सल्फोनिल–1,2,3,4–टेट्राहाइड्रो–9एच–पायरिडो (3,4–बी) इनडोल–3–कारबॉक्सलिक एसिड इस्टर्स/एमाइड्स एज़ एण्टीथ्रोम्बोटिक एजेण्ट्स।
इण्डियन पेटेण्ट नं. : 243415 **डेट ऑफ ग्रांट** : 15–अक्टूबर–2010
अन्वेषक : स्तुति गौर, ज़ीशान फातिमा, अंशुमान दीक्षित, जाहिद अली, विलियम रास्कान सूरीन, कपिल कपूर, कान्ता भूटानी, मोहम्मद सलीम अन्सारी, मधु दीक्षित एवं अनिल कुमार सक्सेना।
सहायक सदस्य : अरिमर्दन सिंह कुशवाहा एवं दयानन्द विश्वकर्मा।

5. **शीर्षक** : नॉवेल 6–(नेथाइल विनाइल)–1,2,4–ट्राईआक्सेन्स, यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स।
इण्डियन पेटेण्ट नं. : 242317 **डेट ऑफ ग्रांट** : 23–अगस्त–2010
अन्वेषक : चन्दन सिंह, रानी कंचन, सुभाष चन्द्रा एवं सुनील कुमार पुरी।

6. **शीर्षक** : सिंथेसिस ऑफ सेकण्डरी अमिनो अल्कोक्सी डेरीवेटिव्स ऑफ सब्सटिट्युटेड डाइएरिल 1,2,3,4–टेट्राहाइड्रो नेथाइल मीथेन।
इण्डियन पेटेण्ट नं. : 242166 **डेट ऑफ ग्रांट** : 17–अगस्त–2010
अन्वेषक : नीता श्रीवास्तव, मन मोहन सिंह एवं सुप्रभात रे।

7. **शीर्षक** : नॉवेल 1–(4–एरिल/हेट्रोएरिलपाइपेरेज़िन/पाइपेरेज़िन/पाइपेरिडाइन–1–यिल)–एन–(क्युनोलॉक्सी–6/7/8 यिल/4–(अन)सब्सटिट्युटेड–पायरोलिडीन–2–ओक्सो–1–यिल) अल्केन्स/अल्केनोन्स एण्ड दिअर साल्ट्स।
इण्डियन पेटेण्ट नं. : 242145 **डेट ऑफ ग्रांट : 16–अगस्त–2010**
अन्वेषक : सुरेश कुमार पाण्डेय, अल्पना श्रीवास्तव, केशव किशोर अवस्थी, रवीश चन्द्र त्रिपाठी, शेखर श्रीवास्तव, झरना अरूण, राम मोहन सक्सेना, मधुर रे, राकेश शुक्ला, मंगल प्रसाद दुबे व अनिल कुमार सक्सेना।

8. **शीर्षक** : ए नॉवेल कॉम्बिनेटोरियल लाइब्रेरी ऑफ 3–सब्सटिट्युटेड अमिनो–3–ग्लाकोसाइलेटड प्रोपेनोएटस, यूज़फुलएज़ एण्टीफंगल एण्ड एण्टीबैक्टिरअल एजेण्ट्स।
इण्डियन पेटेण्ट नं. : 242121 **डेट ऑफ ग्रांट** : 12–अगस्त–2010
अन्वेषक : रमा पति त्रिपाठी, बिजोय कुण्डू, प्रवीण कुमार शुक्ला, सुधीर सिन्हा, रंजना श्रीवास्तव, किशोर कुमार श्रीवास्तव, विनीता चतुर्वेदी, अनिल श्रीवास्तव एवं ब्रह्म शंकर श्रीवास्तव।
सहायक सदस्य : विनोद कुमार मौर्या।

9. **शीर्षक** : नॉवेल अमिनो फंक्शनालईज्ड 1,2,4–ट्राइओक्सेन्स, यूज़फुल एज़ एण्टीमलेरियल एजेण्ट्स एण्ड प्रोसेस फॉर द प्रिपेरेशन दिअरऑफ।
इण्डियन पेटेण्ट नं. : 240677 **डेट ऑफ ग्रांट** : 26–मई–2010
अन्वेषक : चन्दन सिंह, हितिका मलिक एवं सुनील कुमार पुरी।

10. **शीर्षक** : सब्सट्टियुटेड कार्बामिक एसिड कुइनोलिन–6–यिल इस्टर्स एज़ एसिटाइलकोलिनएस्टरेज इन्हिबिट्र्स।
इण्डियन पेटेण्ट नं. : 241999 **डेट ऑफ ग्रांट** : 08–मई–2010
अन्वेषक : नीरज़ शाक्य, ज़ीशान फतिमा, चण्डीश्वर नाथ एवं अनिल कुमार सक्सेना।
सहायक सदस्य : जाजिद अली एवं विश्वम्भर नाथ।

11. **शीर्षक** : ए वन पॉट सिंथेसिस ऑफ कार्बामेट इस्टर्स यूज़िंग मिट्सनोबुज, रिएजेण्ट।
इण्डियन पेटेण्ट नं. : 239942 **डेट ऑफ ग्रांट** : 13–अप्रैल–2010
अन्वेषक : देवदत्त चतुर्वेदी एवं सुप्रभात रे।
सहायक सदस्य : वसी अहमद

12. **शीर्षक** : नॉवेल मरकेप्टो फिनॉयल नेथाइल मीथेन डेरीवेटिव्स एण्ड प्रिपेरेशन दिअरऑफ।
इण्डियन पेटेण्ट नं. : 237915 **डेट ऑफ ग्रांट** : 12–जनवरी–2010
अन्वेषक : संगीता, अतुल कुमार, मन मोहन सिंह, गिरिश कुमार जैन, पुव्वडा श्री रामचन्द्र मूर्ति एवं सुप्रभात रे।

2008

(वार्षिक प्रतिवेदन 2008–09 तथा 2009–10 में सम्मिलित नहीं)

1. **शीर्षक** : एन इम्प्रुव्ड प्रोसेस फॉर दि सिंथेसिस ऑफ गुग्गुलस्टिरोन्सः ए फार्माकोलॉजिकली एक्टिव कांस्टीट्वेन्ट ऑफ गुगुलिपिड।
इण्डियन पेटेण्ट नं. : 226206 **डेट ऑफ ग्रांट** : 11–दिसम्बर–2008
अन्वेषक : राम प्रताप, धर्मेन्द्र प्रताप सिंह, राघवेन्द्र पाल एवं सत्यवान सिंह।

विदेशों में आवेदित पेटेण्ट्स

1. **शीर्षक** : नॉवेल डोनर–एक्सेप्टर फ्लूरीन स्काफ्फोल्डसः ए प्रोसेस एण्ड यूजेज़ दिअरऑफ।
कोरियन एप्लिकेशन नं. : **10–2010–7024460** **डेट ऑफ फाइलिंग** : 29–अक्टूबर–2010
अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन एवं आर.एस. आनन्द।

2. **शीर्षक** : नॉवेल डोनर–एक्सेप्टर फ्लूरीन स्काफ्फोल्डसः ए प्रोसेस एण्ड यूजेज़ दिअरऑफ।
आस्ट्रेलियन एप्लिकेशन नं. : **2009233324** **डेट ऑफ फाइलिंग** : 01–अक्टूबर–2010
अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन एवं आरएस आनन्द।

3 **शीर्षक** : ए बायोऐक्टिव एक्सट्रेक्ट/फ्रेक्शन फ्रॉर्म *उल्मस वल्लिच्यना* एण्ड इट्स कम्पाउण्डस फॉर प्रिवेन्शन फॉर ट्रीटमेण्ट ऑफ अस्टियो–हेल्थ डिस्आर्डर्स।
कोरियन एप्लिकेशन नं. : **2010–7021933** **डेट ऑफ फाइलिंग** : 30–सितम्बर–2010
अन्वेषक : राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दिकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मणिक्वासगम, गिरिश कुमार जैन, कमल राम आर्या एवं नवैद्य चट्टोपाध्याय।
सहायक सदस्य : सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त एवं अमृता केन्दुरकर।

4. **शीर्षक** : नॉवेल डोनर–एक्सेप्टर फ्लूरेंस स्काफ्फोल्डसः ए प्रोसेस एण्ड यूजेज़ दिअरऑफ।
जापानिज़ एप्लिकेशन नं. : **0053एनएफ2008/जेपी** **डेट ऑफ फाइलिंग** : 01–अक्टूबर–2010
अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन एवं आरएस आनन्द।

5 **शीर्षक** : नॉवेल डोनर–एक्सिेप्टर फ्लूरेन्स स्केफ्फोल्डसः ए प्रोसेस एण्ड यूजेस देयरऑफ
कानाडियन एप्लिकेशन नं. : **0053एनएफ2008/सीए** **डेट ऑफ फाइलिंग** : 29–सितम्बर–2010
अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार सुन्दर मनोहरन एवं आर.एस. आनन्द।

6 **शीर्षक** : नॉवेल हाइड्रोक्सी फंक्शनलाइज्ड 1,2,4–ट्राईओक्सेन्स एण्ड दिअर डेरीवेटिव्स।
फिलीपिन्स एप्लिकेशन नं. : **1–2010–502187** **डेट ऑफ फाइलिंग** : 24–सितम्बर–2010
अन्वेषक : चन्दन सिंह, वेद प्रकाश वर्मा एवं सुनील कुमार पुरी।

7 **शीर्षक** : एन इम्प्रूव्ड प्रोसेस फॉर प्रिपेरेशन ऑफ *ट्रांस–3*, 4–डाइएरिलक्रोमन
ब्राजिलियन् एप्लिकेशन नं. : **पी10820944–8** **डेट ऑफ फाइलिंग** : 17–जून–2010
अन्वेषक : देवी प्रसाद शाहू।

8. **शीर्षक** : एन इम्प्रूव्ड प्रोसेस फॉर प्रिपेरेशन ऑफ *ट्रांस–3*, 4– डाइएरिलक्रोमन।
साउथ अफ्रीकन एप्लिकेशन नं. : **पी10820944–8** **डेट ऑफ फाइलिंग** : 17–जून–2010
अन्वेषक : देवी प्रसाद शाहू।

9. **शीर्षक** : कम्बिनेशन ऑफ BAR एण्टागोनिस्ट एण्ड HMG-CoA रिडक्टैज़ इन्हिबिटर्स फॉर ट्रीटमेंट ऑफ डिसलिपिडिमिया।
पीसीटी एप्लिकेशन नं. : **पीसीटी/आईबी2010/000898** **डेट ऑफ फाइलिंग** : 21–अप्रैल–2010
अन्वेषक : इन्द्रवदन अम्बालाल मोदी, बकुलेश मफतलाल खामर, छित्तर मल गुप्ता, अंजू पुरी, रबि शंकर भट्टा, राम प्रताप, गिरीश कुमार जैन, स्मृति भदौरिया, अशोक कुमार खन्ना, ओमकार प्रसाद अस्थाना एवं असीम घटक।

10. **शीर्षक** : पॉलिमेरिक नैनोमैट्रिक्स एसोशिएटड डिलीवरी ऑफ केम्फेरोल इन रेट्स टू इम्प्रूव इट्स अस्टियोजेनिक एक्शन।
पीसीटी एप्लिकेशन नं. : **पीसीटी/आईइन2010/000115** **डेट ऑफ फाइलिंग** : 26–फरवरी–2010
अन्वेषक : प्रभात रंजन मिश्रा, रितु त्रिवेदी, गिरिश कुमार गुप्ता, अविनाश कुमार, वर्षा गुप्ता, श्रीकांत कुमार रथ, कमिनी श्रीवास्तव, नैवेद्य चट्टोपाध्याय एवं अनिल कुमार द्विवेदी।

2009

(वार्षिक प्रतिवेदन 2009–10 में सम्मिलित नहीं)

1. **शीर्षक** : नॉवेल डोनर–एक्सेप्टर फ्लूरिन स्कॉफ्फोल्डसः ए प्रोसेस एण्ड यूज़ेज दिअरऑफ।
यूरोपियन एप्लिकेशन नं. : 09728598.5 **डेट ऑफ फाइलिंग** : 31–मार्च–2009
अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन एवं रघुबीर सिंह आनन्द।

2008

(वार्षिक प्रतिवेदन 2008–09 तथा 2009–10 में सम्मिलित नहीं)

1. **शीर्षक** : ए प्रोसेस फॉर आइसोलेशन ऑफ 16 α हाइड्रोक्सीक्लेरोडा–3,13(14)जेड–डाइन–15, 16–ओलाइड फ्रॉम *पॉलिअल्थिया लांगिफोलिया*।
यूरोपियन एप्लिकेशन नं. : 12/323156 **डेट ऑफ फाइलिंग** : 25–नवम्बर–2008
अन्वेषक : कोनेनि वेंकटा शशिधरा, अंजु पुरी एवं जमीमकुन्तला नागा रोसइया।
सहायक सदस्य : सूर्या प्रताप सिंह, जय कुमार जोशी, नूर जहाँ, कृष्णा कांत यादव, देवीदत्त एवं राम जियावन।

2 **शीर्षक** : नेच्युरली अकरिंग क्युमॉरिन्स एण्ड दिअर प्रिकर्सर्स एज़ एसिटाइलकोलिनएस्टरेज इन्हिबिटर्स।
चाईनिज़ एप्लिकेशन नं. 200780016176.00 **डेट ऑफ फाइलिंग** : 04–नवम्बर–2008
अन्वेषक : जानास्वामी मधुसूदनन राव, चिन्ना राजू भीमापका, वेंकटा श्रीनिवास पुलेला, सुरेश बाबू कटरागड्डा, झिल्लूरसिंह यादव, विजया राघवन कोडापुरम, हेमन्त कुमार सिंह एवं चण्डीश्वर नाथ।

3 **शीर्षक** : नेच्युरली अकरिंग क्युमॉरिन्स एण्ड दिअर प्रिकर्सर्स एज़ एसिटाइलकोलिनएस्टरेज इन्हिबिटर्स।
यूरोपियन एप्लिकेशन नं. : 7734021.40 **डेट ऑफ फाइलिंग** : 23–सितम्बर–2008
अन्वेषक : जानास्वामी मधुसूदनन राव, चिन्ना राजू भीमापका, वेंकटा श्रीनिवास पुलेला, सुरेश बाबू कटरागड्डा, झिल्लूरसिंह यादव, विजया राघवन कोदापुरम, हेमन्त कुमार सिंह एवं चण्डीश्वर नाथ।

4 **शीर्षक** : नेच्युरली अकरिंग क्युमॉरिन्स एण्ड दिअर प्रिकर्सर्स एज़ एसिटाइलकोलिनएस्टरेज।
जपानिज एप्लिकेशन नं.: 2009–500954 **डेट ऑफ फाइलिंग**: 19–सितम्बर–2008
अन्वेषक : जानास्वामी मधुसूदनन राव, चिन्ना राजू भीमापका, वेंकटा श्रीनिवास पुलेला, सुरेश बाबू कटरागड्डा, झिल्लूरसिंह यादव, विजया राघवन कोदापुरम, हेमन्त कुमार सिंह एवं चण्डीश्वर नाथ।

5 **शीर्षक** : फार्मास्यूटिकल कम्पोजिशन फॉर दि प्रिवेंशन/ट्रीटमेंट ऑफ बोन डिस्आर्डर्स एण्ड प्रोसेस फॉर दि प्रिपेरशन दिअरऑफ।
यू.एस. एप्लिकेशन नं. : 12/281098 **डेट ऑफ फाइलिंग** : 28–अगस्त–2008
अन्वेषक : राकेश मौर्या, गीतू सिंह, पाण्डुर्वडा सुब्रामण्यम नारायण मूर्ति, संध्या मेहरोत्रा, दिव्या सिंह, बिजु भार्गव एवं मन मोहन सिंह।
सहायक सदस्य : जे.के. जोशी।

6. **शीर्षक** : फार्मास्यूटिकल कम्पोजिशन कन्टेनिंग *ब्यूटिया* आइसोफ्लेवोन्स फॉर दि प्रिवेंशन/ट्रीटमेंट ऑफ बोन डिस्आर्डर्स एण्ड ए प्रोसेस फॉर दि प्रिपेरेशन दिअरऑफ।
कनाडियन एप्लिकेशन नं. : 2643973.00 **डेट ऑफ फाइलिंग** : 27–अगस्त–2008
अन्वेषक : राकेश मौर्या, गीतू सिंह, पाण्डुर्वडा सुब्रामण्यम नारायण मूर्ति, संध्या मेहरोत्रा, दिव्या सिंह, बिजु भार्गव एवं मन मोहन सिंह।
सहायक सदस्य : जे.के. जोशी।

7. **शीर्षक** : फार्मास्यूटिकल कम्पोजिशन कन्टेनिंग *ब्यूटिया* आइसोफ्लेवोन्स फॉर दि प्रिवेंशन/ट्रीटमेंट ऑफ बोन डिस्आर्डस एण्ड ए प्रोसेस फॉर दि प्रिपेरेशन दिअरऑफ।
जापानिज़ एप्लिकेशन नं. : 2008–556868 **डेट ऑफ फाइलिंग** : 28–अगस्त–2008
अन्वेषक : राकेश मौर्या, गीतू सिंह, पाण्डुर्वा सुब्रामण्यम नारायण मूर्ति, संध्या मेहरोत्रा, दिव्या सिंह, बिजु भार्गव एवं मन मोहन सिंह।
सहायक सदस्य : जे.के. जोशी।

भारत में आवेदित पेटेण्ट्स

1 **शीर्षक** : (ई)–5–(2–नाइट्रोफिनॉयल)–1–फिनायल–3{2–(2,6,6–ट्रिमिथायलसायक्लोहेक्स–2–इनायल)विनायल}–4, 5–डिहाइड्रो–1एच–पायराजोल एण्ड इट्स एनालॉग्स।
इण्डियन एप्लिकेशन नं. : **2175डीईएल2010** **डेट ऑफ फाइलिंग**: 14–सितम्बर–2010
अन्वेषक : शिवाजी नारायणराव सूर्यवंशी, सुमन गुप्ता, नीना गोयल, अविनाश तिवारी, मोनिका मित्तल एवं प्रीति विश्वकर्मा।
सहायक सदस्य : मंजू।

2 **शीर्षक** : (ई)–5–(4–क्लोरोफिनॉयल)–1, 1–बिस(मिथाइलथायो)पेण्टा–1, 4–डायइन–3–ओन एण्ड इट्स एनालॉग्स।
इण्डियन एप्लिकेशन नं. : **2174डीईएल2010** **डेट ऑफ फाइलिंग** : 14–सितम्बर–2010
अन्वेषक : शिवाजी नारायणराव सूर्यवंशी, सुमन गुप्ता, नीना गोयल, संतोष कुमार, मोनिका मित्तल एवं प्रीति विश्वकर्मा।
सहायक सदस्य : मंजू।

3 **शीर्षक** : ए फायटो–फार्मास्यूटिकल प्रिपेरेशन यूज़फुल फॉर दि ट्रीटमेंट ऑफ फाइलेरिया स्पेशली एज़ ए मैक्रोफाइलेसियडल एजेण्ट।
इण्डियन एप्लिकेशन नं. : **1695डीईएल2010** **डेट ऑफ फाइलिंग** : 20–जुलाई–2010
अन्वेषक : राकेश तुली, अजय कुमार सिंह रावत, सैय्यदा खातून, शरद श्रीवास्तव, सुभा रस्तोगी, मदन मोहन पाण्डेय, कीर्ति सक्सेना, विकास कुशवाहा एवं पुव्वडा कल्पना मूर्ति।

4. **शीर्षक** : नॉवेल कौमारिन–चाल्कोन हाइब्रिडस एज़ एण्टीकैंसर एजेण्ट्स।
इण्डियन एप्लिकेशन नं. : **1843डीईएल2010** **डेट ऑफ फाइलिंग** : 08–मई–2010
अन्वेषक : कोनेनि वेंकटा शशिधरा, अबधेश कुमार, मनोज कुमार, जयन्ता सरकार एवं सुधीर कुमार सिंन्हा।
सहायक सदस्य : संजीव मीना।

5. **शीर्षक** : कम्बिनेशन ऑफ BAR एण्टागोनिस्ट एण्ड HMG-CoA रिडक्टेज इन्हिबिटर फॉर ट्रीटमेंट ऑफ डिसलिपिडिमिया।
इण्डियन एप्लिकेशन नं. : **1052एमयूएम2009** **डेट ऑफ फाइलिंग** : 22–अप्रैल–2010
अन्वेषक : इन्द्रवदन अम्बालाल मोदी, बकुलेश मफतलाल खामर, छित्तर मल गुप्ता, अंजु पुरी, रबि शंकर भट्टा, राम प्रताप, गिरिश कुमार जैन, स्मृति भदौरिया, अशोक कुमार खन्ना, ओमकार प्रसाद अस्थाना एवं असीम घटक।

6 **शीर्षक** : इम्प्रूव्ड प्रोसेस फॉर ए प्रिपेरेशन ऑफ बाइवैलिरूडिन।
इण्डियन एप्लिकेशन नं. : **0671डीईएल2010** **डेट ऑफ फाइलिंग**: 12–मार्च–2010
अन्वेषक : वहाजुल हक।

7. **शीर्षक** : थायोफीन कन्टेनिंग ट्राइसब्सटियुटेड मीथेन (TRSMs) एज़ एण्टीट्युबर्क्युलर एजेण्ट्स।
इण्डियन एप्लिकेशन नं. : **0685डीईएल2010** **डेट ऑफ फाइलिंग** : 12–मार्च–2010
अन्वेषक : गौतम पाण्डा, मलोय कुमार पराई, प्रियंका सिंह, विनीता चतुर्वेदी एवं सुधीर सिन्हा।
सहायक सदस्य : अजय सिंह वर्मा, श्याम सिंह एवं होरी लाल।

8. **शीर्षक** : ए प्रोसेस फॉर दि आइसोलेशन ऑफ एन एण्टीलीश्मैनियल फ्रेक्शन फॉर्म ए मैराइन अल्गी।
इण्डियन एप्लिकेशन नं. : **0317डीईएल2010** **डेट ऑफ फाइलिंग** : 10–फरवरी–2010
अन्वेषक : विजय लक्ष्मी, सुनील कुमार मिश्रा, शिशिर श्रीवास्तव, महेन्द्र नाथ श्रीवास्तव, प्रशांत खरे, प्रज्ञा मिश्रा एवं अनुराधा दुबे।
सहायक सदस्य : हृदय राम मिश्रा, नवीन प्रकाश मिश्रा, जय कुमार जोशी एवं रामचन्द्र।

9. **शीर्षक** : नॉवेल इण्डेन डेरीवेटिव्स फॉर ट्रीटमेंट ऑफ माइकोबैक्टिीरयल इंफेक्शन्स।
इण्डियन एप्लिकेशन नं. : **0130डीईएल2010** **डेट ऑफ फाइलिंग** : 15–जनवरी–2010
अन्वेषक : रंजना श्रीवास्तव, देवी प्रसाद शाहू, किशोर कुमार श्रीवास्तव, शैलेश कुमर, आत्मा प्रकाश द्विवेदी एवं गरिमा यादव।
सहायक सदस्य : संदीप कुमार शर्मा एवं दिनेश कुमार त्रिपाठी।

*वर्ष 2010 में भारत में आवेदित तीन पेटेण्ट्स वार्षिक प्रतिवेदन 2009–10 में प्रकाशित किए जा चुके हैं।

2 सम्मेलनों में प्रस्तुत शोध पत्र

2009

(वार्षिक प्रतिवेदन 2009–10 में सम्मिलित नहीं)

तीसरा सीआईजी सिम्पोजियम ऑन डीएनए रिपेयर एण्ड ह्यूमन हेल्थ, लॉसेन, स्विट्जरलैण्ड (10–11 जून)

पी53 एआरजी72पीआरओ (आरएस1042522) जीन पॉलिमार्फिज्म एण्ड द रिस्क्स ऑफ हेड नेक स्क्वामोज़ सेल कॉर्सिनोमा (एचएनएससीसी) एण्ड ब्रीस्ट कैंसर अमोंग नॉर्थ इण्डियन्स, एस.वी. सिंह, ए.के. मित्रा, नीतू सिंह, वी.के. गर्ग, रश्मि चतुर्वेदी, मन्दिरा शर्मा एवं एस.के. रथ।

पाँचवाँ एन्युअल कांफ्रेस ऑफ इण्डियन सोसायटी ऑफ बोन एण्ड मिनरल रिसर्च, उदयपुर (08 अक्टूबर)

ए नेच्युरल अकरिंग एण्ड ओरली एक्टिव स्मॉल मॉलीक्यूल, 6–ग्लुकोप्रयानोस्यल–3,3',4'5,7–पेन्टाहाइड्रोआक्सीफ्लेवोन प्रमोट्स पीक बोन मॉस एण्ड हेव नॉन–इस्ट्रोजेनिक आस्टियो प्रोटेक्टिव इफेक्ट, जावेद ए सिद्दिकी, जी. स्वर्णकार, के. सरन, पी. रावत, आर. मौर्या, वी. गुप्ता, ए.के. द्विवेदी एवं एन. चट्टोपाध्याय।

दसवां इण्टरनेशनल सिम्पोज़ियम ऑफ वेक्टर्स एण्ड वेक्टर बोर्न डिज़ीजेज, गोवा (4–6 नवम्बर)

ट्रांसक्रिप्टोमिक एनालासिस ऑफ म्यूरिन होस्ट लिवर फॉलोविंग एक्सपोजर टू *प्लाज़मोडियम विन्केई*, एस.के. मिश्रा, पी. सिंह, पी. मिश्रा, ए.के. वर्मा, एस. कुमार, एस.के. पुरी एवं एस.के. रथ।

इण्टरनेशनल सिम्पोज़ियम ऑन कैंसर किमोप्रिवेंशन एण्ड ट्रांसलेशन रिसर्च, नई दिल्ली (21 दिसम्बर)

रोल ऑफ सोल्युबल एफएएस इन द डायग्नोसिस ऑफ यूरिनरी ब्लेड्डर कैंसर, ए.के. श्रीवास्तव, पी.के. सिंह, एस.के. रथ, डी. सिंह, पी. सिंह, एस. सिंह, डी. दलेला, एम.एम. गोयल एवं एम.एल.बी. भट्ट।

2010

दूसरा नेशनल सिम्पोज़ियम ऑन मॉडर्न ट्रेण्ड्स इन डिफरेन्शियल जियोमेट्री एण्ड मैथमेटिकल मॉडलिंग इन बायो–साइंसेज, लखनऊ (9–10 जनवरी)

ए मल्टीवैरिएट मैथड फॉर द पैरामीटर इस्टिमेशन ऑफ बायोरिदम्स, मुकेश श्रीवास्तव एवं एम. अब्बास।

इण्टरनेशनल कांफ्रेंस ऑन एडवांसेज इन फ्री रेडिकल रिसर्च, हैदराबाद (11–13 जनवरी)

पीएमए इंडूयस्ड न्यूट्रोफिल एक्स्ट्रासेल्युलर ट्रेप्स रिलीज़ इज मिडियेटेड बॉय पी38 एमएपीके एक्टिवेशन, रवि शंकर केसरी, एस. कुमार, ए. ज्योति, एस. पटेल, एम.के. बरथवाल, ए. वर्मा, वी.के. वाजपेयी एवं एम. दीक्षित।

एक्सप्रेशन, बायोकैमिकल एण्ड लोकलाइजेशन स्ट्डी ऑफ नाइट्रिक सिंथेज इन ह्यूमन न्यूट्रोफिलः इफेक्टस ऑन नाइट्रिक आक्साइड प्रोडक्शन, ए. ज्योति, आर. सलूजा, एस. कुमार, एम. चटर्जी, ए. वर्मा, एम.के. बरथवाल एवं एम. दीक्षित।

चौदहवां आईएससीबीसी इण्टरनेशनल कांफ्रेस ऑन कैमिकल बायोलॉजी फॉर डिस्कवरी पर्सपेक्टिव्स एण्ड चैलेन्जेस, लखनऊ (15–18 जनवरी)

बायोएनालिटिकल मैथड वैलीडेशनः ए टूल फॉर फार्माकोकाइनेटिक स्ट्डीज, निधि, प्रिया जैन एवं जे. लाल।

फार्माकोकाइनेटिक्स ऑफ एरिलपाइप्रेजिन डिराइव्ड एसएआरएम फॉर बिनाइन प्रोस्टेटिक हाइपरप्लाज़िया मैनेजमेंट, ए.के. पाण्डेय, ए. सारस्वत एवं जे. लाल।

सायमल्टेनियस इस्टीमेशन ऑफ फ्युरोज़माइड अलांग विद फिनॉल रेड एण्ड नेप्रोक्सेन यूजिंग आरपी–एचपीएलसी, कुशलकुमार पटेल, दिव्येश तिवारी, एस.पी. सिंह, वहाजुद्दीन एवं जी.के जैन।

मैथड डेवलपमेण्ट एण्ड वैलिडेशन ऑफ नोबिलेटिन इन रैट प्लाज्मा, डी. तिवारी, के. पटेल, एस.पी. सिंह, वहाजुद्दीन एवं जी.के. जैन।

डेवलेपमेण्ट एण्ड वैलिडेशन ऑफ एएचपीएलसी मैथड फॉर द प्रीफार्म्युलेशन स्ट्डीज ऑफ कैण्डीडेट ड्रग 99–411, बी. चौरसिया, एम. श्रीवास्तव, पी. कुशवाहा, एस.डी. पचौरी, वी. गुप्ता एवं ए.के. द्विवेदी।

क्लोनिग एण्ड एक्सप्रेशन ऑफ *प्लाजमोडियम योलाई* फॉस्फोराइबोसिलपायरोफॉस्फेट सिंथिटेज़, एम.के. सुथार, अनीता, पी.के. दोहरे, एस.वी. सिंह एवं जे.के. सक्सेना।

क्लोनिंग एण्ड एक्सप्रेशन ऑफ *ब्रुगिया मैलेई* ग्लूकोज–6–फॉस्फेट डिहाइड्रोजीनेज़, अनीता, एम.के. सुथार, पी.के. दोहरे, एस.वी. सिंह एवं जे.के. सक्सेना।

डिज़ाइन, सिंथेसिस एण्ड एण्टीमलेरियल एक्टिविटी ऑफ दी हाईब्रिड ट्राइऐजिन थायोसेमिकार्बाजोन्स, मोनी शर्मा, कुमकुम श्रीवास्तव, एस.के. पुरी एवं पी.एम.एस चौहान।

सिंथेसिस एण्ड एण्टीमलेरियल एक्टिविटी ऑफ हाईब्रिड 4–अमिनोक्यूनोलिन ट्राइऐजिन डेरीवेटिव्स, कुलदीप चौहान, मोनी शर्मा, कुमकुम श्रीवास्तव, एस.के. पुरी एवं पी.एम.एस. चौहान।

डिज़ाइन एण्ड सिंथेसिस ऑफ न्यू 4–अमिनोक्यूनोलिन–बेस्ड सेटिन

डेरीवेटिव्स एज़ एण्टीमलेरियल एजेण्ट्स, रश्मि शर्मा, कुमकुम श्रीवास्तव एवं पी.एम.एस. चौहान।

SnCl2.2H2O: एन एफिशिएण्ट रिएजेंट फॉर डाईरेक्ट कन्वर्जन ऑफ 2–थायोहाइडेंटोइंस टू कार्रेस्पोंडिंग हाइड्रेशन, साक्षी पाण्डेय, रवि कुमार एवं पी.एम.एस चौहान।

डिज़ाइन एण्ड सिंथिसिस ऑफ न्यू पायरानोन– डिराइव्ड एण्टीहाइपरग्लाइसिमिक एजेण्ट्स, अमृता परिहार, एस. चौरसिया, एफ.वी. सिंह एवं अतुल गोयल।

सिंथिसिस ऑफ प्रिविलेज्ड एन–हेट्रोसाइक्लिक काम्पाउण्ड्स थ्रू नॉवेल ब्रिज्ड एन्नुलेशन्स, सलिल पी. सिंह, अमित कुमार, रूचिर कांत, पी. आर. मौलिक एवं अतुल गोयल।

एन इफिशिएण्ट वन पॉट सिंथिसिस ऑफ 4–अरोइल–2–पायरोन्स, मोह. इमरान अंसारी, रवि शंकर, मोहम्मद कामिल हुसैन, निशा यादव, रूचिर कांत, पी.आर. मौलिक, रवि कुमार एवं के. हजेला।

ओलिगोसैकेराइड्स प्रजेण्ट इन मेयर्स मिल्क माड्युलेट द इम्मयुनोलॉजिक रिस्पांस ऑफ बाल्ब/सी माईस, नसरीन बानो, मनीषा पाठक, वी.के. सोनी, अमित श्रीवास्तव, देश दीपक एवं शैलजा मिश्रा–भट्टाचार्य।

