खंड 1 अंक 2 अक्टूबर 2009 - मार्च 2010
Vol. 1 No. 2 October 2009 - March 2010

सी डी आर आई (सी एस आई आर) समाचार

CDRI (CSIR) Newsletter

Council of Scientific & Industrial Research
www.csir.res.in

Central Drug Research Institute, CSIR
www.cdriindia.org

From the Director's Desk

Central Drug Research Institute, Lucknow has entered into its 60th year of the existence. I am very happy to present the activities carried out by us during the last 6 months i.e. from October 2009 to March 2010 as well as performance report of 2009-10 through this second issue of CDRI Newsletter. This period was full of all round productivity and we are committed to serve the nation by providing new drugs and diagnostics for cure of different ailments for humans. Reorganization of our research activities has started showing excellent positive results and we expect to have a fruitful future. I feel proud to state here that in 2009 the number of research publications reached an all time high to 290, with an average IF of nearly 2.6. Our EBR during the financial year 2009-10 also rose to nearly Rs. 21 crores, the highest ever in the history of CDRI. My heartiest congratulations go to everyone in CDRI for this stupendous all round achievement.

We celebrated our 59th Annual Day on 17th February 2010 and on this special day, CDRI launched a unique memory enhancer formulation **Memory Sure**. The product is being marketed by CDRI/CSIR Licensee – Lumen Marketing Company, Chennai and Zaar Distributors Pvt. Ltd., New Delhi. Besides extensive marketing of Memory Sure in India, it is being exported to several foreign countries. A new, economical, safe and environmental friendly process for synthesis of Ormeloxifene, has been licensed to HLL Life Care Ltd., Thiruvanthapuram. A standardized plant fraction has indicated potent anti-osteoporotic activity and its know-how has been licensed to Natural Remedies Pvt. Ltd., Bangalore for development as a neutraceutical and dietary supplement for optimum bone health. During the period of report, 10 new grant-in-aid projects and 3 new sponsored projects were approved by different funding agencies worth Rs. 324.5 lakhs. A new Neuro-behavioral Laboratory was established for assessment of neuro-psychiatric disorders. Further, I am glad to inform that several products are in different stages of drug development and interesting basic studies are in progress, details thereof shall be intimated later.

During these 6 months, 4 international and 2 Indian patents were granted while 1 foreign patent application and 8 Indian patent applications were filed. Besides, 2 international conferences and 5 workshops/symposia were organized and several dignitaries visited CDRI and delivered lectures in their area of expertise. Five of my colleagues and 11 research fellows received recognition for their outstanding research findings. My best wishes to all with the expectation of having many more prizes by them and others in future.

I am sad to report untimely demise of 3 of my colleagues during this period. CDRI family prays to God that their soul rest in peace. The whole-hearted support extended by all members of the staff is gratefully appreciated and I look forward for their continued affiliation.

T. K. Chakraborty

(Tushar Kanti Chakraborty)

Highlights of Achievements

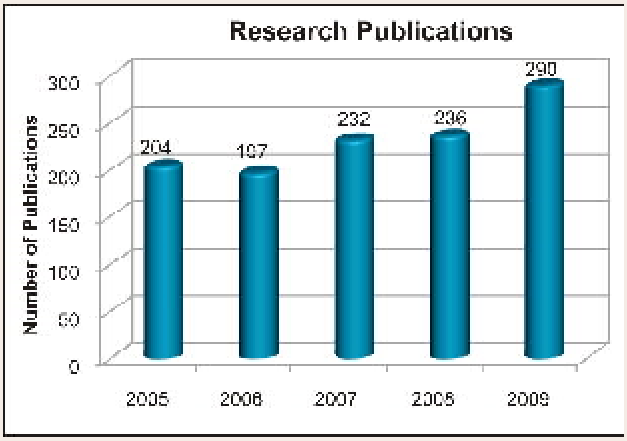
Prestigious Award Received (2009-10)	:	**CSIR Technology Award for Innovation-2009**
Product Launched for Marketing (2009-10)	:	**01**
Product/Process Licensed to Industries (2009-10)	:	**02**
Publications in SCI Journals (2009)	:	**290**
Average Impact Factor	:	**2.591**
Publications with >5 Impact Factor	:	**20**
Book Chapters (2009)	:	**07**
Instruction Manual (2009)	:	**01**
Patents (2009-10)		
Filed Abroad	:	**05**
Filed in India	:	**09**
Granted Abroad	:	**13**
Granted in India	:	**05**
Ph.D. Thesis Submitted (2009)	:	**60**
New Contract Research Undertaken (2009-10)	:	**03**
New Grant-in-Aid Projects Initiated (2009-10)	:	**23**
Total External Budgetary Resources (2009-10)	:	**Rs. 20.528 Crore**

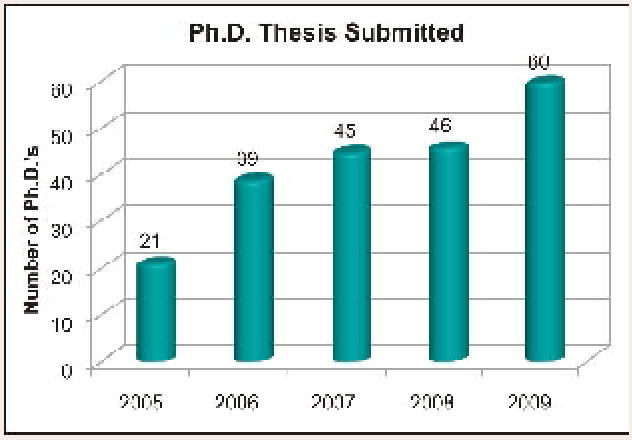
*Provisional data

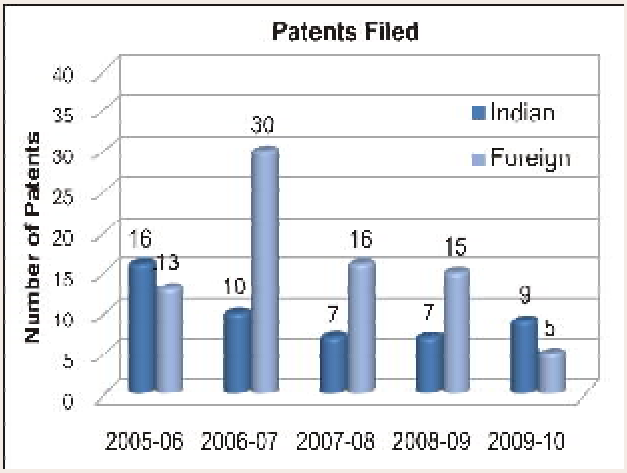
A Newsletter from
Central Drug Research Institute
(Council of Scientific and Industrial Research, New Delhi)
Chattar Manzil Palace, M.G. Marg, Lucknow - 226 001
Phone: 0522-2612411-18 (PABX)
Fax: 91-522-2623405/2623938/2629504
Website: www.cdriindia.org

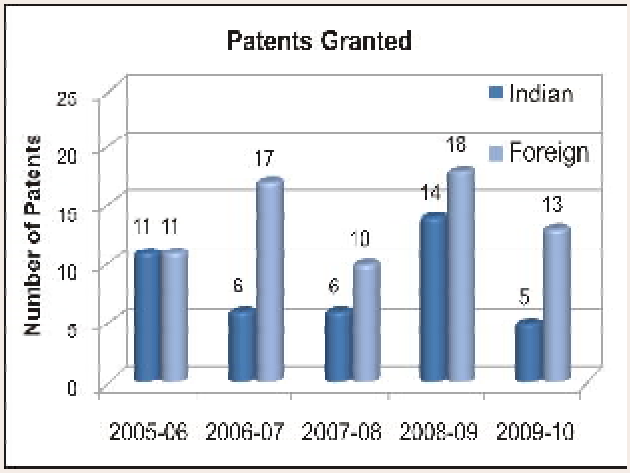
केन्द्रीय औषधि अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)
छत्तर मंजिल पैलेस, एम.जी. मार्ग, लखनऊ - 226 001

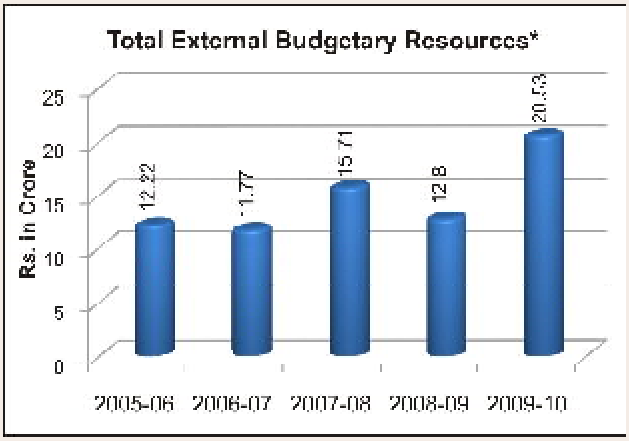
Performance Report











*Provisional data

External Budgetary Resources 2009-10*		
		(Rs. in Crore)
	R909 EXTERNAL CASH FLOW	
a)	Government Departments/PSU's	16.290
b)	Industries/Private Agencies	0.282
c)	Foreign Governments/Agencies	1.801
	TOTAL ECF (a+b+c)	**18.372**
	R071 LAB RESERVE GENERATED	
a)	Royality Premia	0.176
b)	Testing & Analytical Charges	0.017
c)	Other Technical Services	0.400
d)	Rest of R 071 Heads	1.564
	Total Lab Reserve (R-071)	**2.156**
Total EBR (ECF+LRF)		**20.528**

*Provisional data

CONTRIBUTIONS TO ECONOMY

1. Product Launched for Marketing

1.1 Launching of Memory Sure

CDRI has developed Bacosides enriched standardised extract of *Bacopa* - a single plant based unique natural memory enhancer formulation and patented its technology. On 17 February, 2010, the Annual Day of CDRI, the product, under the brand name - Memory Sure, was launched for extensive marketing in India. The product is being marketed by CDRI Licensee - Lumen Marketing Co., Chennai and Zaar Distributors Pvt. Ltd., New Delhi and is being exported to following countries:

Country	Brand Name
New Zealand & Australia	Keenmind, Membac
Malaysia, Philippines & Singapore	Memo Plus Gold
France & Germany	Memory Perfect

2. Products/Processes Licensed

2.1 Improved Process for Ormeloxifene

Ormeloxifene is a non-steroidal once-a-week oral contraceptive, developed by CDRI. It was marketed in India in 1992 as Saheli by (Hindustan Latex Ltd., Thiruvananthapuram) and was included in the National Family Welfare Program in 1995.

