Vol. 3 No. 2 October 2011 - March 2012

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

CSIR - CDRI Newsletter

CSIR-Central Drug Research Institute
www.cdriindia.org

From the Director's Desk

It gives me immense pleasure to present before you the CSIR-CDRI newsletter pertaining to a period of last six months in which we concluded our 11th plan programs with a satisfactory note in terms of scientific accomplishments as well as measurable outputs. Further, we strived relentlessly and tuned our 12th plan programs aligned with the aspirations of new India.

Before proceeding further, I wish to record a quick glance of what we have achieved during 11th plan period. We led 3 major network projects, one supra institutional project and participated in 11 networked projects led by other CSIR labs. Apart from the above, we undertook more than 100 new extramural projects funded by national and international funding agencies and industries and generated External Budgetary Resources to the tune of more than Rs. 85.65 Crore. During the same period, we licensed 8 drugs / candidate drugs / new leads / technologies to different industries for further development and commercialisation in the disease areas of national importance towards realising the dream of affordable healthcare. Two products viz. Memory Sure and PCR based Mtb diagnosis kit were launched for marketing. Published more than 1310 research papers with an average IF of 2.66, filed 38 patents in India and 71 patents abroad. About 244 Ph.D. Theses have been submitted and we imparted training to more than 1090 post graduate students in different aspects of health and pharmaceutical research. We received prestigious CSIR Award for Innovation for two consecutive years 2008 & 2009. Several of our scientists received prestigious honours and awards instituted by national and international agencies/organizations. I am glad to note than in each and every parameter of performance measurement, we set new benchmarks.

While basking in the glory of 11th plan performance, we are moving into the 12th plan period with renewed confidence, vigour, and zeal to deliver our best to set new benchmarks of performance. During 12th plan period, apart from the conventional mode of R&D, we are also adopting and leading innovative model of research - Open Source Drug Discovery (OSDD) to deliver the maximum using all the available resources across the national and international front. I take this opportunity to thank all my staff members and students for their constant support and contribution towards taking the Institute to newer heights.

With best wishes

T. K. Chakraborty

(Tushar Kanti Chakraborty)

Highlights of Achievements*

Publications in SCI Journals (2011)	:	**302**
Average Impact Factor (IF)	:	**2.88**
Number of publications with IF>5	:	**22**
Book Chapters (2011)	:	**04**
Patents (2011)		
Filed Abroad	:	**07**
Filed in India	:	**10**
Granted Abroad	:	**09**
Granted in India	:	**02**
Ph.D. Thesis Submitted (2011)	:	**56**
New Projects Initiated (2011-12)	:	**22**
Industry Sponsored Projects	:	**3**
Grant-in-Aid Projects	:	**19**
Technology Demonstrated 2011-12	:	**01** (CDR134D123)
ECF & LRF for 2011-12		**(Rs. in Lakh)**
ECF - Government Departments/PSU's	:	**1343.550**
ECF - Industries/Private Agencies	:	**23.264**
ECF - Foreign Governments/Agencies	:	**49.580**
Total Lab Reserve Generated (LRF)	:	**269.633**
Total External Budgetary Resources (ECF + LRF)	:	**1686.027**

*Provisional Data

A Newsletter from
CSIR-CENTRAL DRUG RESEARCH INSTITUTE
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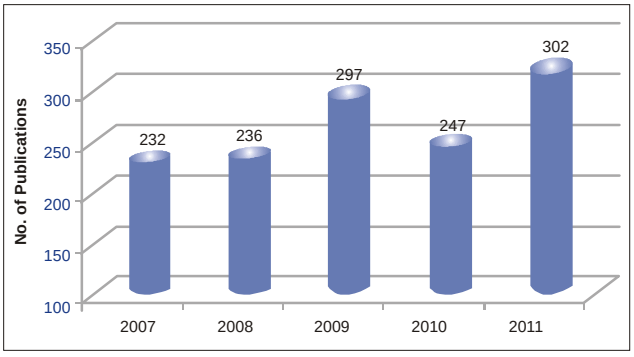
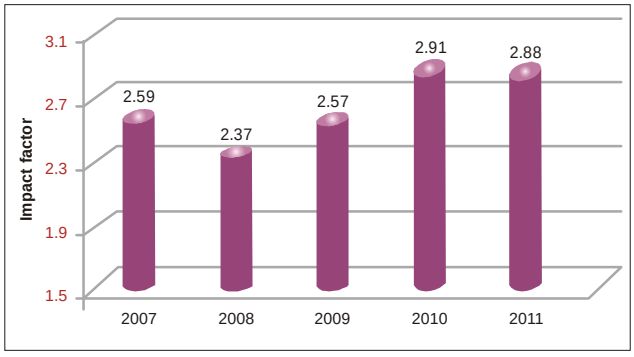
Phone: 0522-2612411-18 (PABX)
Fax: 91-522-2623405/2623938/2629504
Website: www.cdriindia.org