द रिकम्बनेंट ट्रिहेलोज फॉस्फेट फॉस्फेटेज़ ऑफ*ब्रुगिया मैलेई*प्रोवाइड्स प्रोटेक्शन एगेन्सट इन्फेक्टिव लार्वल चैलेंज इन रोडेण्ट वाया मिक्स्ड Th1/Th2 रिस्पान्स, सुशीला कुशवाहा, प्रशांत कुमार सिंह एवं शैलजा मिश्रा–भट्टाचार्य।

अल्टर्ड एक्सप्रेशन *ब्रुगिया मैलेई* प्रोटिओम पैटर्न एण्ड द होस्ट इन्फलामेटरी इम्युन रिएक्शन इन रिस्पांस टू प्रोलांग्ड टेट्रासायक्लिन ट्रीटमेंट, प्रीति वाजपेयी, अनिल डांगी, एस.के. कार एवं शैलजा मिश्रा – भट्टाचार्य।

आइसोनामीन सी एण्ड इट्स ऐनालॉग्सः डेवलपमेण्ट ऑफ एन एक्स्पीडिशियस हाईली वर्सेटिल, प्रोटेक्टिंग ग्रुप फ्री सिंथेसिंस एण्ड डिस्कवरी ऑफ दियर एण्टीलीशमैनियल पोटेंशियल, रवि कुमार, शाहनवाज खान, एस. श्रीवास्तव, एस. गुप्ता एवं पी.एम.एस. चौहान।

डिजायनिंग एण्ड सिंथिसिस ऑफ पेण्टामीडिन–अप्लाइसिनोप्सिन हाईब्रिड मॉलीक्युल्स एज़ एण्टीलीशैमनियल एजेण्ट्स, शिखा एस. चौहान, शरद पोरवाल, पी.एम.एस. चौहान, निशी शाक्य, आदित्य वर्मा एवं सुमन गुप्ता।

ऑगमेन्टेशन ऑफ लीशमैनियल कीमोथैरेपी इन एनीमल मॉडल यूजिंग सीपीजी–ओडीएन इन कम्बिनेशन विद मिल्टेफोसिन, साने श्रद्धा ए, निशी, डब्ल्यू हक एवं सुमन गुप्ता।

सिंथेसिस ऑफ क्लोरोक्वीन– अप्लाइसिनोप्सिन हाईब्रीड्स एज़ नॉवेल एण्टीमलेरियल एजेण्ट्स, शाहनवाज खान, रवि कुमार, विकास त्यागी, कुमकुम श्रीवास्तव एवं पी.एम.एस. चौहान।

सिंथिसिस एण्ड बायोलॉजिकल एक्टिविटी ऑफ अमिनो एसिड कंज्युगेट्स ऑफ 4–अमिनोक्यूनोलिन एज़ एण्टीमलेरियल एजेण्ट, मनीष सिन्हा, डब्ल्यू हक, के. श्रीवास्तव, एस.के. पुरी एवं एस.बी. कट्टी।

चौथा आरबीएफ सिम्पोजियम ऑन करेन्ट ट्रेन्ड्स इन फार्मास्यूटिकल साइंसेज एडवांसेस इन कार्डियोमेटाबोलिक रिसर्च–बेसिक साइंस एण्ड क्लीनिकल आस्पेक्ट, अहमदाबाद (2–5 फरवरी)

प्लेटलेट एण्ड कौगुलेशन एक्टिवेशन इन हाई फेट हाई फ्रुक्टोज डाइट फेड हाइपरलिपिडेमिक हेमस्टर्स, वी. सिंह, वी. खन्ना, टी. संतोष, अंजु पुरी, एस. भदौरिया, एम.के बरथवाल एवं एम. दीक्षित।

बायोएशिया 2010 : दि ग्लोबल बायोबिज़नेस फोरम, हैदराबाद (4 फरवरी)

सम हेल्थी साइनिसिज़्म रिगार्डिंग नैनोमीटर–साइज्ड ड्रग एण्ड एण्टीजन डिलीवरी सिस्टम, अमित मिश्रा।

इण्टरनेशनल सिम्पोज़ियम ऑन इण्डोक्राइनोलॉजी एण्ड रिप्रोडक्शन, नई दिल्ली (4–6 फरवरी)

एण्टीप्रोलिफरेटिव इफेक्ट ऑफ बेंजोपायरन डेरीवेटिव्स, आर. सक्सेना, आई. फतिमा, वी. चन्द्रा, के. हजेला एवं ए. द्विवेदी।

बारहवां सीआरएसआई नेशनल सिम्पोज़ियम इन कैमिस्ट्री, आईआईसीटी, हैदराबाद (4–7 फरवरी)

सिंथेसिस एण्ड क्वांटम कैमिकल एनॉलसिस ऑफ पार्शियली रिड्यूज्ड 8–ऑक्ज़ा[5]हेलीसिन्स, गौरव तनेजा, दीप्ति वर्मा, वी.जे. राम, यस्मीन हेमबर्गर, गेर्हार्ड ब्रिंगमैन्न एवं अतुल गोयल।

सिंथेसिस ऑफ एज़ा–हेट्रोसाइकल्स यूजिंग बैलिस–हिलमान कैमिस्ट्री, ए. मिश्रा एवं संजय बत्रा।

द्वितीय इण्टरनेशनल कांग्रेस ऑफ वर्ल्ड हार्ट फैल्योर कांग्रेस, चण्डीगढ़ (5–7 फरवरी)

इफेक्ट ऑफ एण्टीथ्रॉम्बोटिक एजेण्ट्स अगेन्स्ट मायोकार्डियल इश्चिमया–रेपरफ्युजन इंज्युरी इन द रैट, प्रेम प्रकाश, अंकिता मिश्रा, एम.के. बरथवाल एवं मधु दीक्षित।

एटोर्वास्टेटिन रिड्यूसेज़ इंफ्लामैट्री लोड एण्ड रिस्टोर्स इण्डोथिलियॉल फंक्शन इन हाइपरट्रायग्लिसरिडेमिक, इन्सुलिन रेजिस्टैंट रैट, प्रेम प्रकाश, विशाल सिंह, अनुपम ज्योति मनीष जैन, विवेक खन्ना, एम. के. बरथवाल एवं मधु दीक्षित।

लांग टर्म फ्रक्टोज डाइट फीडिंग अग्ग्रेवेटस मायोकार्डियल रेपरफ्युजन इंज्युरी एण्ड इज़ अमिलियोरेटेड बॉय एटोर्वास्टेटिन ट्रीटमेंट इन रैट्स, प्रेम प्रकाश, विवेक खन्ना, अनुपम ज्योति, विशाल सिंह, मनीष जैन, एम.के. बरथवाल एवं मधु दीक्षित।

क्लोपिडोग्रेल कॉजेज़ पार्शियल रिवर्जन ऑफ एथ्रोथ्रॉम्बोटिक इवेन्टस इन हाइपरलिपिडिमिक हेमस्टर्स, मनीष जैन, विशाल सिंह, विवेक खन्ना, अंकिता मिश्रा, प्रेम प्रकाश, मधु दीक्षित एवं एम.के. बरथवाल।

दि इण्डियन वर्चुअल कांफ्रेस ऑन बायोइनफारमेटिक्स (12–13 फरवरी)

बायोइनफारमेटिक्स अप्रोचेस इन आइडेण्टीफिकेशन ऑफ प्लान्ट डिराइव्ड लीड मालिक्युल्स फॉर एण्टीट्राइपैनोथाइन एक्टिविटी इन लीश्मैनिएसिस, स्तुति गुप्ता एवं आर.के. शर्मा।

चौथा इण्टरनेशनल सिम्पोज़ियम ऑन करेन्ट ट्रेण्ड्स इन ड्रग डिस्कवरी रिसर्च, लखनऊ (17–21 फरवरी)

डिटरमिनेशन एण्ड फार्माकोकाईनेटिक स्ट्डी ऑफ बायोचेनिन ए एण्ड इट्स मेटाबोलाइट जेनिस्टिन इन रैट प्लाज़्मा बॉय लिक्विड क्रोमेटोग्राफी–मॉस स्पेक्ट्रोमेट्री, वहाजुद्दीन, ए.पी. सिंह एवं जी.के. जैन।

इफेक्ट ऑफ कार्बामेज़ेपाइन – एन एण्टीपिलैप्टिक ऑन फार्माकोकाइनेटिक्स प्रोफाइल ऑफ ए एण्टी मलेरियल ट्राइऑक्ज़ेन इन रैट्स, एच.एन. कुशवाहा, एन. गौतम एवं एस.के. सिंह।

एक्सक्रिशन स्ट्डी ऑफ नॉवेल एण्टीडायबेटिक एस002–853 इन रैट यूरीन एण्ड फिसिस क्वाण्टीफाइड बॉय एलसी–एमएस/एमएस मैथड, एन. गौतम, एच.एन. कुशवाहा एवं एस.के. सिंह।

एचपीएलसी–पीडीए मैथड फॉर क्वांट्टिेटिव एनॉलसिस ऑफ एक्टिव मारकर्स ऑफ अस्टियोजेनिक हर्बल प्रीपैरेशन्स ऑफ *उल्मुस वल्लिशियाना*, एम. लक्ष्मी, आर. मौर्या, एन. चट्टोपाध्याय एवं जी.के. जैन।

एलसी–एमएस–एमएस मैथड फॉर साइमल्टेनिअस एनॉलसिस ऑफ क्लेड्रिन एण्ड इक्विओल इन रैट प्लाज़्मा एण्ड इट्स एप्लीकेशन इन फार्माकोकाइनेटिक्स स्ट्डी ऑफ क्लेड्रिन, एम. लक्ष्मी, एस. गुप्ता, एस. मिश्रा, आर. मौर्या, एन. चट्टोपाध्याय एवं जी.के. जैन।

बायो–एनॉलाइटिकल मैथड डेवलपमेंट एण्ड वैलीडेशन फॉर साइमल्टेनिअस एस्टिमेशन ऑफ डाइएस्टिरिओमर्स ऑफ एस002–333 ए पोटेण्ट एण्टी–थ्रोम्बोटिक एजेण्ट यूजिंग एलसी–एमएस/एमएस, आर.एस. भट्टा, वाई.एस. छोनकर, डी. कुमार, ए.के. सक्सेना एवं जी.के. जैन।

क्लोरोफार्म फ्रैक्शन ऑफ *ज़ायलोकार्पस ग्रेनेटम* फ्रुट प्रोटेक्ट्स द गैस्ट्रिक म्युकोज़ा थ्रू इन्हिबिशन ऑफ H+K+ATPase एक्टिविटी, नीतू सिंह, प्रतिभा सिंह, विजय लक्ष्मी एवं गौतम पालित।

एमेलिओरेशन ऑफ म्युकोज़ल इन्फ्लामेशन इन एक्सपेरिमेन्टल रिफ्लक्स इसोफेगिटिस बॉय सेलेक्टिव COX-2 इन्हिबिटर, प्रतिभा सिंह, नीतू सिंह एवं गौतम पालित।

ब्लाक कोपॉलिमर सेल्फ–असेम्बल्ड मिसेल्स एज़ नैनोकैरियर्स फॉर एम्फोटेरिसिन, बी. भोलेनाथ, विवेक पटेल, पी.आर. मिश्रा एवं ए.के. द्विवेदी।

डेवलपमेण्ट ऑफ ह्यूमन सायटोकाइन्स बेस्ड रिपोर्टर सेल लाइनः *इन विट्रो* मॉडल फॉर इम्यूनोटॉक्सीसिटी टेस्टिंग ऑफ ड्रग्स, धर्मशीला, पंकज सिंह, बलवंत कुमार, पूनम सिंह एवं आर.के. त्रिपाठी।

टॉक्सीकोइनफॉरमेटिक्स इन ड्रग डिज़ाइन, पूनम सिंह।

एप्लीकेशन ऑफ प्लाण्ट बायोइंफारमेटिक्स इन दि प्रिडिक्शन ऑफ मेडिसिनल प्रोपर्टिज ऑफ मरीन आर्गोनिज्म फॉर एण्टी–पैरासाइटिक प्रोपर्टीज, स्तुति गुप्ता, एम. शर्मा, जी. सिंह एवं आर.के. शर्मा।

एण्टीड़िस्लिपिडेमिक एण्ड एण्टीओक्सीडेण्ट एक्टिविटी *ऑफ पाइनस रोक्सबर्घी* नीड़ेल्स, अंजु पुरी, ए.के. श्रीवास्तव, बरखा एस., एस.के. मिश्रा, एस. श्रीवास्तव एवं वी. लक्ष्मी।

डिज़ाइन एण्ड सिंथेसिस ऑफ पाइपरेज़िन डेराइव्ड एण्टिस्पर्मेटोजेनिक एजेण्ट्स, नंद लाल, विकास वर्मा, जे.पी. मैखुरी, जी. गुप्ता एवं वी. एल. शर्मा।

सिंथेसिस एण्ड *इन वाइवो* एण्टीहाइपरग्लाइसेमिक एक्टिविटी ऑफ फंक्शनलाइज्ड टरएरिल्स एण्ड क्वाटरएरिल्स इन STZ-S मॉडल, विजय कुमार, सुमित चौरसिया, पंकज नाग, ए.के. श्रीवास्तव एवं अतुल गोयल।

सिंथेसिस एण्ड एण्टीलीश्मैनियल एक्टिविटी ऑफ नॉवेल एरिलॉक्सि/बेन्जिलॉक्सि ट्रेटाहाइड्रोनेथ्थिल अज़ोल्स, वी.के. मरप्पु, एन. श्रीनिवास, निषी, एम. मित्तल, एस. गुप्ता एवं के. भण्डारी।

एप्लीकेशन ऑफ 7–इण्डो ट्रिग पिक्टेट–स्पेन्लेर साइक्लाइजेशन लीडिंग टू द सिंथिसिस ऑफ नॉवेल बेन्जोएजेपिनोइन्डोल एण्ड नेच्युरली अकरिंग स्केलिटन पायरोलो[2,1-c][1,4] बेन्जोडायजेपीन–5–ओन एण्ड दिअर डेरीवेटिव्स, एस.के. शर्मा, वी.के. हरित, सहज गुप्ता एवं बिजोय कुण्डू।

ए न्यू इंट्री टू फेनेन्थ्रिडीन रिंग सिस्टम्स वाया सिक्वेन्शियल एप्लीकेशन ऑफ सूजुकी एण्ड दि मोडीफाइड पिक्टेट–स्पेंग्लर रिऐक्शन, ए.के. मण्डाड्पु, मोहम्मद सैफुद्दीन, पी.के. अग्रवाल एवं बिजोय कुण्डू।

रिज्योसेलेक्टिव इंट्रामॉलिक्युलर इलेक्ट्रोफिलिक सब्स्टीयूशन रिएक्शन इंवॉल्विग पी–डेफिशिएण्ट पायरिडिन सबस्ट्रेट्स, मोहम्मद सैफुद्दीन, पीयूष के. अग्रवाल एवं बिजोय कुण्डू।

3,4,6–ट्रायऐरिल्स–2–पॉयरेनोन्स एज़ ए पोटेंशियल न्यू क्लास ऑफ एण्टी–ब्रेस्ट कैंसर एजेण्ट्स, मोहम्मद इमरान अंसारी, एम. कामिल हुसैन, हर्षा शुक्ला, निशा यादव, आर. शंकर, बी. चक्रवर्ती, यू.एस. सिंह, एस. देशपाण्डे, एस.के.डी. द्विवेदी, ए.के. बिड, आर. कोनवार, जी. खरगवाल, वी. चन्द्रा, ए. द्विवेदी एवं के. हजेला।

3D-QSAR ComFA , MComSIA ऑन प्रोटीन टायरोसिन फॉस्फेटेज 1बी–इन्हिबिटर्स, वी. शुक्ला, एस. गुप्ता, एवं ए.के. सक्सेना।

16अल्फा–हाइड्रोक्सीक्लेरोडा–3, 13(14)जेड–डाइन–15, 16–ओलाइड, ए नेच्युरल लीड फ्रॉम *पॉलिएल्थिया लॉंगिफोलिया* अगेन्स्ट लीश्मैनियासिस, के.वी. शशिधरा, एस.पी. सिंह, प्रज्ञा मिश्रा, ए. कुमार, आर. गुप्ता, एस.एस. चौधरी, एस.एस. गुप्ता, एच.के. मजुमदार, ए.के. सक्सेना एवं अनुराधा दुबे।

डिज़ाइन एण्ड सिंथेसिस ऑफ bmp-2 एगोनिस्ट्स एज़ पोटेण्ट एण्टीओस्टियापोरोटिक एजेण्ट्स, वी.एम. बलरामनावर, इमरान अहमद खान एवं ए.के. सक्सेना।

डिजाइन, सिंथेसिस एण्ड डॉकिंग स्ट्डीज ऑफ फिनॉक्सि–3–पाइपेरेज़िन–1–यिल–प्रोपॉन–2–ओल डेरीवेटिव्स एज़ इन्हिबिटर्स ऑफ प्रोटीन टायरोसिन फॉस्फेटेज़ 1बी, स्वाति गुप्ता, ज्ञानेन्द्र पाण्डेय एवं ए.के. सक्सेना।

इन सिलिको डेवलपमेण्ट एण्ड वैलिडेशन ऑफ क्वांटिटेट्विं फार्माकोफोर मॉडल ऑन हीट शॉक प्रोटीन 90(HSP90) इन्हिबिटर्स एज़ एण्टी–कैंसर एजेण्ट्स, सुप्रिया सिंह, कुलदीप के. राय एवं ए.के. सक्सेना।

3D-QSAR फार्माकोफर मॉडलिंग एण्ड डॉकिंग स्टडीज ऑन बेन्जिमिडाजोल डेरीवेटिव्स एज़ एक्टिवेटर्स ऑफ द एएमपी–एक्टिवेटड प्रोटीन काइनेज़ (AMPK), सुगंधा शर्मा, वी.एम. बलरामनावर एवं ए.के. सक्सेना।

डिजाइन, सिंथेसिस एण्ड 3डी–क्यूएसएआर मॉलीक्युलर माडलिंग स्टडीज ऑफ नॉवेल डीएनए–गाइरेज़ इन्हिबिटर्स एज़ एण्टीट्युबर्क्युलर एजेण्ट्स, चन्द्रा एस. आज़ाद, अनिषा थॉमस एण्ड ए.के. सक्सेना।

3D-QSAR स्टडीज ऑन एन्थ्रानिलामाइड डेरीवेटिव्स एज़ फैक्टर XA इन्हिबिटर्स, सोम एस. भुनिया एवं ए.के. सक्सेना।

थ्री–डायमेन्शनल कॉमन–फीचर हाइपोथिसिस एण्ड डॉकिंग स्ट्डीज ऑन आइसोइन्डोलिनोन बेस्ड P53-MDM2 इन्हिबिटर्स, एस. सक्सेना एवं ए.के. सक्सेना।

डेवलपमेंट ऑफ 3डी–फार्माकोफोर मॉडल एज़ विर्चुअल स्क्रीनिंग टूल फॉर नॉवेल ब्रेडीकायनिन रिसेप्टर एण्टाग्नोस्ट्स, एस.एस. चौधरी एवं ए.के. सक्सेना।

सब्सट्यिुटेड हाइड्राजिनेकार्बोथियोमाइड एज़ पोटेण्ट एण्टीट्युबर्क्युलर एजेण्ट्सः सिंथेसिस एण्ड स्ट्रक्चर–एक्टिविटी रिलेशनशिप (QSAR), नागेन्द्र सिंह, सुप्रिया सिंह एवं ए.के. सक्सेना।

डिज़ाइन, सिंथेसिस एण्ड मॉडलिंग ऑफ एण्टीहिस्टामिन्स एच1, मॉदुला सक्सेना, स्तुति गौड़, एस.एस. चौधरी, इमरान ए. खान, सुप्रिया सिंह, राम रघुबीर एवं ए.के. सक्सेना।

इन सिलिको विर्चुअल स्क्रीनिंग, सिंथेसिस एण्ड इवैल्युएशन ऑफ नॉवेल कार्बामेट्स एज़ एसिटाइलकोलिनएस्टेरज (AChE) इन्हिबिटर्स फॉर अल्ज़ाइमर्स डिज़ीज (AD), के.के. राय, एस.एस. चौधरी, नीरज शाक्य, गुंजन सक्सेना, सी. नाथ एवं ए.के. सक्सेना।

स्ट्रक्चर–बेस्ड डिस्कवरी एण्ड मालिक्युलर डॉकिंग स्ट्डीज ऑफ स्मॉल मालिक्युल इन्हिबिटर्स टार्गेटड टू प्रोटीन टायरोसिन फॉस्फेट्स, 1बी, कनिका वार्ष्णेय, स्वाति गुप्ता, नागेन्द्र सिंह एवं ए.के. सक्सेना।

पायरिडो (3, 4–बी) इण्डोल–2–सल्फोनिल डेरिवेटिव्स एज़ पोटेंशियल एण्टीथ्रॉम्बोटिक एजेण्ट्स, इमरान ए. खान, स्तुति गौड़, सुरेश के. पाण्डेय, योगेन्द्रपाल, मधु दीक्षित एवं ए.के. सक्सेना।

फार्माकोफोर मॉडलिंग ऑफ डाइवर्स क्लासेस ऑफ EGFR (HER1) टायसिन काइनेज़ इन्हिबिटर्स, ए.के. गुप्ता, कपिल देव एवं ए.के सक्सेना।

थ्री–डाइमेन्शनल *इन सिलिको* फार्माकोफोर एण्ड कोम्फा, कोम्सिया स्ट्डीज ऑन अल्फा1ए–एड्रेनर्जिक रिसेप्टर एण्टागोनिस्ट्स, ए.के. गुप्ता, पी.बी. डोगोपार्थी, सुचेता दास एवं ए.के. सक्सेना।

नॉवेल 2–एरिल–नैप्थो 1,2–डी ओक्ज़ाजोल डेरिवेटिव्स एज़ एण्टीहाइपरग्लाइसेमिक एजेण्ट्स, टी.ए. अंसारी, पी. अहमद, एस.पी. श्रीवास्तव, ए.के. श्रीवास्तव एवं ए. कुमार।

बायोएक्टिव कांस्टीट्युन्ट्स फ्रॉम फ्रूट्स ऑफ *क्युप्रेसस सेम्पर्विरेन्स*, एम.एफ. खान, पी. रावत, एम. कुमार, ए.के. श्रीवास्तव एवं आर. मौर्या।

एण्टीहाइपरग्लाईसेमिक कांस्टीट्युन्ट्स ऑफ *डोडेकैडिनिया ग्राण्डीफ्लोरा* एम. कुमार, पी. रावत, ए.के. श्रीवास्तव एवं आर. मौर्या।

पायरेनोक्युमैरिन्सः ए न्यू क्लॉस ऑफ एण्टी–हाइपरग्लाईसेमिक एण्ड एण्टी–डिस्लिपिडेमिक एजेण्ट्स, पी.कुमार, पी. अहमद, जी. भाटिया, ए.के. श्रीवास्तव एवं ए. कुमार।

सिंथेसिस एण्ड इन वाइवो एण्टीहाइपरग्लाइसेमिक एक्टिविटी ऑफ फंक्शनलाइज्ड टरएरिल्स एण्ड क्वाटरएरिल्स इन STZ-S मॉडल, वी. कुमार, एस. चौरासिया, पी. नाग, ए.के. श्रीवास्तव एवं ए. गोयल।

डिजाइन एण्ड सिंथिसिस ऑफ 3,5–डाइऐरिल्सओक्ज़ाजोल डेरीवेटिव्स एज़ नॉवेल क्लास ऑफ एण्टी–हाईपरग्लाईसेमिक एण्ड लिपिड लोअरिंग ऐजेण्ट, एस. शर्मा, आर.ए. मौर्या, जी. भाटिया, ए.के. श्रीवास्तव एवं ए. कुमार।

चॉल्कोन–बेस्ड एरिलओक्सीइथाईलामाइन एज़ एण्टीहाइपरग्लाईसेमिक एजेण्ट्स, पी. शुक्ला, जे. तिवारी, पी.सी. वर्मा, नेहा, ए.के. श्रीवास्तव एवं आर. प्रताप।

वैक्सीनेशन विथ रिकोम्बिनेंट इण्डीपेंडेण्ट फॉस्फोग्लिसरेट म्यूटेज अगेन्स्ट चैलेंज इंफेक्शन विथ *ब्रुगिया मैलेई* कन्फर्स प्रोटेक्टिव इम्म्युनिट इन रोडेण्ट, प्रशांत कुमार सिंह, सुशीना कुशवाहा एवं शैलजा मिश्रा–भट्टाचार्या।

इन वाइवो इम्युन–सप्रेस्सांट एक्टिविटी ऑफ प्लांट एक्सट्रेक्ट इन बॉल्ब/सी माउस मॉडल, मनीषा पाठक, नसरीन बानो, विशाल कुमार सोनी, प्रीति दीक्षित, अकांक्षा, राकेश मौर्या एण्ड शैलेजा मिश्रा–भट्टाचार्य।

इम्प्रूवमेण्ट इन द एण्टीफाइलेरियल इफ्फिकेसी एण्टीवोल्बचियल

एण्टीबायोटिक फार्मुलेशन ऑफ डॉक्सीसाइक्लिन एण्ड रिफैम्पिसिन वेन कम्बाइन्ड टूगेदर एण्ड विथ डाइथिलकार्बामॉजिन, मीनाक्षी वर्मा, अनिल डांगी, वी. द्विवेदी, एस. वेदी, मो. ओवेज़ एवं शैलजा मिश्रा–भट्टाचार्या।

क्लोनिंग, एक्सप्रेशन एण्ड करैक्टराइजेशन ऑफ रिपेट्टिव इंफेक्टिव लॉर्वल एण्टीजन बीएमएल3 आर15 ऑफ लिम्फैटिक फाइलेरियल ब्रुगिया मेलई, विशाल कुमार सोनी, प्रशांत कुमार सिंह, सुशीला कुशवाहा एवं शैलजा मिश्रा–भट्टाचार्या।

डेवलमेण्ट ऑफ अक्सेनिकली ग्रोविंग *लीश्मैनिया डोनोवनी* एमस्टीगोट्स एक्सप्रेसिंग हचि एज़ एन *इन विट्रो* मॉडल फॉर ड्रग स्क्रीनिंग, ए.के. जायसवाल, रीमा गुप्ता एवं अनुराधा दुबे।

प्रोटियोमिक एनॉलासिस ऑफ ए क्लीनिकल आइसोलेट ऑफ *लीश्मैनिया डोनोवनी* प्रोमास्टिगोट्स फॉर आईडेण्टीफिकेशन ऑफ ड्रग टारगेटस फ्रॉम मैम्ब्रेन–एनरिच्ड फ्रैक्शन, प्रज्ञा मिश्रा, अश्विनी कुमार, रति टण्डन, संचिता दास एवं अनुराधा दुबे।

इनोलेज (2–फॉस्फो–ग्लिसरेट हाइड्रोलेज): ए पोटेंश्यिल एण्टीलीश्मैनियल ड्रग टारगेट, आर. गुप्ता, पी.के. कुशवाहा, एम. सामंत एवं ए. दुबे।

क्लोनिंग एण्ड ओवर–एक्सप्रेशन ऑफ इलांगेशन फेक्टर 2 – ए पॉसिबल ड्रग टारगेट फ्रॉम लीश्मैनिया डोनोवनी, पी.के. कुशवाहा, रीमा गुप्ता, राजेन्द्र बहरिया एवं अनुराधा दुबे।

लोक्लाइजेशन ऑफ एल्डोलेज़, ए पोटेंश्यिल ड्रग टारगेट, इन ग्लाइकोसोम्स एण्ड फ्लेज़ेला ऑफ *लीश्मैनिया डोनोवनी*, रीमा गुप्ता, पी.के. कुशवाहा, मुकेश सामंत एवं अनुराधा दुबे।

सिंथेसिस एण्ड *इन–विट्रो* एण्टीमलेरियल एक्टिविटी ऑफ नॉवेल 4–अनिलिनोक्यूनोलिन मैन्निच बेस डेरीवेटिव्स, भूपेन्द्र सिंह, दीपक चेतिया, कुमकुम श्रीवास्तव, एस.के. पुरी एवं अनिल प्रकाश।

एण्टीमलेरियल एक्टिविटी इन *जॉयलोकार्पस ग्रानेट्म* (Koen), वी. लक्ष्मी, एस. श्रीवास्तव, एस.के. मिश्रा, एम.एन. श्रीवास्तव, के. श्रीवास्तव एवं एस.के. पुरी।

इण्टरनेशनल सिम्पोजियम ऑन करेन्ट स्टेटस एण्ड अप्पार्च्युनिटिज इन एरोमेटिक एण्ड मेडिसिनल प्लांट्स, लखनऊ (21–24 फरवरी)

उल्मस वल्लिशियाना एन एथनोमेडिसिनल प्लाण्ट फॉर ओस्टियोजेनिक ड्रग फ्रॉम वेस्टर्न हिमालय, के.आर. आर्या।

इण्टरनेशनल कांफ्रेस एण्ड हम्बोल्ट कॉलेज, फ्रण्टियर्स ऑफ इनवायरमेण्टल एण्ड हेल्थ साइंसेज यूज़फुल टू मैनकाइण्ड: ए मल्टीडिसिप्लिनरी अप्रोच, लखनऊ (24–27 फरवरी)

लेक्टोन्स मैथोडोलॉजी इन द कंस्ट्रक्शन ऑफ पॉलि अरोमेटिक हाइड्रोकार्बन्स, ओ–एण्ड एन–हेट्रोसाइक्लिक स्केफ्फोल्ड्स, अमित कुमार, विजय कुमार, सलिल प्रताप सिंह एवं अतुल गोयल।

नॉवेल कन्सेप्ट ऑफ इन्हिबिटिंग 'ग्रीन एम्मिशन डिफेक्ट': 2–पायरैनोन डिराइव्ड न्यू टीटी–कांजुकेटड एरिन्स फॉर ओएलईडीएएस, सुमित चौरिसया, विजय कुमार, आर.एस. आनन्द, एस.एस. मनोहरन एवं अतुल गोयल।

फार्माकोफोर आईडेण्टीफिकेशन एण्ड डॉकिंग स्ट्डीज ऑन दHSP90 इन्हिबिटर्स, शालिनी सक्सेना, एस.एस. चौधरी, कनिका वार्ष्णेय एवं ए.के. सक्सेना।

कॉमन फ़ीचर हाइपोथिसिस फॉर प्रोटीन टाइरोसिन फॉस्फेटेज़ 1बी इन्हिबिशन, स्वाति गुप्ता एवं ए.के. सक्सेना।

फार्माकोफोर मॉडलिंग एण्ड विर्चुअल स्क्रीनिंग स्ट्डीज फॉर दी डिज़ाइन ऑफ पोटेंट P53-MDM2 इन्हिबिटिर्स, सुप्रिया सिंह, केशव प्रसाद, एस.एस. चौधरी, कोनवार रितुराज एवं ए.के. सक्सेना।

होमोलॉजी मॉडलिंग एण्ड बाइंडिंग साइट कैरेक्टराइजेशन ऑफ एड्रेनोरिसेप्टर, कुलदीप के. राय एवं ए.के. सक्सेना।

द्वितीय इण्टरनेशनल सिम्पोज़ियम ऑन ड्रग मेटाबोलिज्म एण्ड फार्माकोकाइनेटिक्स(डीएमपीके): एप्लिकेशन्स टुवर्ड ड्रग डिस्कवरी एण्ड डेवलपमेण्ट, मोहाली (27–28 फरवरी)

अप्टिमाइजेशन एण्ड वैलिडेशन ऑफ RP-HPLC मैथेड विद प्रोटीन प्रेसिपिटेशन फॉर डिट्रमिनेशन ऑफ नोबिलिटीन इन रैट प्लाज़्मा एण्ड ब्रेन टिश्यू, दिव्यांश तिवारी, कुशल पटेल, शीलेन्द्र पी. सिंह, वहाजुद्दीन एवं जी.के. जैन।

पीएएमपीए परमिएबिलिटी स्ट्डी ऑफ टेस्ट कम्पाउण्ड्स एलांग विद एप्रूव्ड मॉरकर्स, कुशलकुमार पटेल, दिव्यांश तिवारी, शीलेन्द्र पी. सिंह, वहाजुद्दीन एवं जी.के. जैन।

फार्माकोकाइनेटिक एण्ड एक्सक्रिशन स्ट्डीज ऑफ नॉवेल एण्टीडायबेटिक S002-857 इन रैट्स, एन. गौतम, एच.एन. कुशवाहा, एच. कुमार, आर. प्रताप एवं एस.के. सिंह।

इफेक्ट ऑफ गाबापेंटिन – एन एण्टीइप्लिपटिक ऑन फार्माकोकाइनेटिक्स प्रोफाइल ऑफ 97–98, एन एण्टीमलेरियल ट्राईओक्ज़ेन इन रैट्स, एच.एन. कुशवाहा, एन. गौतम, एच. कुमार, आर. प्रताप एवं एस.के. सिंह।