An economical, safe, environmental friendly process for production of Ormeloxifene was developed and patented by CDRI and has been licensed to M/s HLL Life Care Ltd., Thiruvananthapuram.

Dr. Rajendra Prasad, Head, Business Management Unit, CDRI signing the agreement with M/s HLL Life Care Ltd., Thiruvananthapuram

2.2 Plant 1020F147

Plant 1020F147, a standardised fraction isolated from a plant source, has been found to promote peak bone mass achievement and prevent bone loss in ovariectomized rats. The fraction has not exhibited estrogen like effects in uterus, which ensures safety of the product. CDRI licensed the know-how for the plant to M/s Natural Remedies Private Ltd., Bangalore for further development and marketing the product as neutraceutical and dietary supplement for optimum bone health, which in turn would help alleviating the severity of osteoporosis in the post-menopausal women.

Dr. Rajendra Prasad signing the agreement with Mr. Anurag Agarwal, Chief Operating Officer, Natural Remedies Pvt. Ltd., Bangalore

Memorandum of Understandings Signed

	Title	Institute	Date of Signing
1.	To understand the reactivity of the formyl group for Baylis-Hilman reaction in heterocyclic aldehydes	Indian Institute of Technology, Kanpur	26/03/2010
2.	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
3.	Aggregation studies on salmon calcitonin in presence of metal ion promoters	Centre of Biomedical Magnetic Resonance, Lucknow	22/02/2010
4.	Impact of adipokine and chemokine gene polymorphism and its protein expression in metabolic syndrome	Chatrapati Shahuji Maharaj Medical University, Lucknow	08/12/2009
5.	Optimization of anticancer leads	Central Institute of Medicinal and Aromatic Plants, Lucknow	27/10/2009
6.	Development of siRNA therapeutics against myeloid cell infections by pathogens	Meharry Medical College, USA	23/10/2009
7.	Synthesis, molecular modeling and development of ER dependent anticancer agents	Amity University, Lucknow	14/09/2009

CONTRIBUTIONS TO SCIENCE & TECHNOLOGY

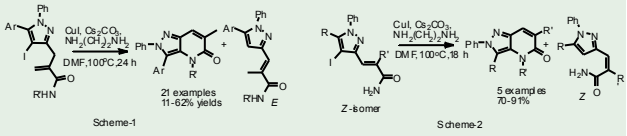
1. Discovery of Novel Antithrombotic Compound S-007-867

Recent advances in understanding the molecular basis of the platelets involvement in intravascular thrombosis have facilitated development of new anti-platelet agents to further reduce the mortality and morbidity associated with cardiovascular pathologies. Experimental data on platelet glycoprotein VI (GPVI) inhibition have predicted it to be a unique target for the new drug development. CDRI has identified novel anti-platelet synthetic molecules that prevent platelet collagen interaction. Among them, compound S-007-867 offered significant protection against collagen-epinephrine induced thrombosis in mice; ferric chloride induced arterial thrombosis and arterio-venous shunt thrombosis in rats. Moreover, in hyperlipidemic hamster model, significant reversal of collagen mediated platelet hyperactivity (viz. adhesion and aggregation), amelioration of endothelial dependent relaxation in aortic rings, reduction in expression of proinflammatory cytokines in the splenocytes, was seen following treatment with S-007-867. It also exhibited specific inhibitory activity towards collagen-induced activation and aggregation of human platelets. The inhibitory mechanism included inhibition of platelet adhesion over collagen coated surface, collagen induced increase in intracellular Ca^{+2} ($[Ca^{+2}]i$), ATP secretion, thromboxane B_2 release, thrombin generation as well as the multitude of intracellular signaling events being orchestrated following platelet collagen interaction involving tyrosine phosphorylation of numerous non receptor tyrosine kinases. The compound thus seems to be a potential candidate as a antithrombotic drug due to its specific inference with collagen mediated platelet adhesion and activation.

2. First Copper-catalyzed Intramolecular Amidation in Substituted 4-Iodopyrazoles Leading to the Synthesis of Pyrazolo[4,3-*b*] Pyridin-5-Ones (*Advanced Synthesis and Catalysis*, 2009, *351*, 2715-2723)

Pyrazole constitutes the substructural unit of an array of pharmacologically active compounds. Earlier it was demonstrated that 4-iodopyrazolecarbaldehydes are fast reacting substrates for the Baylis-Hillman (BH) reaction. In order to unfold the synthetic application of the BH adducts, a Cu-mediated intramolecular amidation via C-N cross-coupling of the amide with the iodo-group, present at 4-position in substituted pyrazoles to afford the annulated pyrazoles, was accomplished for the first time. In order to introduce diversity to the range of products which could be generated using the methodology the BH-adducts of acrylonitrile and acrylates were used to obtain the required starting materials. The cross coupling reactions were performed in the presence of CuI using Cs_2CO_3 as the base and ethylenediamine as the ligand in DMSO at 100 °C. It was demonstrated that for amide-function, which is present across the double bond, only Z-isomer has the capability to undergo intramolecular C-N coupling reactions.

In contrast, the E-isomer of acrylamides afforded deiodinated pyrazoles as the sole product. In an effort to understand the stereochemical implications, the study was extended to the substrates derived via Horner-Wadsworth-Emmons chemistry. In contrast to the unsaturated amides, coupling reaction in saturated counterparts were found to be sluggish and were accompanied by deiodination of pyrazole. Beyond this, the effect of substitution at the 5-position of the pyrazole on the cross-coupling reaction was also delineated. This strategy opens new-vistas for accomplishing C-N coupling at the 4-position of the pyrazole leading to synthesis of new pyrazole-annulated heterocycles.



Scheme-1 Scheme-2

3. Functional Studies of Actin-Network in *Leishmania* Parasites

Actin has been regarded as central player in many vital cellular processes including cell division, cell movements and phagocytosis/endocytosis. It has been demonstrated that *Leishmania* parasites express actin as well as several actin-binding proteins, the functions of which are unknown in human pathogens. Recent studies have shown that *Leishmania* actin by itself is able to produce nicks in the DNA and this property has relevance in the kDNA remodeling during kinetoplast division in these parasites. By generating gene-knockout mutants of an actin-dyncmics regulating protein (LdCof), its functions have been studied in *Leishmania* parasites. The studies on these mutants revealed that actin-dynamics is required for the formation of flagellum in *Leishmania*. Based on the detailed cell biological analysis of the LdCof null mutants, it has been established that decreased actin-dynamics adversely affects flagellar pocket duplication during cytokinesis, which may serve as a novel cell cycle check point in these parasites.

New Projects Undertaken

Grant-in-Aid Projects

1. Design, synthesis and biological evaluation of HIV-1 RT inhibitors: 4 - thiazolidinone compounds

This joint collaborative project, involving scientists from CDRI and NARI, Pune focuses on the design and synthesis of new anti-HIV-1-RT compounds, using the rational drug design approaches. These compounds will be first screened against *in vitro* HIV-RT assay system and later, the active compounds will be screened in cell based assay system. Drug resistant HIV-1-RT strains will be used for above screening. The aim of this study is to develop new anti-HIV-1-RT drugs, which are active against both native and drug resistant HIV-1-RT strains, having reduced toxicity.

Sponsored by: ICMR
Total approved cost: Rs. 61.14 lakh
PI: Dr. S.B. Katti, Scientist G, Medicinal & Process Chemistry Division

2. 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

Human sperm is a highly differentiated cell, thought to be transcriptionally inactive. However, it is a matter of curiosity to understand as to how genes deliver their functions in the sperm. Particularly interesting is the role of the genes on the Y-chromosome. It is known from microdeletion studies that Y-chromosome is important for human male fertility; however, it is still unclear what role the Y-chromosome genes play. The project aims at exploring the transcriptome of the human sperm. The identification and exploration of these genes could unravel their biological function and offer new targets for male contraception/treatment of male infertility. In addition, if differences exist between different sub-categories of infertile individuals, the information could be valuable in providing diagnostic tools for reproductive biologists in planning biological screening before assisted reproductive techniques are performed.

Sponsored by: DBT
Total approved cost: Rs. 14.5 lakh
PI: Dr. Rajender Singh, Scientist C, Div. of Endocrinology

3. A systematic RNAi screen for identification of genetic modulators of specific disease pathogenesis in a novel *Caenorhabditis elegans* model

Genetic model system *C. elegans* is considered to be an excellent model for carrying out functional genomic studies particularly with respect to human disease conditions. The project proposes to carry out a systematic RNAi screen for genes involved in specific disease pathogenesis. A novel transient model established in the lab, would be used to identify genes involved and epistatic interactions thereof. The project aims at studying protein-protein interactions and would also serve as targets for the design of specific inhibitors.

Sponsored by: DST
Total approved cost: Rs. 15.29 lakh
PI: Dr. Aamir Nazir, Scientist C, Division of Toxicology

4. Development of antimicrobial agents from soil microflora

It is basic need of modern society to develop new antimicrobial agents of natural origin which are relatively economically affordable, safer and easily available to common people. The current project is an attempt for proper utilization of natural resources and development of health healing product(s) by using modern biotechnological tools in developing anti-pathogenic drugs based on microbial-fauna of unexplored area. The goal in this project is to not only to find out candidate compound active against infectious diseases but also to add value by way of its refining, chemical characterization and ultimately the formulation development and its commercialization.