Performance Report

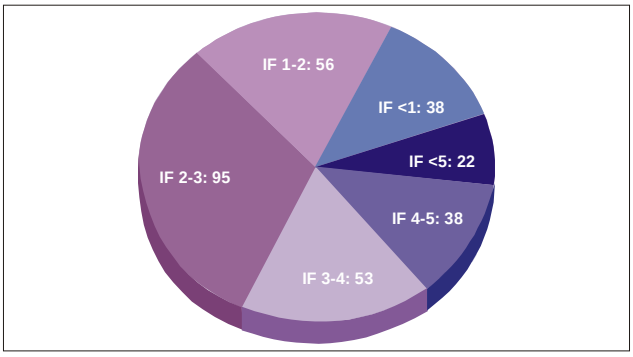
Total Number of Publications



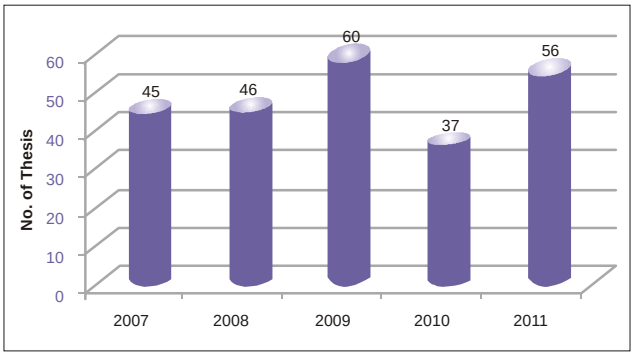
Average Impact Factor of Publications



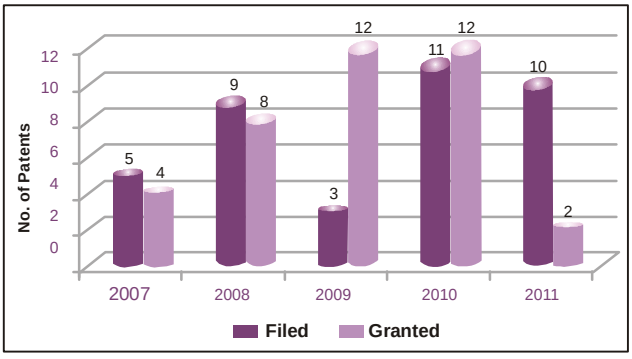
IF wise Number of Publications 2011



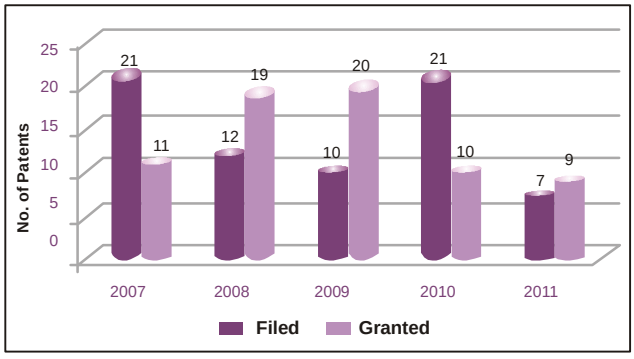
Ph.D. Thesis Submitted



Indian Patents



Foreign Patents



Editorial Board : Chairman : Dr. Tushar Kanti Chakraborty, **Editor-in-Chief :** Mr. Vinay Tripathi, **Executive Editors :** Dr. Anand P. Kulkarniand, Dr. Sanjeev Yadav, **Editorial Board Members :** Dr. D N Upadhyay, Dr. Sripathi Rao Kulkarni, **Hindi Translator :** Mrs. Neelam Srivastava, **Technical Support :** Mr. Jitendra Patel, Mrs. Preeti Agarwal, Mr. Abhishek Ramnani, Mr. Pradeep Srivastava