ओरल फार्माकोकाइनेटिक, *इन सिटु* एब्जारप्शन एण्ड SGF/SIF स्टेबिलिटी स्ट्डीज ऑफ S002-857, ए नॉवेल एण्टीडाइबेटिक कम्पाउण्ड सिंथेसाइज्ड बाय सीडीआरआई, एन. गौतम, एच. कुमार, एच.एन. कुशवाहा एवं एस.के. सिंह।

एस्से मैथेड फॉर सेन्टक्रोमॉन, ए सेलेक्टिव इस्ट्रोजन रिस्पेटर माड्युलेटर इन रैट ड्राइड ब्लड स्पॉट, निधि एवं जे. लाल।

आइडेण्टीफिकेशन ऑफ मेटाबोलिक पाथवे ऑफ नॉवेल लिपिड लोअरिंग एजेण्ट 16–डीएचपी इन ह्यूमन लिवर माइक्रोसोम यूजिंग एलसी–एमएस/एमएस, डी. कुमार, सी. राठी, एच. चण्डासना, वाई. एस. छोनकर, आर.एस. भट्टा एवं जी.के. जैन।

इस्टीमेशन ऑफ *इन विट्रो* ह्यूमन इन्टेस्टायनल परमिइएबिलिटी एण्ड मेटाब्लॉज़िम ऑफ नॉवेल एण्टी–हाईपरलिपिडिमिक एजेण्ट 16–डिहाइड्रोप्रेग्नेंलोन (DHP, 80/574), डी. कुमार, एच. चण्डासना, सी. राठी, वाई.एस. छोनकर, एस. मीना, एस. नीतू, जे सरकार, आर. एस. भट्टा एवं जी.के. जैन।

सिम्पोज़ियम ऑन डीएनए रिपेयर जीनोमिक इनस्टेबिलिटी एण्ड कैंसर, वाराणसी (4–5 मार्च)

जीन पॉलिमोर्फिज्म्स इन स्क्वामोज सेल कारसिनोमा ऑफ हेड एण्ड नेक एण्ड ब्रेस्ट कैंसर – अवर एक्पीरियन्स, एस.वी. सिंह, ए.के. मित्रा, नीतू सिंह, वी.के. गर्ग, रश्मि चतुर्वेदी, मन्दिरा शर्मा एवं एस.के. रथ।

पैंतीसवीं एन्युअल कांफ्रेस ऑफ दि इण्डियन सोसायटी ऑफ ह्युमन जेनेटिक्स, लखनऊ (6–8 मार्च)

पॉलिमोरिफिज्म इन द *IL-10* जीन डॅज नॉट एसोशिएट विथ ब्रेस्ट कैंसर इन नॉर्थ इण्डियन पॉप्युलेशन, पूजा सिंह, संदीप कुमार, हेमन्त कुमार बिड, नैबेद्य चट्टोपाध्याय एवं रितुराज कोनवर।

चौदहवीं एन्युअल कांफ्रेस ऑफ ब्रेस्ट कैंसर फाउण्डेशन ऑफ इण्डिया, लखनऊ (7–8 मार्च)

रिस्पानसिवनेस ऑफ मॉलिक्युलर प्रिडिक्टिव बायोमारकर्स इन ब्रीस्ट कैंसर कीमोथेरेपी एन इन्नोवेटिव आइडिया, ए.के. श्रीवास्तव, पी.के. सिंह, पी. सिंह, एस. नायक, एस. सिंह, पी. शिल्पी एवं एम.एल.बी. भट्ट।

एपिजेनिन, इज इट फिट फॉर ब्रेस्ट कैंसर ट्रीटमेंट?, पी. सिंह, एस. के. मिश्रा, पी.के. सिंह, ए.के. श्रीवास्तव, ए.के. वर्मा, एस.के. मौर्या, एस. शर्मा एवं एस.के. रथ।

सिंगल न्यूक्लोटाइड पॉलिमोरिफिज्मस (SNPs) इन p53, p21 एण्ड Cox-2 एण्ड ब्रेस्ट कैंसर रिस्क इन नॉर्थ इण्डियन वुमैन–केस कंट्रोल स्ट्डी, एस.वी. सिंह, नीतू सिंह, वी.के. गर्ग, रश्मि चतुर्वेदी, मंदिरा शर्मा एवं एस.के. रथ।

सिंगल न्यूक्लिोटाइड पॉलिमोरिफिज्मस (SNPs) एण्ड ब्रेस्ट कैंसर रिस्क–अवर एक्सपीरियंस, एस.वी. सिंह, ए.के. मित्रा, नीतू सिंह, वी.के. गर्ग, रश्मि चतुर्वेदी, मन्दिरा शर्मा एवं एस.के. रथ।

इण्टरनेशनल कांफ्रेस ऑन एडवांसेस इन इलेक्शन माइक्रोस्कोपी एण्ड रिलेटेड टेक्नीक्स, मुंबई (8–10 मार्च)

स्ट्रक्चरल स्ट्डीज ऑन द लारजेस्ट नोन वाइरस बॉय क्रायो–इलेक्ट्रॉन माइक्रोस्कोपी, कल्याण मित्रा एवं माइकल जी. रॉसमन्न।

नेशनल सेमिनार ऑन दि स्ट्रक्चर एण्ड फंक्शन ऑफ कोस्टल वेजिटेशन एण्ड इट्स रिलेवेन्स टू दि सोसायटी, पुर्वा मेदिनीपुर (17–18 मार्च)

कोस्टल वेजीटेशन ऑफ वेस्ट बंगाल एण्ड इट्स इम्पोरटेन्स इन न्यू ड्रग डेवलपमेंट, डी.के. मिश्रा।

द्वितीय नाइपर–सीडीआरआई सिम्पोज़ियम ऑन मेडिसिनल कैमिस्ट्री एण्ड फार्मास्यूटिकल साइंसेज, लखनऊ (25–27 मार्च)

चिटोसन कोटेड पॉलि–कैप्रोलेक्टोन नैनोपार्टिक्ल फॉर ऑक्युलर डिलीवरी ऑफ एम्फोटेरिसिन–बी, सी. राठी, एच. चण्डासना, डी. कुमार, वाई.एस. छोनकर, पी.के शुक्ला, के. मित्रा, आर.एस. भट्टा एवं जी.के. जैन।

इन सिटु रैट परमिएबिलिटीः ए प्रिडिक्टिव टूल फॉर ह्यूमन इंटेस्टाइनल परमिएबिलिटी, कुशलकुमार पटेल, दिव्यांश तिवारी, एस.पी. सिंह, वहाजुद्दीन एवं जी.के. जैन।

ए न्यू पैराडाइम इन बायोएनालिसिस, जी.के. जैन।

प्रिफार्म्युलेशन स्ट्डीज ऑफ सीडीआरआई कम्पाउण्डS000-20, वर्षा गुप्ता, नीति रावत, डी.के. दीक्षित एवं ए.के. द्विवेदी।

यूजीसी नेशनल सेमिनार ऑन टेक्नोलॉजिकल एडवांसेस इन फार्मास्युटिकल एजुकेशन एण्ड रिसर्च, लखनऊ (26 अप्रैल)

टेक्नोलॉजी इन फार्मास्यूटिक्स रिसर्चः ए केस स्ट्डी ऑफ द एडवांटेजेज़ ऑफ *जुगाड़*, अमित मिश्रा।

रीज़नल एक्सपर्टस मीटिंग ऑन हर्बल मेडिसिन प्रोसेसिंग इन्क्लुडिंग एक्सट्रेक्शन, स्टैण्डर्डाइजेशन, प्रोसेसिंग, फारम्युलेशन, पैकेजिंग एण्ड कर्मिश्यलाइजेशन, तेहरान, ईरान (19–21 जून)

आइसोलेशन, स्ट्रक्चर डिटरमिनेएशन, कैमिकल ट्रांसफारमेशन एण्ड सिंथेसिस ऑफ नेच्युरल प्रोड्क्टस, राकेश मौर्या।

ब्रेन रिसर्च इन्स्टीट्यूट, ज्यूरिक, स्विट्जरलैण्ड (11–16 जुलाई)

एनीमल मॉडल्स फॉर स्पाइनल कॉर्ड एण्ड ब्रेन इंज्युरिज, नीलेन्द्र सिंह।

छठवीं एन्युअल कांफ्रेन्स ऑफ दि इण्डियन सोसायटी फॉर बोन एण्ड मिनरल रिसर्च, नई दिल्ली (13–14 अगस्त)

CDR-S007-1500 हैज पोटेंशियल एज़ एन ओस्टियोप्रोटेक्टिव एण्ड

फ्रेक्चर रिपेयर एजेण्ट, रश्मि पाण्डेय, होसिला प्रसाद पाण्डेय, नैबेद्य चट्टोपाध्याय एण्ड दिव्या सिंह।

CPhI मीटिंग ऑन नॉवेल ड्रग डिलीवरी सिस्टम्स, मुंबई (19 अगस्त)

यूटिलाइजिंग एडवांस्ड ड्रग डिलीवरी एप्रोचेज़ फॉर कॉम्प्लेक्स रेसपिरेटरी थैरेपीज़, अमित मिश्रा।

इण्टरनेशनल रिसर्च मीटिंग ऑन पल्मोनरी हाइपरटेन्शन एसोशिएटेड विथ हाई अल्टीट्युड एण्ड हाइपोक्सिया, लेह (27–30 सितम्बर)

इण्डोथिलियल डिसफंक्शन, इन्सुलिन रैजिस्टेंस, ऑक्सीडेटिव स्ट्रेस एण्ड मायोकार्डियल इश्चिमिया/रेपरफ्यूज़न इंज्युरी इन लांग टर्म फ्रक्टोज़ फेड रैट्स, पी. प्रकाश, वी. खन्ना, एम. जैन, ए. ज्योति, वी. सिंह, आर.एस. केसरी, एम.के. बरथवाल एवं एम. दीक्षित।

इफेक्ट ऑफ एक्वस एक्सट्रेक्ट ऑफ *प्युनिका ग्रेनेटम* ऑन मोनोक्टोटालियोन इन्ड्युस्ड पल्मोनरी हाइपरटेंशन इन रैट्स, के. हनीफ एवं एम. दीक्षित।

InCOFIBS 2010: इण्टरनेशनल कांफ्रेंस ऑन फ्रंटियर्स इन बायोलॉजिकल साइंस, राउरकेला (1–3 अक्टूबर)

एप्रोएचेस टू ट्युबर्क्युलोसिस ड्रग डेवलपमेंट, वी. सिंह एवं आर. श्रीवास्तव।

दसवीं बाइएन्युल मीटिंग ऑफ दि एशियन पैसेफिक सोसायटी फॉर न्यूरोकैमिस्ट्री, बैंकाक, थाईलैण्ड (10–20 अक्टूबर)

एक्सप्लोरेशन ऑफ ग्लुटामेट ट्रांस्पोर्टर–1(GLT-1) एज़ ए पोटेंशियल थेराप्युटिक टॉरगेट फॉर न्यूरोप्रोटेक्शन, राजकुमार वर्मा

एशिया–पैसेफिक सोसाइयटी ऑफ न्यूरोकैमिस्ट्री, फुकैट, थाईलैण्ड (18–20 अक्टूबर)

एक्सप्लोरेशन ग्लुटामेट ट्रांस्पोर्टर–1 (GLT-1) एज़ ए पोटेंशियल थेराप्युटिक टारगेट फॉर न्यूरोप्रोटेक्शन, आर. वर्मा, वी. मिश्रा एवं आर. रघुबीर।

इण्टरनेशनल सिम्पोज़ियम ऑन अल्टरनेट एनिमल मॉडल्स इन बायोलॉजिकल रिसर्चः प्रेजेण्ट एण्ड फ्युचर पर्सपेक्टिव इन टॉक्सिकोलॉजी, लखनऊ (29–31 अक्टूबर)

प्रोटेक्टिव इफेक्ट ऑफ एपिजेनिन अगेन्स्ट लिथोकोलिक एसिड इन्ड्युस्ड–ऑक्सीडेट्रिव स्ट्रेस एण्ड टॉक्सिसिटी इन हेपाटिक, सेल लाइन्स, पी. सिंह, पी. मिश्रा, ए.के. वर्मा, पी. श्रीवास्तव, एस. शर्मा एवं एस.के. रथ।

बाईसवीं कांग्रेस ऑफ पैरासिटोलॉजी, कोलकाता (30 अक्टूबर –1 नवम्बर)

क्लोनिंग एण्ड एक्सप्रेशन ऑफ *ब्रुगिया मैलेई*थाईमिडाइलेट काइनेज़, पी.के. दोहरे, अनिता, एम.के. सुथार, एस.वी. सिंह एवं जे.के. सक्सेना।

सिंथिसिस एण्ड बायोलॉजिकल इवैल्युएशन ऑफ इण्डोलिल ग्लाइओक्सिलअमाइड्स एज़ ए न्यू क्लास ऑफ एण्टीलीश्मैनियल एजेण्ट्स, मोनिका मित्तल, शिखा एस. चौहान, लीना गुप्ता, प्रीति विश्वकर्मा, पी.एम.एस. चौहान एवं सुमन गुप्ता।

इफेक्ट ऑफ कम्बीनेशन्स ऑफ सब–क्यूरेटिव डोज़ेज ऑफ एण्टीबायोटिक(एस) ऑफ माइकोप्लाज़्मा कान्टेमिनेशन एण्ड सर्वाइवल ऑफ *इन विट्रो प्लाज़मोडियम फाल्सिपैरम*, पूजा अग्रवाल, साकिब किदवई, एस.के. पुरी एवं कुमकुम श्रीवास्तव।

प्लाज़्मोडियम योइली स्पोरोजाइट इंड्युज्ड इंफेक्शन इलिसिट्स वैरीड उत्छ। एक्सप्रेशन ऑफ IFN-γZ एण्ड IL-10 इन लीवर एण्ड स्पिलीन फ्रॉम इन्फेक्टेड माइस, आरिफ जे. सिद्दिकी, ज्योति भारद्वाज एवं एस.के. पुरी।

हाई IFN-γ mRNA एक्सप्रेशन कोरिलेट्स टू प्रोटक्शन अगेन्स्ट नॉन लीथल म्यूरिन मलेरिया इंफक्शन, ज्योति भारद्वाज, आरिफ जे, सिद्दिकी एवं एस.के. पुरी।

कॉम्पारेटिव जीन सिक्वेन्स एनॉलासिस ऑफ हीम डिटॉक्सिफिकेशन प्रोटीन (HDP) फ्रॉम अर्टीथर सेंसिटिव एण्ड अर्टीथर रेजिस्टेण्ट स्ट्रेन्स ऑफ *प्लाज़मोडियम विनकेई*, आकाश सोनी, संतोष कुमार एवं एस.के. पुरी।

इण्टरनेशनल कांफ्रेस ऑन मल्टीडिसिप्लेनरी अप्रोचेज़ टू डायबिटीज़ रिसर्च एण्ड हेल्थ, जयपुर (14–16 नवम्बर)

मल्टी–मॉडल QSAR ऑफ एन–सल्फोनाइल–2– इण्डोल कार्बोक्सामाइड एज़ PPAR-γ अगोनिस्टसः टोपोलोजिकल फीचर्स इन एक्सप्लेनिंग दि एक्टिविटी, एस. देशपाण्डे, एस.बी. कट्टी एवं वाई. एस. प्रभाकर।

FIP फार्मास्युटिक्ल साइंसेज वर्ल्ड कांग्रेस 2010, न्यू ऑरलेन्स, यूएसए (14–18 नवम्बर)

फार्माकोकाइनेटिक्स एण्ड बायोअवेलेबिलिटी ऑफ ल्यूमिफेंट्राइन, ए हाइली प्रोटीन बाउण्ड एण्टीमलेरियल इन रैटस, वहाजुद्दीन, एस. पी. सिंह एवं जी.के. जैन।

साइमल्टेनिअस डिटरमिनेशन ऑफ फोर आइसोफ्लेवोन्स इन रैट प्लाज्मा बॉय LC-ESI-MS/MS: अस्से डेवलपमेण्ट, वैलिडिएशन एण्ड अप्लीकैशन टू फार्माकोकाइनेटिक स्ट्डी, शीलेन्द्र प्रताप सिह, वहाजुद्दीन एवं जी.के. जैन।

पल्मोनरी डिलीवरी ऑफ माइक्रोस्फेयर्स दैट एक्टिवेट लंग मैक्रोफैजेज़ इंफेक्टेड विद *मायकोबैक्टीरियम ट्युबर्क्युलोसिस*, अमित मिश्रा।

इम्पेक्ट ऑफ इंवायरमेण्ट चैन्जेस ऑन ह्यूमन लाइफ, इलाहाबाद (20–21 नवम्बर)

इफेक्ट ऑफ डेल्टामिथ्रिन ऑन प्रोटीन कन्टेण्ट ऑफ गोनेड ऑफ फ्रेश वॉटर फिश *चन्ना पन्क्टैट्स*, ए. कुमार, वाई देवी एवं आर.के. सिंह।

हिमैटोलॉजिकल डिस्आर्डर इन राइस मिल वर्कर्स ऑफ डिस्ट्रिक सुल्तानपुर, उत्तर प्रदेश, आर.के. सिंह, एफ.डब्ल्यू बनसोडे एवं ए. त्रिपाठी।

सत्ताइसवां एन्युअल कन्वेन्शन एण्ड कांफ्रेंस ऑन ओपन एक्सेसः गेटवे टू ओपन इन्नोवेशन, कोलकाता (24–26 नवम्बर)

सीडीआरआई MoES प्रोजेक्ट वेब पोर्टलः ए प्लेटफॉर्म टू अचीव हाई थ्रोपुट इन कोलेबोरेटिव ड्रग रिसर्च, स्तुति गुप्ता, नीलू सिंह एवं आर. के. शर्मा।

डिज़ाइनिंग एण्ड डेवलपमेण्ट ऑफ "Leish-Net" ए वेब बेस्ड सर्वर फॉर माईक्रोअरे डाटा ऑन लीश्मैनिएसिस, नीलू सिंह, एस. गुप्ता, आशीष सेन गुप्ता एवं आर.के. शर्मा।

इण्टरनेशनल कांफ्रेंस ऑन फोक एण्ड हर्बल मेडिसिन, उदयपुर (25–27 नवम्बर)

इन–विट्रो सेल लाइन फॉर दी प्रोडक्शन ऑफ ओस्टियोजेनिक कम्पाउण्ड्सः एथनोबोटेनिकल लीड फ्रॉम *उल्मस वल्लिशियाना* PLANCH, के.आर. आर्या, दीप्ति शर्मा एवं बृजेश कुमार।

आइडेण्टीफिकेशन एण्ड कम्पेरेटिव स्ट्डी ऑफ कैमिकल कम्पाउण्ड्स ऑफ डिफरेन्ट पार्टस (बार्क, स्टेम एण्ड लीव्स) ऑफ *उल्मस वल्लिशियाना* यूजिंग हाई रिशोल्युशन लिक्विड क्रोमोटोग्राफी–मॉस स्पेक्टोमेट्री (HRLCMS) टेक्नीक, दीप्ति शर्मा, के.आर. आर्या एवं बृजेश कुमार।

प्रोफाइलिंग ऑफ *पइपर बिटल* लिन्न. कल्टीवर्स बाय हाई रिशोल्युशन मॉस स्पेक्ट्रोमेट्रिक (HRMS) टेक्नीक्स, बृजेश कुमार।

जेण्डर स्पेसिफिक कैमिकल डिफरेन्शिएशन ऑफ बायोएक्टिव कम्पाउण्ड्स ऑफ *टिनोस्पोरा कोर्डिफोलिया* प्लांट यूजिंग डाइरेक्ट एनलिसिस रियल टाइम मॉस स्पेक्ट्रोमैट्रिक टेक्नीक, बृजेश कुमार, विकास एवं निखिल कुमार।

प्लांट डिराइव्ड माड्युलेटर ऑफ Glut-4 ट्रांस्लोकेशन फॉर द ट्रीटमेंट ऑफ इन्सुलिन रैजिस्टेन्स ए.के. ताम्रकार, एन. जायसवाल, आर. मौर्या, टी. नरेन्द्र एवं ए.के. श्रीवास्तव।

इण्डियन एकादमी ऑफ न्यूरोसाइंसेज़, लखनऊ (25–28 नवम्बर)

इवैल्युशन ऑफ मेलाटोनिन अगेन्स्ट DNA डैमेज एण्ड न्युक्लियर कन्डेन्सेशन एलांग विथ GFAP एक्सप्रेशन इन रोटेनॉन ट्रीटेड रैट सी6 अस्ट्रोसायटोमा सेल्स, (अवार्ड लेक्चर) स्वर्णकर सुप्रिया, एस. सिंह, पी. गोस्वामी एवं सी. नाथ।

इनवोल्वमेंट ऑफ ऑक्सीडेटिव स्ट्रेस एण्ड नाईट्रिक आक्साइड, गोस्वामी पी., स्वर्णकार सुप्रिया, एस. सिंह एवं सी. नाथ।

रिविजटिंग केटामाइन इन्ड्यूस्ड एक्सपेरीमेंटल सायकोसिसः मॉइस मॉडल टू एक्सप्लोर दी रिलेशनसिप बिटवीन एन–एसिटाइलएस्पार्टेट मेटॉबोजिलज्म एण्ड बीहेवियल डेफिसिक्ट्स, एस. गांगुली, एम. चटर्जी, सी. चण्डोला, आर. ठाकुर, एम.ए. नम्बूदरी एवं जी. पालित।

मेलाटोनिन मॉड्युलेटेड इंफ्लाम्मेटोरी सायटोकाइन जीन्स एक्सप्रेशन एण्ड इन्हिबिटेड NF-kB एण्ड CHOP एक्टीवेशन इन LPS स्टिम्युलेटड रैट अस्ट्रोसाइटोमा सेल्स–C6, राकेश शुक्ला, आर. निरंजन एवं सी. नाथ।

इण्टरनेशनल मीटिंग ऑन रिसेन्ट डेवलपमेण्टस इन मलेरिया रिसर्च, नई दिल्ली (1–3 दिसम्बर)

डेसिफरिंग द रोल ऑफ एपिकोप्लास्ट–टॉरगेटेड प्रोटीन्स इन ऑर्गनेलर डीएनए रिप्लिकेशन एण्ड ट्रांसलेशन, सुबीर बिस्वास, अंकित गुप्ता, इवीएस. रघु राम, अम्बरीश कुमार एवं समन हबीब।

फ्रंटियर्स इन कैमिकल साइंसेज़, गुवाहाटी (3–4 दिसम्बर)

1–फार्मिल–9एच–β–कार्बोलाइनः ए वैलयुब्ल प्रिकर्सर टू द सिंथेसिस ऑफ β–कार्बोलाइन–फ्यूज्ड साइक्लिक फ्रेमवर्क्स ऑफ बायोलॉजिकल इम्पोरटेंस, समीरन हुतैत एवं एस. बत्रा।

ऑल इण्डिया सेल बायोलॉजी कांफ्रेस, कोलकाता (4–6 दिसम्बर)

हाउसकीपिंग फंक्शन्स ऑफ द *प्लॉज्मोडियम फैल्सीपेरम*एपिकोप्लास्ट एज़ साइट्स फॉर ड्रग इन्टरवेन्शन अगेन्स्ट मलेरिया, सुबीर बिस्वास, अंकित गुप्ता, इवीएस रघु राम, अम्बरीश कुमार एवं समन हबीब।

तीसरा इण्डो–जापानिज़ इण्टरनेशनल सिम्पोज़ियम ऑन ओवरकमिंग इंटरेक्टेबल इन्फेक्शियस डिज़ीज़ेज, टोक्यो (13–14 दिसम्बर)

प्रिक्लीनिकल सैफ्टी, एफिकेसी एण्ड मैकनिज्म्स ऑफ एक्शन ऑफ इनहेल्ड माइक्रोपार्टिकल्स कन्टेनिंग एण्टी–ट्युबर्क्युलोसिस एजेण्ट्स, अमित मिश्रा।

इण्टरनेशनल कांफ्रेस ऑन स्टीम सेल्स एण्ड कैंसरः प्रोलिफरेशन, डिफरेन्शिएशन एण्ड अपोप्टोसिस, पुणे (11–14 दिसम्बर)

Cdkn1a (p21) एण्ड tp53 जीन snps एण्ड रिस्क्स ऑफ स्क्वामोज़ सेल कार्सिनोमाज़ ऑफ अप्पर एइरो डाइजेस्टिव ट्रेक्ट (UADT) इन

नार्थ इण्डियन सब–पॉप्युलेशन, एस.वी. सिंह, ए.के. मित्रा, अमृता वाधवानी, वी.के गर्ग, आर. चतुर्वेदी, एम. शर्मा एवं एस.के. रथ।

उन्नयासीवीं मीटिंग ऑफ सोसायटी ऑफ बायोलॉजिकल कैमिस्ट्स, बंगलौर (13–15 दिसम्बर)

नाइट्रिक आक्साइड डोनर इन्ड्युस्ड न्यूट्रोफिल एक्स्ट्रासेल्युलर ट्रेप्स फार्मेशनः इम्प्लिकेशन फॉर द इन्फ्लामेटोरी डिज़ीज कण्डीशन्स, रवि शंकर केसरी, अनुपम ज्योति, सचिन कुमार, निखिल कोठारी, जयश्री बोगरा, अनुपमा वर्मा, एम.के. बरथवाल एवं मधु दीक्षित।

मॉलिक्युलर क्लोनिंग, एक्सप्रेशन, प्यूरीफिकेशन एण्ड इम्मयुन कैरक्टराइजेशन ऑफ ट्रांस्लेशन इनिशिऐशन फैक्टर–1 ऑफ वोल्बशिया, द इण्डोसिम्बायोन्ट ऑफ ब्रुग्रिया मैलई, जीतेन्द्र कुमार नाग, निधि श्रीवास्तव, ज्योति गुप्ता एवं शैलजा मिश्रा–भट्टाचार्या।

क्लोनिंग, एक्सप्रेशन एण्ड कैरेक्टराइजेशन ऑफ लेक्टेट डिहाइड्रोजीनेज़ ऑफ *प्लाज्मोडियम नोलिसी,* वन्दना सिंह, डी.सी. कौशल एवं नुज़हत ए. कौशल।

आइसोलेशन एण्ड कैरक्टराइजेशन ऑफ इम्मयुनोरिएक्टिव प्रोटिन्स ऑफ *सेटेरिया सर्वी* अडल्ट्स, प्रियंका प्रियदर्शी, डी.सी. कौशल एवं एन.ए. कौशल।

इम्मयुनोकैमिकल कैरक्टराइजेशन ऑफ एसिटाइलकोलिनएस्टरेज फ्रॉम अडल्ट एण्ड माइक्रोफाइलेरियल स्ट्रेज ऑफ *सेटेरिया सर्वी,* सुनीता सक्सेना एवं एन.ए. कौशल।

तैंतालिसवीं इण्डिया फार्माकोलॉजिकल सोसायटी मीटिंग, हैदराबाद (13–16 दिसम्बर)

इन्सुलिन कैटालाइजेज़ दि क्रूकूमिन इन्ड्युज्ड वुण्ड हीलिंगः नॉवेल, *इन विट्रो* बी मॉडल फॉर पेरिओडोन्टल रिपेयर, नीतू सिंह, दीबा जैदी, अपर्णा सिंह, दिव्या लोधा, रमेश शर्मा, उमेश वर्मा, जया दीक्षित एवं ए.के. बालापुरे।

सिनर्जी बिट्वीन कर्क्युमिन एण्ड सेन्टक्रोमन इन ह्यूमन ब्रेस्ट कैसर सेल्स *इन विट्रो,* दीबा जैदी, नीतू सिंह, रमेश शर्मा एवं ए.के. बालापुरे।

डोपामाइन D1 रिसेप्टर मिडिएट्स गैस्ट्रोप्रोटेक्शन बॉय इन्हिब्टिंग (H+K+ATPase) एक्टिविटी एण्ड गैस्ट्रिन एलिसिटेड इंक्रीज इन सायटोसोलिक लेवल, नीतू सिंह, प्रतिभा सिंह एवं गौतम पालित।

कम्पेरेटिव इवैल्युशन ऑफ द इफेक्ट्स ऑफ एल–ट्रिप्टोफेन एण्ड मेलाटोनिन ऑन द रिफ्लक्स इसोफेगिटिस इन्ड्युज्ड ऑक्सीडेटिव लोड एण्ड इन्फ्लामेशन, प्रतिभा सिंह, नीतू सिंह एवं गौतम पालित।

इनवोल्वमेंट ऑफ गैस्ट्रिन एण्ड हिस्टामिन इन द एण्टी–अल्सर पोटेंशियल ऑफ हर्बल कम्पाउण्ड्स–गेदुनिन एण्ड फोटोगेदुनिन, निशांत राय, नीतू सिंह, प्रतिभा सिंह, विजय लक्ष्मी एवं गौतम पालित।

प्रोटेक्टिव इफेक्ट ऑफ पेरिन्डोप्रिल ऑन सेरेब्रल ब्लड फ्लो एण्ड मेमोरी इम्पेयरमेण्ट इन्ड्युस्ड बाय ICV स्ट्रेप्टोजोटोसिन इन रैट्स, राकेश शुक्ला, एस. टोटा, के. हनीफ एवं सी. नाथ।

एपेटाइट सप्रेसेन्ट एक्टिविटी ऑफ सीडीआरआई कम्पाउण्ड S006. 1591ए ए. नाथ, पी.के. कामत, ए.के. श्रीवास्तव, सी. नाथ एवं आर. रघुबीर

51वीं एन्युअल कांफ्रेंस ऑफ एशोसिएशन ऑफ माइक्रोबोलॉजिस्ट ऑफ इण्डिया, रांची (14–17 दिसम्बर)

प्रोड्क्शन एण्ड प्यूरीफिकेशन ऑफ कोलेस्ट्रॉल ऑक्सीडैज फ्रॉम *पैनीसिलियम* स्पी., अकांक्षा श्रीवास्तव एवं सी.के.एम. त्रिपाठी।

माइनिंग द टीबी जीनोम फॉर ड्रग टारगेट्स, रंजना श्रीवास्तव।

इण्टरनेशनल सिम्पोज़ियम ऑन टीबी डायग्नोस्टिक्सः इन्नोवेटिंग टू मेक एन इम्पेक्ट, नई दिल्ली (16–17 दिसम्बर)

जीन्स एक्सप्रेस ड्यूरिंग इन्फेक्शन एज़ ए की टू डायग्नोसिस ऑफ टीबी, रंजना श्रीवास्तव।

जीन्स एक्सप्रेशन एनॉलासिस ऑफ rpf-like जीन्स ऑफ *मायकोबैक्टिरियम ट्युबर्क्युलोसिस* H37Rv अण्डर डिफरेण्ट फिजियोलॉजिकल स्ट्रेस एण्ड ग्रोथ कण्डीशन्स, रवि कुमार गुप्ता, एस. श्रीवास्तव एवं रंजना श्रीवास्तव।

रोल ऑफ BCAA पॉथवे एंजाइम्स इन ग्रोथ एण्ड सर्वाइवल ऑफ मायकोबैक्टिरियम ट्युबर्क्युलोसिस *इन विट्रो, एक्स विवो* एण्ड इन माइस, विनायक सिंह, बी.एस. श्रीवास्तव एवं रंजना श्रीवास्तव।

ओवर एक्सप्रेशन ऑफRv3097c ऑफ *माइकोबैक्टिरियम ट्युबर्क्युलोसिस* इन *माइकोबैक्टिरियम बोविस* BCG डाउन रेगुलेट्स इम्मयुन रिसपांस इलिसिटेड बॉय BCG वैक्सीन, विपुल कुमार सिंह, रंजना श्रीवास्तव एवं बी.एस. श्रीवास्तव।

आइडेण्टीफिकेशन ऑफ PKnJ एज़ ए रोल मॉलिक्युल इन द इंट्रासेल्युलर सर्वाइवल ऑफ माइकोबैक्टिरिया, डी.के. सिंह, रूमा कुमारी, सुष्मिता कुमारी, पी.के सिंह एवं के.के. श्रीवास्तव।

प्रोटीन काइनेज़ K रेग्युलेट्स मैक्रोफेज़ेज प्रोटीन्स टू एक्जिबिट सर्वाइवल, रूमा कुमार, सुष्मिता कुमारी, डी.के. सिंह एवं के.के. श्रीवास्तव।

मल्टीपल फंक्शन ऑफ PE3 एण्ड PE4 प्रोटीन्स डाइरेक्ट माइकोबैक्टिरियम/होस्ट ऐसोशिएशन, सुष्मिता कुमारी, रूमा कुमारी, डी.के. सिंह, समीर तिवारी एवं के.के. श्रीवास्तव।

बासठवीं इण्डियन फार्मास्यूटिक्ल कांग्रेस 2010, मनिपाल यूनिवर्सिटी, मनिपाल (17–19 दिसम्बर)