Sponsored by: DST & KAPL, Bangalore
Total approved cost: Rs. 88.4 lakh
PI: Dr. A.K. Saxena, Scientist G & Head, Medicinal & Process Chemistry Division

5. Polymeric nano-matrix-associated *in vivo* delivery of Kaempferol in rats for bone anabolic action

Indians have one of the highest prevalence of low bone mass and osteoporosis, as examined by plain x-ray and autopsy studies. The role of kaempferol (K) in promoting bone cell functions *in vitro* has already been

reported. Data shows that K has rapid absorption and sharp post absorption elimination. To circumvent this problem, K has been encapsulated in the biodegradable nanomatrix to provide bone specificity as a sustained release formulation. It is expected that this formulation may prolong the bioavailability of K and its delivery to bone marrow will increase, thereby enhancing its bone sparing efficacy under postmenopausal bone loss. Successful completion of the study has the potential for the development of novel therapeutic interventions that specifically target this debilitating disease.

Sponsored by: DST
Total approved cost: Rs. 28.36 lakh
PI: Dr. Ritu Trivedi, Scientist C, Division of Endocrinology

6. Investigation on involvement of adipose tissue in persistence of pathogenic mycobacteria

The proposed activities in the project are aimed to study interactions between mycobacteria and mouse-derived adipocytes, adipocytes and mycobacteria infected macrophages/DCs and the effects of such interactions on the outcome of therapy in mouse model. In addition to *M. tuberculosis*, *M. avium sub sp. paratuberculosis*, another pathogenic species that is hypothesized to interact with adipocytes also will be investigated. The information generated from this project will improve understanding of chronic and hidden mycobacterial infections which in turn will help to target persistent bacilli more efficiently.

Sponsored by: DBT
Total approved cost: Rs. 22.58 lakh
PI: Dr. Y.K. Manju, Scientist C, Division of Drug Target Discovery & Development

7. Design and development of database and analytical tools for microarray data on *Leishmania donovani* parasite

Leishmania donovani is a major parasite causing Kala-azar (Visceral leishmaniasis) in India. There is a need to investigate the parasite in greater detail with emphasis on the genome, employing all modern tools. It is therefore, proposed to design and develop an integrated software process to manage the microarray data and analyse it for finding out potent and functional genes, sequences of which, in turn, could be matched with other gene sequences for finding out the functionalities. The proposed software process will be user friendly, menu driven, modular with essential database management utilities, interface and O.S./platform independant. The database, in addition to experimental data, will also have bibliographic references, technical reports and full text published papers on the parasite, statistical techniques/analysis of experimental data, including microarray, so as to provide single point access to the required information to the scientists working in this area.

Sponsored by: DBT
Total approved cost: Rs. 17.76 lakh
PI: Dr. Neeloo Singh, Scientist E II, Division of Drug Target Discovery & Development

8. Effect of cancer chemotherapeutic drugs on spermatogonial stem cell niche, chromatin remodeling and epigenetic programming in male germ cells

With the advancement in cancer therapy, sevaral novel chemotherapeutic drugs are being used in treatment regimens. However, their short-term and long-term effects on male reproductive health remain largely unknown. The present project was initiated with the aim to study the effects of chemotherapeutic drugs on male fertility, influence on stem cell niche, chromatin remodeling and epigenetic reprogramming in male germ cells. Major objectives of the project are to study the effect of chemotherapeutic drugs on male germ line stem cell niche; study the specific of these drugs on the chromatin modifications and down stream signaling pathways; and to study the effect of paternal exposure of the chemotherapeutic drugs on the epigenetic programming in male germ cells.

Sponsored by: DST
Total approved cost: Rs. 7.48 lakh
PI: Dr. D.P. Mishra, Scientist EI, Division of Endocrinology

9. Efficient synthesis of novel axially chiral biaryls and their optical resolution by HPLC

The demand of axially chiral biaryls has grown rapidly during past decades. Axially chiral biaryls have shown immense applications as chiral ligands or auxiliaries in asymmetric synthesis, as chiral phases for chromatography and as important substrates for chiral liquid-crystalline

materials. This project is aimed to synthesize axially chiral biaryls with two or more stereogenic axis prepared through versatile chemistry of 2H-pyran-2-ones followed by optical resolution by chiral HPLC and further assignment of their absolute configuration.

Sponsored by: Alexander von Humboldt Foundation, Bonn, Germany
Total approved cost: Rs. 12.4 lakh
PI: Dr. Atul Goel, Scientist E I, Medicinal & Process Chemistry Division

10. Effect of Indian herbal preparations on hypobaric hypoxia induced epigenetic modifications in male germ cells: A proteomic analysis

Male infertility or sub-fertility is often attributed to physiological stress. Further, it has been widely believed that unexplained infertility could be due to underlying epigenetic changes, which can be reversed or altered by drug/s. In the ancient system of traditional medicines, plant extracts have been used for the improvement of endurance against improving male sexual disorders, like psychogenic impotence and unexplained infertility. With this background, some selected plant extracts from the Fabaceae family will be tested for their effects on spermatogenesis using adult male rat model. The prime objectives of the study are: (1) Identification of epigenetic modifications in the male germ cells exposed to hypobaric hypoxia stress by proteomics approach; (2) Identification of the functional effect of the identified epigenetic modifications on male fertility and (3) Investigation of the effects of (two selected plant extracts from the Fabaceae family) supplementation on the identified epigenetic modifications post hypobaric hypoxic stress.

Sponsored by: DRDO
Total approved cost: Rs. 9.92 lakh
PI: Dr. D.P. Mishra, Scientist E I, Division of Endocrinology

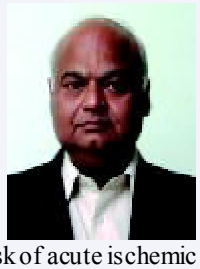
Sponsored Projects Undertaken

11. Stability and formulation development studies of Ormeloxifene and authentification of *cis* and *trans* standards

Ormeloxifene is a non-steroidal oral contraceptive agent developed by CDRI, Lucknow and licensed to M/S HLL Lifecare Ltd., Thiruvananthapuram for marketing. On 2nd December 2009, a sponsored project agreement was signed between Central Drug Research Institute, Lucknow and HLL Lifecare Ltd., Thiruvananthapuram for generation of data on Ormeloxifene as per ANVISA guidelines, which is mandatory for the for registration/marketing in Brazil and its inclusion in WHO medicines list.

Sponsored by: HLL, Thiruvananthapuram
Total approved cost: Rs. 20.20 lakh
PI: Dr. A.K. Dwivedi, Scientist F, Pharmaceutics

12. Development of non-infiringing manufacturing process of Bivalirudin



An industry sponsored agreement has been signed between Central Drug Research Institute, Lucknow and Biocon Limited, Bangalore for the ‘‘Development of non-infiringing manufacturing process of Bivalirudin”.

Bivalirudin (Angiomax®), is a peptide based drug used to reduce the risk of acute ischemic complications in patients undergoing percutaneous coronary intervention or coronary artery bypass. The preparation of Bivalirudin, a 20 mer linear peptide, has been covered under several granted patents and patent applications. In consideration to the available patented processes, a novel and non-infringing route of synthesis for bivalirudin is being developed.

Sponsored by: Biocon Limited, Bangalore
Total approved cost: Rs. 17.65 lakh
PI: Dr. W. Haq, Scientist E II, Medicinal & Process Chemistry Division

13. Antiplatelet effect of clopidogrel salts in rats after single dose oral administration

An industry sponsored agreement has been signed on March 19, 2010 between Central Drug Research Institute, Lucknow and M/s Zydus Research Centre, Ahmedabad for efficacy study on antiplatelet effect of clopidogrel salts in rats after single dose oral administration.

Clopidogrel is an orally administered thienopyridine that selectively and irreversibly inhibits ADP-induced platelet aggregation. The study aims to explore the anti-platelet effect of various clopidogrel formulations on platelet aggregation to assess their efficacy.

Sponsored by: Zydus Research Centre, Ahmedabad
Total approved cost: Rs. 8.82 lakh
PI: Dr. Madhu Dikshit, Scientist F, Pharmacology Division