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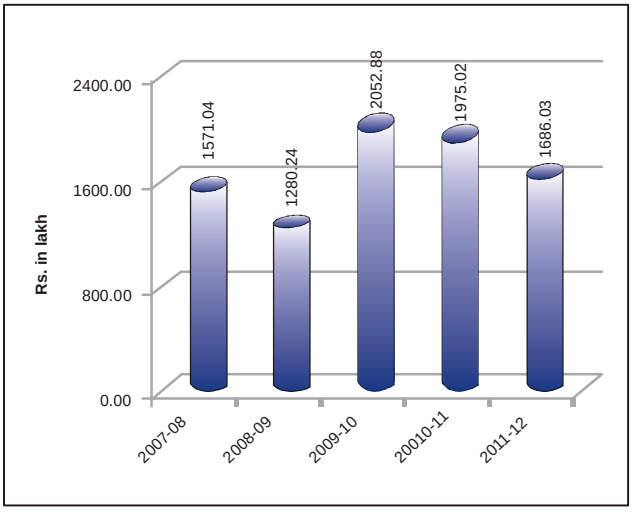
CONTRIBUTIONS TO ECONOMY 2011-12

Total External Budgetary Resources



Demonstration of Process Know-how of CDR-134-D123 (antihyperglycemic)

CDR134D123 is a standardized fraction isolated from a marine source under the mega project 'Drugs from Sea' sponsored by the Ministry of Earth Sciences, Government of India. The product has shown promising antihyperglycemic activity. Product has been licensed to M/s TVC Skyshop Ltd., Mumbai for further development and commercialization. Phase I single and multiple dose study have been completed. Efforts are in place to avail marketing permission for the product in herbal mode. In pursuance of the license agreement with the licensee towards commercialization, the process Know-how for preparation of CDR134D123 has been successfully demonstrated to the representative from M/s TVC Skyshop Ltd during Feb. 27- March 5, 2012.

Major Agreements Signed

S. No.	Title	Industry	Signing Date
Sponsored Project Agreements			
1	Single dose clinical pharmacokinetic study of CDRI 97/78 in healthy human volunteers	Ipca Labortories Ltd., Mumbai.	08.11.2011
2	14 days systemic toxicity study of Ferrocept in rats.	IIT, Kharagpur.	12.11.2011
3	14 days systemic toxicity study RISUGadv in rats	IIT, Kharagpur.	21.11.2011
Consultancy Agreement			
1	To create a facility for polypeptide synthesis at R&D Centre.	Ranbaxy Laboratories Ltd., Gurgaon.	11.10.2011
Secrecy Agreements			
1	A fracture healing bone anabolic agent.	Kemxtree LLC, NJ, USA.	02.09.2011
2	Plant- 4744/F004 showing osteoprotective activity.	Supreem Pharmaceuticals, Mysore.	28.09.2011
3	An anti-osteoporosis (antiresorptive) compound designated as 99/373 for the management of estrogen deficiency including post menopausal osteoporosis.	HLL Lifecare Ltd., Thiruvananthapuram	14.12.2011
Memorandum of Understanding Signed for joint R&D			
1	For the establishment of an international collaboration in research and education.	University of California, San Diego, USA.	23.09.2011
2	An innovation in distraction osteogenesis for mandibular regeneration using a refined transport distractor.	C.S.M. Medical University, Lucknow.	13.10.2011
3	To work on chemical fingerprinting of rare piper and other species	Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Trivandrum	16.02.2012
4	Screening of Anti-filarial Compounds	Banaras Hindu University, Varanasi	23.02.2012
5	CDRI compound 99-373 and Centchroman against Breast Cancer	Medanta Duke Research Institute, Gurgaon	12.03.2012

Contributions to Science & Technology

1. Novel mechanisms of IL-1 β production (Tiwari RL, Singh V, Singh A and Barthwal MK; *Journal of Immunology*, 2011, 187(5), 2632-45; IF: 5.745)