प्रोटेक्टिव इफेक्ट ऑफ सिलिबिनिन अगेन्स्ट इन्ट्रासेरेब्रल स्ट्रेप्टोजोटोसिन इन्ड्युज्ड मेमोरी इम्पेयरमेंट इन माइस, एस.के. टोटा, आर. शुक्ला एवं सी. नाथ।

3 अन्तःअभिकरण संबद्धता

परियोजना शीर्षक	मुख्य अन्वेषक
पृथ्वी विज्ञान मंत्रालय, भारत सरकार	
नेशनल प्रोजेक्ट ऑन डेवलपमेण्ट ऑफ पोटेन्शियल ड्रग्स फ्रॉम दि ओशन	निदेशक, सी.डी.आर.आई.
स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार	
एण्टीफर्टिलिटी रिसर्च प्रोग्राम	निदेशक, सी.डी.आर.आई.
टू सप्लाई दि फायटोकेमिकल रिफ्रेरेन्सेज़ स्टैण्डर्ड (पीआरएस) टू इण्डियन फार्माकोपिया कमीशन	डॉ. ए.के. सक्सेना
टेक्नोलॉजिकल इन्नोवेशन फॉर कर्मिश्यल एक्सप्लॉइटेशन ऑफ *मोरिण्डा सिट्रिफोलिया* (Noni) एज़ लिवलीहुड आप्शन फॉर आइलैण्ड्स फार्मर्स	डॉ. जे.के. सक्सेना
विश्व स्वास्थ्य संगठन, जिनेवा, स्विट्जरलैण्ड	
डेवलपमेण्ट ऑफ न्यू मैक्रोफाइलेरिसाइडल एण्ड/ऑर एम्ब्रियॉस्टैटिक एजेण्ट्स	डॉ. एस. भट्टाचार्या
ड्रग्स फॉर नेग्लेक्टेड डिज़ीजेज इनिशिएटिव, जिनेवा	
लीड आईडेण्टीफिकेशन फॉर एण्टी–लीश्मैनियल कम्पाउण्डस	डॉ. एस.के. पुरी
अलेक्जेण्डर वॉन हम्बोल्ट–फाउण्डेशन, जर्मनी	
एफिशिएण्ट सिंथेसिस ऑफ नॉवेल ऐक्सिअलि किरॉल बायरिल कम्पाउण्डस एण्ड दिअर ऑप्टिकल रेज़ल्युशन बाय एचपीएलसी टेक्नीक	डॉ. अतुल गोयल
यूरोपियन कमीशन, बेल्ज़ियम	
टारगेटिंग प्रोटीन सिंथेसिस इन दि एपिकोप्लास्ट एण्ड सायटोप्लाज्म ऑफ प्लासमोडियम (MEPHITIS)	डॉ. समन हबीब
विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार	
सोफिस्टीकेटेड एनालिटिकल इन्स्ट्रुमेंट फैसिलिटी (एसएआईएफ)	निदेशक, सी.डी.आर.आई.
जे.सी. बोस फेलोशिप	डॉ. टी.के. चक्रवर्ती
सिंथेसिस ऑफ स्माल रिंग सैचुरेटेड हेट्रोसाइकल्स एण्ड साइक्लोअलकेन्स फ्रॉम 2,3–इपॉक्सि अल्कोहल्स कन्टेनिंग अक्रिलिक मोइटी बय कोन्जुगेट रेडिकल एड्डिशन ट्रिगर्ड बाय इपॉक्सिडी रिंग ओपनिंग विथ Cp2TiCl: एप्लिकेशन इन दि सिंथेसिस ऑफ नेचुरल प्रोडक्ट्स	डॉ. टी.के. चक्रवर्ती
स्ट्रक्चरल कैरेक्टराइजेशन ऑफ गामा ग्लुटामाइलसिस्टीन सिंथेटेज (गामा जीसीएस) एण्ड ग्लुटाथाइन सिंथेटेज़ (जीएस) फ्रॉम *लीश्मैनिया* स्पीसीज़	डॉ. जे.वी. प्रताप
पॉलिमेरिक नैनो–मैट्रिक्स एशोसिएटेड *इन विवो* डिलीवरी ऑफ केम्फिरोल इन रैट्स फॉर बोन एनाबालिक एक्शन	डॉ. रितु त्रिवेदी
इफेक्ट ऑफ कैंसर केमोथेराप्युटिक ड्रग्स ऑन स्पर्मेटोगोनियल स्टेम सेल निके, क्रोमटिन रिमॉडलिंग एण्ड एपिजेनेटिक प्रोग्रामिंग इन मेल जर्म सेल्स	डॉ. डी.पी. मिश्रा
डिज़ाइन, सिंथेसिस एण्ड बायोलॉजिकल इवैल्युएशन ऑफ SIRT-1 एक्टिवेटर्स फॉर दि ट्रीटमेंट ऑफ टाइप–।। डायबिटीज़	डॉ. बिजोय कुण्डू
कैरेक्टराईजेशन ऑफ नेचुरल एण्टीमॉनी रेजिस्टेंन्स रिलेटेड जीन(स) ऑफ *लीश्मैनिया डोनोवनी*	डॉ. नीना गोयल
एप्लिकेशन ऑफ बेलिस–हिल्मन कैमेस्ट्री फॉर दि सिंथेसिस ऑफ नेचुरल प्रोडक्ट्स एण्ड दिअर मिमिक्स	डॉ. संजय बत्रा
अमिनो एसिड्स एज़ चिराल सिंथांसः डेवलपमेण्ट ऑफ न्यू सिंथेटिक प्रोटोकॉल्स फॉर क्रीटिंग नेचुरल प्रोडक्ट्स एण्ड रिलेटड डाइवरसिटी इन क्युस्ट फॉर एण्टीकैंसर एजेण्ट	डॉ. गौतम पाण्डा
किरॉन अप्रोच सिंथेसिस ऑफ नेचुरल प्रोडक्ट्स एण्ड नेचुरल प्रोडक्ट लाइक मालिक्युल फ्रॉम कार्बोहाइड्रेट बेस्ड बिल्डिंग ब्लॉक्स	डॉ. ए.के. शॉ
एक्सपेन्शन ऑफ फैसिलिटीज इन नेशनल सेण्टर फॉर फार्माकोकाइनेटिक एण्ड मेटाबॉलिक स्टडीज़	डॉ. जी.के. जैन

परियोजना शीर्षक	मुख्य अन्वेषक
आइडेण्टीफिकेशन एण्ड इल्युसिडेशन ऑफ नॉवेल सिग्नलिंग पाथवेज़ इन्वोलव्ड इन मोनोसाइट/मेक्रोफेण्ट एक्टिवेशन, माइग्रेशन, डिफरेन्शिऐशन, प्रोलाइफरेशन एण्ड डेथ ड्यूरिंग डिस्लिपिडेमिया एण्ड एथिरोस्क्लेरोसिस	डॉ. एम.के. बरथवाल
ओस्टियोजेनिक एक्शन्स ऑफ ए नेचुरली डेराइव्ड NP-1 प्योर कम्पाउण्ड ऑन बोन	डॉ. दिव्या सिंह
प्रोटियोमिक एनालिसिज ऑफ ड्रग रेसिस्टेन्स इन *लीश्मैनिया डोनोवनी* क्लीनिकल आइसोलेट	डॉ. नीलू सिंह
आइडेण्टीफिकेशन एण्ड करेक्टराइजेशन ऑफ प्रोटिन(एस) फ्रॉम आर्टीथर सेंसिटिव एण्ड आर्टीथर रेसिस्टेण्ट रोडेण्ट मलेरिया पैरासाइट फॉर इल्युसिडेशन ऑफ मेकैनिज्म ऑफ रेसिस्टेंस	डॉ. एस.के. पुरी
डिज़ाइन, सिंथेसिस एण्ड डेवलपमेण्ट ऑफ नॉवेल एण्टीलीश्मैनियल एजेण्ट्स	डॉ. टी. नरेन्द्र
ए सिस्टेमेटिक RNAi स्क्रीन फॉर आइडेण्टीफिकेशन ऑफ जेनेटिक मॉड्युलेटर्स ऑफ एचआईवी–एनईएफ इन्ड्युस्ड पैथोजेनेसिस इन ए नॉवेल *कैनारहेबडाइटिय ऐलेगन्स* मॉडल	डॉ. आमिर नाज़िर
मॉलिक्युलर डाइवर्सिटी ओरिएंटेड सिंथेसिस ऑफ अरोमेटिक स्काफ्फोल्डस थ्रू रिंग ट्रांसफॉरमेशन स्ट्रेटज़ी (रमन फेलोशिप)	डॉ. अतुल गोयल
ह्युमन सायटोक्रोम P450 1B1:: इम्पलीकेशन्स इन सेंटक्रोमान ट्रीटेड हॉरमोन–मीडिएटेड MCF-7 ट्युमर सेल मेटाबालिज्म एज़ ए नॉवेल टारगेट फॉर थेराप्युटिक इन्टरवेंशन (वूमेन साइंसटिस्ट स्कीम)	डॉ. नीतू सिंह
पॉलिमेरिक नैनोमैट्रिक्स एसोशिएटेड *इन विवो* डिलीवरी ऑफ कैम्पफ्राल इन रैट्स फॉर बोन एनाबॉलिक एक्शन	डॉ. रीतू त्रिवेदी
विज्ञान एवं प्रौद्योगिकी विभाग एवं केएपीएल, बंगलौर	
डेवलपमेण्ट ऑफ एण्टीमाइक्रोबियल एजेण्ट्स फ्रॉम सोइल माइक्रोफ्लोरा	डॉ. ए.के. सक्सेना
जैव प्रौद्योगिकी विभाग, भारत सरकार	
क्लोनिंग एण्ड ओवर–एक्सप्रेशन ऑफ स्टिम्युलेटरी पॉलि–प्रोटिन्स आइडेण्टीफाइड थ्रू प्रोटियोमिक्स फॉर देअर प्रोफिलेकटिक पोटेंशियल एगेन्स्ट एक्सपेरीमेंटल विसॅरॅल लीश्मैनियासिस	डॉ. अनुराधा दूबे
न्यू इन्हिबिटर डिज़ाइन/ड्रग डेवलपमेण्ट यूज़िग नॉवेल प्रोटीन टारगेटसः एनएडी+डिपेन्डेन्ट डीएनए डिपेन्डेण्ट लाइगेजेज़ एण्ड फीस्ट/फैमाइन रेग्युलेटरी प्रोटिन्स फ्रॉम *एम. ट्युबर्क्युलोसिस*	डॉ. आर. रविशंकर
स्ट्डीज ऑन दि स्ट्रक्चर एण्ड फंक्शन्स ऑफ एक्टिन सायटोस्केलेटल नेटवर्क इन *लीश्मैनिया डोनोवनी*	डॉ. सी.एम. गुप्ता
अण्डरस्टैण्डिंग दि मकैनिजम ऑफ माइटोटिक/स्पाइंडल चेकपॉइन्ट यूज़िंग जेनेटिक्स अप्रोचेज़ इन फ़िजन यीस्ट शाइज़ोसैक्रोमाइसेज पोम्बी	डॉ. शकील अहमद
एण्टी–अस्टियोक्लास्टोजेनिक इफेक्ट ऑफ 99/373 एण्ड इट्स मोड ऑफ एक्शन	डॉ. एन. चट्टोपाध्याय
एक्सप्रेसन प्रोफाइलिंग ऑफ मेजर टेस्टिस स्पेसिफिक जीन्स इन ह्यूमन सीमन/स्पर्मेटोजोआ फॉर आइडेण्टीफिकेशन ऑफ दि बायोलॉजिकल रोल ऑफ दिज़ जीन्स, दिअर डायग्नोस्टिक यूटिलिटि एण्ड आईडेण्टीफिकेशन ऑफ नॉवेल टारगेटस फॉर इन्फर्टिलिटि ट्रीटमेण्ट/मेल कॉन्ट्रासेप्शन	डॉ. राजेन्द्र सिंह
इन्वेस्टीगेशन ऑन इन्वोल्वमेण्ट ऑफ एडिपोस टिश्यू इन परसिस्टेन्स ऑफ पैथोजेनिक मायकोबैक्टेरिया	डॉ. वाई.के. मंजू
डिज़ाइन एण्ड डेवेलपमेण्ट ऑफ डाटाबेस एण्ड एनालॉटिकल टूल्स फॉर माइक्रोअरे डाटा ऑन *लीश्मैनिया डोनोवनी* पैरासाइट	डॉ. नीलू सिंह
अण्डरस्टैण्डिंग मेकैनिज़म ऑफ एक्शन ऑफ दि एण्टी–अस्टियोपोरोटिक ऐक्टिविटी ऑफ कम्पाउण्डस K095 & 1709	डॉ. एस. सान्याल
शाइज़ोफ्रेनियाः डेवलपिंग एनीमल मॉडल्स, ट्रांसलेशनल मारकर्स एण्ड ए पॉसिबल ट्रीटमेण्ट स्ट्रेटजी	डॉ. गौतम पालित
दि बर्थ ऑफ दि फर्स्ट इण्डियन लीश्मैनिया जीनॉम सीक्वन्स	डॉ. नीलू सिंह
आइडेण्टीफिकेशन ऑफ ER अल्फा इन्टेरेक्टिंग प्रोटिन्स फ्रॉम टामोक्सीफेन इन्ड्यूस्ड एण्ड अनइन्ड्यूस्ड MCF7 सेल्सः ए मॉस स्पेक्ट्रोमेट्री बेस्ड प्रोटियॉमिक्स अप्रोच	डॉ. ए.के. त्रिवेदी

परियोजना शीर्षक	मुख्य अन्वेषक
स्ट्रक्चरल एनालासिस ऑफ बैक्टीरियल पेप्टाइडिल–t RNA हाइड्रोलेज़ एंज़ायम्स एण्ड डिजाईन ऑफ हाई एफ्फिनिटी बाइन्डर्स	डॉ. अशीष अरोड़ा
जेनेरेशन एण्ड करैक्टराइजेशन ऑफ *मायकोबैक्टीरिअम स्मैगमेटिस* sigF म्यूटण्ट एण्ड स्ट्डीज ऑन दि sigF–मिडिएटेड जीन एक्सप्रेशन बाय माइक्रोअरे एनालिसिस	डॉ. बी.एन. सिंह
भारतीय चिकित्सा अनुसंधान परिषद, भारत सरकार	
डिज़ाइन, सिंथेसिस एण्ड बायो–एवाल्युऐशन ऑफ नॉवेल हाइब्रिड कम्पाउण्डस फॉर एण्टीमलेरियल एक्टिविटी	डॉ. संजय बत्रा
डिज़ाइन, सिंथेसिस एण्ड एवैल्युएशन ऑफ न्यु कैमिकल एन्टिटिज अगैन्स्ट ए टिपिकल *मायकोबैक्टिेरियम–2–फोर्तुइतुम*	डॉ. आर. श्रीवास्तव
सायटोकाइन जीन पॉलिमॉरफिज्म इन ब्रेस्ट कैंसर पेशेन्ट्स	डॉ. रितुराज कोनवर
डेवलपमेण्ट ऑफ बोन एनाबॉलिक एजेण्ट्स फ्रॉम एन इण्डियन मेडिसिनल प्लान्ट	डॉ. एन. चट्टोपाध्याय
इफेक्ट ऑफ 2,3–डियरिल–2एच–1–बेन्जोपायरन डेरीवेटिव्स ऑन इस्ट्रोजन इन्ड्युस्ड इन्डोमीट्रिअल सेल प्रोलीफरेशन एण्ड यूटिराइन हाइपरप्लासिक फॉरमेशन	डॉ. अनिला द्विवेदी
डिज़ाइन, सिंथेसिस एण्ड बायोलॉजिकल इवैल्युशन ऑफ एचआईवी–1 आरटी इन्हिबिटर्स–4–थियाजोलिडिनोन कम्पाउण्डस	डॉ. एस.बी. कट्टी
डिज़ाइन, सिंथेसिस एण्ड बायोइक्विवलेन्स ऑफ न्यू एनालॉग्स ऑफ फ्लूकोनाजोल फॉर एण्टीफंगल एक्टिविटी	डॉ. पी.के. शुक्ला
इवैल्युएशन ऑफ डीएनए बेस्ड टूल्स फॉर एण्टीमलेरियल ड्रग स्क्रीनिंग अगेन्स्ट प्लाजमोडियम फैल्सीपैरम एण्ड स्ट्डीज विथ मोडिफाइड (RPNI) मीडियम	डॉ. के. श्रीवास्तव
डेवलपमेण्ट ऑफ एण्टी–अल्सर ड्रग फ्रॉम इण्डियन मेडिसिनल प्लाण्ट *टेक्टोना ग्रांडिस*	डॉ. गौतम पालित
रक्षा अनुसंधान एवं विकास संगठन	
इफेक्ट ऑफ मोनोआइसोएमिल 2,3–डाइमरकैप्टोसक्सीनिक एसिड ऑन कार्डियोवासक्युलर एण्ड रेस्पाइरेटरी पैरामीटर्स इन द रैट	डॉ. मधु दीक्षित
सिंथेसिस ऑफ बायोलॉजिकली एक्टिव मॉलिक्युल्स फ्रॉम कार्बोहाइड्रेट्स बेस्ड लिगैन्ड्स फॉर पोटेंशियल एप्लिकेशन्स इन डिफ़ेन्स	डॉ. आर.पी. त्रिपाठी
एनएमआईटीएलआई (सीएसआईआर)	
लीड बेस्ड ड्रग डेवलपमेण्ट एण्ड जेनेटिक इम्प्रूवमेन्ट ऑफ अश्वगंधा (*विथनिया सोमनिफेरा*)	डॉ. राम रघुबीर डॉ. एस. भट्टाचार्या
नॉवेल DPP IV इन्हिबिटर फॉर दी ट्रीटमेण्ट ऑफ डायबिटिज़	डॉ. एस.के. रथ डॉ. एस. सान्याल
आयुष	
मॉस स्पेक्ट्रम फिंगरप्रिंटिंग ऑफ इण्डियन मेडिकल प्लान्ट्स (ए स्पेशल रेफरेन्स टू एण्टीडाइबेटिक ऐस्पेक्ट)	डॉ. बृजेश कुमार
उद्योग प्रायोजित परियोजनाएँ	
स्टेबिलिटी एण्ड फारम्युलेशन डेवलपमेण्ट स्ट्डीज़ ऑफ आर्मेलोक्सिफेन एण्ड अथेण्टिफिकेशन ऑफ सिस एण्ड ट्रांस स्टैण्डर्ड (एचएलएल लाइफ केयर, तिरूवंतपुरम)	डॉ. ए.के. द्विवेदी
DPP IV इन्हिबिटर (कोडेड OCID 3570) इन रीसस मंकीज़ (ऑर्किड रिसर्च लैबोटरी लिमिटेड, चैन्नई)	डॉ. एस.के. पुरी
आइडेण्टीफिकेशन ऑफ बायोएक्टिव मार्कर(एस) फ्रॉम *सिसस क्युरॅग्युलारिस* एक्सट्रेक्ट (सुप्रीम फार्मास्युटिक्ल्स मैसूर प्राइवेट लिमिटेड, मैसूर)	डॉ. एन. चट्टोपाध्याय

4 मानव संसाधन विकास

1 प्रशिक्षण कार्यक्रमों में सीडीआरआई कर्मचारियों की प्रतिभागिता

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श्री वरूण कुमार पाठक

- सीएसआईआर ओरिएंटेशन प्रोग्राम फॉर न्यूली प्रमोटेड सीनियर पीएस/पीएस/पीए, एचआरडीसी, गजियाबाद, दिनांक 24 से 26 मई, 2010।

जितेन्द्र पटेल

- सीएसआईआर ओरिएंटेशन प्रोग्राम फॉर न्यूली प्रमोटेड सीनियर पीएस/पीएस/पीए, एचआरडीसी, गजियाबाद, दिनांक 24 से 26 मई, 2010।

इण्टरनेशनल वर्कशॉप ऑन रिसेण्ट ट्रेण्ड्स इन आईपी प्रेक्टिस एण्ड मैनेजमेंट, सीडीआरआई, लखनऊ, दिनांक 05 से 06 अक्टूबर, 2010

संयुक्त राज्य अमेरिका पेटेण्ट, ट्रेडमार्क कार्यालय (यूएसपीटीओ) तथ सीडीआरआई के सहयोग से दिनांक 05 से 06 अक्टूबर, 2010 को आईपी अभ्यास एवं प्रबंधन पर एक अंतर्राष्ट्रीय कार्यशाला का आयोजन किया गया जिसमें सीडीआरआई से 45 वैज्ञानिकों ने भाग लिया।

2. प्रस्तुत शोध प्रबन्ध

	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक
जवाहर लाल नेहरू विश्वविद्यालय, नई दिल्ली।		
1	**अभिषेक देसाई**	स्ट्डीज ऑन द रोल ऑफ न्यूक्लियर फेक्टर–kB इन सेरेब्रल स्ट्रोक।/**डॉ. राम रघुवीर**
2	**आकांक्षा**	फायटोकैमिकल इनवेस्टीगेशन ऑफ इण्डियन मेडिसिनल प्लाण्टस एण्ड कैमिकल ट्रांस्फारमेशन ऑफ बायोएक्टिव कम्पाउण्ड्स।/**डॉ. राकेश मौर्या**
3	**बृजेश कुमार पाण्डेय**	स्ट्डीज ऑन द स्ट्रक्चर–फंक्शन रिलेशनसिप्स ऑफ मेम्बर्स–एक्टिव सेगमेंट्स डिराइव्ड फ्रॉम पोर फार्मिंग टॉक्सीन एण्ड एण्टीमाइक्रोबियल पेप्टाइड्स।/**डॉ. जे.के. घोष**
4	**डिम्पी सिकरीवल**	डिज़ाइन एण्ड सिंथसिस ऑफ सम एंटीट्युबर्क्युलर कम्पाउण्ड्स एण्ड स्ट्डीज इन C-C बॉण्ड फार्मिंग रिएक्शन्स।/**डॉ. डी.के. दीक्षित**
5	**गया प्रसाद यादव**	स्ट्रक्चरल एण्ड फंक्शनल स्ट्डीज आन मॉलिक्युल्स ऑफ बायोलॉज़िकल इम्पॉर्टेन्स।/ डॉ. रविशंकर आर
6	**मनमीत कुमार**	फायटोकैमिकल इनवेस्टीगेशन ऑफ इण्डियन मेडिसिनल प्लाण्ट इन सर्च ऑफ बायोएक्टिव नेचुरल प्रोडक्ट्स।/**डॉ. राकेश मौर्या**
7	**नागसेन गौतम**	फार्माकोकाइनेटिक्स ऑफ नोवल एण्टीडायबेटिक ऐजेण्ट्स एण्ड ए हाइली इफ़ेक्टिव एण्टीमलेरियल ट्राईआक्ज़ेन (99–411)।/**डॉ. एस.के. सिंह**
8	**निधि सेठी**	डिज़ाइन एण्ड सिंथिसस ऑफ DPP-IV इनहिबिटर्स ऐज़ एण्टी–डाइबेटिक एजेंटस।/ **डॉ. एस.बी. कट्टी**
9	**राजीव कुमार**	नॉवेल थेराप्युटिक स्ट्रैट्जीज़ फॉर द मैनेजमेंट ऑफ प्रोस्टेटिक हाइपरप्लासिया एण्ड द मॉलिक्युलर मैकेनिज्म इनवोल्वड इन दीज़ थेरैपीज़।/**डॉ. गोपाल गुप्ता**
10	**रवि कुमार गुप्ता**	स्ट्डीज ऑन ऑटोक्राइन ग्रोथ फैक्टर्स इनवोलव्ड इन द रिसाइटेशन ऑफ डॉरमेन्ट माइकोबैक्टीरिया।/**डॉ. रंजना श्रीवास्तव**
11	**रितुराज निरंजन**	स्ट्डी ऑन द रोल ऑफ मालिक्यूलर एण्ड सेल्युलर मीडिएटर्स इनवोलव्ड इन न्यूरो–इनफ्लामेशन। /**डॉ. राकेश शुक्ला**

	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक
12	**एस.वी.एस.आर. कृष्णा पुलवर्ती**	सोल्यूशन स्ट्रक्चर डायनेमिक्स ऑफ पेप्टिडाइल–टीआर.एन.ए. हाइड्रोलेज़ फ्रॉम *माइकोबैक्टीरियम ट्युबरकुलॉसिस* H37Rv।/**डॉ. आशीष अरोड़ा**
13	**सतिन्दर कौर**	मालिक्यूलर कैरेक्टराइजेशन ऑफ *माइकोबैक्टरियम ट्यूबरक्लोसिस* H37Rv प्रोटीन्स इनवोल्व्ड इन परसिस्टेंस/लैटेंसी।/**डॉ. रजंना श्रीवास्तव**
14	**श्रद्धा ए. साने**	एण्टीलीशमैनिया ट्रीटमेंट यूजिंग कीमोथैरेपी इन कम्बिनेशन विद इम्यून–मॉड्यूलेटर्स इन एक्सीपेरिमेंटर विसरल लीशमैनियसिस।/**डॉ. सुमन गुप्ता**
15	**श्रवण कुमार मिश्रा**	स्ट्डी ऑफ टॉक्सीसिटी एण्ड डिफरेन्शियल जीन एक्सप्रेशन इन माइस फॉलोइंग एक्सपोज़र टू सेलेक्टेड एंटीमलेरियल ड्रग्स।/**डॉ. एस.के. रथ**
16	**श्रीकांत देशपाण्डे**	सिंथेसिस, बायोलॉजिकल इवैल्युएशन एण्ड QSAR स्ट्डीज ऑफ नोवल एण्टीमलेरियल एजेण्ट्स। /**डॉ. एस.बी. कट्टी** एवं **डॉ. वाई.एस. प्रभाकर**
17	**सिद्धार्थ शंकर झा**	स्ट्डीज ऑन ईआरपी (एक्सपोर्टेड रिपिटिटिव प्रोटीन Rv3810) ऑफ *एम. टयूबरक्यूलिसस* H37Rv।/ **डॉ. चारू शर्मा** व **डॉ. अमित मिश्रा**
18	**सोमनाथ नाग**	एक्सप्लोरेशन ऑफ द सिंथिटिक यूटिलिटी ऑफ सब्स्टीट्यूटेड 1,3–ऐमिनो एल्कोहल्स एण्ड एलाइलएमिन्स फॉर जनरेटिंग बायोडायनेमिक एजेण्ट्स।/**डॉ. संजय बत्रा**
19	**सुबीर विश्वास**	एनालेसिस ऑफ न्यूक्लियर–एनकोडेड प्रोटीन्स प्युटेटिवली इनवोलव्ड इन ट्रान्सलेशन ऑफ प्लाज़मोडियम फैलिसिपैरम एपिकोप्लास्ट डीएनए।/**डॉ. समन**
20	**सुरेन्द्र कुमार विष्ट**	सिंथेसिस ऑफ एण्टीट्यूबर्क्यूलर एजेंट्स बेस्ड ऑन कार्बोहाइड्रेट्स, ऐरोमेटिक्स एण्ड हेट्रोसाइक्ल्स।/ **डॉ. आर.पी. त्रिपाठी**
21	**उज्मा साकिब (सईद)**	मॉलिक्यूलर मॉडलिंग एण्ड स्ट्रक्चरल बायोइनफारमेटिक्स स्ट्डीज ऑन प्रोटीन ड्रग टारगेट ऑफ टाइप ।। डायबिटीज़ एण्ड एंटी–डायबेटिक एजेण्ट्स।/**डॉ. मो. इमरान सिद्दिकी**
22	**विकास कुमार**	सिंथेसिस ऑफ डेरिवेटिवस ऑफ मोनोसैक्राइड्स फॉर ड्रग डिस्कवरी।/**डॉ. ए.के. शॉ**
23	**विरेन्दर सिंह**	डिज़ाइन एण्ड सिंथिसिस ऑफ नाइट्रोजन कन्टेनिंग मीडियम रिंग एण्ड एन्यूलेटेड हेट्रोसाइकिल्स ऑफ बायोलॉजिकल इन्टेरेस्ट।/**डॉ. संजय बत्रा**
छत्रपति शाहू जी महाराज विश्वविद्यालय, कानपुर		
24	**अम्बर रिज़वी**	रोल ऑफ ड्रग मेटाबोलाइजिंग एंजायम्स एण्ड ग्लूटाथाइन सिस्टम इन डेवलपमेंट ऑफ ड्रग रेजिस्टेंस इन प्लाजमोडियम योलाई।/**डॉ. रेणु त्रिपाठी**
25	**प्राची भार्गव**	मॉलिक्यूलर क्लोनिंग, एक्सप्रेसन एण्ड कैरक्टराइजेशन ऑफ *लीशमैनिया डोनोवनी* स्कवॉलीन सिंथेज़।/**डॉ. उमा रॉय**
26	**समन राजा**	डिज़ाइन सिंथेसिस एण्ड इवैल्युएशन ऑफ थाईएजोलिडिंस एज़ नोवल परऑक्जीसोम प्रोलिफरेटर एक्टिवेटड रिसेप्टर (पीपीएआर–गामा) मॉड्यूलेटर्स।/**डॉ. एस.बी. कट्टी**
27	**सुजीत कुरियन**	पैरासिटालॉजिकल एण्ड इम्युनोलॉजिकल स्ट्डीज़ ऑन दि इफेक्ट ऑफ इम्युनाईजेशन विथ फॉइलेरियल वॅम फ्रैक्शन ऑन सब्सीक्युंट इन रोडण्ट होस्ट।/**डॉ. पी.के. मूर्ति**
लखनऊ विश्वविद्यालय, लखनऊ		
28	**अमित कुमार**	सिंथेसिस एण्ड बायोलॉजिकल प्रॉपर्टीज ऑफ 2–पायरेनोन डिराइव्ड मॉलिक्यूलर स्केफ्फॉल्डस।/**डॉ. अतुल गोयल**
29	**विनायक सिंह**	मॉलिक्यूलर करैक्टराइजेशन ऑफ *माइक्रोबैक्टीरियम ट्यूबरक्यूलोसिस* प्रोटीन।/ **डॉ. रंजना श्रीवास्तव**
डॉ. राम मनोहर लोहिया अवध विश्वविद्यालय, फैजाबाद		
30	**कैलाश चन्द**	फायटोकैमिकल इनवेस्टिगेशन ऑफ मेडिसिनल प्लाण्ट एण्ड कैमिकल ट्रांसफारमेशन ऑफ बायोएक्टिव कम्पाउण्ड्स।/**डॉ. राकेश मौर्या**

	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक
31	**प्रीति रावत**	कैमिकल इन्वेस्टीगेशन ऑफ इण्डियन मेडिसिनल प्लांट इन सर्च ऑफ बायोएक्टिव कम्पाउण्ड्स।/ **डॉ. राकेश मौर्या**
ज़ामिया हमदर्द विश्वविद्यालय		
32	**गिरीश कुमार गुप्ता**	अल्ट्रा–थिन पॉलिइलेक्ट्रोलाइट कैप्सूल्स फॉर नॉन–इनवेसिव डिलीवरी ऑफ प्रोटीन्स एण्ड पेप्टिाइड्स।/**डॉ. पी.आर. मिश्रा**
जीवाजी विश्वविद्यालय, ग्वालियर		
33	**गुंजन सक्सेना**	रोल ऑफ कोलीनरजिक सिस्टम एण्ड माइटोकॉन्ड्रिया इन कॉस्पेस मीडिएटेड एपोप्टोटिक सेल डेथ इन द एक्सपेरिमेंटल मॉडल्स ऑफ डिमेन्शिया।/**डॉ. सी. नाथ**
अलीगढ़ मुस्लिम विश्वविद्यालय, अलीगढ़		
34	**ओसफ अहमद**	डेवलपमेंट ऑफ एण्टी–स्ट्रेस एजेंट्स एण्ड स्टैबलिशिंग दिअर मेकैनिज़्म ऑफ एक्शन।/ **डॉ. गौतम पालित**
गौतम बुद्ध टेक्निकल विश्वविद्यालय, लखनऊ		
35	**जसप्रीत बंगा**	प्यूरीफिकेशन एण्ड कैरेक्टराइजेशन ऑफ माइक्रोबियल हिपेरिनेज़ फॉर प्रोडक्शन ऑफ लो मॉलिक्यूलर वेट हिपेरिन्स (LMWHs) एक्टिंग एज़ एण्टीथ्रोमबोटिक एजेण्ट्स।/ **डॉ. सी.के.एम. त्रिपाठी**
इंटेग्रल विश्वविद्यालय, लखनऊ		
36	**शैलेन्द्र एस. चौधरी**	सिंथेसिस, QSAR एण्ड मॉलिक्यूलर मॉडलिंग स्ट्डीज ऑन एण्टी–अल्ज़ाइमर एजेण्ट्स।/ **डॉ. ए.के. सक्सेना**
डॉ. बी.आर. अम्बेडकर विश्वविद्यालय, आगरा		
37	**अशोक कुमार**	सिंथेसिस ऑफ पॉसिबल ऐण्टीपैरासाइटिक एजेंटस एण्ड दिअर कॉम्बीनेटोरियल कैमेस्ट्री।/**डॉ. पी.एम.एस. चौहान**

3 बाह्य अभ्यर्थियों को प्रदान किया गया प्रायोजित प्रशिक्षण।

उपर्युक्त कार्यक्रम के अन्तर्गत संस्थान औषधि तथा औषधि निर्माण अनुसंधान, प्रयोगशाला जन्तुओं में तकनीक, ऊतक एवं कोशिका संवर्धन, इन्स्ट्रूमेंटेशन, अत्याधुनिक विश्लेषणात्मक उपकरण एवं अन्य प्रयोगशाला तकनीक के विभिन्न पक्षों पर स्नातकोत्तर छात्रों, विदेशी छात्रों एवं शैक्षिक जगत तथा उद्योग जगत के अभ्यार्थियों को प्रशिक्षण प्रदान करता है।

3.1 स्नातकोत्तर छात्रों का प्रशिक्षण : –

जनवरी से दिसम्बर, 2010 के कैलेण्डर वर्ष के दौरान संपूर्ण देश से 39 विश्वविद्यालयों एवं संबद्ध कालेजों के 178 स्नातकोत्तर छात्रों का चयन मेरिट के आधार पर किया गया एवं 4–10 महीने की अवधि तक औषधि तथा औषधि अनुसंधान में विभिन्न विषयों में प्रशिक्षण प्रदान किया गया।

3.2 नाइपर, रायबरेली के विद्यार्थियों को विभिन्न विषयों में प्रशिक्षणः–

नाइपर, रायबरेली के परामर्शदाता संस्थान होने के कारण 20 एम.एस. फार्मा. छात्रों को बायोमेडिकल रिसर्च में एक वर्ष का परियोजना प्रशिक्षण प्रदान किया गया।

3.3 ऊतक संवर्धन तकनीक में प्रशिक्षणः–

ऊतक संवर्धन तकनीक में सी.एस.एम. चिकित्सा विश्वविद्यालय, लखनऊ के 4, बाबा साहब भीमराव अम्बेडकर विश्वविद्यालय, लखनऊ के 1, ऐमिटी विश्वविद्यालय, लखनऊ के 1 एवं बी.जी. कॉलेज, जयपुर के 1 छात्र को प्रशिक्षण प्रदान किया गया।

3.4 ब्रीडिंग एवं प्रयोगशाला जन्तु प्रबंधन पर प्रशिक्षणः–

ब्रीडिंग एवं प्रयोगशाला जन्तु प्रबंधन पर कनक मंजरी इन्स्टीट्यूट ऑफ फार्मास्युटिक्ल साइंसेज, राउरकेला के एक छात्र एवं सरस्वती डेन्टल कॉलेज, लखनऊ के दो छात्रों को प्रशिक्षण प्रदान किया गया।

3.5 बेसिक एवं परिष्कृत विश्लेषणात्मक उपकरण के प्रयोग पर लघु अवधि प्रशिक्षणः–

सैफ, सीडीआरआई में उपर्युक्त विषय पर विभिन्न विश्वविद्यालयों/कालेजों के 15 छात्रों को प्रशिक्षण प्रदान किया गया।

5 पुरस्कार एवं सम्मान

डॉ.मधु दीक्षित
विज्ञान रत्न सम्मान 2009–10 (काउन्सिल ऑफ साइन्स एंड टेक्नोलॉजी उ. प्र.)