TOP 25 PUBLICATIONS

	Authors	Title	Journal	Vol/Issue/ page	Impact Factor
1	Akhtar MS, Heidemann M, Tietjen JR, Zhang DW, Chapman RD, Eick D and Ansari AZ	TFIIH kinase places bivalent marks on the carboxy-terminal domain of RNA polymerase II	Molecular Cell	34(3), 387-93	12.903
2	Jyoti A, Keshari RS, Kumar S, Patel S, Srinag BS, Verma A, Barthwal MK, Krishnamurthy H, Bajpai VK and Dikshit M	Nitric oxide dependent increase in free radical generation mediates release of extracellular traps from human neutrophils	FASEB Journal	23, 890.10	7.049
3	Kumar S, Barthwal MK and Dikshit M	Biphasic regulation of cell cycle by nitric oxide donors in promyelocytic HL-60 cell line	FASEB Journal	23, 890.11	7.049
4	Dikshit M and Barthwal M	Thrombotic potential in high fat high fructose fed hyperlipidemic hamsters	Atherosclerosis -Supplements	10(2) e1143	6.559
5	Barthwal M and Dikshit M	Atherothrombotic events in hyperlipidemic hamsters	Atherosclerosis -Supplements	10(2), e474	6.559
6	Nag S, Nayak M and Batra S	First copper-catalyzed intramolecular amidation in substituted 4-iodopyrazoles leading to the synthesis of pyrazolo[4,3-b]pyridin-5-ones	Adv. Synth. Catal.	351, 2715-2723	5.619
7	Avasthi Kamlakar, Ansari Amantullah, Tewari AK, Kant Ruchir and Maulik PR	Pyrazolo[3,4-d]pyrimidinophanes: Convenient synthesis of a new class of cyclophane and X-ray structure of the first representative	Organic Letters	11(22), 5290–5293	5.128
8	Goel A, Singh SP, Kumar A, Kant R and Maulik PR	Unprecedented bridged annulation approach to the construction of 5,6-dihydro-4H-benzo[*kl*]acridines	Organic Letters	11,5122-5125	5.128
9	Johnson TA, Taro Amagata, Sashidhara KV, Oliver AG, Tenney Karen, Matainaho Teatulohi, Ang KK, McKerrow JH and Crews Phillip	The aignopsanes, a new class of sesquiterpenes from selected chemotypes of the sponge *Cacospongia mycofijiensis*	Organic Letters	11(9), 1975-1978	5.128
10	Porwal Sharad, Chauhan PMS, Shakya Nishi, Verma Aditya and Gupta Suman	Discovery of novel antileishmanial agents in an attempt to synthesize pentamidine-aplysinopsin hybrid molecule	Journal of Medicinal Chemistry	52, 5793–5802	4.898
11	Pathak R and Batra Sanjay	Malaria and Leishmaniasis. Current status of chemotherapy, new leads and targets for drug development	Anti-Infective Agents in Medicinal Chemistry	2009, 226-267	4.823
12	Dangi Anil, Vedi Satish, Nag JK, Paithankar Sameer, Singh MP, Kar SK, Dube Anuradha and Misra-Bhattacharya Shailja	Tetracycline treatment targeting *Wolbachia* affects expression of an array of proteins in *Brugia malayi* parasite	Proteomics	9, 4192–4208	4.586
13	Krishnan MY, Manning EJ and Collins MT	Comparison of three methods for susceptibility testing of *Mycobacterium avium* sub sp. *paratuberculosis* to 11 antimicrobial drugs	Journal of Antimicrobial Chemotherapy	64(2), 310-6	4.328
14	Krishnan MY, Manning EJ and Collins MT	Effects of interactions of antibacterial drugs with each other and with 6-mercaptopurine on *in vitro* growth of *Mycobacterium avium* sub species *paratuberculosis*	Journal of Antimicrobial Chemotherapy	64(5), 1018-23	4.328
15	Ahmad A, Asthana N, Azmi S, Srivastava RM, Pandey BK, Yadav V and Ghosh JK	Structure-function study of cathelicidin-derived bovine antimicrobial peptide BMAP-28: Design of its cell-selective analogs by amino acid substitutions in the heptad repeat sequences	Biochimica et Biophysica Acta: Biomembrane	1788(11), 2411-20	4.18

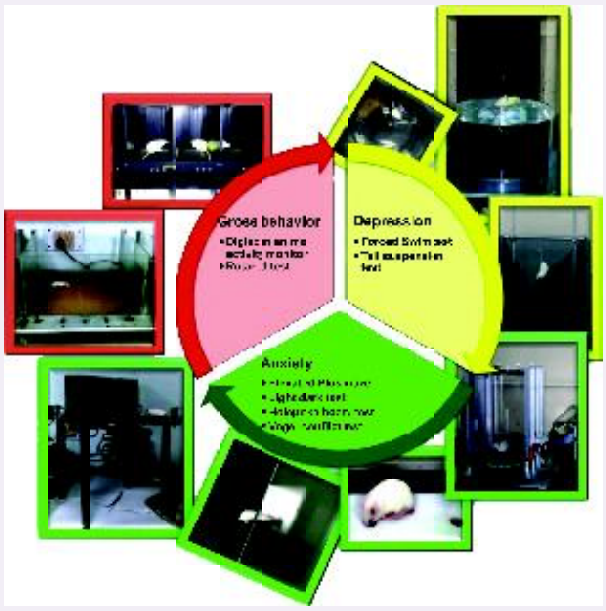
16	Shukla KK, Mahdi AA, Ahmad MK, Shankhwar SN, Rajender S and Jaiswar SP	*Mucuna pruriens* improves male fertility by its action on the hypothalamus-pituitary-gonada axis	Fertility and Sterility	92(6), 1934-40	4.167
17	Singh Rajender, Gupta NJ, Chakrabarty B, Singh L and Thangaraj K	Asp mutation in androgen receptor disrupts transactivation function without affecting androgen binding	Fertility and Sterility	91(3), 933.e23-8	4.167
18	Shrivastava Tripti, Dey Abhishek and Ramachandran Ravishankar	Ligand-induced structural transitions, mutational analysis, and 'open' quaternary structure of the *M. tuberculosis* feast/famine regulatory protein (Rv3291c)	Journal of Molecular Biology	392 (4) 1007-1019	4.146
19	Chatterjee S, Singh R, Kadam S, Maitra A, Thangaraj K, Meherji P and Modi D	Longer CAG repeat length in the androgen receptor gene is associated with premature ovarian failure	Human Reproduction	24(12), 3230-3235	3.773
20	Mandadapu AK, Saifuddin M, Agarwal PK and Kundu B	A new entry to phenanthridine ring systems via sequential application of Suzuki and the modified Pictet-Spengler reactions	Organic & Biomolecular Chemistry	7(13), 2796-803	3.550
21	Singh R, Parai MK and Panda Gautam	Application of Nazarov cyclization to access [6-5-6] and [6-5-5]tricyclic core embedded new heterocycles: An easy entry to structures related to Taiwaniaquinoids	Organic & Biomolecular Chemistry	7(9), 1858-1867	3.550
22	Bhargavan B, Gautam AK, Singh D, Kumar A, Chaurasia S, Tyagi AM, Yadav DK, Mishra JS, Singh AB, Sanyal S, Goel A, Maurya R and Chattopadhyay N	Methoxylated isoflavones, cajanin and isoformononetin, have non-estrogenic bone forming effect via differential mitogen activated protein kinase (MAPK) signaling	Journal of Cellular Biochemistry	108(2), 388-99	3.54.
23	Misra G, Aggarwal A, Dube D, Zaman MS, Singh Y and Ramachandran Ravishankar	Crystal structure of the *Bacillus anthracis* nucleoside diphosphate kinase and its characterization reveals an enzyme adapted to perform under stress conditions	Proteins-Structure Function and Bioinformatics	76(2), 496-506	3.419
24	Agrawal R, Tyagi E, Shukla R and Nath C	A study of brain insulin receptors, AChE activity and oxidative stress in rat model of ICV STZ induced dementia	Neuropharmacology	56 (4), 779-787	3.383
25	Ahmad A, Azmi S, Srivastava RM, Srivastava S, Pandey BK, Saxena R, Bajpai VK and Ghosh JK	Design of nontoxic analogues of cathelicidin-derived bovine antimicrobial peptide BMAP-27: The role of leucine as well as phenylalanine zipper sequences in determining its toxicity	Biochemistry	48(46), 10905-17	3.379

New Facility Established

Neuro-behavioral Lab

The Neuro-behavioral laboratory was inaugurated by the Director, CDRI on 26th Novemeber, 2009. The lab has been equipped with state-of-the-art equipment and expertise necessary for design and interpretation of animal behavior experiments assessing neuropsychiatric disorders. Various models of anti-anxiety, anti-depression, anti-dementia, anti-psychotic and anti-cataleptic have been established in the facility for screening of drugs and study of mechanism of action, using fully automated and computerized settings which will minimize manual errors. Besides, a fully automated Microdialysis system was also installed in the facility, which enables investigators to monitor real time changes in brain neurotransmitter levels.

Inauguration of neuro-behavioral lab



Models of neuro-behavioural studies

PATENTS

(October 2009 - March 2010)

Patents Granted Abroad	:	**4**
Patents Granted in India	:	**2**
Patents Filed Abroad	:	**1**
Patents Filed in India	:	**8**

I. Patents Granted Abroad:

1. **US Pat. No.:** 7601838 **Grant Date:** 13/10/2009
   Patent Appl. No.: 11/023915 **Filing Date:** 28/12/2004
   Title: 2-Alkyl/aryl sulphonyl-1,2,3,4-tetrahydro-9H-pyrido [3,4-b] indole-3-carboxylic acid esters /amides as antithrombotic agents
   Inventors: Stuti Gaur, Zeeshan Fatima, Anshuman Dixit, Zahid Ali, William Rascan Surin, Kapil Kapoor, Kanta Bhutani and Mohd. Salim Ansari

2. **US Pat. No.:** 7635779 **Grant Date:** 22/12/2009
   Patent Appl. No.: 11/052833 **Filing Date:** 09/02/2005
   Title: Oxy substituted falvones/chalcones as antihyperglycemic and antidyslipidemic agents
   Inventors: Ram Pratap, Mavurapu Satyanarayana, Chandeshwar Nath, Ram Raghubir, Anju Puri, Ramesh Chander, Priti Tiwari and Brajendra Kumar Tripathi

3. **US Pat. No.:** 7651705 **Grant Date:** 26/01/2010
   Patent Appl. No.: 10/695471 **Filing Date:** 28/10/2003
   Title: Herbal composition for the treatment of gastric ulcer
   Inventors: Janaswamy Madhusudana Rao, Upparapalli Sampathkumar, Boggavarapu Subrahmanya Sastry, Jhillu Singh Yadav, Kondapuram Vijaya Raghavan, Gautam Palit, Dwaraka Nath Bhalla, Deepak Rai, Panniyampally Madhavankutty Varier, Trikovil Sankaran Muraleedharan and Kollath Muraleedharan

4. **US Patent No.** 7655801 **Grant Date:** 02/02/2010
   Patent Appl. No.: 11/022924 **Filing Date:** 28/12/2004
   Title: Substituted carbamic acid quinolin-6-yl esters, useful as acetylcholinesterase inhibitors
   Inventors: Neeraj Shakya, Zeeshan Fatima, Chandishwar Nath and Anil Kumar Saxena