IL-1β is an important pro inflammatory cytokine that has a role in varied type of diseases including type1 and 2 diabetes, atherosclerosis, metabolic syndrome and autoimmune diseases like rheumatoid arthritis and inflammatory bowel disease. Recent findings from our lab demonstrate that interleukin 1 receptor associated kinase (IRAK) regulates IL-1β production in monocytic cells. A functional interaction between IRAK1 and PKC delta is important for the production of this inflammatory cytokine. In this study we identify a novel mechanism of IL-1β production that involves TLR2, CD11b, PKCδ-IRAK1-JNK-AP1 axis. This study proposes new therapeutic targets for the prevention of chronic inflammatory diseases involving IL-1β production.

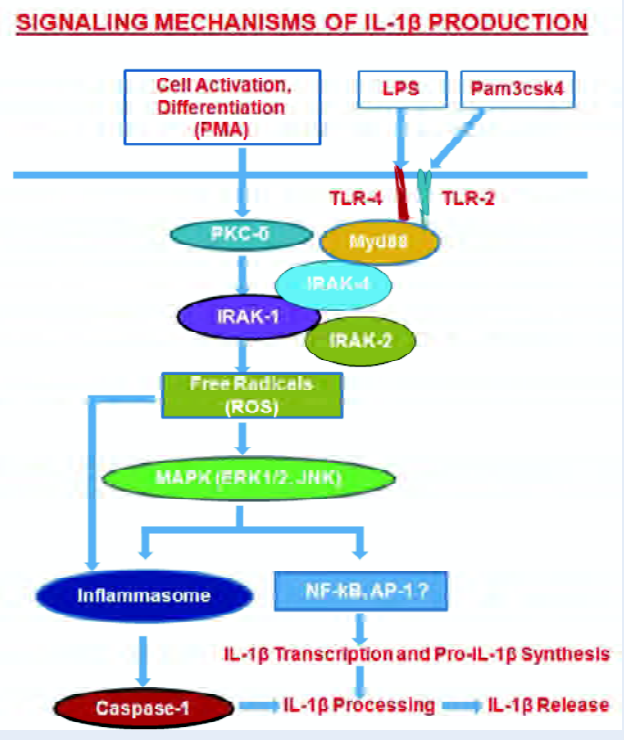
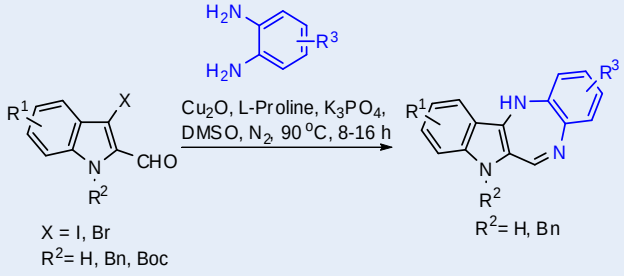


Figure: Model for PKCd- and IRAK1-induced IL-1b production in monocytes. PMA treatment of monocytic cells leads to activation of PKCd. This in turn activates the IRAK1/JNK/AP-1 module to induce IL-1b production. Although NF-kB is also activated, its pharmacological inhibition does not prevent PMA-induced IL-1b production. PKCd-induced IL-1b production seems to be mediated via TLR2 and CD11b since Rottlerin prevents their expression and IL-1b production. IRAK2 and IRAK4 positively regulate PMA-induced IL-1b production whereas IRAKM has a negative impact.

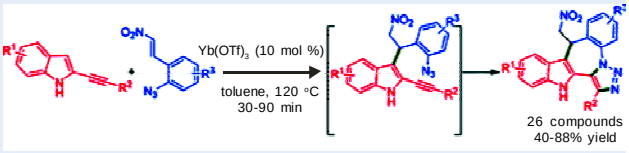
2. Copper-catalyzed synthesis of Indole-fused Benzodiazepines. (Biswas S and Batra S; *Advance Synthesis & Catalysis*, 2011, 353, 2861-2867; IF: 5.250)

The copper-catalyzed synthesis of indole-fused benzodiazepine via a cascade reaction between 3-halo-1H-indole-2-carbaldehydes and substituted 1,2-phenylenediamines is reported. Reactions with N-Boc-protected indole-aldehydes are found to be more efficient to afford indole[3,2-b][1,5]benzodiazepines.