डॉ. राम रघुबीर
ब्रेन रिसर्च अवार्ड, 2009 (एल्जेवियर पब्लिकेसन्स)

डॉ. रविशंकर आर.
नेशनल बायोसाइन्स अवार्ड फॉर कैरियर डेवलपमेन्ट 2010
एन ए एस आइ स्कोपस यंग सांइटिस्ट अवार्ड 2010 इन बायोलॉजिकल साइंसेज

डॉ. सी. नाथ
फैलो ऑफ नेशनल अकादमी ऑफ मेडिकल साइंसेज, इंडिया

डॉ. स्मृति भदौरिया
यंग सांइटिस्ट अवार्ड इन मेडिकल साइंसेज (इण्डियन साइंस कांग्रेस एशोसिएशन)

डॉ. जे.एस. श्रीवास्तव
डॉ. बी.बी. सेठी ओरेशन अवार्ड 2010
(इण्डियन सायकैट्रिक सोसायटी सेन्ट्रल जोन)

डॉ. संजय बत्रा
सीआरएसआई ब्रोन्ज मेडल, 2010
(कैमिकल रिसर्च सोसायटी ऑफ इण्डिया)
चीफ कोएडिटरः एण्टी इन्फेक्टिव एजेण्ट्स इन मेडिसिनल कैमिस्ट्री

डॉ. राकेश शुक्ला
फैलो, इण्डियन अकादमी ऑफ न्यूरोसाइंसेज
फैलो, इण्डियन फार्माकोलॉजिकल सोसायटी

डॉ. आशीष अरोड़ा
प्रो. बी.के. बछावत मेमोरियल यंग साइंटिस्ट लेक्चर अवार्ड–2010
(नेशनल अकादमी ऑफ साइंसेज, इण्डिया)

डॉ. जे.के. सक्सेना
डॉ.बी.एन. सिंह मेमोरियल ओरेशन अवार्ड, 2009
(द इण्डियन सोसायटी ऑफ पैरासिटालॉजी)

डॉ. ए.के. सक्सेना
फैलो ऑफ रॉयल सोसाइटी ऑफ कैमेस्ट्री, कैम्ब्रिज, यू.के.

डॉ. आर.पी. त्रिपाठी
एक्सीलेंस इन कार्बोहाइड्रेट रिसर्च अवार्ड –2009 (25वां कार्बोहाइड्रेट कांफ्रेस, शिमला)

डॉ. नीरज सिन्हा

फैलो ऑफ द ऐशोसिएशन ऑफ बायोटेक्नोलॉजी एण्ड फार्मेसी, इण्डिया–2010

डॉ. संजीव कुमार शुक्ला

बॉयस्कास्ट(बी.ओ.वाई.एस.सी.ए.एस.टी.) फैलोशिप

डॉ. पी.एम.एस. चौहान

राष्ट्रीय गौरव अवार्ड, 2010 (इण्डिया इंटरनेशनल फ्रैंडशिप सोसायटी, दिल्ली)

डॉ. जयंता सरकार

बॉयस्कास्ट (बी.ओ.वाई.एस.सी.ए.एस.टी.) फैलोशिप

डॉ. अतुल गोयल

एलेक्सजेण्डर वॉन हम्बोल्ट फैलोशिप

डॉ. कल्यान मित्रा

बेस्ट इलेक्ट्रान माइक्रोग्राफ आवार्ड (इंटरनेशनल कांफ्रेस ऑन एडवांसेस इन इलेक्ट्रॉन माईक्रोस्कोपी एण्ड रिलेटड टैक्नीक्स, मुंबई)

डॉ. मनोज बरथवाल

आईयूएसएसटीएफ रिसर्च फैलोशिप–2010

श्री अमित कुमार

इली लिली कम्पनी एशिया आउटस्टेडिंग थीसिस अवार्ड– 2010 प्रथम पुरस्कार

डॉ. आमिर नाज़िर

इण्डिया डिस्टिंग्विस्ड विजटिंग फैलोशिप यूनीवर्सिटी ऑफ नॉटिंगम, यू.के.

श्री प्रबोध कपूर

डॉ. एम.एम. धर मेमोरियल अवार्ड, 2009 (बेस्ट थीसिस इन बायोलॉजिकल साइंसेज)

डॉ. अखिलेश कुमार ताम्रकार

बॉयस्कास्ट(बी.ओ.वाई.एस.सी.ए.एस.टी.) फैलोशिप

श्री मोहम्मद साकिब

डॉ. एम.एम. धर मेमोरियल अवार्ड, 2009 (बेस्ट थीसिस इन कैमिकल साइंसेज)

श्री राजकुमार वर्मा

तोकुजि इकेनका गोल्ड अवार्ड फॉर बेस्ट पोस्टर (10वीं बाइएनियल मीटिंग ऑफ दी एशियन पेसेफिक सोसायटी फॉर न्यूरोकैमिस्ट्री, 2010, थाईलैण्ड)

श्री मनीश कुमार सुथार

बेस्ट पोस्टर अवार्ड (इंटरनेशनल कॉंफ्रेंस ऑफ इण्डियन सोसायटी ऑफ कैमिस्ट एण्ड बायोलॉजिस्ट–2010)

कु. रूचि सक्सेना

प्रो. एन.जे. चिनॉय अवार्ड फॉर बेस्ट ओरल प्रजेंटेशन (इंटरनेशनल सिम्पोजियम ऑन इण्डोक्राइनोलॉजी एण्ड रिप्रोडक्शनः मॉलिक्युलर मेकैनिज्म टू मॉलिक्युलर मेडिसिन, नई दिल्ली)

कु. ज्योति भारद्वाज

बेस्ट पोस्टर अवार्ड (22वीं नेशनल कॉंग्रेस ऑफ पैरासिटॉलॉजी **2010**)

डॉ. नीतू सिंह

गूफिक प्राइज़ फार द बेस्ट पेपर (43वें इण्डियन फार्माकोलॉजिक्ल सोसायटी मीटिंग, एनआईएन, हैदराबाद)

श्री रवि शंकर केशरी

अप्परिशिएशन अवार्ड फॉर पोस्टर

(79वीं बैठक सोसायटी ऑफ बायोलॉजिकल कैमेस्ट्स, इण्डिया)

डॉ. अंतिमा गुप्ता

यूनेस्को लोरिएल इंटरनेशनल फैलोशिप

कु. नीतू सिंह

अप्परिशिएशन अवार्ड फॉर पोस्टर

(79वीं बैठक सोसायटी ऑफ बायोलॉजिकल कैमेस्ट्स, इण्डिया)

श्री सर्वेन्द्र विक्रम सिंह

बेस्ट पोस्टर अवार्ड (14वें एनुवल कांफ्रेंस ऑफ ब्रेस्ट कैंसर फाउण्डेशन ऑफ इण्डिया, लखनऊ)

कु. एम. लक्ष्मी

बायोकैम्प 2010 चयनित (नोवार्टिस, हैदराबाद)

श्री विक्रम खेडगिकर

बेस्ट पोस्टर अवार्ड (6वें नेशनल कांफ्रेस ऑफ इण्डियन सोसायटी फॉर बोन एण्ड मिनरल रिसर्च, नई दिल्ली)

अन्य गतिविधियाँ

1 प्रमुख आयोजित कार्यक्रम

केन्द्रीय औषधि अनुसंधान संस्थान का वार्षिक दिवस

संस्थान ने 17 फरवरी, 2010 को अपने स्थापना का 59वाँ वार्षिक दिवस मनाया। कार्यक्रम का प्रारम्भ सी.डी.आर.आई. क्लब के वार्षिक पुरस्कार वितरण समारोह से हुआ जिसकी अध्यक्षता क्लब के अध्यक्ष डॉ. टी.के. चक्रवर्ती द्वारा की गयी। डॉ.(श्रीमती) सुष्मिता

डॉ. सुष्मिता चक्रवर्ती विजेताओं को पुरस्कृत करते हुए

चक्रवर्ती ने मुख्य अतिथि के रूप में कार्यक्रम की गरिमा बढ़ाई। उन्होंने संस्थान द्वारा आयोजित एक माह तक चलने वाले क्रिया–कलापों में विभिन्न खेलों एवं प्रतियोगिताओं के विजेताओं को पुरस्कार प्रदान किये।

मुख्य समारोह का आयोजन मध्याह्न में किया गया जिसके मुख्य अतिथि राष्ट्रीय रसायन प्रयोगशाला, पुणे के निदेशक डॉ. स्वामीनाथन शिवराम थे। लखनऊ विश्वविद्यालय के कुलपति प्रो. मनोज कुमार मिश्र ने कार्यक्रम की अध्यक्षता की। डॉ. टी.के. चक्रवर्ती ने रिपोर्टिंग अवधि के दौरान सी.डी.आर.आई. द्वारा प्राप्त की

(ऊपर) डॉ. मनोज कुमार मिश्रा, डॉ. स्वामीनाथन शिवराम को सम्मानित करते हुए (नीचे) उन्सठवें वार्षिक दिवस पर मेमोरी श्योर का लोकर्पण

गयी उपलब्धियों का विस्तृत ब्यौरा दिया।

डॉ. शिवराम ने **"उभरते भारत"** के संदर्भ में सी.एस.आई.आर. प्रयोगशालाओं की भूमिका को पुनः निरूपित करने की आवश्यकता पर जोर दिया। उन्होंने मनुष्य के स्वास्थ्य आवश्यकताओं को पहचानने के लिये सी.डी.आर.आई. को सहायक होने और विभिन्न बीमारियों के इलाज के लिये विश्वस्तरीय औषधियाँ प्रदान करने के लिये अभिनव एवं उद्यमी का स्थान प्राप्त करने के लिये बधाई दी। बाद में गणमान्य व्यक्तियों द्वारा एकल पादप आधारित अद्वितीय प्राकृतिक स्मृतिवर्धक यौगिक **"मेमोरी श्योर"** के शुभारंभ के पश्चात् **वार्षिक प्रतिवेदन–2010** का विमोचन किया गया। इस अवसर पर विभिन्न श्रेणियों के अंतर्गत सम्मान पुरस्कार 2010 की उद्घोषणा की गयी और पुरस्कार प्राप्तकर्ताओं को एक पट्टिका, प्रमाण पत्र और नकद पुरस्कार देकर सम्मानित किया गया। दो शोध छात्रों को उनके सर्वोत्तम शोध पत्र वर्ष 2009 हेतु **डॉ. एम.एम. धर स्मृति पुरस्कार** प्रदान किये गये। इस अवसर पर सी.डी.आर.आई. में लगातार अपनी सेवा के 25 वर्ष व्यतीत कर चुके व्यक्तियों को भी सम्मानित किया गया।

मेलानबी स्मृति व्याख्यान

17 फरवरी, 2010 को 35वें मेलानबी स्मृति व्याख्यान का आयोजन सी.डी.आर.आई. के संस्थापक निदेशक सर एडवर्ड मेलानबी

डॉ. टी.के. चक्रवर्ती प्रो. हरबर्ट वाल्डमन का सम्मान करते हुए

डॉ. टी.के. चक्रवर्ती श्री फेलिक्स काह्ले का सम्मान करते हुए

की स्मृति में किया गया। इस अवसर पर मैक्स प्लाक इंस्टीट्यूट ऑफ मॉलीक्युलर फिज़ियॉलोजी, जर्मनी के निदेशक प्रो. हरबर्ट वॉल्डमन ने व्याख्यान प्रस्तुत किया। प्रस्तुतीकरण का शीर्षक **बायोलॉजी ओरिएन्टेड सिथेसिस** था। प्रो. वॉल्डमन ने रसायन जीव विज्ञान तथा औषधीय रसायन अनुसंधान में प्रयुक्त हो रहे यौगिक श्रेणियों का विस्तृत विवरण दिया। उनके अनुसार प्रोटीन बाइन्डिंग के लिये आवश्यक प्राकृतिक उत्पादों का आधारिक ढाँचा गुणधर्म की एनकोडिंग करते हुए विकसित चयनित रसायन संरचना प्रदान करता है। इन तर्कों पर बनाया गया जीव विज्ञान उन्मुख संश्लेषण लाइब्रेरी डिज़ाइन और रसायन विभिन्नता हेतु दिशा–निर्देश रणनीतियों के लिये वैकल्पिक अवधारणा प्रदान करता है। मैक्स प्लैन्क सोसाइटी, म्यूनिख, जर्मनी के श्री फेलिक्स काह्ले ने कार्यक्रम की अध्यक्षता की।

चतुर्थ इण्टरनेशनल सिम्पोजियम ऑन करेन्ट ट्रेण्ड्स इन ड्रग डिस्कवरी रिसर्च

17–21 फरवरी, 2010 की अवधि में सी.टी.डी.डी.आर पर एक अन्तर्राष्ट्रीय संगोष्ठी का आयोजन किया गया। आयोजन को सी.एस. आई.आर., आई.सी.एम.आर., डी.बी.टी., डी.एस.टी., डी.ओ.डी. और नोवो नॉरडिस्क द्वारा प्रायोजित किया गया। लगभग 500 अनुसंधानकर्ताओं ने भारत से तथा लगभग 50 विशेषज्ञों ने विदेशों से भाग लिया।

उद्घाटन सत्र के दौरान प्रतिनिधियों का स्वागत करते हुए सी. डी.आर.आई. के निदेशक डॉ. टी.के. चक्रवर्ती ने कहा कि GATT अनुबंध, जो कि औषधि अणु के पेटेण्ट युग को लेकर आया, के बाद भारत औषधि खोज और स्वास्थ्य की देखरेख के क्षेत्र में आत्मनिर्भर हो गया।

उद्घाटन व्याख्यान प्रो. जोहान गैस्टीजर (जर्मनी) द्वारा दिया गया जिन्होंने केमिनो फॉरमेटिक्स क्षेत्र में अनुसंधान और शिक्षा हेतु उनकी उत्कृष्ट उपलब्धियों के लिये ए.सी.एस. अवार्ड फॉर कम्प्यूटर्स इन केमिकल एण्ड फार्मास्यूटिक्ल रिसर्च प्राप्त किया। उन्होंने अपने पिछले लखनऊ आगमन को याद किया, एक शहर जो अपनी सांस्कृतिक विरासत हेतु जाना जाता है और सम्मेलन के सचिव डॉ. ए.के. सक्सेना को एक पुस्तक भेंट की। सी.डी.आर.आई. के भूतपूर्व निदेशक डॉ. नित्यानन्द ने अध्यक्षीय भाषण दिया।

संगोष्ठी संक्रामक और उष्ण कटिबंधीय बीमारियों, बढ़ती उम्र, अनुवांशिकी, चयापचय, अंतःस्रावी और प्रजनन संबंधी विकृतियो की औषधि खोज एवं विकास के क्षेत्र में प्रयोग किये जा रहे विश्वव्यापी नवीन दृष्टिकोणों पर अभिकेन्द्रित रही। विषयों की विस्तृत श्रृंखला पर गहन विचार–विमर्श किया गया जिनमें गणना प्रयास, नवीन औषधि खोज मार्ग और संरचना क्रिया–कलाप संबंधों, नए औषधि लक्ष्य और कार्बनिक अणुओं के संश्लेषण हेतु नए औषधि लक्ष्य और अत्याधुनिक तकनीक सम्मिलित है।

FP–7 स्वास्थ्य दिवस और प्रशिक्षण

यूरोपियन यूनियन एण्ड इण्डिया एनहैन्स्ड कोऑपरेशन फ्रेम वर्क EUINEC ने विज्ञान एवं प्रौद्योगिकी के क्षेत्र में एक BILET परियोजना जो यूरोपियन कमीशन द्वारा निधि प्रदत्त है, का प्रारम्भ किया।

12 मार्च, 2010 को एफपी–7 स्वास्थ्य सूचना दिवस और प्रशिक्षण के एक दिवसीय कार्यक्रम का आयोजन संस्थान में किया गया। कार्यक्रम का आयोजन भारतीय स्टेकहोल्डर्स को एफपी–7 प्रस्तावों की सफलतापूर्वक जानकारी प्रदान करने अनुसंधान उपायों

डॉ. सुदीप कुमार उद्घाटन भाषण देते हुए

डॉ. स्टीफन होगन श्रोताओं को संबोधित करते हुए

की जानकारी प्रदान करने, अनुसंधान प्राथमिकताओं के विषय में सूचना देने और अनुसंधान प्रस्ताव के विकास की संपूर्ण प्रक्रिया के माध्यम से दिशा–निर्देश प्राप्त करने के लिये किया गया जिसमें कॉल–आइडेन्टीफिकेशन (चिह्नित करने) से लेकर प्रस्ताव प्रस्तुतीकरण, जिसमें बजट तैयार करना, और यूरोपीय निधि हेतु अपनाए जाने वाले आई.पी.आर. और उसके तरीके सम्मिलित हैं।

लखनऊ के विभिन्न संस्थानों और विश्वविद्यालयों के लगभग 100 अनुसंधानकर्ताओं ने कार्यक्रम में भाग लिया। सी.डी.आर.आई. के

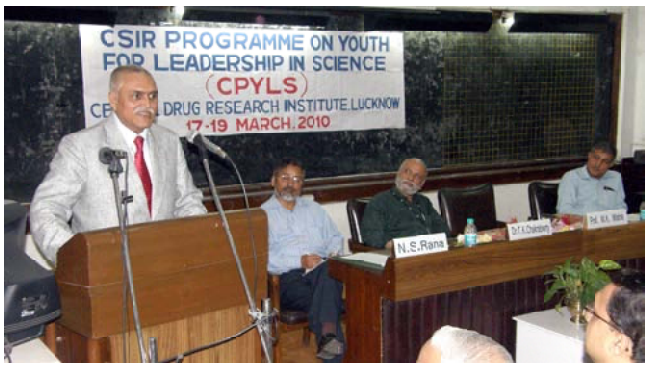
निदेशक डॉ. टी.के. चक्रवर्ती और सी.एस.आई.आर., नई दिल्ली के पी. पी.डी. के प्रभागाध्यक्ष डॉ. सुदीप कुमार ने स्वागत भाषण दिया। स्वास्थ्य निदेशालय, डी.जी. रिसर्च, यूरोपियन कमीशन के डॉ. स्टीफेन होगन और सी.डी.आर.आई. के डॉ. वी. कुण्डू, वैज्ञानिक 'जी' ने मुख्य व्याख्यान दिया।

सूचना के आपसी आदान–प्रदान के कार्यक्रम में यूरोपियन कमीशन, सी.डी.आर.आई. और आई.जी.आई.वी. के साथ–साथ हेल्थ नैशनल कॉन्ट्रेक्ट पॉइण्ट नेटवर्क के प्रतिनिधि भी सम्मिलित थे।

भारतीय संस्थान ने, जो पहले यूरोपीय परियोजनाओं में भाग लेते थे, अपने अनुभवों को बाँटा और न्यू इण्डिगो प्रोजेक्ट ने निधि प्राप्त करने के स्रोतों को प्रस्तुत किया।

सीएसआईआर द्वारा विज्ञान में नेतृत्व हेतु युवाओं के लिए कार्यक्रम (सीपीएलवाईएस)

17–19 मार्च, 2010 की अवधि में तीन दिवसीय सीपीएलवाईएस कार्यक्रम का आयोजन किया गया। कार्यक्रम का लक्ष्य मेधावी छात्राओं के मन में हाईस्कूल स्तर से विज्ञान के प्रति रूचि उत्पन्न करना था। सी.डी.आर.आई. के निदेशक डॉ. टी.के. चक्रवर्ती ने कार्यक्रम के लिये चयनित छात्रों का स्वागत किया। लखनऊ विश्वविद्यालय के कुलपति प्रो. मनोज कुमार मिश्र मुख्य अतिथि थे। उत्तर प्रदेश के पंद्रह मेधावी छात्रों ने भाग लिया और सी.डी.आर.आई.



(ऊपर) डॉ. एम.के. मिश्रा सीपीएलवाईएस कार्यक्रम में युवाओं को संबोधित करते हुए एवं (नीचे) विद्यार्थी वैज्ञानिकों से प्रयोगशाला में बातचीत करते हुए

के प्रतिष्ठित वैज्ञानिकों ने व्याख्यान दिये। छात्र विभिन्न प्रयोगशालाओं को देखने गए और वैज्ञानिकों के साथ विज्ञान तथा विभिन्न खोजों के बारे में जिज्ञासा और प्रश्नों को लेकर बातचीत की।

प्रयोगशाला जन्तु आचार शास्त्र, प्रौद्योगिकी और विकल्प पर राष्ट्रीय संगोष्ठी

राष्ट्रीय प्रयोगशाला जन्तु केन्द्र, केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ द्वारा भारतीय जन्तु विज्ञान प्रयोगशाला संघ(LASAI) के सहयोग से 19 मार्च, 2010 को प्रयोगशाला जन्तु आचार शास्त्र, प्रौद्योगिकी और विकल्प पर एक दिवसीय राष्ट्रीय संगोष्ठी का आयोजन किया गया। सेमिनार का मुख्य केन्द्र शिक्षा और परीक्षण कार्यक्रमों, बायोमेडिकल रिसर्च में प्रयोगशाला जन्तुओं की देखरेख, प्रबन्धन और प्रयोग के वैज्ञानिकों और नैतिक विषयों पर था जिसमें विज्ञान के साथ–साथ जन्तुओं के कल्याण हेतु सामान्य रूचि के विषयों पर विचार–विमर्श का अवसर प्रदान किया गया।

प्रारंभ में इस संगोष्ठी के उद्देश्यों और प्रारंभ के विषय में राष्ट्रीय प्रयोगशाला जन्तु केन्द्र के प्रभागाध्यक्ष डॉ. डी.एस. उपाध्याय ने संक्षिप्त विचार प्रस्तुत किये। सेमिनार का उद्घाटन करते हुए सी. डी.आर.आई. के निदेशक डॉ. टी.के. चक्रवर्ती ने अनुसंधानों में जन्तुओं के विवेकपूर्ण प्रयोग पर बल दिया। बैठक को सम्बोधित करते हुए उन्होंने प्रमाणिक पुनः प्रयोग किये जा सकने योग्य, समान अनुसंधान आँकड़ें उत्पन्न करने के लिये स्वस्थ जन्तु मॉडल के महत्व पर प्रकाश डाला। उन्होंने जन्तुओं की गुणवत्ता और मानक स्तर बनाए रखने के लिये जन्तु सुविधा में **"गुड लेबोरेटरी प्रैक्टिस"** (जीएलपी) को क्रियान्वित करने और व्यवहार में लाने पर जोर दिया। इस अवसर पर उन्होंने एक स्मारिका और LASAI न्यूजलेटर का विमोचन किया।

LASAI के अध्यक्ष डॉ. के.आर. भारद्वाज ने प्रयोगशाला जन्तु विज्ञान के क्षेत्र में NLAC द्वारा किये जा रहे असाधारण कार्यों विशेष रूप से जन्तु मॉडल का प्रबन्धन एवं उत्पादन, प्रशिक्षण कार्यक्रमों का विवरण, वैज्ञानिक बैठक का आयोजन, संबंधित क्षेत्र में ज्ञान के प्रसार एवं अभिवृद्धि हेतु सेमिनार एवं संगोष्ठी के आयोजन के विषय में विवरण दिया।

वर्कशाप ऑन बेसिक्स एण्ड एप्लिकेशन ऑफ मास एन.एम.आर., आई.आर. फ्लोसाइटोमिट्री एण्ड एलिमेंटल एनालिसिस

सोफिस्टिकेटेड एनालिटिकल इन्स्ट्रूमेंट फैसिलिटी (परिष्कृत विश्लेषणात्मक उपकरण सुविधा) सी.डी.आर.आई. ने उपर्युक्त विषयों पर 21 से 25 जून, 2010 को एक प्रशिक्षण कार्यक्रम का आयोजन किया। विभिन्न विश्वविद्यालयों एवं कालेजों के 15 प्रतिभागियों ने कार्यक्रम में हिस्सा लिया तथा विभिन्न तकनीकों पर प्रशिक्षण प्राप्त किया।

चिकित्सा रसायन और औषधि निर्माण विज्ञान पर द्वितीय सीडीआरआई–नाइपर (रायबरेली) संगोष्ठी

चिकित्सा रसायन और औषधि निर्माण विज्ञान पर द्वितीय सीडीआरआई–नाइपर (रायबरेली) संगोष्ठी का आयोजन 25 से 27 मार्च, 2010 को केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में किया गया। यह संगोष्ठी नाइपर (रायबरेली) और देश के दूसरे अनेक औषधि निर्माण कॉलेजों के छात्रों को औषधि खोज, विकास सहित वितरण पद्धति के अग्रणी क्षेत्रों में हाल में हुए विकास को स्पष्ट करने के लिये आयोजत की गयी थी। संगोष्ठी में 170 पंजीकृत सहभागियों ने उपस्थित होकर आयोजन को सफल बनाया। उद्घाटन भाषण हैदराबाद विश्वविद्यालय के कुलपति और प्रधानमंत्री की वैज्ञानिक सलाहकार समिति के सदस्य पद्मश्री प्रो. सैय्यद ई. हसनैन ने दिया जिसका विषय था "अंडरस्टैडिंग द विरूलन्स ऐण्ड पैथॉजेनिसिटी ऑफ इन्फेक्शियस माइक्रोऑर्गेनिजम"। उद्घाटन समारोह की अध्यक्षता

लखनऊ विश्वविद्यालय के कुलपति प्रो. मनोज मिश्रा ने की। दो दिनों के वैज्ञानिक विचार–विमर्श के दौरान दवा–उद्योग और शिक्षा जगत के प्रतिष्ठित वक्ताओं ने कुल 16 व्याख्यान दिये। अनेक ज्वलंत विषय जैसे (1) इन सिलिको तथा संरचना आधारित औषधि अभिकल्पना, (2) नैनो औषधि, (3) कैंसर एवं मधुमेह जैसी औषधियों का जैविक नियंत्रण, (4) औषधि खोज का औद्योगिक परिप्रेक्ष्य, (5) नई एपीआई के रूप में कोक्रिस्टल, (6) काइरैलिटी की भूमिका (7) एनएमआर के माध्यम से मेटाबोलोमिक्स, (8) वक्ताओं द्वारा ड्रग डिलीवरी पद्धतियों का प्रस्तुतीकरण, और विचार–विमर्श किया गया।

सी.एस.आई.आर. का स्थापना दिवस (26 सितम्बर 2010)

26 सिम्बर, 2010 को संस्थान में सी.एस.आई.आर. का 68वाँ स्थापना दिवस मनाया गया। इस दिन सी.डी.आर.आई. म्यूज़ियम में एक विज्ञान प्रदर्शनी का आयोजन किया गया जिसका उद्घाटन आई. सी.जी.ई.बी., नई दिल्ली के वैज्ञानिक डॉ. शाहिद ज़मील ने किया। प्रदर्शनी पूरे दिन छात्रों एवं जनता के लिये खुली रही।

पूर्वाह्न में एक कार्यक्रम का आयोजन किया गया जिसमें डॉ. ज़मील ने स्थापना दिवस व्याख्यान दिया जिसका विषय था "इवेज़न ऑफ होस्ट इम्यूनिटी बाइ एचआईवी"। प्रो. जी. मुगेश को 2010 का सी.डी.आर.आई. रसायन विज्ञान पुरस्कार दिया गया। उन्होंने मेटेलोप्रोटीन्स ऐज ड्रग टारगेट्सः इनहिविशन ऑफ पैराक्साइडेज कैटेलाइज्ड आयोडाइनेशन वाई ऐण्टीथायरॉयड ड्रग्स पर व्याख्यान दिया। कार्यक्रम की अध्यक्षता भूतपूर्व निदेशक डॉ. वी.पी. कम्बोज ने की।

मुख्य कार्यक्रम का आयोजन मध्याह्न में किया गया। डॉ. शाहिद ज़मील ने सी.एस.आई.आर. की सेवा में 25 वर्ष पूरे करने वाले स्टाफ सदस्यों का अभिनन्दन किया और जो कर्मचारी 28 सितम्बर, 2008 से अगस्त 2009 के बीच सेवानिवृत्त हुए थे उनको एक प्रमाणपत्र, कलाई घड़ी और शाल देकर सम्मानित किया। इसके अतिरिक्त डॉ. (श्रीमती) सुष्मिता चक्रवर्ती ने निबन्ध/प्रश्नमंच प्रतियोगिताओं में विजयी स्टाफ सदस्यों के बच्चों को नगद पुरस्कार प्रदान किये।

सी.डी.आर.आई. पुरस्कार – 2010

औषधि अनुसंधान में उत्कृष्टता के लिए **सी.डी.आर.आई. अवार्ड 2010** की घोषणा की गयी। भारतीय प्रौद्योगिक संस्थान, मुंबई के प्रो. दुलाल पांडा को लाइफ साइंस के लिए तथा भारतीय विज्ञान संस्थान, बंगलौर के प्रो. जी मुगेश को रसायन विज्ञान के लिए **सी.डी.आर.आई. अवार्ड – 2010** के लिए चुना गया। प्रो. जी. मुगेश ने सी.एस.आई.आर. के स्थापना दिवस पर पुरस्कार ग्रहण किया तथा **'मेटेलोप्रोटीन्स एज़ ड्रग टारगेट्सः इन्हिबिशन ऑफ परऑक्सीडेज कैटालाइज्ड आयोडिनेशन बाय एण्टीथायरायड ड्रग्स'** विषय पर अपना व्याख्यान दिया। भारतीय प्रौद्योगिकी संस्थान के प्रो. दुलाल पाण्डा ने बाद में 16 नवम्बर, 2010 में अपना पुरस्कार ग्रहण किया तथा **'इन्हिबिशन ऑफ FtsZ असेम्बली डायनामिक्सः ए प्रॉमिसिंग अप्रोच फॉर एण्टीबैक्टीरियल थैरेपी'** पर अपना अवार्ड व्याख्यान दिया।