II. Patents Granted in India:

1. **Patent No.:** 237239 **Grant Date:** 12/10/2009
   Patent Appl. No.: 05373DELNP2005 **Filing Date:** 23/11/2005
   Title: Heterologous expression of trypanothione reductase from *Leishmania donovani* in a prokaryotic system
   Inventors: Neena Goyal and Mukul Kumar Mittal

2. **Patent No.:** 237915 **Grant Date:** 12/01/2010
   Patent Appl. No.: 0246DEL2004 **Filing Date:** 20/02/2004
   Title: Novel mercapto phenyl naphthyl methane derivatives and preparation thereof
   Inventors: Sangita, Atul Kumar, Man Mohan Singh, Girish Kumar Jain, Puvvada Sri Ramanchandra Murthy and Suprabhat Ray

III. Patent Filed Abroad:

1. **PCT Patent Appl. No.** PCT/IN2010/000115 **Filing Date:** 26/02/2010
   Title: Polymeric nanomatrix associated delivery of kaempferol in rats to improve its osteogenic action
   Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay and Anil Kumar Dwivedi
   Supporting Staff Mahesh Chandra Tewari and Geet Kumar Nagar

IV. Patents Filed in India:

1. **Patent Appl. No.:** 2344DEL2009 **Filing Date:** 13/11/2009
   Title: A mercapto phenyl naphthyl methane compounds and preparation thereof
   Inventors: Sangita, Atul Kumar, Man Mohan Singh, Girish Kumar Jain, Puvvada Sri Ramanchandra Murthy and Suprabhat Ray

2. **Patent Appl. No.:** 0183DEL2010 **Filing Date:** 29/01/2010
   Title: An antitubercular formulation of 4-alkoxy phenyl cyclopropyl alkanols
   Inventors: Rama Pati Tripathi, Prabhat Ranjan Mishra, Girish Kumar Gupta, Surendra Singh Bisht, Jyoti Pandey, Vinita Chaturvedi, Sudhir Sinha, Varsha Gupta and Anil Kumar Dwivedi
   Supporting Staff Vinod Kumar Maurya , Hori Lal, A.S.Verma and Chandra Mool

3. **Patent Appl. No.:** 0182DEL2010 **Filing Date:** 29/01/2010
   Title: Novel dispiro cycloalkanones useful as inhibitors of NAD+-dependent DNA ligase and antitubercular agents
   Inventors: Rama Pati Tripathi, Jyoti Pandey, Nimisha Singh, Divya Dube, Vandna Kukshal, Shalini Bhatnagar, Sudhir Sinha, Vinita Chaturvedi and Ravishankar Ramachandran

4. **Patent Appl. No.:** 0384DEL2009 **Filing Date:** 12/02/2010
   Title: A controlled release pharmaceutical composition for osteogenic action
   Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay and Anil Kumar Dwivedi
   Supporting Staff Mahesh Chandra Tewari and Geet Kumar Nagar

5. **Patent Appl. No.:** 0317DEL2010 **Filing Date:** 15/02/2010
   Title: A process for preparation of antileishmanial fraction from *Chondrococcus harnemonii*
   Inventors: Vijai Lakshmi, Sunil Kumar Mishra, Shishir Srivastava, Mahendra Nath Srivastava, Prashant Khare, Pragya Mishra and Anuradha Dube
   Supporting Staff Hriday Ram Mishra, Naveen Prakash Mishra, J.K. Joshi and Ram Chandra.

6. **Patent Appl. No.:** 0458DEL2009 **Filing Date:** 08/03/2010
   Title: Novel substituted spiro [indoline-heterocycle]-carboxylic acid derivatives as antidiabetic and metabolic disorder treating agents
   Inventors: Atul Kumar, Ram Awatar Maurya, Arvind Kumar Srivastava, Amar Bahadur Singh and Akhilesh Kumar Tamrakar
   Supporting Staff Tahseen Akhtar Ansari

7. **NF. No.:** 0034NF2010 **Filing Date:** 12/03/2010
   Title: Improved process for a preparation of bivalirudin
   Inventors: Wahajul Haq
   Supporting Staff Deepali Pandey and Meenakshi Sharma

8. **NF. No.:** 0137NF2009/IN **Filing Date:** 12/03/2010
   Title: Thiophene containing trisubstituted methanes(TRSMs) as antitubercular agents
   Inventors: Gautam Panda, Maloy Kumar Parai, Priyanka Singh, Vinita Chaturvedi and Sudhir Sinha
   Supporting Staff Ajay S. Verma , Shyam Singh and Hori Lal

EVENTS ORGANIZED

1. Faculty Training & Motivation and Adoption of Schools/Colleges by CDRI

CDRI formally launched the above program on 29 October, 2009 in a function attended by principals, teachers and a large number of students of the colleges adopted earlier by CDRI viz. Govt. Jubilee Inter College, Govt. Husainabad Inter College and Govt. Girls Inter College. Dr. U.N. Dwivedi, Vice Chancellor, Lucknow University graced the occasion as Chief Guest and Dr. T.K. Chakraborty, Director, CDRI presided over the function.

Inauguration of Faculty Training & Motivation and Adoption of Schools/Colleges by CDRI

As part of the above function, CDRI organized science quiz and essay competitions on 27th October 2009 at Govt. Jubilee Inter College Lucknow. About sixty students from all 3 adopted colleges participated in both the events and winners were given awards and the certificates. Continuing the scheme, a popular lecture series was initiated on 30th Nov, 2009 at Govt. Jubilee Inter College, Lucknow. The inaugural lecture was delivered by Mr. Pradeep K. Srivastava, Scientist, CDRI on "Global Warming and the Climate Change".

2. CDRI Annual Day

Central Drug Research Institute celebrated its 59th Annual day on February 17, 2010. The day started with the annual prize distribution function of CDRI Club in which its President, Dr. T.K. Chakraborty presided over. Dr. (Mrs.) Shusmita Chakraborty graced the occasion as the Chief Guest. She presented prizes to the winners of different sport and field events, organized at the institute during a month long sports activities.

The main function was organized in the afternoon in which Dr. Swaminathan Sivaram, a polymer chemist, mentor and science manager of distinction and the Director of 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 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 honoured 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 continuoous service in CDRI/CSIR, were also felicitated during the function.

Release of Annual Report 2009-10

Launch of Memory Sure for marketing

3. Mellanby Memorial Lecture

In memory of Sir Edward Mellanby, Founder Director, CDRI, the 35th Mellanby Memorial Lecture was organised on February 17, 2010. The lecture was delivered by Prof. Herbert Waldmann, Director, Max Plank Institute of Molecular Physiology, University of Dortmund, 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. Their structural scaffolds represent relevant and pre-validated fractions of chemical space, explored by nature, so far. Biology oriented synthesis builds on these arguments and offers a conceptual alternative to guiding strategies for library design and chemical diversity. Mr. Felix Kahle, Max Planck Society, Unit of International Relations, Munich, Germany presided over the function.

Dr. T.K. Chakraborty, Director, CDRI felicitating Prof. Herbert Waldmann

4. CSIR Program on Youth for Leadership in Science

The three-day CSIR-CDRI Program on Youth for Leadership in Science (CPYLS) was organized in the Institute during 17-19 March 2010. The event was aimed to inculcate interest in science amongst the meritorius students right from the High School level. Dr. T.K. Chakraborty, Director, CDRI welcomed all the students for the program. Prof. Manoj Kumar Misra, Vice Chancellor, Lucknow University was the Chief Guest. Fifteen meritorius students from Uttar Pradesh participated in the program. Eminent scientists from CDRI delivered lectures. Students visited different laboratories and interacted with bench scientists about the excitements associated with science and discoveries.

Dr. T.K. Chakraborty, Director, CDRI and participants of CPYLS

SEMINARS/SYMPOSIA/CONFERENCES/WORKSHOPS ORGANIZED

1. WHO-TDR Training Workshop on OECD Principles of Good Laboratory Practice

Good Laboratory Practice is being implemented in different divisions of the Institute for making the test facilities and safety studies to be GLP compliant. These divisions include: Toxicology, Pharmaceutics, Pharmacokinetics & Metabolism, Pharmacology, Biometry & Statistics, Instrumentation, Computer Cell and Division of Laboratory Animals. A WHO-TDR Training Workshop on **OECD Principles of Good Laboratory Practice** was organized at CDRI from October 27 – 29, 2009 in which 29 scientific workers, involved in GLP studies, were provided extensive training. External GLP trainers were Dr. Deepak Agarwal from IITR, Lucknow and Dr. Sudhir Srivastava while from CDRI, trainers were Dr. Rakesh Shukla and Dr. J.K. Saxena. Certificates were presented to participants by Dr. T.K. Chakraborty, Director, CDRI.

2. Workshop on Rational Approaches in Drug Designing - Application of Tools & Techniques of Bioinformatics

As a part of Bioinformatics activities, funded by DBT (under BTISNET Project), a one day workshop on **Rational Approaches in Drug Designing - Application of Tools and Techniques of Bioinformatics** was organized on 30th October 2009. The workshop provided hands-on training on bioinformatic tools applied in drug discovery process; structural biology and its application in drug design and computer aided modeling. Faculty included senior scientists from IGIB, New Delhi, CDRI and IIT, Kanpur.

3. 14th ISCB International Conference

Indian Society of Chemists and Biologists, India organized 14th International Conference on **Chemical Biology for Discovery: Perspectives and Challenges** at CDRI from January 15-18, 2010. Dr. P.M.S. Chauhan, General Secretary of the ISCB was Organizing Secretary of this conference. Prof. David St. C. Black, Secretary General, IUPAC was Chief Guest of the function. Prof. Robert H. Grubbs, Nobel Laureate delivered a special lecture. Prof. Nancy B. Jackson, Elected President of American Chemical Society, Prof. Colin J. Suckling, Prof. Michael D. Threadgill and many more dignitaries participated in valedictory function of conference.