3. Cascade intermolecular michael addition–intramolecular azide/internal alkyne 1,3-dipolar cycloaddition reaction in one pot (Rajesh K. Arigela, Anil K. Mandadapu, Sudhir K. Sharma, Brijesh Kumar and Bijoy Kundu *Org. Lett.*, 2012, *14* (7), pp 1804–1807 IF: 5.25)

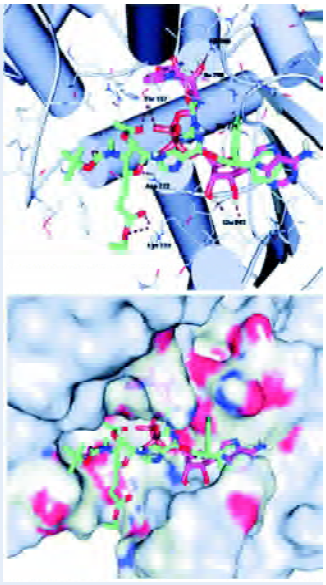
A rapid one-pot protocol for the synthesis of indole-based polyheterocycles via a sequential Lewis acid catalyzed intermolecular Michael addition and an intramolecular azide/internal alkyne 1,3-dipolar



cycloaddition reaction has been described. The generality of the method has been demonstrated by treating a series of aromatic/aliphatic 2-alkynyl indoles with substituted (*E*)-1-azido-2-(2-nitrovinyl)benzenes to furnish annulated tetracyclic indolo[2,3-*c*][1,2,3] triazolo [1,5-*a*][1]benzazepines in good yields.

4. Identification of novel *S*-Adenosyl-L-homocysteine hydrolase inhibitors through homology-model-based virtual screening, synthesis, and biological evaluation (Prashant Khare, Amit K. Gupta, Praveen K. Gajula, Krishna Y. Sunkari, Anil K. Jaiswal, Sanchita Das, Preeti Bajpai, Tushar K. Chakraborty, Anuradha Dube, and Anil K. Saxena *J. Chem. Inf. Model.*, 2012, *52* (3), pp 777–791 (IF: 3.88)

The present study describes a successful application of computational approaches to identify novel *Leishmania donovani* (*Ld)* AdoHcyase inhibitors utilizing the differences for *Ld* AdoHcyase NAD^+ binding between human and *Ld* parasite. The development and validation of the three-dimensional (3D) structures of *Ld* AdoHcyase using the *L. major* AdoHcyase as template has been carried out. At the same time, cloning of the *Ld* AdoHcyase gene from clinical strains, its overexpression and purification have been performed. Further, the model was used in combined docking and molecular dynamics studies to validate the binding site of NAD in *Ld*. The hierarchical structure based virtual screening followed by the synthesis of five active hits and enzyme inhibition assay has resulted in the identification of novel *Ld* AdoHcyase inhibitors. The most potent inhibitor, compound **5**, may serve as a "lead" for developing more potent *Ld* AdoHcy hydrolase inhibitors as potential antileishmanial agents.



OPEN SOURCE DRUG DISCOVERY

CSIR-Central Drug Research Institute, Lucknow

Calls for Project proposals under "OSDD Chemistry Outreach Program" (An Open Source Drug Discovery Program)

Open Source Drug Discovery (OSDD) is a CSIR led team India consortium with international partnerships for affordable healthcare. On the occasion of the International Year of Chemistry in 2011, OSDD launched a Chemistry Outreach Program to create an Open Chemical Library to encourage M.Sc. as well as Ph.D. students at universities/ institutes synthesize molecules to screen against infectious diseases like TB, malaria and other neglected tropical diseases. The main objective in this program is to support research programs for synthesizing molecules with diverse chemical scaffolds that will be stored in a national repository at CSIR-CDRI and will be made available for the different biological screening programs being pursued under the aegis of Open Science initiatives of CSIR. Researchers in universities, academic and research institutes in the country are invited to submit project proposals online in http://crdd.osdd.net/osddchem/ following the guidelines given therein. The proposals can be submitted by any regular faculty of any of the institution. Submissions from industry researchers are also welcome. The submitted proposals shall undergo online open review, which shall form the basis for the final sanction. The sanctioned projects will be funded to the tune of Rs. 1.0 lakh for consumable and non-consumable grant of 5-10 lakhs, depending on the requirements. The consumable grant will be adjusted against the number of samples submitted. Funds will be released subject to signing of an agreement to abide by the terms and conditions contained in the agreement and the terms and conditions of the OSDD license agreement available on the Open Source Drug Discovery website www .osdd.net. For any query the proponents may write to the Director, CSIR-CDRI, Lucknow (director@cdri.res.in), Dr. Sanjay Batra (s_batra@cdri.res.in) or Dr. Haridas B. Rode (haridas.rode@csir.res.in).