(ऊपर) प्रो. जी. मुगेश तथा (नीचे) प्रो. दुलाल पांडा, सी.डी.आर.आई. पुरस्कार–2010 ग्रहण करते हुए।

प्रो. वी.के. बछावत स्मृति युवा वैज्ञानिक व्याख्यान पुरस्कार–2010

राष्ट्रीय विज्ञान अकादमी, भारत (लखनऊ) द्वारा एक समारोह में 29 सितम्बर, 2010 को सी.डी.आर.आई. के वैज्ञानिक डॉ. आशीष अरोड़ा को प्रो. वी.के. बछावत स्मृति युवा वैज्ञानिक व्याख्यान पुरस्कार 2010 से सम्मानित किया गया। डॉ. अरोड़ा ने अंडर स्टैंडिंग द सॉफ्टस्किल्स ऑफ ड्रग टार्गेट प्रोटीन्स यूजिंग एनएम आर स्पेक्ट्रोस्कोपी पर पुरस्कार व्याख्यान प्रस्तुत किया। NASI लखनऊ के अध्यक्ष डॉ. टी.के. चक्रवर्ती ने भी अपने विचार प्रस्तुत किया। NASI के महासचिव प्रो. कृष्ण मिश्रा ने स्वर्ण पदक भेंट किया और NASI के सलाहकार डॉ. के.सी. गुप्ता ने डॉ. अरोड़ा को नगद पुरस्कार प्रदान किया।

सतर्कता जागरूकता सप्ताह–2010

केन्द्रीय सतर्कता आयोग के दिशानिर्देशों के अनुसार 25 अक्टूबर से 01 नवमबर, 2010 के दौरान सतर्कता सप्ताह का आयोजन किया गया। सी.डी.आर.आई स्टाफ के सभी सदस्यों ने पारदर्शिता सुनिश्चित करने, भ्रष्टाचार के मूल कारणों को चिह्नित करने और किसी भी कीमत पर समाज से उसका उन्मूलन करने का संपूर्ण प्रयत्न करने की शपथ ली। इस विषय पर भारतीय रेलवे, लखनऊ के वरिष्ठ पुलिस अधीक्षक डॉ. जी.के. गोस्वामी, आई.पी.एस., ने रोचक व्याख्यान दिया। सप्ताह के दौरान विभिन्न कार्यक्रमों का आयोजन किया गया जिनमें व्याख्यान, वाद–विवाद और निबन्ध प्रतियोगिताएं सम्मिलित हैं। प्रतियोगिताओं के विजेताओं को सी.डी.आर.आई में दिनांक 01 नवम्बर, 2010 को आयोजित समापन समारोह में पुरस्कार वितरित किया गया। समारोह की अध्यक्षता संस्थान के निदेशक डॉ. टी.के. चक्रवर्ती ने की।

साम्प्रदायिक एकता सप्ताह 2010

नेशनल फाउण्डेशन फॉर कम्युनल हॉर्मनी के दिशानिर्देशों के अनुसार संस्थान द्वारा 19–25 नवम्बर, 2010 तक साम्प्रदायिक एकता सप्ताह मनाया गया। सी.डी.आर.आई के सभी स्टाफ सदस्यों द्वारा इस अवसर पर लोगों के मध्य साम्प्रदायिक सौहार्द्र और राष्ट्रीय एकता बढ़ाने की शपथ ली।

सीएसआईआर टेक्नोफेस्ट–2010

सी.डी.आर.आई., लखनऊ ने हाल नं. 11, प्रगति मैदान, नई दिल्ली में **सीएसआईआर टेक्नोफेस्ट–2010** में भाग लिया जिसका उद्घाटन विज्ञान एवं प्रौद्योगिक मंत्री माननीय श्री कपिल सिब्बल जी द्वारा किया गया। इसको महाराष्ट्र के मुख्यमंत्री श्री पृथ्वीराज चव्हाण ने भी देखा जोकि आई.आई.टी.एफ. में एक सहयोगी राज्य है।

प्रारंभ से ही सी.एस.आई.आर. टेक्नोफेस्ट 2010 में हमारे हाल को उत्साहवर्धक प्रतिक्रिया प्राप्त हुई। सी.एस.आई.आर. की संपूर्ण टीम ने सी.एस.आई.आर. के योगदान को अभूतपूर्व तरीके से सामने रखने के लिए अपना सर्वोत्तम प्रयास किया अर्थात् जहाँ उद्योग तथा अन्य भागीदार हमारी चर्चा कर सकें। इस अवसर पर सी.डी.आर.आई. की मेमोरी श्योर एवं अन्य उत्पाद सभी आगन्तुकों के आकर्षण का केन्द्र थे।

सीएसआईआर टेक्नोफेस्ट 2010 की झलकियाँ

नाइपर, रायबरेली – प्रथम दीक्षांत समारोह

भारत सरकार ने भारतीय दवा उद्योग द्वारा द्रुत गति से चलने के लिये पन्द्रह वर्ष पूर्व औषधि निर्माण विज्ञान में अत्याधुनिक शिक्षण एवं अनुसंधान संस्थान बनाने की आवश्यकता का अनुभव किया था। इस कारण मोहाली, पंजाब में प्रथम **"नेशनल इंस्टीट्यूट ऑफ फार्मास्यूटिक्ल एजूकेशन एण्ड रिसर्च"** की स्थापना की गयी। संस्थान की स्थापना रसायन एवं खाद मंत्रालय के तत्वाधान में संसद द्वारा बनाए गए अधिनियम के द्वारा की गयी। भारतीय दवा उद्योग की चुनौतियों का सामना करने में नाइपर, मोहाली द्वारा निर्वाह की जा रही महत्वपूर्ण भूमिका से प्रोत्साहित होकर भारत सरकार ने औषधि निर्माण में उच्चतर शिक्षा, अनुसंधान एवं विकास में उत्कृष्टता के केन्द्र के रूप में अहमदाबाद, हैदराबाद, कोलकाता, हाजीपुर, गुवाहाटी और रायबरेली में छः नए नाइपर खोलने का निर्णय लिया गया। प्रत्येक नव स्थापित नाइपर को एक स्थापित एवं समीपस्थ वैज्ञानिक संस्थान के परामर्श के अंतर्गत रखा गया।

"नेशनल इंस्टीट्यूट ऑफ फार्मास्यूटिक्ल एजूकेशन एण्ड रिसर्च (नाइपर)", रायबरेली ने सी.डी.आर.आई., लखनऊ के परामर्श के अंतर्गत 14 नवम्बर, 2008 से कार्य करना प्रारंभ किया। नाइपर, रायबरेली चिकित्सा रसायन और औषधि निर्माण में एम.एस. (फार्मा) पाठ्यक्रम प्रस्तावित करता है। नाइपर के छात्र सी.डी.आर.

आई. वैज्ञानिकों के पर्यवेक्षण में अपना (द्वितीय वर्ष) परियोजना कार्य पूरा करते हैं।

छात्रों के प्रथम बैच ने 2010 में अपना एम.एस. फार्मास्यूटिकल पूरा किया। नाइपर का प्रथम दीक्षांत समारोह सी.डी.आर.आई., लखनऊ में 15 दिसम्बर, 2010 को आयोजित किया गया जहाँ सी.सी.एम.बी. के भूतपूर्व निदेशक प्रो. लालजी सिंह मुख्य अतिथि थे। प्रो. लालजी सिंह और औषधि निर्माण विभाग, भारत सरकार के संयुक्त सचिव श्री अरूण झा द्वारा संयुक्त रूप से डिग्रियाँ प्रदान की गयीं।

ग्रामीण विद्यालयों के लिये सम्पूर्ण स्वास्थ्य शिक्षा कार्यक्रम

छात्रों में जागरूकता उत्पन्न करने के लिये नियत कालीन स्वास्थ्य सर्वेक्षण प्रारंभ करने, छात्रों के चिकित्सीय परीक्षण के लिये स्वास्थ्य शिविरों का आयोजन तथा स्वास्थ्य शिक्षा, सफाई, स्वच्छता, पोषण, सुरक्षित पर्यावरण इत्यादि के उद्देश्य से सी.डी.आर.आई. ने सी.एस.आई.आर., नई दिल्ली के वित्तीय सहयोग से उपर्युक्त कार्यक्रम का प्रारंभ किया। इस परियोजना के अंतर्गत सी.डी.आर.आई. ने 01–02 दिसम्बर, 2010 को राजकीय इण्टर कॉलेज, बरोली, जाटा, जिला बाराबंकी, उ.प्र. में एक दो दिवसीय स्वास्थ्य जागरूकता कार्यक्रम का आयोजन किया गया। 01 दिसम्बर, 2010 को उद्घाटन समारोह का आयोजन किया गया जिसकी अध्यक्षता सी.डी.आर.आई. के डॉ. एस.के. पुरी, वैज्ञानिक 'जी' ने की। बाराबंकी के जिला विद्यालय निरीक्षक डॉ. ए.के. दुबे और छत्रपति शाहूजी महाराज चिकित्सा विश्वविद्यालय के एस.पी.एम. विभाग के प्रो. डॉ. उदय मोहन ने मुख्य अतिथि के रूप कार्यक्रम की गरिमा बढ़ाई। सी.डी.आर.आई. के डॉ. सी. नाथ, कुछ वरिष्ठ वैज्ञानिक, कॉलेज के प्रधानाचार्य, स्टाफ सदस्य तथा लगभग 800 छात्रों ने कार्यक्रम में भाग लिया। इस अवसर पर 26 नवम्बर, 2010 को आयोजित स्वास्थ्य प्रश्नोत्तरी, निबन्ध तथा कला प्रतियोगिता के विजेताओं को आकर्षक पुरस्कार प्रदान किये गये।

कार्यक्रम को जारी रखते हुए सी.डी.आर.आई ने मुख्य चिकित्साधिकारी, बाराबंकी और सी.एच.एस., बरोली के सहयोग से 21–24 दिसम्बर, 2010 को उपर्युक्त कॉलेज में एक दो दिवसीय ''स्वास्थ्य शिविर'' का आयोजन किया। शिविर का उद्घाटन परजीवी विज्ञान प्रभाग, सी.डी.आर.आई., लखनऊ के प्रभागाध्यक्ष डॉ. एस.के. पुरी ने किया। शिविर में बाराबंकी के मुख्य चिकित्साधिकारी द्वारा प्रतिनियुक्त 5 विशेषज्ञ चिकित्सकों, जिनमें दो महिला चिकित्सक शामिल थीं, ने लगभग 600 छात्र–छात्राओं की पूर्ण रूप से जाँच की। शिविर में निःशुल्क दवाओं का वितरण किया गया। शिविर का समापन एक संक्षिप्त विदाई समारोह के साथ किया गया। जिसकी अध्यक्षता सी.डी.आर.आई. के वरिष्ठ वैज्ञानिक श्री एन.एस. राणा ने की। सी.डी.आर.आई. के निदेशक की ओर से श्री राणा ने सभी डॉक्टरों, पैरामेडिकल स्टाफ, प्रधानाचार्य और कॉलेज स्टाफ को इस सफलतापूर्वक आयोजन में योगदान करने के लिये स्मृतिचिह्न प्रदान किये। कॉलेज के प्रधानाचार्य श्री एस.पी. मिश्रा ने सी.डी.आर.आई. के निदेशक और अन्य टीम सदस्यों के प्रति सभी विद्यार्थियों को लाभान्वित करने वाले उत्कृष्ट कार्यक्रम के आयोजन के लिये आभार व्यक्त किया।

राजभाषा कार्यक्रम

नगर राजभाषा कार्यान्वयन समिति, लखनऊ की छमाही बैठक

नगर राजभाषा कार्यान्वयन समिति, लखनऊ की छमाही बैठक दिनांक 28 जुलाई, 2010 एच. ए. एल. परिसर, लखनऊ के मुख्य प्रेक्षागृह में सम्पन्न हुई। इस अवसर पर भारत सरकार, गृह मंत्रालय, राजभाषा विभाग से पधारे संयुक्त सचिव श्री डी. के. पाण्डेय ने दीप प्रज्ज्वलित कर बैठक का शुभारंभ किया। 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 डॉ. विजय नारायण तिवारी ने अध्यक्ष महोदय तथा उपस्थित सभी विभागाध्यक्षों/कार्यालय प्रमुखों, हिन्दी अधिकारियों एवं अन्य कार्यालय प्रतिनिधियों का हार्दिक स्वागत करते हुए 120 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 पुरस्कृत किया गया तथा प्रशस्ति पत्र प्रदान किये गये। राजभाषा पत्रिका प्रकाशन के लिए तीन कार्यालयों को पुरस्कृत किया गया तथा प्रशस्ति पत्र प्रदान किये गये। इस अवसर पर भारत सरकार गृह मंत्रालय राजभाषा विभाग द्वारा पधारे संयुक्त सचिव श्री डी. के. पाण्डेय ने अपना व्याख्यान दिया। इसके पश्चात् अध्यक्ष महोदय ने नराकास की वेबसाइट का शुभारंभ किया तथा एच.ए.एल. के चीफ ऑफ प्रोडक्शन, श्री सी.के. विश्वकर्मा ने धन्यवाद ज्ञापन प्रस्तुत किया।

हिन्दी पखवाडा

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ द्वारा दिनांक 14 सितम्बर से 28 सितम्बर, 2010 के मध्य हिन्दी पखवाड़ा का आयोजन किया गया। सत्र का उद्घाटन दिनांक 14 सितम्बर, 2010 को महामहिम राज्यपाल, उ.प्र., लखनऊ के प्रमुख सचिव, श्री जी. पटनायक द्वारा किया गया। इस अवसर मुख्य अतिथि के रूप में श्री पटनायकजी ने हिन्दी में काम करने की प्रतिबद्धता पर अपने विचार व्यक्त किया। पखवाड़े के दौरान विभिन्न प्रतियोगिताओं का आयोजन किया गया जिसमें संस्थान तथा नराकास, लखनऊ के सदस्य कार्यालयों के कर्मचारियों ने भाग लिया। दिनांक 28 सितम्बर,

2010 को पखवाड़े का समापन समारोह आयोजित किया गया जिसमें मुख्य अतिथि के रूप में प्रो. मनोज कुमार मिश्र, कुलपति, लखनऊ विश्वविद्यालय, लखनऊ ने अपना व्याख्यान प्रस्तुत किया तथा विजयी प्रतिभागियों को पुरस्कृत किया। डॉ. वी.एन. तिवारी, सचिव, नराकास के धन्यवाद ज्ञापन के पश्चात् हिन्दी पखवाड़ा का समापन किया गया।

सामूहिक हिन्दी कार्यशाला

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में वर्ष 2010 की प्रथम दो दिवसीय सामूहिक हिन्दी कार्यशाला का आयोजन दिनांक 24–25 जून, 2010 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 के मुख्य अतिथि के रूप में पधारे श्री जी.के. गोस्वामी, आई.पी.एस. ने **''साइबर क्राइम''** विषय पर अपना व्याख्यान दिया। संस्थान के वरिष्ठ हिन्दी अधिकारी एवं सचिव नराकास डॉ. वी.एन. तिवारी ने राजभाषा नीति पर अपना व्याख्यान प्रस्तुत किया तथा डॉ. एस.के. तिवारी, वैज्ञानिक ने **''वैज्ञानिक/प्रशासनिक पारिभाषिक शब्दावली''** विषय पर अपना व्याख्यान दिया। दिनांक 25 जून, 2010 को चतुर्थ सत्र के बाद श्री ए.पी. राय, वरिष्ठ भू– वैज्ञानिक के धन्यवाद ज्ञापन के पश्चात् कार्यशाला का समापन किया गया।

केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में दिनांक 29–30 दिसम्बर, 2010 को द्वितीय दो दिवसीय सामूहिक कार्यशाला का आयोजन संस्थान के लघु प्रेक्षागृह में किया गया जिसमें नराकास, लखनऊ तथा संस्थान के अधिकारियों व कर्मचारियों ने भाग लिया। उद्घाटन सत्र के दौरान सशस्त्र सीमा बल, लखनऊ के महानिरीक्षक, श्री अनिल अग्रवाल जी ने उद्घाटन भाषण के दौरान **साइबर क्राइम** पर अपने विचार व्यक्त प्रस्तुत किये तथा संस्थान के वरिष्ठ हिन्दी अधिकारी डॉ. वी.एन. तिवारी ने **''यूनीकोड फांट की सहायता से कंप्यूटरों पर हिन्दी में कार्य करने की संभावनाएं''** विषय पर अपना व्याख्यान दिया। डॉ. विजय कर्ण, प्रवक्ता, विद्यांत कालेज, लखनऊ एवं डॉ. एस.के. तिवारी, वैज्ञानिक ने इस अवसर पर प्रमुख वक्ता के रूप में व्याख्यान प्रस्तुत किये। दिनांक 30 दिसम्बर, 2010 को चतुर्थ सत्र के बाद डॉ. वी.एन. तिवारी, सचिव, नराकास के द्वारा धन्यवाद ज्ञापन के पश्चात् कार्यशाला का समापन किया गया।

2 हीरक जयन्ती समारोह

उद्घाटन समारोह



सी.डी.आर.आई. हीरक जयन्ती समारोह 1951–2011 का उद्घाटन 14 जुलाई, 2010 को किया गया। योजना आयोग के सदस्य तथा इसरो के भूतपूर्व अध्यक्ष डॉ. के. कस्तूरीरंगन इस अवसर पर सम्मानित अतिथि थे। सी.डी.आर.आई. के निदेशक डॉ. टी.के. चक्रवर्ती ने गणमान्य व्यक्तियों का स्वागत किया। उन्होंने डॉ. के. कस्तूरीरंगन के नेतृत्व में 'इसरो' के योगदान का स्मरण किया। डॉ. के. कस्तूरीरंगन ने हीरक जयन्ती एवं पोस्टर का अनावरण करके हीरक जयन्ती समारोहों का उद्घाटन किया।

अपने सम्बोधन में डॉ. कस्तूरीरंगन ने एक ऐसे संस्थान की हीरक जयंती के अवसर पर भागीदार बनने के लिये कृतज्ञता प्रकट की जिसका एक अद्भुत अतीत रहा है। उन्होंने भारत में स्वास्थ्य तथा औषधि निर्माण अनुसंधान में सी.डी.आर.आई. की उपलब्धियों की सराहना की। उन्होंने युवा पीढ़ी को अपने पूर्व पीढ़ी का अनुसरण करते हुए भारत को प्रौद्योगिकी पर आधारित विकास के मार्ग पर अग्रसर करने का सुझाव दिया। समारोह का समापन आयोजन समिति के संयोजक डॉ. बी. कुण्डू वैज्ञानिक 'जी' के धन्यवाद ज्ञापन से हुआ।

हीरक जयन्ती लघु संगोष्ठी (19 जुलाई, 2010)

नाम, पता एवं व्याख्यान का शीर्षक

प्रो. एस. चन्द्रशेखरन,
आई.आई.एस.सी., बंगलौर
स्ट्डीज ऑन लायज़िन बेस्ड पेप्टाइड कंन्जुगेट्स ऐज इनहिबिटर ऑफ एसआईआर–2 ऐक्टिीविटी

प्रो. शान्तनु भट्टाचार्य
आई.आई.एस.सी., बंगलौर
हाउ कैन वी डिसरप्ट टिलोमरेज फंक्शन?

डॉ. जी. विजय नायर
एन.आई.आई.एस.टी., त्रिवेन्द्रम
सम नॉवल सी.सी. बॉण्ड फॉरमिंग रिएक्शन्स इन्वॉलविंग एनएचसी कैटालिसिस एण्ड रिलेटेड कैमिस्ट्री

डॉ. अरविन्द चौधरी
आई.आई.सी.टी, हैदराबाद
कटायनिक ट्रांसफैक्शन लिपिड्स ऑन टारगेटेड कैंसर थेरैपी एण्ड डीएनए वैक्सिनेशन

कार्डियोवसक्युलर डिज़ीजेज पर हीरक जयंती लघु संगोष्ठी (11 अगस्त, 2010)

डॉ. रोजरपॉल मैकएवर
ओकलाहोमा मेडिकल रिसर्च फाउण्डनेशन, यू.एस.ए.
ल्युकोसाइट ऐडेशन टु वैस्कुलर सर्फेस अन्डर फ्लो

डॉ. फ्लोरिआ ल्युपु
ओकलाहोमा मेडिकल रिसर्च फाउण्डनेशन, यू.एस.ए.
पैथॉफिज़ियॉलॉजी एण्ड थेरॉप्यूटिक्स ऑफ सेप्सिस इन्ड्यूज्ड ऑरगन फेल्योर नॉन ह्यूमन प्राइमेट्स

डॉ. संजय बैनर्जी
आई.आई.सी.टी., हैदराबाद
एसजीएलटी1: ए नॉवेल टारगेट फॉर ड्रग डेवलपमेंट इन कार्डियो मायोपैथी

हीरक जयन्ती लघु संगोष्ठी (18 अगस्त, 2010)

नाम, पता एवं व्याख्यान का शीर्षक

प्रो. के.एन. गनेश,
आई.आई.एस.ई.आर., पुणे
फ्रॉम पेप्टाइड न्यूक्लीक एसिड टु PUNE न्यूक्लीक एसिड

डॉ. शेखर सी. माण्डे
सी.डी.एफ.डी., हैदराबाद
द चेन्जिंग पैराडाइम ऑफ *माइकोबैक्टीरियम* ट्यूबरकुलोसिस हीट शॉक प्रोटीन्स

डॉ. राजेश एस. गोखले
आई.जी.आई.बी., नई दिल्ली
डिकोडिंग बायोलॉजिकल सिस्टम्स डाइवर्सिटी एण्ड मेटाबॉलिक नेटवर्क्स

डॉ. आर. नागराज,
सी.सी.एम.बी., हैदराबाद
होस्ट डिफेन्स एण्टीमाइक्रोबियल पेप्टाइडस: डू दे हैव थेराप्यूटिक पोटेन्शियल ?

डॉ. भास्कर साहा,
एन.सी.सी.एस., पुणे
डुएल सीडी 40 सिग्नलिंग इन इम्यूनिटी

बोन बायोलॉजी एण्ड मेटाबोलिक बोन डिस्आर्डर पर हीरक जयंती लघु संगोष्ठी (12 नवम्बर, 2010)

डॉ. मोहन आर. वानी
एन.सी.सी.एस., पुणे
रोल ऑफ इण्टरल्युकिन–3 इन बोन मॉडलिंग

डॉ. अमिताभ बंदोपाध्याय
आई.आई.टी., कानपुर
रोल ऑफ बीएमपी सिग्नलिंग इन वर्टिब्रेट्स: एक्सीडिंग दी ब्रीफ ?

डॉ. सव्यसाची सान्याल
सी.डी.आर.आई., लखनऊ
एस्ट्रोजन रेगुलेशन ऑफ ओस्टियोब्लास्ट फंक्शन: कैन फाइटोएस्ट्रोजन बी इफेक्टिव एस्ट्रोजन मिमिक इन ओस्टियोब्लास्ट?

डॉ. रविन्द गोस्वामी
ए.आई.आई.एम.एस., नई दिल्ली
हाइपोकैलसिमिक डिस्आर्डर्स इन इण्डिया

बैकोसाइड्स एनरिच्ड स्टैडर्डाइज्ड एक्सट्रेक्ट ऑफ बैकोपा एज़ मेमोरी इन्हेन्सर पर हीरक जयंती लघु संगोष्ठी (26 नवम्बर, 2010)

नाम, पता एवं व्याख्यान का शीर्षक

डॉ. गौतम पालित
सी.डी.आर.आई., लखनऊ
न्यूरो फार्माकॉलॉजिकल स्ट्डीज ऑफ *बैकोपा मोनिएरा*

डॉ. कॉन स्टॉ,
ब्रेन साइंस इन्स्टीट्यूट एस.यू., आस्ट्रेलिया
ऑन रीसेन्ट क्लीनिकल ट्रॉयल बीइंग डन इन आस्ट्रेलिया

डॉ. सुभाष कानन
ओज मार्केटिंग, मलेशिया
मार्केटिंग एक्सपीरिएंस इन मलेशिया सिन्स 1996

मि. लियोनार्ड माइगल,
डैवेबेन एन्टरप्राइजेज कॉर्प, फिलीपींस
मार्केटिंग एक्सपीरिएंस इन फिलीपींस

मि. नाइजेल पोलार्ड
एस.एफ.आई., आस्ट्रेलिया
स्ट्रैटजी ऑन इण्टर नैशनल मार्केटिंग ऑफ मेमोरी श्योर

थेराप्यूटिक इंटरवेन्शन फॉर मलेरिया / पैरासिटिक डिसिजेज़ पर हीरक जयंती लघु संगोष्ठी (2 दिसम्बर, 2010)

नाम, पता एवं व्याख्यान का शीर्षक

डॉ. जेरेमी बरोज़
मेडिसिन्स फॉर मलेरिया वेन्चर, जेनेवा
ऐन्टीमलेरियल मेडिसिनल कैमिस्ट्री चैलेन्जेज एण्ड अपार्च्युनिटीज

डॉ. स्टीफेन ए. वार्ड
लिवरपूल स्कूल ऑफ ट्रॉपिकल मेडिसिन, लिवरपूल, यू.के.
एनडीएच2 ऐज ए पोटेण्ट ड्रग टार्गेट

हीरक जयंती व्याख्यानमाला

नाम, पता एवं व्याख्यान का शीर्षक

डॉ. गनेश पाण्डे
एन.सी.एल. पुणे
ऐडवेंचर विद द टोटल सिंथेसिस ऑफ स्ट्रक्चरली कॉम्प्लेक्स बायोलॉजीकली ऐक्टिव आल्कलाइड्स
29 जुलाई, 2010

प्रो. मनोज के. मिश्रा
लखनऊ विश्वविद्यालय
डायनमिक्स ऑफ लेज़र असिस्टेड सेलेक्टिव बॉन्ड डिसोसिएशन
28 सितम्बर, 2010

प्रो. हरजिन्दर सिंह
आई.आई.आई.टी., हैदराबाद
कम्प्यूटेशनल स्ट्डीज़ ऑफ स्ट्रक्चर एण्ड डायनमिक्स ऑफ नैचुरल सिस्टम्स
28 सितम्बर, 2010

डॉ. लुई रिबैस डी पॉप्लाना
इंस्टीट्यूट फॉर रिसर्च इन बायोमिडिसिन स्पेन
बियॉन्ड आईआरएनए रिकॉग्निशनः न्यू फंक्शन एंण्ड बायोमेडिकल अप्लीकेशल रिलेटेड टु द जेनेटिक कोड, 10 नवम्बर, 2010

प्रो. पिनाकपानि चक्रबर्ती
बोस इंस्टीट्यूट , कोलकाता
इफेक्ट ऑफ प्रोटीन स्ट्रक्चर डयू टू द बाइन्डिंग ऑफ ZnO नैनोपार्टिकल
16 नवम्बर, 2010

डॉ. लालजी सिंह
सी.सी.एम.बी, हैदराबाद
जेनेटिक डाइबर्सिटी इन इण्डियन पॉप्युलेशन एण्ड इट्स हेल्थ इम्पलिकेशन्स
15 दिसम्बर, 2010

प्रो. अल्ब्रेक्ट बर्केस्ल
कोलोग्न यूनीवर्सिटी, जर्मनी
आर्गेनोकैटालायसिस बॉय हाइड्रोजन बान्डिंग नेटवर्क
23 दिसम्बर, 2010

डॉ. एन. सुकुमार
रेन्सेलियर पॉलिटेक्निक इंस्टीट्यूट, न्यूयार्क, यू.एस.ए.
कैमिइन्फॉरमेटिक्स एण्ड बायोइन्फारमेटिक्सः फ्रॉम ग्राफ्स टू *DIXELS* टू नेटवर्क टोपोलॉजी,
12 जनवरी, 2011

रिसेण्ट ट्रेण्ड्स इन आईपी प्रैक्टिस एण्ड मैनेजमेण्ट पर अन्तर्राष्ट्रीय कार्यशाला

सी.डी.आर.आई. में चल रहे हीरक जयंती समारोह (1951–2011) के अन्तर्गत एक अन्तर्राष्ट्रीय कार्यशाला का आयोजन किया गया। यह कार्यशाला संयुक्त राज्य अमेरिका के पेटेण्ट तथा ट्रेडमार्क कार्यालय (यूएसपीटीओ) के सहयोग से 5–6 अक्टूबर, 2010 तक आयोजित की गयी।

इस कार्यशाला का शुभारंभ दीप प्रज्जवलित करने के उपरांत गणमान्य व्यक्तियों द्वारा अपने–अपने विचारों के संक्षिप्त आदान–प्रदान द्वारा किया गया। इन गणमान्य व्यक्तियों में प्रो. डॉ.(श्रीमती) सरोज सी. गोपाल, कुलपति, छत्रपति शाहूजी महाराज चिकित्सा विश्वविद्यालय, लखनऊ, श्री आर.के. गुप्ता, प्रभागाध्यक्ष, आई.पी.एम. डी.–सी.एस.आई.आर., मिस कल्पना रेड्डी, प्रथम सचिव, इन्टलेक्च्युअल प्रॉपर्टी, संयुक्त राज्य दूतावास, नई दिल्ली, डॉ. ए.के. सक्सेना, कार्यवाहक निदेशक, सी.डी.आर. आई. और कार्यशाला के आयोजन सचिव श्री विनय त्रिपाठी प्रमुख थे।

कार्यशाला का प्रमुख उद्देश्य आई. पी. फाइल करने में शामिल व्यक्तियों तथा अनुसंधान में लगे हुए वैज्ञानिकों को संयुक्त राज्य तथा भारत में आई.पी. प्रक्रिया के विषय में नवीनतम जानकारी प्रदान करना था। विचार–विमर्श का केन्द्र फार्मास्युटिकल्स और जैविक सामग्री, प्रलेखन, पेटेण्ट का निर्धारण, कार्यालय कार्यों में भाग लेना, दावा आलेखन एवं व्याख्या, तुलनात्मक आईपी प्रथाओं, प्रौद्योगिकी हस्तांरण और पोर्टफोलियो प्रबंधन तथा पेटेण्ट प्रिअर आर्ट सर्च पर आधारित था। विभिन्न विश्वविद्यालयों, अनुसंधान संस्थानों और औद्योगिक संस्थानो के लगभग 100 से अधिक उम्मीदवारों ने कार्यशाला में भाग लिया।