About 550 delegates from India and abroad participated in the event. Several scientists presented their work on drug research, chemical sciences, bionanotechology, chemical biology, glycobiology, pharmacokinetics, toxicology, clinical research, biochemistry, etc.

Inauguration of ISCB - 2010

Dr. T.K. Chakraborty, Director, CDRI presenting a memento to Prof. Robert H. Grubbs, Nobel Laureate

Renowned pharma companies and industries like THINQ Pharma (USA), Jubilant Chemsys Limited, Ranbaxy, ZydusCadila, Orion Pharma, Nicholas Piramal, GVK Biosciences Pvt. Ltd., Torrent Pharmaceuticals Ltd., Wockhardt Aurangabad, etc. also participated in this conference. The four days scientific programs included 9 plenary lectures, 50 invited lectures and 16 oral presentations. Dr. P.M.S.Chauhan, General Secretary declared 9 posters for Best Poster Award of ISCB.

4. 4th International Symposium on Current Trends in Drug Discovery Research

The 4th International symposium on **Current Trends in Drug Discovery Research** 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 scientists and experts from abroad participated in the symposium.

During the inaugural session the candidates were welcomed and addressed by 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. The deliberations were held on wide range of topics including the computational endeavors, 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. The sub-areas for discussion included: cellular and molecular signaling, virtual library design and screening, systems biology, bio-imaging, validated therapeutic targets, translational research, ethics regulation and governance.

Inagural function of CTDDR 2010

Dr. Nitya Nand, Former Director, CDRI presenting a memento to Prof. Johann Gasteiger

5. 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).

A 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 how to cooperate for European funding.

More than 100 researchers, from various Lucknow based institutes and universities, particpated in the programme. Dr. T.K. Chakraborty, Director, CDRI and Dr. Sudeep Kumar, Head, PPD, CSIR, New Delhi delivered welcome address and opening remarks. Dr. Stephane Hogan, Directorate for Health DG Research – European Commission and Dr. B. Kundu, Scientist G, CDRI, Lucknow delivered keynote speeches.

This interactive programme included presentations from representatives from the European Commission, CSIR-Central Drug Research Institute, CSIR-Institute of Genomics and Integrative Biology as well as the Health National Contact Point Network. Indian Institutions, who previously participated in European projects, shared their experiences and the New Indigo project presented the funding opportunities offered within the Networking Pilot Programme.

Dr. Sudeep Kumar, Head, PPD addressing the audience

Ms. Martina DeSole, APRE, Italy addressing the audience

6. National Seminar Laboratory Animal Ethics, Technology and Alternatives

The National Laboratory Animal Centre (NLAC), Central Drug Research Institute, Lucknow organized a one day **National Seminar Laboratory Animal Ethics, Technology and Alternatives** on 19th 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.

Release of Laboratory Animal Science Association of India Newsletter

Dr. D.S. Upadhyay, Head, Laboratory Animal Division, CDRI addressing the audience during symposium

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, Laboratory Animal Science Association of India 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.

7. 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 other pharmacy colleges of the country, to recent developments in the frontier areas of drug discovery, development and delivery systems. About 170 participants attended the symposium. 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. The inaugural function was presided over by Prof. Manoj Kumar Mishra, Vice Chancellor, Lucknow University, Lucknow. Eminent speakers from pharma industry and academia delivered 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 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. The students discussed with eminent speakers about their future prospects in research and pharmaceutical company.

The major attractions of the scientific program were two poster sessions, where in addition to the original research work based presentations, M. Pharm. students also displayed their project based presentations. Two best posters were awarded with cash prize.

A view of the CDRI - NIPER (RBL) symposium

Padma Shree Prof. Seyed E. Hasnain, Vice Chancellor, University of Hyderabad addressing the audience

DEPUTATIONS ABROAD

Name	Place of Visit	Purpose of Visit	Duration
Dr. T.K. Chakraborty	France	For discussion with Dr. Siriwardena Aloysius on collaborative project entitled Design and Synthesis of Novel SAA Based Glycosidase Inhibitors.	16 - 25 October 2009
Dr. Ranjana Srivastava	France	To attend 8th ICAV International Symposium	3 - 6 October 2009
Dr. D.K. Dikshit	France	To attend 8th ICAV International Symposium	3 - 6 October 2009
Dr. Arvind Kumar Srivastava	Poland	INSA, Bilateral Scientist Exchange Programme	22 March -14 April 2010
Dr. Mohd. Imran Siddiqi	Italy	Advanced Diagnostics and Drug Delivery at the Nano-scale: State of the Art and Possible Applications to Orphan Diseases	13 - 15 October 2009
Dr. Rabi Sankar Bhatta	USA	For 5500/4000QTRAP System Proteomics Operator Training Course on Protein Identification	8 - 11 December 2009
Mr. A.L. Vishwakarma	USA	Invited to attend a training course at San Jose, California	5 - 9 October 2009

Distinguished Visitors and Lectures Delivered

Name of Visitor	Lecture Delivered	Date
Dr. N. Pratap Mukhopaydhyay CEO and Head, R&D GeneOmbio Technologies Pvt. Ltd. Pune.	Custom DNA Sequencing and DNA Fingerprinting	06.10.09
Prof. Mohammed Ahmad Director Biotech Centre, University of West Indies, Kingston, Jamaica, West Indies.	Business of Biotechnology: A Marketing and Management Perspective	08.10.09
Prof. Geoffrey A. Cordell University of Illinois, USA.	Sustainable Drugs and Global Health	14.10.09
Ms. Neera Pandey Manager, Business Development Center for Genomic Applications, New Delhi.	Applications and Infrastructure at The Center for Genomic Applications: Utility of These Platform in Scientific Research	24.11.09
Prof. S.S. Agarwal Former Director Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow.	Role of Institutional Ethics Committee	24.11.09
Prof. Raymond C.F. Jones Department of Chemistry Loughborough University, UK.	The Expected and the Unexpected: Adventures with 1,3-Dipoles	08.12.09
Prof. Shantanu Sinha Department of Radiology University of California, San Diego, USA.	Role of Magnetic Resonance Imaging in Drug Discovery and Development	25.12.09
Prof. Ram Mohan Professor of Natural Sciences Department of Chemistry Illinois Wesleyan University, Bloomington, USA.	Environmentally Friendly Organic Synthesis using Bismuth (III) Compounds	18.12.09
Dr. Utpal Banerjee Co-Director, Molecular, Cell & Development Biology University of California, Los Angeles, USA.	Drosophila Hematopoiesis: Stem Cells, Development and Stress Response	31.12.09
Dr. S.R. Narhari Director, Institute of Applied Dermatology, Kasargod, Kerala.	Integrated management of Lymphadenopathy in Filariasis and other Conditions	08.01.10
Dr. John Watson Director of Cellular Analysis and Pharma/Biotech at Promega Corporation, USA.	Using Bioluminescent Technologies to Screen Small Molecule Modulator of Cell Signaling Pathways	09.02.10
Dr. K. Swaminathan Associate Prtofessor Department of Biological Science National University of Singapore, Singapore.	Cell Signaling and Gene Regulation: A Structural Address	22.02.10
Prof. Tariq M. Haqqi Research Director Department of Rheumatology Medicine Metrohealth Medical Centre, Ohio, USA.	Natural Products for Use in Arthritis	08.03.10
Dr. Keshav K. Singh Professor of Oncology Roswell Park Cancer Institute, New York, USA .	Intergenomic Crosstalk and its Role in Cancer	10.03.10
Dr. Helen Parkes LGC, Teddington, Middlesex , UK.	Comparable Precise Measurements: Underpinning Innovation in Bioscience and Healthcare	18.03.10

HONOURS & AWARDS

Dr. S.K. Puri, Scientist G & Head, Division of Parasitology has been elected **Fellow of National Academy of Sciences, India**. Dr. Puri has published over 165 research papers in national and international journals and holds more than 36 Indian and foreign patents.

Dr. S.K. Puri has been associated with planning and execution of CDRI's malaria drug discovery and development programme for the last 30 years. His studies with *Plasmodium cynomolgi* relapsing malaria infection in rhesus monkeys led to the commercialization of novel 8-aminoquinoline antimalarial drug Elubaquine, which has 3-4 times higher safety index as compared to the currently used drug Primaquine. Dr. Puri has been actively involved in the pre-clinical development of third generation synthetic endoperoxide derivatives as alternatives to artemisinine-based drugs, one of which is undergoing Phase I clinical trials and has recieved the prestigious CSIR Technology Award for Innovation - 2009.

Dr. C. Nath, Scientist G & Head, Toxicology Division has been elected **Fellow of Indian Academy of Neurosciences, India**. Dr. Nath has published over 91 research papers in national and international journals and holds over 8 patents.

Dr. Nath, a neuropharmacologist, is working on central neurotransmitter systems in neurobehavioural disorders, dementia, parkinsonism, drug dependence, depression and aggressive behaviour and has received wide recognition. He has been awarded with UVNAS prize for research paper on histaminergic mechanism in aggressive behaviour. His group has done pioneer studies in acetylcholinesterase, a proven target for the development of anti-dementia drugs and brain insulin receptors. Dr. Nath currently working on molecular neuropharmacological aspects of memory functions.

Dr. Renu Tripathi was awarded **Prof. GD. Bhalerao Medal - 2009** for her outstanding scientific research and academic contributions in the area of parasitology. Dr. Tripathi's area of expertise is malaria and she has significantly contributed to the development of a new antimalarial drug α/β arteether for severe drug resistant and cerebral malaria. This drug is marketed by Themis Medicare Ltd., Mumbai and is being exported to more than 30 countries in Asia and African continents. She has also developed oral formulation, as suspension and rectal formulations of this drug as suppositories, for the treatment of critical malaria cases.