THIS IS AN OPEN ADVERTISEMENT AND THE PROPOSALS CAN BE SUBMITTED THROUGHOUT THE YEAR

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New Projects Undertaken

1. Nanoreservoirs carrying *Brugia malayi* recombinant proteins as potential vaccine against experimental lymphatic filariasis

Aim of this research proposal is to develop an oral vaccine by encapsulation of a few recombinant proteins, identified as a candidate vaccine targets due to their reactivity with putatively immune endemic normal human sera, in nanoreservoirs, a type of supra molecular self assemblage carrier module for systemic delivery

PI: Dr. Shailja Bhattacharya, Chief Scientist, Parasitology
Funding agency: ICMR
Approved budget: Rs. 6.99 lakh (Ist year grant)

2. Identification and Characterization of cross-reactive molecules of filarial and leishmanial parasites and their possible prophylactic potential against either infection

The results of the proposed study are expected to provide information on interactions of cross-reactive molecules of both the parasites on the mobilization of immune responses to either infection. This will provide insight into the coinfection in humans and may give valuable leads for designing common parasite molecule-targeted prophylactics.

PI: Dr. P Kalpana Murthy, Chief Scientist, Parasitology
Funding agency: ICMR
Approved budget: Rs. 10.09 lakh (Ist year grant)

3. Elucidation of inflammatory pathways involved in septic shock

This joint project, led by CSIR-CDRI and involving researchers from CSMMU, Lucknow is being undertaken to investigate inflammatory cytokines and Neutrophil extracellular traps formation/release in sepsis patients and cellular signalling events involved in sepsis and NETs formation. The study would have implications in identifying infection in ICU at an early stage and thus help in regulating onset of sepsis & septic shock.

PI: Dr. Madhu Dikshit, Chief Scientist, Pharmacology
Funding agency: ICMR
Approved budget: Rs. 8.08 lakh (Ist year grant)

4. Neuroinflammation and memory impairment in hypertension: Role of the central rennin angiotensin system

Renin angiotensin system (RAS), consisting of angiotensin converting enzyme (ACE) and angiotensin receptors (AT1 and AT2), is known to regulate blood pressure and there preliminary experimental evidences to indicate involvement of RAS in memory functions. However, how ACE and angiotensin receptors effect neuroinflammation is not known. This will be investigated in Lipopolysaccharide induced neuroinflammation in spontaneously hypertensive rats. This study will unveil the role of rennin angiotensin system in neuroinflammation associated with memory deficit in hypertensive rats.

PI: Dr. Rakesh Shukla, Senior Principal Scientist, Pharmacology

Funding agency: ICMR

Approved budget: Rs. 7.08 lakh (Ist year grant)

5. Preclinical studies of a novel phyto-estrogen-like compound for the management of postmenopausal osteoporosis

Proposed project aims to study the cellular target of 6-C-β-D-glucopyranosyl-(2S,3S)-(+)-3',4',5,7-tetrahydroxyflavoneas (GTPD) an osteogenic agent, isolated from an Indian medicinal plant, determine its bone forming effect in osteopenic female rats, oral bio availability and assess acute toxicity and genotoxicity. Successful completion of this study has the potential to develop therapeutic modalities for the human diseases where lack of bone formation is the pathology, such as Menopausal osteoporosis.

PI: N Chattopadhyay, Senior Principal Scientist, Endocrinology

Funding agency: ICMR

Approved budget: Rs. 13.19 lakh

6. Circadian modifications in cancer progression

This joint collaborative project under India-Japan S&T Cooperation Program to be implemented by researchers from CSIR-CDRI, Lucknow and Toho University School of Medicine, Japan aims to characterize the circadian protein modifications in cancer progression and integrate theoretical hypotheses with experimental evidence in order to help optimize basis for circadian administration of cancer treatments.