3 अति विशिष्ट आगुन्तक एवं व्याख्यान का विवरण

नाम	व्याख्यान का शीर्षक	दिनांक
डॉ. एस. आर. नरहरि निदेशक, इन्स्टीट्यूट ऑफ अप्लाइड डरमेटोलॉजी, कासरगोड़	इन्टिग्रेटेड मैनेजमेंट ऑफ लिम्फैडिनोपैथी इन फाईलेरियासिस एण्ड अदर कन्डीशन्स	**08.01.2010**
डॉ. जॉन वॉटसन निदेशक, सेल्यूलर एनालिसिस एण्ड फार्मा/बायोटेक प्रोमेगा कार्पोरेशन, यू.एस.ए.	यूजिंग बायोल्यूमिनिसेंट टेक्नोलॉजिज़ टू स्क्रीन स्मॉल मॉलिक्युल मॉड्युलेटर ऑफ सेल सिग्नलिंग पाथवेज़	**09.02.2010**
डॉ. के. स्वामीनाथन असोशिएट प्रोफेसर, डिपार्टमेंट ऑफ बायोलॉजिकल साइंस, नेशनल यूनीवर्सिटी ऑफ सिंगापुर, सिंगापुर	सेल सिग्नलिंग एण्ड जीन रेग्युलेशन : ए स्ट्रक्चरल ऐड्रसेज	**22.02.2010**
प्रो. तारिक एम. हक्की रिसर्च निदेशक, डिपार्टमेंट ऑफ रिह्यूमेटालॉजी मेडिसिन, मेट्रो हेल्थ मेडिकल सेण्टर, ओहियो, यू.एस.ए.	नेच्युरल प्रोडक्ट्स फॉर यूज इन आर्थराइटिस	**08.03.2010**
डॉ. केशव के. सिंह प्रोफेसर ऑफ ऑन्कोलॉजी, रॉसवेल पार्क कैंसर इंस्टीट्यूट, न्यूयार्क, यू.एस.ए.	इण्टरजीनॉमिक क्रॉसटॉक एण्ड इट्स रोल इन कैंसर	**10.03.2010**
डॉ. हेलन पारकेस एल.जी.सी., टेडिंगटन, मिडिलसेक्स, यू.के.	कम्पैरेबल प्रेसाइज़ मेजरमेण्ट्स : अण्डरपिनिंग इनोवेशन इन बायोसाइंस एण्ड हेल्थकेयर	**18.03.2010**
डॉ. अमरनाथ मुखर्जी जॉन हॉपकिन्स स्कूल ऑफ मेडिसिन, यू.एस.ए.	टारगेटिंग कैंसरः फ्रॉम द पर्सपेक्टिव ऑफ ए कैमिस्ट	**14.05.2010**
डॉ. मेघा द वेल्कम ट्रस्ट/डीबीटी इंडिया एलाइंस, हैदराबाद	एम्पॉवरिग द बेस्ट साइंटिस्ट टू सक्सीड इन इंडिया	**11.06.2010**
डॉ. चन्द्र देब स्कूल ऑफ मेडिसिन, लोमा लिण्डा यूनीवर्सिटी, यू.एस.ए.	रोल ऑफ टी–सेल इन न्यूरो–इंफ्लामेटरी डिज़ीज	**30.08.2010**
डॉ. सईद काज़िम मेहदी सेण्टर फॉर ह्यूमन जेनेटिक्स एण्ड मॉलिक्यूलर मेडिसिन, करांची पाकिस्तान	जेनेटिक डाइवरसिटी इन एशिया	**27.10.2010**
डॉ. शोज़ेब हैदर लंदन स्कूल ऑफ फार्मेसी सटन यू.के.	मॉलीक्युलर मॉडलिंग ऑन इनहिबिटर कॉम्प्लेक्सेज एण्ड एक्टिव साइट डायनेमिक्स ऑफ साइटोक्रोम P450 C17: ए टारगेट फॉर प्रोस्टेट कैंसर थैरेपी	**28.10.2010**
राजेश पाण्डेय इंस्टीट्यूट ऑफ जीनोमिक्स एण्ड इन्टेग्रेटिव बायोलॉजी, दिल्ली	रिपिटेटिव (REPETITIVE) रिस्पॉसेस इन स्ट्रेस	**19.10.210**
डॉ. बी.एन. सिंह लिलेहि हार्ट इंस्टीट्यूट, मिन्नियापोलिस, यू.एस.ए.	मॉलीक्युलर मैकेनिज्म ऑफ स्ट्रेस डिफरेन्सिएशन एण्ड रिजनरेशन इन मसल सेल्स	**18.11.2010**
प्रोफेसर सुरेश रत्तन लेब्रोरेट्री ऑफ सेल्युलर एजिंग, आथस यूनीवर्सिटी, डेनमार्क	हेल्थी एजिंग फ्रॉम मॉलीक्युलर बायोलॉजी टू हॉर्मेसिस	**19.11.2010**
डॉ. प्रसेनजीत गुच्छैत डिपार्टमेंट ऑफ मेडिसिन, बैयलर कॉलेज ऑफ मेडिसिन, टेक्सास, यू.एस.ए.	न्यू मैकेनिज्म फॉर द हिमोलायसिस–इंड्यूस्ड थ्रॉम्बोसिस एण्ड वास्क्युलर ऑक्लुजन इन पेसेण्ट विथ सिकल सेल डिज़ीज़ एण्ड थैलेसिमिया एण्ड डेवलपमेंट ऑफ एण्टी–थ्रोम्बोटिक थेराप्यूट्रिक एजेण्ट्स	**23.11.2010**
डॉ. आर. पद्मनाभन प्रोफेसर, जॉर्जटाउन यूनीवर्सिटी स्कूल ऑफ मेडिसिन, यू.एस.ए.	मॉलीक्युलर टारगेट्स फॉर डेंगू वाइरस ड्रग डिस्कवरी	**20.12.2010**
डॉ. श्रीनिवास पेन्त्यला निदेशक, ट्रांस्लेशनल रिसर्च, हेल्थ साइंसेज सेण्टर, स्टॉनी ब्रुक, यू.एस.ए.	ट्रांस्लेशनल अप्रोच टू ड्रग डिस्कवरी	**29.12.2010**

4 विशिष्ट प्रतिनिधियों का सी.डी.आर.आई. आगमन

डॉ. थॉ ज़िन, निदेशक (अनुसंधान) डिपार्टमेंट ऑफ मेडिकल रिसर्च, यंगून म्यांमार

डॉ. थॉ जिन, निदेशक (अनुसंधान) और डॉ. खिन थाय यर मिंट, अनुसंधान अधिकारी, डिपार्टमेंट ऑफ मेडिकल रिसर्च, यंगून, म्यांमार का दिनांक 21–22 मई, 2010 को सी.डी.आर.आई. में आगमन हुआ। उनकी इस यात्रा का उद्देश्य अनुसंधान एवं विकास में सहयोग, आधारिक संरचना एवं ज्ञान की भागीदारी तथा विज्ञान एवं प्रौद्योगिकी लाभ के लिये साइन्टिफिक स्टाफ और शोध छात्रों के आदान–प्रदान की संभावनाओं को तलाशना था। उन्होंने विभिन्न प्रभागों का भ्रमण किया और वैज्ञानिकों तथा शोध छात्रों से बातचीत की।

सी.डी.आर.आई. के निदेशक से मुलाकात में डॉ. थॉ ज़िन ने संस्थान से मिले आतिथ्य एवं सहयोग के प्रति संतोष व्यक्त किया। साथ ही उन्होंने आधारिक संरचना और ज्ञान के आदान–प्रदान को मजबूत बनाने के लिये दोनों संस्थानों के बीच सद्भावपूर्ण संबंध विकसित होने की आशा व्यक्त की।

वियतनामी प्रतिनिधिमंडल

औषधि अनुसंधान के क्षेत्र में कार्यरत एक पाँच सदस्यीय वियतनामी प्रतिनिधि मंडल ने 24 जून, 2010 को संस्थान का दौरा किया। यात्रा का उद्देश्य फ़ाइटोफार्मास्युटिकल उत्पादों के क्षेत्र में अनुसंधान एवं विकास की संभावनाओं का अवलोकन करना था। प्रतिनिधिमण्डल का नेतृत्व ग्रामीण क्षेत्र के लिये राष्ट्रीय अनुसंधान एवं विकास कार्यक्रम के कार्यकारी निदेशक श्री ग्युयेन ट्रॉग विन तथा योजना एवं वित्त विभाग, विज्ञान एवं प्रौद्योगिकी मंत्रालय के उप महानिदेशक द्वारा किया गया। प्रतिनिधि मंडल ने विभिन्न प्रयोगशालाओं को देखा और वैज्ञानिक सहयोग के लिए सी.डी.आर.आई. की अनुसंधान सुविधाओं के बारे में विचार–विमर्श किया।

नोबेल लॉरेट (फिजियालॉजी मेडिसिन) प्रो. ट्रोस्टेन एन. वीजेल का सी.डी.आर.आई. आगमनः

फिज़ियोलॉजी मेडिसिन में नोबेल पुरस्कार प्राप्त स्वीडिश वैज्ञानिक प्रो. ट्रोस्टेन एन. वीजेल ने 26 नवम्बर, 2010 को संस्थान का दौरा किया। सी.डी.आर.आई. ने लखनऊ के विभिन्न अनुसंधान संस्थानों के युवा वैज्ञानिकों के लिये प्रो. वीजेल के साथ एक परिचर्चा का आयोजन किया। लखनऊ विश्वविद्यालय, चिकित्सा विश्वविद्यालय,

आई.आई.टी.आर. तथा सी.डी.आर.आई. के अनेक युवा वैज्ञानिकों ने परिचर्चा में हिस्सा लिया तथा नोबेल लॉरेट से विचार–विमर्श किया। प्रो. वीजेल वर्तमान में व्हाइट एण्ड लियोन लेवी सेण्टर फॉर माइण्ड, ब्रेन एवं विहेबियर, रॉकफेलर यूनिवर्सिटी, न्यूयॉर्क, यू.एस.ए. के निदेशक पद पर कार्यरत हैं तथा उन्होंने वर्ष 1981 में दृश्यतंत्र में सूचना प्रसंस्करण संबंधित खोजों के लिये विज्ञान का सर्वोच्च नोबेल पुरस्कार प्राप्त किया।

5 संस्थान के वैज्ञानिकों द्वारा दिये गये व्याख्यान

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वैज्ञानिक का नाम	देश	यात्रा का उद्देश्य (प्रतिनियुक्ति की अवधि)
डॉ. टी.के. चक्रवर्ती	जर्मनी	सम्मेलन में भाग लेने के लिये। (दिनांक 3 से 6 अक्टूबर, 2010)
डॉ. ए.के. सक्सेना	जर्मनी	आमंत्रण व्याख्यान देने के लिये। (दिनांक 7 से 15 अप्रैल, 2010 व दिनांक 3 से 9 दिसम्बर, 2010)
	इजिप्ट	सम्मेलन में भाग लेने के लिये। (दिनांक 30 नवम्बर, से 2 दिसम्बर, 2010)
डॉ. सी. नाथ	जर्मनी	इन्सा–अन्तर्राष्ट्रीय सहयोग/द्विपक्षीय विनिमय कार्यक्रम। (दिनांक 21 जुलाई से 22 अगस्त, 2010)
डॉ. एस. भट्टाचार्य	जिनेवा	परियोजना अनुवीक्षण बैठक में भाग लेने के लिये। (दिनांक 28 से 30 जून, 2010)
डॉ. ए.के. द्विवेदी	यू.के.	परियोजना कार्य हेतु। (दिनांक 29 अगस्त से 6 सितम्बर, 2010)
डॉ. राकेश मौर्या	इरान	क्षेत्रीय विशेषज्ञों की बैठक में भाग लेने के लिये। (दिनांक 19 से 21 जून, 2010)
डॉ. ए.के. श्रीवास्तव	पोलैण्ड	इन्सा–द्विपक्षीय वैज्ञानिक विनिमय कार्यक्रम। (दिनांक 22 मार्च से 14 अप्रैल, 2010)
डॉ. समन हबीब	यू.के.	बैठक में भाग लेने के लिये। (दिनांक 6 से 7 सिमम्बर, 2010)
डॉ. अमित मिश्रा	यू.के.	परियोजना कार्य हेतु। (दिनांक 29 अगस्त से 4 सितम्बर, 2010)
	यू.एस.ए.	सम्मेलन में भाग लेने के लिये। (दिनांक 14 से 18 नवम्बर, 2010)
	जापान	संगोष्ठी में भाग लेने के लिये। (दिनांक 13 से 14 दिसम्बर, 2010)
डॉ. नीलू सिंह	आस्ट्रेलिया	सम्मेलन में भाग लेने के लिये। (दिनांक 15 से 20 अगस्त, 2010)
	यू.एस.ए.	बैठक में भाग लेने के लिये। (दिनांक 3 से 7 नवम्बर, 2010)
डॉ. अतुल गोयल	जर्मनी	एडवांस रिसर्च कार्य हेतु। (दिनांक 1 अक्टूबर से 31 दिसम्बर, 2010)
डॉ. पी.आर. मिश्रा	यू.के.	परियोजना कार्य हेतु। (दिनांक 29 अगस्त से 6 सितम्बर, 2010)
डॉ. मनोज बरथवाल	यू.एस.ए.	एडवांस रिसर्च हेतु। (दिनांक 15 नवम्बर, 2010 से 14 नवम्बर, 2011)
डॉ. रितु त्रिवेदी	सिंगापुर	बैठक में भाग लेने के लिये। (दिनांक 10 दिसम्बर से 13 दिसम्बर, 2010)
डॉ. आमिर नाज़िर	यू.के.	इण्डिया डिस्टिंग्विश्ड विजिटिंग फैलोशिप। (दिनांक 1 मई से 10 जुलाई, 2010)
डॉ. राजेन्दर सिंह	यू.एस.ए.	टू अण्डरटेक ए पाइलट (एक्सपलोरेटरी) स्ट्डी। (दिनांक 4 जून से 04 अगस्त, 2010)
श्री वहाजुद्दीन	यू.एस.ए.	सम्मेलन में भाग लेने के लिये। (दिनांक 14 से 18 नवम्बर, 2010)

7 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) प्रोग्राम एडवाइज़री कमेटी (आर्गनिक कैमेस्ट्री) डीएसटी। (4) स्टियरिंग कमेटी, नेशनल बायो–रिर्सोस डेवलपमेंट बोर्ड, डीबीटी। (5) सब–कमेटी ऑफ स्पांर्स्ड स्कीम्स रिसर्च कमेटी, सीएसआईआर। (6) एक्सपर्ट कमेटी, ड्रग्स एण्ड फार्मास्यूटिकल्स रिसर्च प्रोग्राम, डीएसटी। (7) ड्रग्स टेक्निकल एडवाइज़री बोर्ड। (8) टेक्निकल एडवाइज़री कमेटी, टेक्नोलॉजी डेवलपमेण्ट एण्ड यूटीलाईजेशन प्रोग्राम फॉर वूमैन, डीएसआईआर। (9) सीनेट, आईआईटी, कानपुर 2010–2011। (10) हाई पॉवरड कमेटी, एनएमआईटीएलआई प्रोजेक्ट्स, सीएसआईआर।
- **सदस्य, संपादक मण्डलः** (1) इण्डियन जर्नल ऑफ कैमेस्ट्री, बी। (2) इण्डियन जर्नल ऑफ बायोकैमेस्ट्री एण्ड बायोफिजिक्स। (3) दि नेचुरल प्रोडक्ट्स जर्नल।

डॉ. ए.के. सक्सेना

- **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) प्रोग्राम एडवाइज़री कमेटी (आर्गनिक कैमेस्ट्री) डीएसटी। (4) स्टियरिंग कमेटी, नेशनल बायो–रिर्सोस डेवलपमेंट बोर्ड, डीबीटी। (5) सब–कमेटी ऑफ स्पांर्स्ड स्कीम्स रिसर्च कमेटी, सीएसआईआर। (6) एक्सपर्ट कमेटी, ड्रग्स एण्ड फार्मास्यूटिकल्स रिसर्च प्रोग्राम, डीएसटी। (7) ड्रग्स टेक्निकल एडवाइज़री बोर्ड। (8) टेक्निकल एडवाइज़री कमेटी, टेक्नोलॉजी डेवलपमेण्ट एण्ड यूटीलाईजेशन प्रोग्राम फॉर वूमैन, डीएसआईआर। (9) सीनेट, आईआईटी, कानपुर 2010–2011। (10) हाई पॉवरड कमेटी, एनएमआईटीएलआई प्रोजेक्ट्स, सीएसआईआर।
- **सदस्य, संपादक मण्डलः** (1) इण्डियन जर्नल ऑफ कैमेस्ट्री, बी। (2) इण्डियन जर्नल ऑफ बायोकैमेस्ट्री एण्ड बायोफिजिक्स। (3) दि नेचुरल प्रोडक्ट्स जर्नल।

डॉ. रंजना श्रीवास्तव

- **एडिटर,** इण्डियन जर्नल ऑफ माइक्रोबायोलॉजी।

डॉ. एस.के. पुरी

- **उपाध्यक्ष** : दि इण्डियन सोसाइटी फॉर पैरासिटोलॉजी
- **सदस्य** : (1) साइंटिफिक एडवाइज़री कमेटी, वेक्टर कांट्रोल रिसर्च सेण्टर, पांडिचेरी। (2) अकादमिक काउन्सिल, जेएनयू, नई दिल्ली।

डॉ. शैलजा भट्टाचार्य

- **सदस्य** : (1) साइंट्फिक एडवाइज़री कमेटी, वेक्टर कांट्रोल रिसर्च सेण्टर, पांडिचेरी।

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 कन्टोलर जनरल ऑफ इण्डिया, मिनिस्ट्री ऑफ हेल्थ, गवर्नमेंट ऑफ इण्डिया, (2) रिसर्च काउन्सिल, आइआईटीआर।

डॉ. आर.के. शर्मा

- **सदस्य** : (1) इण्टरनेशनल सोसाइटी फॉर कम्प्यूटेशनल बायोलॉजी। (2) इण्डियन फायटोपैथोलॉजिकल सोसाइटी। (3) कम्प्यूटर सोसाइटी ऑफ इण्डिया।
- **सदस्य** : एडिटोरियल बोर्ड (1) इण्टरनेशनल जर्नल ऑफ

एडवान्स बायोइन्फॉर्मेटिक्स। (2) ऑनलाइन जर्नल ऑफ बायोटेक्नोलॉजी रिसर्च।

डॉ. एस.पी.एस. गौड़

- **सदस्य** : एडिटोरियल बोर्ड, जर्नल ऑफ फार्मास्यूटिकल एण्ड बायोमेडिकल साइंसेज।

डॉ. विनोद भाकुनी

- **सदस्य** : (1) बोर्ड ऑफ गवर्नेंस, आईआईटी, रूड़की। (2) कमेटी फॉर सेण्टर फॉर एक्सिलेंस, डीबीटी। (3) काउंसिल ऑफ नेशनल अकादमी ऑफ सांइसेज, इण्डिया। (4) सेक्शनल कमेटी नौवीं, इन्सा (आईएनएसए)। (5) टेक्नीकल स्क्रीनिंग कमेटी ऑफ स्माल बिजनेस इंनोवेशन रिसर्च इनिशियेटिव, डीबीटी। (6) प्रोग्राम एडवाइज़री कमेटी, लाइफ साइंसेज, डीएसटी। (7) डीबीटी–पीडीएफ फैलोशिप, बायोकैमेस्ट्री डिपार्टमेंट, आईआईएससी, बंगलौर।
- **सदस्य, संपादक मण्डलः** इण्टरनेशनल जर्नल ऑफ इंटरगेटिव बायोलॉजी।

डॉ. ए.के. द्विवेदी

- **आजीवन सदस्य** : इण्डियन फार्मास्यूटिकल एसोसिएशन।
- **सदस्य** : ड्रग्स पैनल फॉर न्यू ड्रग मैन्यूफैक्चिरिंग लाईसेंसेज़, डाइरेक्टोरेट ऑफ मेडिकल एण्ड हेल्थ सर्विसेज, यू.पी.।

डॉ. मधु दीक्षित

- **सदस्यः** कांउसिल, द नेशनल अकादमी ऑफ साइंसेज (एनएएसआई) 2008.2010
- **उपाध्यक्ष** : द साइटोमेट्री सोसायटी।
- **सदस्य** : (1) डीएसटी (डब्ल्यूओएस–ए) पीएसी। (2) इण्डियन कांउसिल ऑफ मेडिकल रिसर्च (मेडिकल साइंसेज) पीएसी। (3) एनएएसी कमेटी।

डॉ. अनुराधा दुबे

- **सदस्य, संपादक मण्डलः** (1) जर्नल ऑफ बायोमेडिकल रिसर्च। (2) बायोमेड सेन्ट्रल, इन्फेक्शस डिजीज़ज (ओपन एक्सेज़)

डॉ. राकेश शुक्ला

- **सदस्य संपादक मण्डलः** इण्डियन जर्नल ऑफ फार्माकोलॉजी।

डॉ. जे.के. सक्सेना

- **सेक्रेटरी** : द इण्डियन सोसाइटी फॉर पैरासिटालॉजी।
- **उपाध्यक्षः** सोसाइटी ऑफ बायोलॉजिस्ट्स एण्ड कैमिस्ट।

डॉ. नैबेद्य चट्टोपाध्याय

- **सदस्य संपादक मण्डलः** (1) अमेरिकन जर्नल ऑफ फिज़ियोलॉजी (इण्डोक्राइनोलॉजी मेटाबोलाजिम)। (2) बायोकैमिकल फार्माकोलॉजी। (3) दि ओपन फिज़ियोलॉजी जर्नल।

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 रिहेबिलेशन ऑफ लेबोरेटरी एनीमल्स। (2) लाइव स्टॉक फीड, इक्यूपमेंट्स एण्ड सिस्टम, सेक्शनल कमेटी, एफएडी, ब्यूरो ऑफ इण्डियन स्टेनडर्ड, नई दिल्ली। (3) वेटनरी कांउसिल ऑफ इण्डिया।
- **सीएसआईआर द्वारा नामित** : नेशनल इंस्टीट्यूट ऑफ ऐनीमल वेलफेयर।

डॉ. पी.एम.एस चौहान

- **महासचिव** : इण्डियन सोसाइटी ऑफ कैमिस्ट एण्ड बायोलॉजिस्ट।
- **कार्यकारी सदस्य** : इण्डियन कांउसिल आफ कैमिस्ट्स

डॉ. रेणु त्रिपाठी

- **आजीवन सदस्य** : जूलॉजिकल सोसाइटी ऑफ इण्डिया, बोध गया।

डॉ. ए.के. श्रीवास्तव

- **आजीवन सदस्य** : इण्डियन सोसाइटी ऑफ पैरासिटालॉजी।

डॉ. नीना गोयल

- **कार्यकारी सदस्य** : इण्डियन सोसाइटी फॉर पैरासीटालॉजी।

डॉ. समन हबीब

- **सदस्य** : (1) एक्सपर्ट एडवाईजरी ग्रुप, सीआरआईएमए एलडीडीआई (कोआर्डिनेशन, रेशनलाईजेशन एण्ड इंटग्रेशन ऑफ एण्टीमलेरियल ड्रग डिस्कवरी इनिशियेटिव) प्रोजेक्ट ऑफ द यूरोपियन यूनियन। (2) इण्डियन सोसाइटी फॉर सेल बायोलॉजी।

डॉ श्रीकांत कुमार रथ

- **संयुक्त सचिव (निर्वाचित)**: इण्डियन सोसाइटी फॉर कैमिकल बायोलॉजिस्ट्स।
- **सदस्य** : इण्डियन सोसाइटी ऑफ सेल बायोलॉजी।

डॉ. अमित मिश्रा

- **आजीवन सदस्य** : इण्डियन फार्मास्यूटिक्ल एसोसिएशन।

डॉ. आर.के. त्रिपाठी

- **आजीवन सदस्य** : सोसाइटी ऑफ टॉक्सीकोलॉजी, इण्डिया।

डॉ. पी.आर. मिश्रा

- **सदस्य, संपादक मण्डल** : (1) रिसेण्ट पेटेण्टस इन ड्रग डिलवरी एण्ड फार्मोलेशन्स। (2) जर्नल ऑफ फार्मास्यूटिक्ल एण्ड बायोमेडिकल साइंसेज।
- **फाउण्डर सदस्य** : इण्डियन नैनोसाइंस सोसाइटी।

डॉ. धनंजय हंसदा

- **सदस्य** : (1) इण्डियन एशोसिएशन ऑफ वेटरिएनरी माइक्रोबायोलॉजिस्ट, इंम्यूनॉलॉजिस्ट एण्ड स्पेशलिस्ट इन इन्फेक्शियस डिजीज़ेज। (2) वेस्ट बंगाल वेटनरी कांउसिल।

डॉ कल्याण मित्रा

- **आजीवन सदस्य** : इलेक्ट्रॉन माइक्रोस्कोपी सोसाइटी ऑफ इण्डिया (इएमएसआई)

डॉ. आमिर नाज़िर

- **आजीवन सदस्य** : इण्डियन सोसाइटी ऑफ सेल बायोलॉजी।
- **सदस्य** : जेनेटिक्स सोसाईटी ऑफ अमेरिका।
- **शोध संपादक**: (1) मॉलीक्युलर टॉक्सीकोलॉजी। (2) जर्नल ऑफ एनवायरमेंट बायोलॉजी।

डॉ पूनम सिंह

- **आजीवन सदस्य** : सोसाइटी ऑफ टॉक्सीकोलॉजी, इण्डिया।
- **सदस्य** : एडिटोरियल/एडवाइज़री बोर्ड, इण्टरनेशनल जर्नल ऑफ कॉम्प्रिहेन्सिव फार्मेसी।

डॉ. जयंत सरकार

- **संयुक्त सदस्य** : अमेरिकन एसोसिएशन फॉर कैंसर रिसर्च।

डॉ. दया नन्द उपाध्याय

- **आजीवन सदस्य** : इलेक्ट्रोकेमिकल साइंस एण्ड टेक्नोलाजी, कराईकुडी (तमिलनाडु)

श्री वहाजुद्दीन

- **सदस्य, संपादक मण्डल**: जर्नल ऑफ बायोइक्यूवैलेंस एण्ड बायोवैलेविलिटी।
- **आजीवन सदस्य** : (1) इण्डियन सोसाइटी फॉर मॉस स्पेकट्रोमेट्री। (2) इण्डियन फार्माकोलॉजिकल सोसाईटी।

डॉ. श्रीपति राव कुलकर्णी

- **आजीवन सदस्य** : (1) एसोएिशन ऑफ माइक्रोबायोलाजिस्ट ऑफ इण्डिया। (2) सोसाइटी फॉर इनफारमेशन साइंस, इण्डिया।

डॉ. संजीव यादव

- **आजीवन सदस्य** : (1) इण्डियन साइंस कॉंग्रेस एसोशिएशन, कोलकाता। (2) सोसायटी फॉर साइंस एण्ड एनवायरमेंट, इण्डिया।

स्टाफ

निदेशक

डॉ. तुषार कान्ति चक्रवर्ती, एम.एस.सी., पी.एच.डी., एफ.एन.ए., एफ.ए.एस.सी., एफ.एन.ए.एस.सी.

अनुसंधान एवं विकास प्रभाग/इकाइयाँ

जैव रसायन

वैज्ञानिक ग्रुप IV (5)
जे.के. सक्सेना, एम.एस.सी., पी.एच.डी.,***प्रभारी***
उमा राय, एम.एस.सी., पी.एच.डी.
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ए.के. श्रीवास्तव, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (4)
नीना गोयल, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
अंजू पुरी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
ए.के. ताम्रकार, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)
ए.के. खन्ना, एम.एस.सी., पी.एच.डी.
बी. मैती, एम.एस.सी., पी.एच.डी.

तकनीकी सहायक
रीमा राय सरकार
इश्बाल अहमद

वरिष्ठ तकनीशियन (2)
सुरेश यादव
बी.आर. यादव

वरिष्ठ तकनीशियन (1)
राम पाल रावत

प्रयोगशाला सहायक
रमेश चन्द्रा
नूरजहाँ

कनिष्ठ आशुलिपिक
विनीत पाण्डेय

वनस्पति विज्ञान

वैज्ञानिक ग्रुप IV (4)
एम.एन. श्रीवास्तव, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (6)
आर.के. शर्मा, एम.एस.सी., पी.एच.डी., (सेवानिवृत्त दिनांक 31.01.2011)

वैज्ञानिक ग्रुप IV (4)
एस.एम. राजेन्द्रन, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
के.आर. आर्या, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
डी.के. मिश्रा, एम.एस.सी., पी.एच.डी.
विनीता त्रिपाठी, एम.एस.सी., पी.एच.डी.

तकनीकी सहायक
सविता त्रिपाठी, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
जे.के. जोशी, बी.एस.सी.

प्रयोगशाला सहायक
राम जीवन
के.के. यादव
देवी दत्त
मैकूलाल
मक्खन लाल
गोपी
सत्य नारायण

प्रयोगशाला परिचालक (1)
आर.सी. मौर्या
लखना देवी
एन.के. खण्डूरी
अशोक कुमार

निजी सचिव
सुमित श्रीवास्तव, बी.कॉम.

क्लीनिकल एवं प्रयोगात्मक औषधि प्रभाग

वैज्ञानिक ग्रुप IV (6)
एस.पी.एस. गौड़, एम.बी.बी.एस., एम.डी., ***प्रभारी***
असीम घटक, एम.बी.बी.एस., एम.डी., एम.एन.ए.एम.एस., एफ.आई.सी.पी.

वैज्ञानिक ग्रुप IV (5)

जे.एस. श्रीवास्तव, एम.बी.बी.एस., एम.डी., डी.एम., एम.एच.एस.सी.

वैज्ञानिक ग्रुप IV (2)
विवेक विद्याधर भोसले, एम.बी.बी.एस., एम.डी.

तकनीकी सहायक
शैल सिंह, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीशियन (2)
एच.एस. दूबे (सेवानिवृत्त दिनांक 30.06.2010)

प्रयोगशाला सहायक
उमेश कुमार

वरिष्ठ आशुलिपिक
मोहम्मद सुफियान

औषधि लक्ष्य, खोज एवं विकास प्रभाग

वैज्ञानिक ग्रुप IV (5)
सुधीर के. सिन्हा, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
नीलू सिंह, एम.एस.सी., पी.एच.डी.
विनीता चतुर्वेदी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
सव्यासाची सान्याल, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
अनिल एन. गायकवाड, एम.एस.(फार्म), पी.एच.डी.
वाई.के. मंजू, एम.एस.सी., पी.एच.डी.
अरूण कुमार त्रिवेदी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
जयन्त सरकार, एम.वी.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)
एस.एल. वर्मा, बी.एस.सी. (सेवानिवृत्त दिनांक 31.12.2010)

तकनीकी सहायक
अजय सिंह वर्मा, एम.एस.सी.
श्याम सिंह, एम.एस.सी.
संजीव मीना, एम.एस.सी.
प्रियंका त्रिवेदी, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
चन्द्रमूल

वरिष्ठ तकनीशियन (1)
होरी लाल

अन्तःस्रावी विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (5)
नैबेद्य चट्टोपध्याय, एम.एस.सी., पी.एच.डी., ***प्रभारी***
अर्चना श्रीवास्तव, एम.एस.सी., पी.एच.डी. (सेवानिवृत्त दिनांक 31.12.2010)

वैज्ञानिक ग्रुप IV (4)
अनिला द्विवेदी, एम.एस.सी., पी.एच.डी.
गोपाल गुप्ता, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
एफ.डब्ल्यू. बनसोडे, एम.एस.सी., पी.एच.डी.
दुर्गा प्रसाद मिश्रा, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
दिव्या सिंह, एम.एस.सी., पी.एच.डी.
रितु त्रिवेदी, एम.एस.सी., पी.एच.डी.
राजेन्द्र सिंह, एम.एस.सी., पी.एच.डी.
रितुराज कोनवर, एम.वी.एस.सी., पी.एच.डी.
राजेश कुमार झा, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
हेमन्त कुमार बिड, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)

जे.पी. मैखुरी, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (2)
मोहनी छाबड़ा, बी.एस.सी., सी.एल.एस.सी.
शक्ति किचलु, एम.एस.सी.

वरिष्ठ तकनीकी अधिकारी (1)
बलवीर सिंह, एम.एस.सी.

तकनीकी सहायक
प्रीति

वरिष्ठ तकनीशियन (2)
ए.पी. देव (वी.आर.एस. 01.09.2010)
टी. फिरदौस (सेवानिवृत्त दिनांक 31.07.2010)
पी.के. भट्टाचार्य
छत्तर पाल

वरिष्ठ तकनीशियन (1)
गीत कुमार नागर

प्रयोगशाला सहायक
एन.पी. मिश्रा
बी.पी. मिश्रा
आर.जी. पाण्डेय

प्रयोगशाला परिचालक (2)
महेश चन्द्र तिवारी

प्रयोगशाला परिचालक (1)
नब्बूलाल
राम करन
प्रदीप सिंह

किण्वन प्रौद्योगिकी प्रभाग

वैज्ञानिक ग्रुप IV (5)
सी.के.एम. त्रिपाठी, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
पी.के. शुक्ला, एम.एस.सी., पी.एच.डी.

प्रधान तकनीकी अधिकारी
ए.के. जोशी, एम.एस.सी.

वरिष्ठ तकनीकी अधिकारी (3)
श्यामेन्द्र मेहरोत्रा, बी.एस.सी.
विक्रम बैनर्जी, बी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
मलखान सिंह, बी.एस.सी.
अग्नेय लाल, बी.एस.सी.

वरिष्ठ तकनीशियन (2)
किशन सिंह

प्रयोगशाला सहायक
लक्ष्मी प्रसाद
ए.एन. दीक्षित

निजी सचिव
एच.के. खुलवे

औषधीय एवं प्रक्रिया रसायन प्रभाग

वैज्ञानिक ग्रुप IV (6)
ए.के. सक्सेना, एम.एस.सी., पी.एच.डी., एफ.आर.एस.सी.,ए ***प्रभारी***
एस.बी. कट्टी, एम.फार्म., पी.एच.डी.
बिजोय कुण्डु, एम.एस.सी., पी.एच.डी., (*इकाई प्रभारी,* इलेक्ट्रॉन सूक्ष्मदर्शिकी व शैक्षणिक संबंधित कार्य)
राम प्रताप, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (5)
एस.एन. सूर्यवंशी, एम.एस.सी., पी.एच.डी.
कमलाकर अवस्थी, एम.एस.सी., पी.एच.डी.
राकेश मौर्या, एम.एस.सी., पी.एच.डी.
कल्पना भण्डारी, एम.एस.सी., पी.एच.डी.
आर.पी. त्रिपाठी, एम.एस.सी., एम.फिल., पी.एच.डी.
विजय लक्ष्मी, एम.एस.सी., पी.एच.डी. (सेवानिवृत्त 31.10.2010)
कंचन हजैला, एम.एस.सी., पी.एच.डी.
डब्ल्यू हक, एम.एस.सी., पी.एच.डी.
वाई.एस. प्रभाकर, एम.एस.सी., पी.एच.डी.
अरूण के. शॉ, एम.एस.सी., पी.एच.डी.
पी.एम.एस. चौहान, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (4)
वी.एल. शर्मा, एम.एस.सी., पी.एच.डी.
प्रदीप कुमार श्रीवास्तव, एम.एस.सी.
अतुल कुमार, एम.एस.सी., पी.एच.डी.
संजय बत्रा, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
अतुल गोयल, एम.एस.सी., पी.एच.डी.
गौतम पाण्डा, एम.एस.सी., पी.एच.डी.
टी. नरेन्द्र, एम.एस.सी., पी.एच.डी.
एम.एस. रेड्डी, एम.एम.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
के.वी. शशिधरा, एम.एस.सी., पी.एच.डी.
प्रेम प्रकाश यादव, एम.एस.सी., पी.एच.डी.
दीपांकर कोले, एम.एस.सी., पी.एच.डी.