Dr. Atul Goel, Scientist, Medicinal and Process Chemistry Division received **Dr. Ghanshyam Srivastava Memorial Award-2007**. The prize was conferred by Professor P.L. Majumder, Honorary Secretary, Indian Chemical Society, India at 46th Annual Convention of Chemists 2009 during 2-6 December 2009 at VIT, Vellore. This award includes honorarium and a Medal. During the award ceremony, Dr. Goel delivered the endowment lecture entitled "2-Pyranones: Versatile Precursors with Unlimited Synthetic Potential".

Dr. Goel's research is mainly focused on developing innovative routes for chemically interesting and biologically important natural and synthetic products as well as synthesis of new organic fluorescent probes with absorption and emission at variety of wavelength for biological (as drug candidates or biomarkers) and material applications. His work published in Organic Letters, has been highlighted by American Chemical Society as significant paper, among 5 selected papers, during May 2009 (Goel et al. Organic Letters, 2009, 6, 1289).

Dr. Kalyan Mitra, Scientist, Electron Microscopy Unit presented an oral paper at the International Conference on Advances in Electron Microscopy and Related Techniques & 31st Annual Meeting of EMSI, held at Bhaba Atomic Research Center, Mumbai from March 8-10, 2010. He won the **Best Electron Micrograph Award in Biological Sciences,** (TEM) category, at a contest held during the conference.

Mr. Prabodh Kapoor, SRF, Molecular and Structural Biology Division bagged the **Dr. M.M. Dhar Memorial Award for the Best Thesis - 2009** in Biological Sciences, sponsored by Dr. Suman Rakhit, President, MCR Research Inc., Canada. He has worked with Dr. C.M. Gupta, Former Director, CDRI towards his Ph.D. program entitled "Functional and structural characterisation of actin from *Leishmania donovani*".

Mr. Mohammad Saquib, SRF, Medicinal and Process Chemistry bagged the **Dr. M.M. Dhar Memorial Award for the Best Thesis - 2009** in Chemical Sciences, sponsored by Dr. Suman Rakhit, President, MCR Research Inc., Canada. He is a student of Dr. A.K. Shaw, Scientist, Medicinal and Process Chemistry Division. The title of his Ph.D. thesis is "Design and synthesis of carbohydrate derived molecules of biological importance".

Ms. Gauri Misra, SRF, Molecular and Structural Biology Division received the **Eli Lilly Asia Outstanding Thesis Award - 2009** (First Prize), awarded by Eli Lilly & Company, USA. She has worked with Dr. R. Ravishankar towards her Ph.D. program entitled "Structural studies on proteins involved in transit peptide mediated transport in *Plasmodium falciparum*".

Mr. Sumit Chaurasia, SRF, Medicinal and Process Chemistry Division received the **Eli Lilly Asia Outstanding Thesis Award - 2009** (Second Prize) awarded by Eli Lilly & Company, USA. He has worked with Dr. Atul Goel, Scientist, Medicinal and Process Chemistry Division towards his Ph.D. program entitled "Studies on isolated or fused 2-pyranones and their nucleophile induced products".

Dr. Antima Gupta, Former SRF, Microbiology Division has received **UNESCO-L'OREAL International Fellowship-2010** based on her Ph.D. work done at CDRI under the supervision of Dr. Ranjana Srivastava, Scientist, Microbiology Division. She is currently working in the University of London, UK.

Ms. Smita Rai, SRF, Biochemistry Division was awarded the **Young Scientist Medal** for her paper entitled "*Leishmania donovani* trypanothione reductase: Role of urea and guanidine hydrochloride in modulation of functional and structural properties" in 21st National Congress of Parasitology, 2009, held at Punjab University, Chandigarh. She is associated with Dr. Neena Goyal, Scientist, Biochemistry Division.

Ms. Mansi Garg, JRF, Biochemistry Division received **Best Poster Award** for her paper "Expression and purification of a protein kinase homologue from *Leishmania donovani*" presented in the 21st National Congress of Parasitology, 2009, held at Punjab University, Chandigarh. She is the research student of Dr. Neena Goyal, Scientist, Biochemistry Division.

Ms. Reema Gupta, SRF, Parasitology Division received **Best Poster Award** for the paper "Miltefosine treatment of *Leishmania donovani* infected hamsters generates Th1 type of response as evidenced by realtime PCR" presented in 10th International Symposium on Vectors and Vector Borne Diseases held at National Institute of Malaria Research, Panaji. She is working with Dr. Anuradha Dube, Scientist, Parasitology Division.

Mr. Prashant Kumar Singh, SRF, Parasitology Division received **Best Poster Award** for the paper entitled "Recombinant iPGM protein of *Brugia malayi* producing Th1/Th2 mixed type immune response shows significant *in vitro* ADCC against *B. malayi* microfilariae and L3 stage" presented in the 21st National Congress of Parasitology, 2009, Punjab University, Chandigarh.He is working with Dr. Shailja Bhattacharya, Scientist, Parasitology Division.

Mr. Hari Narayan Kushwaha, SRF, Pharmacokinetics and Metabolism Division received **Best Poster Award** for the poster "LC-MS/MS assay for quantification of 97/78 and its metabolite 97/63, a promising trioxane antimalarial in human plasma" presented in the 11th ISMAS Triennial International Conference on Mass Spectrometry, Hyderabad. He is working with Dr. S.K. SIngh, Pharmacokinetics & Metabolism Division.

Mr. Sarvendra Vikram Singh, SRF, Toxicology Division received **Best Poster Award** for the poster "Single nucleotide polymorphisms (SNPs) in p53 , p21 and COX2 genes and breast cancer risk in North Indian women - case control study" presented in the 14th Annual Conference of Breast Cancer Foundation of India - 2010, held at CSJM University, Lucknow. He is working with Dr. S.K. Rath, Scientist, Toxicology Division.

CDRI Appreciation Awards - 2010

To enhance the performance and promote high quality research efforts as well as to help organization achieve its potential, CDRI has instituted **Appreciation Awards**, which are being given every year to the CDRI staff under different categories, like best research papers, patents granted during the previous year and best administrative, works & services staff. Each award consists of certificate, plaque and a cash prize.

1. Award for Best Research Paper

This award has been instituted to promote high quality research in biological science and chemical science group and to provide recognition and incentives to promising scientists for original research work. Appreciation Awards 2010 for Best Research Papers were awarded to following research papers:

1.1 Biology Group

a. Amogh A Sahasrabuddhe, RC Nayak and CM Gupta, Ancient Leishmania coronin (CRN12) is involved in microtubule remodeling during cytokinesis, Journal of Cell Science, 122(Pt 10), 1691-1699, [IF: 6.247].

b. Mukesh Samant, Reema Gupta, Shraddha Kumari, Pragya Misra, Prashant Khare, Pramod Kumar Kushawaha, Amogh Anant Sahasrabuddhe and Anuradha Dube, Immunization with the DNA-encoding N-terminal domain of proteophosphoglycan of *Leishmania donovani* generates Th1-type immunoprotective response against experimental visceral leishmaniasis, J Immunol. 183 (1), 470-479 [IF: 6].

c. Parul Mishra and Vinod Bhakuni, Self-assembly of bacteriophage-associated hyaluronate lyase (HYLP2) into an enzymatically active fibrillar film, Journal of Biological Chemistry, 284(8), 5240-5249 [IF: 5.52].

d. Shawon Lahiri, Pratibha Singh, Sarvesh Singh, Naila Rasheed, Gautam Palit and KK Pant, Melatonin protects against experimental reflux esophagitis, J. Pineal Res., 46(2), 207-213 [IF: 5.056].

1.2 Chemistry Group

a. Somnath Nag, Maloy Nayak and Sanjay Batra, First copper-catalyzed intramolecular amidation in substituted 4-iodopyrazoles leading to the synthesis of pyrazolo[4,3-b]pyridin-5-ones, Adv. Synth. Catal. 351, 2715-2723 [IF: 5.619].

b. Mohammad Saquib, Irfan Husain, Brijesh Kumar and Arun K. Shaw, Facile Synthesis of Enantiomerically Pure 2-and 2,3-Disubstituted Furans Catalysed by Mixed Lewis Acids: An Easy Route to 3-Iodofurans and 3-(Hydroxymethyl)furans, Chemistry-A European Journal, 15(24), 6041-6049 [IF: 5.454].

c. Kamlakar Avasthi, Amantullah Ansari, AK Tewari, Ruchir Kant and PR Maulik, Pyrazolo[3,4-d]pyrimidinophanes: Convenient Synthesis of a New Class of Cyclophane and X-ray Structure of the First Representative, Organic Letters, 11(22), 5290–5293 [IF: 5.128].

d. Atul Goel, Sumit Chaurasia, Manish Dixit, Vijay Kumar, Sattey Prakash, Bijayalaxmi Jena, Jai K Verma, Mayank

Jain, RS Anand and SS Manoharan, Donor-acceptor 9-uncapped fluorenes and fluorenones as stable blue light emitters, Organic Letters, 11(6), 1289-1292 [IF: 5.128].

e. Atul Goel, Salil Pratap Singh, Amit Kumar, Ruchir Kant and PR Maulik, Unprecedented ;Bridged Annulation; Approach to the Construction of 5,6-Dihydro-4H-benzo[kl]acridines, Organic Letters, 11,5122-5125 [IF: 5.128].

f. Sharad Porwal, PMS Chauhan, Nishi Shakya, Aditya Verma and Suman Gupta, Discovery of Novel Antileishmanial Agents in an Attempt to Synthesize Pentamidine-Aplysinopsin Hybrid Molecule, Journal of Medicinal Chemistry, 52, 5793–5802 [IF: 4.898].