PI: Dr. DP Mishra, Senior Scientist, Endocrinology

Funding agency: DST

Approved budget: Rs. 4.58 lakh

7. Investigation of effect of polysaccharide in modifying leishmanicidal potential of nanoparticulate system bearing chemotherapeutics agent

Project proposed to develop nanoparticles with and without anchoring or coating with polysaccharide for delivery of leishmanicidal drug with an objective of enhancing antileishmanial activity of entrapped bioactive molecule with simultaneous reduction of its dose. A robust delivery system for controlled release of anti-leishmanial drug may be expected with sufficient data from this project.

PI: Dr. Manish K. Chourasia, Scientist, Pharmaceutics

Funding Agency: DST

Approved budget: Rs. 21.63 lakh

8. Functional characterization of CRN 12 In Leishmania Parasites

It has been established that coronin isoform(CRN12) that co-localizes in the actin-filaments in Leishmania parasites is essential for survival of these parasites. However in order to validate this protein as a drug target, it is essential to precisely decode its vital functions, in absence of which Leishmania cell die. Project proposes to create a 'conditional gene knockout' mutant of CRN12 in Leishmania which can bypass the problem of ploidy generation and then elucidate the mechanism by which lethal phenotypes are generated in the CRN12 null cells.

PI: Dr. Amogh Sahasrabuddhe, Scientist, Molecular & Structural Biology

Funding agency: DBT

Approved budget: Rs. 38.32 lakh

9. To study immunoprotective roles of methoxyisoflavones in estrogen-deficiency induced bone loss

Project aims to study the immune protective potential of methoxyisoflavones, compounds isolated from Butea with osteogenic activity, in estrogen deficiency induced bone loss. The result will help to understand the crosstalk between immune system and bone and further the immune protective potential of these methoxyisoflavones in estrogen deficiency induced bone loss.

PI: Dr. Divya Singh, Scientist, Endocrinology

Funding agency: DST

Approved budget: Rs. 34.60 lakh

10. Investigation on immunomodulation mediated by *Mycobacterium tuberculosis* during persistent infection

Fibroblasts are known to have immunomodulatory properties to control tissue damage inevitable during immune defense mechanisms. *Mycobacterium tuberculosis* (MTB) has been demonstrated to infect and replicate inside mouse and human fibroblast cell lines, and MTB DNA has been detected inside human lung fibroblasts. The proposed project aims to demonstrate if MTB can infect lung fibroblasts *in vivo* (mouse model) during acute and/or chronic stages of infection and to see if infected/uninfected fibroblasts affect the functions of innate and adaptive immune cells fighting MTB. Project is expected to reveal more about host-MTB interactions leading to MTB persistence.