प्रधान तकनीकी अधिकारी
आर.के. अस्थाना, एम.एस.सी., पी.एच.डी.
एस.पी. विश्नोई, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)
ए.के. मण्डवाल, एम.एस.सी., पी.एच.डी.
एस.सी. त्रिपाठी, बी.एस.सी.
जानकी प्रसाद, ए.एम.आई.ई., एम.टेक.
केशव प्रसाद, ए.एम.आई.ई., एम.टेक.
सुरेश चन्द्रा, बी.एस.सी., एल.एल.बी.
एस.पी.एस. भण्डारी, एम.एस.सी., पी.एच.डी.
पी.एन. राय, डिप. मैक. इंजी.
एस.के. काकाजी, बी.एस.सी.
वसी अहमद, बी.एस.सी., एल.एल.बी.
जाहिद अली, बी.एस.सी.
तारा रावत, बी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
दीपाली पाण्डेय, बी.एस.सी.
ए.एस. कुशवाहा, बी.एस.सी.

तकनीकी सहायक
अशोक कुमार शर्मा, बी.एस.सी., डी.सी.एच.ई., ए.एम.आई.ई.

तकनीकी सहायक
आत्मा प्रकाश द्विवेदी, एम.एस.सी.

विदिशा शर्मा
के.एस. अनिल कुमार, एम.एस.सी., पी.जी.डी.सी.ए.
तहसीन अख्तर, एम.एस.सी.
सूर्य प्रताप सिंह, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
प्रीति रस्तोगी, एम.एस.सी.
रामजीत, बी.एस.सी., पी.जी.डी.सी.
जहीर अहमद
राधा रानी गुप्ता, बी.एस.सी.
राजू अरोड़ा, बी.एस.सी.
वी.के. मौर्या
ए.के. श्रीवास्तव, एम.एस.सी.
शशि रस्तोगी, एम.एस.सी.
मिथिलेश शर्मा, एम.एस.सी.
वीना मेहरोत्रा, एम.एस.सी.

वरिष्ठ तकनीशियन (1)
टीका राम (निधन दिनांक 16.12.2010)
राजेश कुमार
के.एम. शुक्ला, बी.एस.सी.
ए.के. श्रीवास्तव, बी.एस.सी.
डी.एन. विश्वकर्मा
मंजू, बी.एस.सी.
राम लखन

तकनीशियन (1)
एच.आर. मिश्रा, एम.एस.सी.
एन.पी. मिश्रा, एम.एस.सी.
कृष्ण कुमार, बी.एस.सी.
अनूप किशोर पाण्डेय, बी.एस.सी.
सतीश चन्द्र तिवारी, बी.एस.सी.

प्रयोगशाला सहायक
राम सनेही
एम.एस. भोल
जे.सी. राजन

प्रयोगशाला परिचालक (2)
सतीश चन्द्र यादव, बी.एस.सी.

वरि. आशुलिपिक
रेनुका मुशरान

वरि. आशुलिपिक (हिन्दी)
अवधेश कुमार

कनि. आशुलिपिक
सुरेन्द्र कुमार

सूक्ष्म जीव विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (6)
रंजना श्रीवास्तव, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
के.के. श्रीवास्तव, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
बी.एन. सिंह, एम.एस.सी., पी.एच.डी.
अरूणव दासगुप्ता, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
सुधीर कुमार सिंह, एम.एस.सी., एम.टेक., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
नेहा टोप्नो, एम.एस.सी.

प्रधान तकनीकी अधिकारी
एम.एन. जोशी, एम.एस.सी., पी.एच.डी.
(सेवानिवृत्त दिनांक 31.01.2011)

तकनीकी सहायक
संदीप कुमार शर्मा, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
पी.डी. मिश्रा
नुज़हत कमल, बी.एस.सी.

वरिष्ठ तकनीशियन (1)
डी.के. त्रिपाठी, एम.एस.सी.

प्रयोगशाला सहायक
यू.सी. पाण्डेय
जे.सी. पंत

प्रयोगशाला परिचालक (1)
रवि शंकर मिश्रा
राम प्रकाश
श्याम सुन्दर यादव

आण्विक एवं संरचनात्मक जीव विज्ञान

वैज्ञानिक ग्रुप IV (6)
विनोद भाकुनी, एम.एस.सी., पी.एच.डी., एफ.एन.ए., एफ.ए.एस.सी., एफ.एन.ए.एस.सी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (5)
पी.आर. मौलिक, एम.एस.सी., पी.एच.डी. (सेवानिवष्त्त दिनांक 28.02.2010)

वैज्ञानिक ग्रुप IV (4)
समन हबीब, एम.एस.सी., पी.एच.डी.
रविशंकर आर., एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
आशीष अरोड़ा, एम.एस.सी., पी.एच.डी.
जिमुत कान्ति घोष, एम.एस.सी., पी.एच.डी.
जे. वेंकटेश प्रताप, एम.एस.सी., पी.एच.डी.
मोहम्मद इमरान सिद्दीकी, एम.एस.सी., पी.एच.डी.
मोहम्मद सोहेल अख्तर, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
अमोघ अनन्त सहस्रबुद्धे, एम.एस.सी., पी.एच.डी.
शकील अहमद, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (2)
आर.के. श्रीवास्तव, बी.एस.सी.
जे.पी. श्रीवास्तव, बी.एस.सी., एल.एल.बी.

तकनीकी सहायक
रूचिर कान्त, एम.एस.सी.
अनुपम जैन, एम.एस.सी.
सरिता त्रिपाठी, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
राम राधेश्याम

परजीवी विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (6)
एस.के. पुरी, एम.एस.सी., पी.एच.डी., एफ.एन.ए.एस.सी., ***प्रभारी***
शैलजा भट्टाचार्य, एम.एस.सी., पी.एच.डी.
पी.के. मूर्ति, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (5)
अनुराधा दुबे, एम.एस.सी., पी.एच.डी.
सुमन गुप्ता, एम.एस.सी., पी.एच.डी.
एन.ए. कौशल, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (4)
रेनु त्रिपाठी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
कुमकुम श्रीवास्तव, एम.एस.सी., पी.एच.डी.
एस. राजाकुमार, एम.एस.सी.

वैज्ञानिक ग्रुप IV (2)
मृगांक श्रीवास्तव, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)
ए.के. राय, एम.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
आर.एन. लाल, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
वी.के. बोस
आर.एस. दुबे
राम दयाल (निधन दिनांक 03.10.2010)
रवि कुमार मेहरा
के.के. सिंह, एम.एस.सी.

प्रयोगशाला सहायक
साहेब प्रसाद (सेवानिवृत्त दिनांक 31.07.2010)

प्रयोगशाला परिचालक (1)
प्रेम बाबू
राम दास
ओम प्रकाश

वरि. आशुलिपिक (ए.सी.पी.)
टी.एस. शशि कुमार

औषधि निर्माण विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (5)
ए.के. द्विवेदी, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
अमित मिश्रा, एम.फार्म., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
प्रभात रंजन मिश्रा, एम.फार्म., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
मनीष कुमार चौरसिया, एम.फार्म., पी.एच.डी.
बथुला सुरेन्दर रेड्डी, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी (3)
माधुरी चौधरी, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
एस.के. भटनागर, बी.एस.सी.

प्रयोगशाला परिचालक (1)
राम कुमार

कनि. आशुलिपिक
पूजा तनेजा

औषधि प्रभाव गति एवं चयापचय प्रभाग

वैज्ञानिक ग्रुप IV (6)
जी.के. जैन, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
एस.के. सिंह, एम.एस.सी., पी.एच.डी.
जवाहर लाल, एम.फार्म., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
आर.एस. भट्टा, एम.फार्म., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
वहाजुद्दीन, एम.एस.फार्म.

वरिष्ठ तकनीकी अधिकारी (3)
एस.के. पाण्डेय, एम.एस.सी.

वरिष्ठ तकनीशियन (1)
नरेन्द्र कुमार

तकनीशियन (1)
अखिलेश कुमार

प्रयोगशाला सहायक
शिवलाल

प्रयोगशाला परिचालक (1)
राम भजन शुक्ला
राम सुन्दर लाल
चन्द्रमणि

वरिष्ठ आशुलिपिक
नंदिता पाण्डेय

औषधि प्रभाव विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (5)
मधु दीक्षित, एम.एस.सी., पी.एच.डी.,एफ.एन.ए.एस.सी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (6)
राम रघुबीर, एम.वी.एस.सी., पी.एच.डी.
गौतम पालित, एम.बी.बी.एस., एम.डी.

वैज्ञानिक ग्रुप IV (5)
राकेश शुक्ला, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (4)
अमर नाथ, एम.एस.सी.

वैज्ञानिक ग्रुप IV (2)
मनोज के. बरथवाल, एम.एस.सी., पी.एच.डी.
शुभा शुक्ला, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
कासिफ हनीफ, एम.एस.सी.

प्रधान तकनीकी अधिकारी
जी.पी. सिंह, एम.एस.सी. (सेवानिवृत्त दिनांक 31.07.2010)

वरिष्ठ तकनीकी अधिकारी (3)
एस. सेनगुप्ता, बी.एस.सी.
टी.एल. सेठ, बी.एस.सी.
झरना अरूण, बी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
एम.एल. भटनागर, बी.एस.सी.
वी.एस. निगम, बी.एस.सी.
सी.पी. पाण्डेय, एम.एस.सी.

तकनीकी सहायक
सुल्ताना जावेद, बी.एस.सी.
शीबा साजी सैम्युल, एम.एस.सी.
साची भारती, एम.एस.सी.
स्मृति, एम.एस.सी.
पंकज कुमार शुक्ला, बी.एस.सी., पी.जी.डी.बी.टी.
दिव्या मोहन, एम.एस.सी.
दीप माला, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
ओ.पी. पाण्डेय, बी.ए.
एच.सी. वर्मा, बी.ए.

वरिष्ठ तकनीशियन (1)
भारती भूषण, बी.एस.सी.
शैलेन्द्र मोहन, एम.एस.सी.
रमेश चन्द्र, एम.एस.सी.
अनिल कुमार वर्मा, बी.एस.सी.

तकनीशियन (1)
सुरेन्द्र सिंह, एम.एस.सी., पी.एच.डी.

प्रयोगशाला परिचालक (1)
पंकज सेनगुप्ता
हरि जोशी
के.पी. मिश्रा

वरि. आशुलिपिक
वरूण कुमार पाठक

विष विज्ञान प्रभाग

वैज्ञानिक ग्रुप IV (6)
सी. नाथ, एम.बी.बी.एस., एम.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (5)
नीरज सिन्हा, एम.एस.सी., पी.एच.डी., डी.एस.सी.

वैज्ञानिक ग्रुप IV (4)
आर.के. सिंह, एम.एस.सी., पी.एच.डी., डी.एस.सी.
शरद शर्मा, एम.बी.बी.एस., एम.डी.
एस.के. रथ, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
आर.के. त्रिपाठी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
आमिर नाज़िर, एम.एस.सी., पी.एच.डी.
स्मृति भदौरिया, एम.एस.सी., पी.एच.डी.
सारिका सिंह, एम.एस.सी., पी.एच.डी.

पूनम सिंह, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीकी अधिकारी ग्रुप (3)
पी.के. अग्निहोत्री, एम.एस.सी., पी.एच.डी.
एस.एम. वर्मा, बी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
सदन कुमार, एम.एस.सी.

तकनीकी सहायक
नीति सागर, एम.एस.सी.
अनुराग कुमार श्रीवास्तव, बी.एस.सी.

वरिष्ठ तकनीशियन (1)
अनुपमा, बी.एस.सी.

प्रयोगशाला सहायक
महाबीर
वी.के. सामंत
श्री कृष्ण
आर.के. सरकार

प्रयोगशाला परिचालक (1)
राम कुमार
नन्द पाल यादव
गणेश प्रसाद

कनि. आशुलिपिक
हिमांशु उपाध्याय

क्लीनिकल औषधि प्रभाव विज्ञान इकाई (सीडीआरआई),
सेठ जी.एस. चिकित्सा महाविद्यालय, मुम्बई

तकनीकी सहायक
एन.ए. राजवाड़े

वरिष्ठ तकनीशियन (2)
पी.एस. आचार्य
विज़ाल जे. अश्हर, एम.एस.सी.

प्रयोगशाला सहायक
आर.बी. पवार

तकनीकी एवं बुनियादी संरचना प्रभाग/इकाई

जैवमिति एवं सांख्यिकी प्रभाग

वैज्ञानिक ग्रुप IV (5)
एम. अब्बास, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वरिष्ठ तकनीकी अधिकारी (3)
मुकेश श्रीवास्तव, एम.एस.सी., पी.एच.डी.

वरिष्ठ तकनीशियन (2)
एम.पी.एस. नेगी

प्रयोगशाला परिचालक (1)
सावित्री देवी

व्यापार विकास प्रभाग

वैज्ञानिक ग्रुप IV (6)
राजेन्द्र प्रसाद, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (1)
रणवीर सिंह, एम.टेक.
नसीम अहमद सिद्दिकी, एम.बी.ए.

कम्प्यूटर प्रभाग

वैज्ञानिक ग्रुप IV (5)
ए.के. श्रीवास्तव, बी.ई., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
कुराल, बी.ई.

वैज्ञानिक ग्रुप IV (1)
अभिषेक कुमार, एम.सी.ए.

वरिष्ठ तकनीकी अधिकारी (3)
जे.ए. जैदी, एम.एस.सी., एम.एल.आई.एस.सी.

तकनीकी सहायक
अजय कुमार मौर्या, एम.सी.ए.
अरविंद कुमार

जन्तु प्रयोगशाला प्रभाग

वैज्ञानिक ग्रुप IV (5)
डी.एस. उपाध्याय, एम.वी.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
ए.के. श्रीवास्तव, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
धनंजय हंसदा, एम.वी.एस.सी.
मंजुनाथ प्रभु, बी.एच., एम.वी.एस.सी.

वैज्ञानिक ग्रुप IV (1)
एच.के. बोरा, एम.वी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (3)
एस.एन.ए. रिजवी, एम.एस.सी.
ए.के. भार्गव, बी.एस.सी.

वरिष्ठ तकनीकी अधिकारी (2)
करूनेश राय, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
ए.के. दुबे, बी.ए.
रविन्दर सिंह, एम.एस.सी.

राम अवतार
एस.आर. यादव, बी.ए.

वरिष्ठ तकनीशियन (1)
दीप माला मिश्रा
रवि कुमार शुक्ला
संजीव कुमार सक्सेना, बी.एस.सी.
नरेन्द्र कुमार, बी.ए.
दिनेश कुमार, बी.ए.
प्रदीप टिर्की

तकनीशियन (1)
अरूण शर्मा, बी.एस.सी.

प्रयोगशाला सहायक
अशरफी लाल
विक्रम सिंह
वज़ाहतुल्लाह
गफ्फार अली
एम.डी. कुशवाहा
वी.बी.एल. श्रीवास्तव
टी.बी. थापा
पी.बी. थापा
शिवपाल सिंह
ओ.पी. वर्मा
एस.के. वर्मा
मोहम्मद सलीम
जी.के. शर्मा
दिलीप कुमार
आर.पी. मौर्या
भीम सिंह (निधन दिनांक 31.05.2010)

प्रयोगशाला परिचालक (1)
छंगा लाल
जमील बेग
नज्बुल्लहा

वरि. आशुलिपिक (हिन्दी)
राज कुमार, बी.ए.

विज्ञान एवं प्रौद्योगिकी प्रबंधन प्रभाग

वैज्ञानिक ग्रुप IV (5)
ए.के. गोयल, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (6)
ज़का इमाम, एम.एस.सी., एम.फिल., पी.एच.डी. (सेवानिवृत्त दिनांक 31.08.2010)

वैज्ञानिक ग्रुप IV (5)
विनय त्रिपाठी, एम.एस.सी., एम.बी.ए., पी.जी.डी. (एसएण्डटी)

वैज्ञानिक ग्रुप IV (4)
एन.एस. राणा, एम.एस.सी.,
डी.एन. उपाध्याय, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
प्रेम प्रकाश, एम.फार्म.

वैज्ञानिक ग्रुप IV (2)
आनन्द पी. कुलकर्णी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (1)
एस.आर. कुलकर्णी, एम.एस.सी., पी.एच.डी., पी.जी.डी. (पेटेण्ट्स लॉ)
संजीव यादव, एम.एस.सी., पी.एच.डी., पी.जी.डी.(बायोइंफारमेटिक्स)

प्रधान तकनीकी अधिकारी
श्रीराम, बी.एस.सी., एल.एल.बी.

वरिष्ठ तकनीशियन (2)
कृष्ण प्रसाद, बी.एस.सी.
चन्द्रिका सिंह, बी.एस.सी., एल.एल.बी.

तकनीशियन (1)
प्रीति अग्रवाल, एम.सी.ए.
अभिषेक रामनानी, बी.कॉम.

हिन्दी अधिकारी
नीलम श्रीवास्तव, एम.ए., बी.एड., एल.एल.बी.

वरि. आशुलिपिक (ए.सी.पी.)
मानसी चटर्जी, बी.ए., बी.एल.आई.एस.सी.

वरि. आशुलिपिक (हिन्दी)
जितेन्द्र पटेल, एम.ए.

प्रयोगशाला परिचालक
किशोरी कुमारी

यांत्रिकी प्रभाग

वैज्ञानिक ग्रुप IV (6)
रविन्दर सिंह, बी.ई., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
एन. के. अग्रवाल, एम.एस.सी.

प्रधान तकनीकी अधिकारी
उषा कपिल, आई.एस.सी., डिप्लोमा

तकनीकी अधिकारी
संजय कुमार, डिप्लोमा
राम करन हरिजन, ए.एम.आई.ई.

वरिष्ठ तकनीशियन (2)
कमल सिंह
लक्ष्मी नारायण

विज्ञान और प्रौद्योगिकी ज्ञान संसाधन केन्द्र

वैज्ञानिक ग्रुप IV (5)
एस.के. मलिक, एम.ए. एम.एल.आई.एस.सी., ***प्रभारी***
शीला टण्डन, एम.एस.सी., पी.एच.डी., बी.एल.आई.एस.सी. (निधन दिनांक 11.06.2010)
श्यामला सक्सेना, एम.एस.सी., बी.एल.आई.एस.सी. (सेवानिवृत्त दिनांक 31.03.2010)

वैज्ञानिक ग्रुप IV (4)
एन.एन. मेहरोत्रा, एम.एस.सी., पी.एच.डी. (सेवानिवृत्त दिनांक 30.06.2010)

प्रधान तकनीकी अधिकारी
अली कौशर, बी.एफ.ए.
सीमा मेहरोत्रा, एम.एस.सी.

तकनीकी अधिकारी (3)
संजय कुमार, एम.एल.आई.एस.सी.
जी.सी. गुप्ता, बी.एस.सी.
वी.के. वोहरा, बी.एस.सी.
डब्ल्यू.एफ. रहमान, एम.ए., एम.एल.आई.एस.सी.
ए.के. वर्मा, एम.एम., एल.एल.बी.
आर.एम. पाठक, बी.एफ.ए.

तकनीकी अधिकारी (2)
आर.एन.एस. लोंधे, जी.डी.आर्ट, आर्ट टीचर्स डिप.

तकनीकी अधिकारी
रमेश चन्द्र गुप्ता, एम.एल.आई.एस.सी.

तकनीकी सहायक (2)
बी.के. सेठी
नाज़िर अकबर
वाई.सी. पाण्डेय

सहायक ग्रुप I(4)
मोहम्मद मुईन (सेवानिवृत्त दिनांक 31.08.2010)
रशीद अहमद
एस. इस्लाम
बसन्ती मुखर्जी (सेवानिवष्त्त दिनांक 30.06.2010)

प्रयोगशाला परिचालक (1)
दीपायन

परिष्कृत विश्लेषणात्मक उपकरण सुविधा प्रभाग (सैफ)

वैज्ञानिक ग्रुप IV (6)
डी.के. दीक्षित, एम.एस.सी., पी.एच.डी., ***प्रभारी***

वैज्ञानिक ग्रुप IV (4)
बृजेश कुमार, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (3)
रवि शंकर अम्पापथी, एम.एस.सी., पी.एच.डी.

वैज्ञानिक ग्रुप IV (2)
संजीव कुमार शुक्ला, एम.एस.सी., पी.एच.डी.
संजीव कनौजिया, एम.एस.सी.

प्रधान तकनीकी अधिकारी
एच.एम. गुनियाल, एम.एस.सी.

वरिष्ठ तकनीकी अधिकारी (3)
ए.एल. विश्वकर्मा, एम.एस.सी.
राकेश खन्ना, बी.एस.सी., ए.आई.सी.
ए.के. सिन्हा, एम.एस.सी.
ए. वोहरा, बी.एस.सी., एम.ए.
ए.के. सरकार, बी.एस.सी., बी.ए.

वरिष्ठ तकनीकी अधिकारी (2)
सुनील कुमार, बी.एस.सी.,
प्रमोद कुमार, एम.एस.सी.
आर.के. पुरूषोत्तम, बी.एस.सी.

तकनीकी सहायक (1)
बिनोद कुमार शॉ, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
आर.के. वर्मा (सेवानिवृत्त 30.06.2010)
अशोक पाण्डेय, बी.एस.सी.
संदीप सेनगुप्ता, बी.एस.सी.
अब्दुल हलीम
राधे कृष्ण, बी.एस.सी., एल.टी., सी.लाई. साइंस
वसुन्धरा मधवार, बी.ए.

वरिष्ठ तकनीशियन (1)
मधु चतुर्वेदी
एस.ए. सिंह, बी.एस.सी., पी.जी.डी.सी.ए.

सहायक (सामा.) ग्रेड I
वी.के. कनल

प्रयोगशाला परिचालक (1)
मंसूर अली
जे.एस. सिंह

शैक्षणिक संबंधित कार्य इकाई

वैज्ञानिक ग्रुप IV (5)
अल्का सिंह, एम.एस.सी., पी.एच.डी.,

वरिष्ठ तकनीशियन (2)
ए.के. पाण्डेय

इलेक्ट्रॉन सूक्ष्मदर्शिकी इकाई

वैज्ञानिक ग्रुप IV (2)
कल्याण मित्रा, एम.एस.सी., पी.एच.डी.

प्रधान तकनीकी अधिकारी
आभा आर्या, बी.एस.सी., बी.एड.

तकनीकी अधिकारी
कविता सिंह, एम.एस.सी., पी.एच.डी.

तकनीकी सहायक
मनीष सिंह, एम.एस.सी.
गरिमा पंत, एम.एस.सी.

वरिष्ठ तकनीशियन (2)
माधुली श्रीवास्तव

ऊतक एवं कोशिका संवर्धन इकाई

वैज्ञानिक ग्रुप IV (5)
ए.के. बालापुरे, एम.एस.सी., पी.एच.डी., *इकाई –प्रभारी*

वरिष्ठ तकनीकी अधिकारी (3)
रामेश शर्मा, एम.एस.सी., पी.एच.डी.

अभियांत्रिकी सेवा प्रभाग

वरिष्ठ उप सचिव (परियोजना संरक्षण, न्यू सीडीआरआई कैम्पस)
तारिक कुतुबुद्दीन, एम.एस.सी. (सेवानिवृत्त दिनांक 31.1.2011)

वरिष्ठ अधीक्षक, इंजीनियर ग्रुप III (7)
परवेज महमूद, बी.एस.सी., ***प्रभारी***

एक्जीक्यूटिव इंजीनियर ग्रुप III (5)
मनोज कुमार, बी.एस.सी.
कमल जैन, बी.ई., एम.बी.ए.

वरिष्ठ तकनीकी अधिकारी
अनिल दयाल, डिप्लोमा

तकनीकी अधिकारी
मोहित कुमार शुक्ला
जय प्रकाश
सिद्धो हेमबरम

तकनीकी सहायक
डी.के. विश्वकर्मा

वरिष्ठ तकनीशियन (2)
ए.के. तिवारी
बी.पी.सुनवार
खान अब्दुल जब्बार
ई.ए. भट्टी (सेवानिवष्त्त 31.08.2010)
राधे राल
राधे श्याम
वी.के. मिश्रा
ए.के. सोनकर
के.के. कौल
एस.के. विश्वास
महेन्द्र सिंह
रमाकंत राम (सेवानिवृत्त 28.02.2010)
एस.के. कार
प्रधान बासुदेव
एम.एस. वर्मा
नसीम मोहम्मद
हरीश कुमार
विजय कुमार

वरिष्ठ तकनीशियन (1)
अरूण कुमार श्रीवास्तव
कमल किशोर वर्मा
रामेश कुवर
एस.एस. भाकुनी
जी.सी. राय
स्वपन कर्मी
रामकरन राम
राजेश चन्द्र द्विवेदी

तकनीशियन (1)
भगवान सिंह पोखरिया
आर.ए. प्रजापति

प्रयोगशाला सहायक
ए.एन. रब्बानी (सेवानिवृत्त 30.06.2010)
लल्लू (सेवानिवृत्त 31.08.2010)
महाबीर प्रसाद (सेवानिवृत्त 31.12.2010)
गणेशी प्रसाद (सेवानिवृत्त 30.09.2010)
राजू
आर.के. यादव
हुसैन तकी
राम अनजोर
कंधाई लाल
एन.के. मुद्गल
शिव गिरी
रामानुज
रामा
तान सेन
फूल चन्द
पोपिन्दर सिंह
टी.पी. पाठक

एस.के. यादव
बिशन सिंह
ए.के. मिश्रा
ओम प्रकाश
इफ्तिखार अहमद
शंकर राय
एस.के. भट्टाचार्य
जेड.यू. बेग

सहायक ग्रुप (2)
रामेश चन्द्र
तारा चन्द्र

प्रयोगशाला परिचालक (1)
मोहम्मद इरफान
धीरेन्द्र मिश्रा
राजू विश्वकर्मा
राम औतार
संदीप राय
हरि ओम गर्ग
दर्शन लाल
विश्वनाथ निगम
राम समुझ
एस.जे. राय
सुरेश कुमार
बिन्देश्वरी प्रसाद
प्रदीप कुमार
राम बिलास
गया प्रसाद
राम आसरे

सहायक (सामा.) ग्रेड ।
एन.के. चेकर
बी.के. शुक्ला

प्रशासन

प्रशासनिक अधिकारी
एल.आर. आर्या

प्रशासनिक अधिकारी कार्यालय

निजी सचिव
जी.एम. दयाल

कनिष्ठ आशुलिपिक
कमला काण्डपाल

प्रयोगशाला सहायक ग्रुप ।(4)
मैकू लाल
सोहन लाल

निदेशक कार्यालय

निजी सचिव
के.एल. गुप्ता

वरिष्ठ आशुलिपिक (ए.सी.पी.)
सुनीता चौपड़ा

प्रयोगशाला परिचालक (1)
नन्द किशोर

सहायक ग्रुप डी
रामस्वार्थ प्रसाद राय

स्थापना – ।

अनुभाग अधिकारी (सामा.)
सुनील कुमार

सहायक (सामा.) ग्रेड ।
सचिन मेहरोत्रा (प्रोन्नत एवं स्थानांतरण, अनुभाग अधिकारी दिनांक 27.12.2010)
कृष्णराज सिंह
मो. रिज़वान

सहायक (सामा.) ग्रेड ॥
स्मृति श्रीवास्तव
साजू पी. नायर
रीना बिसारिया
विभाष कुमार

कनिष्ठ आशुलिपिक
दीपक धवन

प्रयोगशाला सहायक
विनोद कुमार

सहायक ग्रुप 'सी' कैडर–डी
मंजू यादव

स्थापना –॥

अनुभाग अधिकारी (सामा.)
बिरंची सारंग

सहायक (सामा.) ग्रेड ।
बी.के. पिल्लई (सेवानिवृत्त दिनांक 30.11.2010)
रश्मी श्रीवास्तव
दिलीप कुमार सेन
तेज सिंह
लता भाटिया

वरिष्ठ आशुलिपिक
विनोद कुमार यादव

सहायक (सामा.) ग्रेड II
गंगादीन यादव
अपर्णा वाजपेयी
नीना रायजदा
मदन चंद्रा
रीति चौधरी

प्रयोगशाला सहायक
भगवंती देवी

सहायक ग्रुप डी
राम कुमार
मोहम्मद सलीम

सामान्य अनुभाग

अनुभाग अधिकारी (सामा.)
रमेश सिंह

सहायक (सामा.) ग्रेड I
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वरिष्ठ आशुलिपिक
सीमा रानी श्रीवास्तव

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राजेन्द्र प्रसाद
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मोहम्मद इरफान

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वाहन चालक
प्रेम चन्द
दयाशंकर सिंह

सहायक ग्रुप डी
कल्पनाथ शर्मा

बीजक अनुभाग

अनुभाग अधिकारी (सामा.)
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विवेक वाजपेयी
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पी.एस. पदमिनी

प्रयोगशाला सहायक
शांति देवी

अभिलेख अनुभाग

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प्रयोगशाला सहायक
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वरि. हिन्दी अधिकारी
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सुरक्षा गार्ड
चक्रसेन सिंह (नॉलेज रिर्सोस सेण्टर)

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पदम सिंह

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कैलाश सिंह
राम रिषी रमन

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प्रयोगशाला सहायक
किशन कुमार
रमा शुक्ला
कमलेश

परिचालक
हरद्वारी

सी.एस.आई.आर. औषधालय

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मेडिकल ऑफिसर ग्रुप III(4)
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एच.यू. खान

तकनीशियन (1)
श्रद्धा
शबाना

कनिष्ठ आशुलिपिक
अजय कुमार

प्रयोगशाला सहायक
एस.के. पासवान

ग्रुप 'सी' कैडर–डी
सुन्दरी

जलपान गृह

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काउण्ट क्लर्क (ए.सी.पी.)
राम जियावन राम
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रसोइयां (ए.सी.पी.)
मान बहादुर

सहायक रसोइयां
उमा शंकर

बीयरर्स
दिल बहादुर
गंगाा राम
राजेन्द्र
कृपा शंकर
सुखदेव प्रसाद

एस/मैन
राजकुमार

वॉश बॉय
राम मूरत
दिनेश पाल सिंह

Organizational Structure

Director General, CSIR

Research Council — **Director** — **Management Council**

Technical Infrastructure Divisions/Units

- Biometry & Statistics
- Business Development Division
- Computer Division
- Division of Laboratory Animals
- Division of S&T Management
- Instrumentation
- Knowledge Resource Centre
- Sophisticated Analytical Instrument Facility
- Academic Affairs Unit
- Electron Microscopy Unit
- Tissue & Cell Culture Unit
- Laboratory Engineering Services

R&D Divisions

- Biochemistry
- Botany
- Clinical & Experimental Medicine
- Drug Target Discovery & Development
- Endocrinology
- Fermentation Technology
- Medicinal and Process Chemistry
- Microbiology
- Molecular & Structural Biology
- Parasitology
- Pharmaceutics
- Pharmacokinetics & Metabolism
- Pharmacology
- Toxicology

General Administration and Facilities

- Administration
- Accounts
- Stores & Purchase
- CSIR Dispensary
- Canteen

Field Station

- CDRI Clinical Pharmacology Unit, Seth G.S. Medical College, Mumbai

'TNFα is one of the most potent osteoclastogenic cytokines produced in osteoblast, which signals via the activation of NF-kB pathway. There is characteristic cytoplasmic and perinuclear localization of the NF-kB p65 subunit in unstimulated osteoblasts. Treating osteoblasts with TNFα leads to intense nuclear labeling of NF-kB. However, Medicarpin inhibits TNFα-stimulated NF-kB nuclear localization, thus impeding TNFα-induced signalling and osteoclastogenesis (Tyagi et al, Mol. Cell Endocrinol. 2010; 325(1-2):101-9).

वार्षिक प्रतिवेदन

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छन्तर मंजिल पैलेस, महात्मा गांधी मार्ग, लखनऊ

Central Drug Research Institute
(Council of Scientific & Industrial Research)

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