2. Award for Innovations

The objective of giving is to promote and encourage the spirit of inventiveness amongst scientists. This award is given to the inventors of patent, granted abroad, provided same invention has not been awarded earlier to any of the inventor. Award winning patents for the year 2010 are :

a. Ram Pratap, Mavurapu Satyanarayana, Chandeshwar Nath, Ram Raghubir, Anju Puri, Ramesh Chander, Priti Tiwari, Brajendra Kumar Tripathi, Arvind Kumar Srivastava, Krishna Kumar Chaudhari and Suresh Yadav. *Oxy substituted flavones as antihyperglycemic and antidyslipidemic agents*, US Pat. No.: 7635779, Grant Date: 22/12/09.

b. Vijay Lakshmi, Ajet Saxena, Kartikay Pandey, Kunnath Padmanabhan Madhusudanan, Mahendra Nath Srivastava, Zafar Kamal Khan, Pooja Jain, Gopal Gupta, Janak Dulari Dhar and Jagdamba Prasad Maikhuri. *Improved process for isolation of Bisvittoside D from sea cucumber.* Sri Lankan Pat. No.: 14131, Grant Date: 30/04/2009.

3. Sangita, Atul Kumar, Man Mohan Singh, Girish Kumar Jain, Puvvada Sri Ramanchandra Murthy, Suprabhat Ray, Vasi Ahmad, Abdul Haq Ansari, Mohini Chhabra & Govind Keshri. *Substituted mercapto phenyl naphthyl methane derivatives as SERM for the prevention and treatment of osteoporosis and other estrogen dependent disorders and as contraceptives.* US Pat. No.: 7582653, Grant Date: 01/09/2009.

4. Stuti Gaur, Zeeshan Fatima, Anshuman Dixit, Zahid Ali, William Rascan Surin, Kapil Kapoor, Kanta Bhutani, Mohd. Salim Ansari, Madhu Dikshit & Anil Kumar Saxena. *2-Alkyl/aryl sulphonyl-1,2,3,4-tetrahydro-9H-pyrido [3,4-b] indole-3-carboxylic acid esters /amides as antithrombotic agents.* US Pat. No.: 7601838, Grant Date: 13/10/2009.

5. Neeraj Shakya, Zeeshan Fatima, Chandishwar Nath, Anil Kumar Saxena, Zahid Ali and Bishambhar Nath. *Substituted carbamic acid quinolin-6-yl esters as acetylcholinesterase inhibitors.* European Pat. No.: 1831172, Grant Date: 18/02/2009.

3. Appreciation Awards for Administrative, Works & Services Staff

For the first time in the history of CDRI, Appreciation Awards were given to the staff members working in Administrative, Works & Service Divisions, so as to appreciate their services and motivate others to deliver their best to the Institute. During the period, following members were honoured :-

3.1 Administration

Mr. C.P. Nawani, *Asstt. (G) Grade I*

Mr. Harsh Bahadur, *Asstt. (G) Grade I*

Mr. Saju P. Nair, *Asstt. (G) Grade II*

Mr. Rajendra Prasad, *Asstt. (G) Grade II*

Mr. Kamla Kandpal, *Jr. Steno*

3.2 Finance and Accounts

Mr. R.P. Tripathi, *Asstt. (F&A) Grade I*

Mr. R.C. Bisht, *Asstt. (F&A) Grade I*

Mr. Vikramaditya, *Helper Group I (1)*

3.3 Stores and Purchase

Mr. Arun Wadhera, *Asstt. (S&P) Grade I*

Mr. A.K. Misra, *Asstt. (S&P) Grade I*

Mr. H.B. Neolia, *Asstt. (S&P) Grade I*

3.4 Works and Services

Mr. B.P. Sunwar, *Technical Asstt. Group II (4)*

Mr. GC. Roy, *Technical Asstt. Group II (3)*

Mr. B.D. Pradhan, *Technical Asstt. Group II (3)*

Mr. Ganeshi Prasad, *Helper Group I (4)*

Mr. Mohd. Irfan, *Helper Group I (1)*

STAFF NEWS

NEW HEAD OF THE DIVISION

Dr. Gautam Palit, Scientist G, joined as Head, Pharmacology Division w.e.f. 01/02/2010.

EXTENSION

Dr. Ram Raghubir, Scienitst Gr. IV(6) received extension of service for two years beyond his superannuation i.e. 31/01/2010.

EMERITUS SCIENTIST

Dr. P. R. Maulik joined as CSIR-Emeritus Scientist in the Divison of Molecular and Structural Biology.

NEW APPOINTMENTS

Mr. Deepak Dhawan, Jr. Steno
Ms. Preeti, Tech. Asstt. Gr. II(1)
Ms. Sharadhha, Tech. Asstt. Gr. II(1)
Ms. Shabana, Tech. Asstt. Gr. II(1)
Mr. Pradeep Singh, Helper Gr. I(1)
Mr. Ashok Kumar, Helper Gr. I(1)
Mr. Pradeep Kumar, Helper Gr. I(1)
Mr. Najbullah, Helper Gr. I(1)

PROMOTIONS

Scientists Gr. IV(5) to Gr. IV(6)

Dr. S.P.S. Gaur
Dr. Ashim Ghatak
Mr. Ravindra Singh
Dr. G.K. Jain
Dr. Rajendra Prasad

Technical Officers Gr. III(6) to Gr. III(7)

Mrs. Asha Negi
Dr. S.P. Vishnoi
Mr. H.M. Gauniyal

Technical Officers Gr. III(5) to Gr. III(6)

Mr. Shyamendra Mehrotra
Mr. Suresh Chandra
Dr. S.P.S. Bhandari
Mr. S.L.Verma
Mr. Bikram Banerjee
Mrs. Annapurna Vohra
Mr. S.N.A. Rizvi
Mr. W.F. Rahman

Technical Officers Gr. III(4) to Gr. III(5)

Dr. B. Maity
Mr. J.P. Srivastava
Mr. R.K. Srivastava

Technical Assistant Gr. III(2) to Gr. III(3)

Mr. Sanjay Kumar

Technical Assistants Gr. II(3) to Gr. II(4)

Mr. Chandrika Singh
Mr. Abdul Haleem
Mr. Swapn K. Kaar
Mr. Lakshmi Narayan
Mr. Ram Awatar
Mr. B.R.Yadav
Mr. V.K. Maurya
Mr. H.C.Verma
Mr. Ravinder Singh
Mr. Anoop Kumar Srivastava
Ms. Mithilesh Sharma
Mr. P.K. Bhattacharya
Mr. Radhe Krishna
Mr. S.K. Bhatnagar
Ms. Shashi Rastogi
Mr. Nazir Akbar
Ms. V.J. Ashar
Mr. R.K. Ram
Mr. Basudev Pradhan

Technical Assistants Gr. II(2) to Gr. II(3)

Mr. K.K. Kashyap
Mr. Shakeel Ahmed Khan
Mr. A.K.Verma

Helpers Gr. I(3) to Gr. I(4)

Mr. Umesh Kumar
Mr. Z.U. Beg
Ms. Bhagwanti Devi

Helper Gr. I(2) to Gr. I(3)

Mr. Tara Chand

Jr. Steno to Sr. Steno

Mr. Varun Pathak
Mr. Md. Sufiyan
Mr. Md. Irfan
Mr. Tej Singh

SUPERANNUATION

Dr. Prakash Ranjan Maulik, Scientist Gr. IV(5)
Mrs. Shyamla Saxena, Scientist Gr. IV(5)
Dr. (Mrs.) Sheela Ghoshal, Scientist Gr. IV(4)
Ms. Kanak Lata, Technical Asstt. Gr. II(4)
Mr. R.C.Samant, Technical Asstt. Gr. II(3)
Mr. Ramakant Ram, Technical Asstt. Gr. II(4)
Mr. Shrikant Pandey, Asstt. (G) Gr II
Mr. M.K.Thapar, Asstt. (G) Gr I
Mr. Ahrar, Helper Gr. I(4)
Mr. Madho Singh, Helper Gr. I(4)

VOLUNTARY RETIREMENTS

Dr. Raja Roy, Scientist Gr. IV(5)
Mr. Hari Lal, Helper Gr. I(4)

OBITUARY

Mr. Rajesh Kumar, Gr. II(3) (expired on 31/12/2009)
Mr. Munna Lal Gr. I(4) (expired on 11/11/09)
Mr. Munna, Safaiwala (expired on 09/12/09)

CDRI Family convey their heartfelt condolences to the bereaved families

Bacosides Enriched Standardised Extract of Bacopa (BESEB) A Product from CDRI (CSIR)

BESEB is a unique single plant based natural memory enhancer formulation developed from the traditionally used medicinal plant *Bacopa monniera*. The process for making enrichment of active constitutents (Bacosides A & B) in BESEB has been patented by CDRI (CSIR). Product is being manufactured, marketed and exported by the CDRI (CSIR) licensee M/s Lumen Marketing Company, Chennai (India).

Clinical Trials:

- Clinical trials were conducted by CDRI (CSIR) in India on children suffering from Attention Deficit Hyperactivity Disorder and on old age subjects suffering from Age Associated Memory Impairment.
- Clinical trials on healthy human volunteers were conducted by the Swineburne University of Technology's Brain Sciences Institute, Australia through the National Institute of Complementary Medicine and data have been published in International Journal of Psychopharmacology-2001.
- Clinical trials on healthy human volunteers were conducted by the University of Wollongong, Australia and data have been published in international forum Neuropsychopharmacology.

Who can benefit from BESEB

- Prevention and treatment of dementia;
- Children suffering from Attention Deficit Hyperactivity Disorder;
- Elderly persons suffering from Age Associated Memory Impairment;
- Subjects suffering from stress, tension, anxiety and want to improve their memory

For further information, please contact:

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Sophisticated Analytical Instrument Facility (SAIF) available Online

Sophisticated Analytical Instrument Facility at Central Drug Research Institute, CSIR, Lucknow was set up by the DST, Government of India in mid seventies. SAIF-CDRI provides primarily chemistry centric analytical facilities viz. mass spectrometry, NMR spectrometry, FT-IR spectometry, GLC, elemental analysis, polarimetry, flowcytometry, etc. for researchers. To help user get the necessary information, SAIF-CDRI has launched a web site http://saiflucknow.org

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