PI: Dr. YK Manju, Scientist, Drug Target Discovery & Development

Funding agency: DST

Approved budget: Rs. 14.41 lakh

Some Important Publications

Biological Sciences

Sl. No.	Authors	Title	Journal, Vol. Issue No. Page No.	IF
1	Saxena R and Dwivedi A	ErbB family receptor inhibitors as therapeutic agents in breast cancer: Current status and future clinical perspective	Medicinal Research Reviews 32(1),166-215	10.228
2	Kushwaha PK, Gupta R, Sundar S, Sahasrabuddhe AA and Dube A	Elongation Factor-2- a Th1 and IL-12 stimulatory protein of *Leishmania donovani* generates strong IFN-γ response in cured Leishmania-infected patients/ hamsters and protects hamsters to Leishmania challenge	Journal of Immunology 187, 6417-6427	5.745
3	Verma RK, Mukker JK, Singh RSP, Verma KK, Priya RP and Misra A	Partial biodistribution and pharmacokinetics of isoniazid and rifabutin following pulmonary delivery of inhalable microparticles to rhesus macaques	Molecular Pharmaceutics 9(4), 1011-6	5.400
4	Srivastava RM, Srivastava S, Singh M, Bajpai VK and Ghosh JK	Consequences of alteration in Leucine Zipper sequence of Melittin in Its neutralization of lipopolysaccharide-induced proinflammatory response in macrophage cells and interaction with lipopolysaccharide	Journal of Biological Chemistry 287(3), 1980-1995	5.328
5	Maurya SK, Rai A, Rai NK, Deshpande S, Jain R, Mudiam MKR, Prabhakar YS and Bandyopadhyay S	Cypermethrin induces astrocyte apoptosis by the disruption of the autocrine/paracrine mode of epidermal growth factor receptor signaling	Toxicological Sciences 125(2), 473-487	5.093
6	Swarnkar G, Sharan K, Siddiqui JA, Mishra JS, Khan, K, Khan P, Gupta V Rawat P, Maurya R, Dwivedi AK; Sanyal S and Chattopadhyay N	A naturally occurring naringenin derivative exerts potent bone anabolic effects by mimicking oestrogen action on osteoblasts	British Journal of Pharmacology 165(5), 1526-42	4.925
7	Siddiqui JA, Swarnkar G, Sharan K, Chakravarti B, Gautam AK, Rawat P, Kumar M, Gupta V, Manickavasagam L, Dwivedi AK, Maurya R and Chattopadhyay N	Naturally occurring rare analog of quercetin promotes peak bone mass achievement and exerts anabolic effect on osteoporotic bone	Osteoporosis International 22(12), 3013-27	4.859
8	Tyagi A and Singh D	Estrogen deficiency leads to increased differentiation of Il-17 secreting Th17 cells which might adversely affect bone formation	Osteoporosis International 22, 214-215	4.859
9	Tyagi AM, Srivastava K, Kureel J, Kumar A, Raghuvanshi A, Yadav D, Maurya R, Goel A and Singh D	Premature T cell senescence in Ovx mice is inhibited by repletion of estrogen and medicarpin: a possible mechanism for alleviating bone loss	Osteoporosis International 23(3), 151-1161	4.859

Chemical Sciences

	Authors	Title	Journal, Vol., Issue, Page No.	IF
1	Kumar A, Tripathi VD and Kumar P	β-Cyclodextrin catalysed synthesis of tryptanthrin in water	Green Chemistry 13 (1), 51-54	5.472
2	Kumar Atul, Gupta, Maneesh Kumar and Kumar Mukesh	L-Proline catalysed multicomponent synthesis of 3-amino alkylated indoles via a Mannich-type reaction under solvent-free conditions	Green Chemistry 14(2), 290-295	5.472
3	Biswas S and Batra S.	Copper-catalyzed synthesis of Indole-fused Benzodiazepines	Advance Synthesis & Catalysis 353, 2861-2867	5.250
4	Biswas S, Nayak M, Kanojiya S and Sanjay Batra	Copper-catalyzed cascade reaction for practical and efficient synthesis of alkyl 2H-isoindole-1-carboxylates	Advance Synthesis & Catalysis 353, 3330-3334	5.250
5	Narender T, Sarkar S, Rajendar K and Tiwari S	Synthesis of Biaryls via AlCl3 catalyzed domino reaction involving cyclization, dehydration and oxidation	Organic Letters 13(23), 6140-43	5.250
6	Kumar Atul, Gupta Garima and Srivastava Suman	Synthesis of new class of alkyl azarene pyridinium zwitterions via Iodine mediated sp3 C-H bond activation	Organic Letters 13 (24), 6366-6369	5.250
7	Reddy Maddi Sridhar, Kumar Yalla Kiran and Thirupathi Nuligonda	A New Synthesis of gamma-Butyrolactones via AuCl3- or Hg(II)-Catalyzed Intramolecular Hydroalkoxylation of 4-Bromo-3-yn-1ols	Organic Letters 14(3), 824-827	5.250
8	Arigela Rajesh K, Mandadapu Anil K, Sharma Sudhir K, Kumar Brijesh and Kundu Bijoy	Cascade intermolecular Michael addition-intramolecular azide/internal alkyne 1,3-dipolar cycloaddition reaction in one pot	Organic Letters 14(7), 804-7	5.250
9	Singh Chandan, Kanchan Rani, Chaudhary Sandeep and Puri Sunil K.	Linker-based hemisuccinate derivatives of artemisinin: Synthesis and antimalarial assessment against multidrug-resistant *Plasmodium yoelii nigeriensis* in mice	Journal of Medicinal Chemistry 55(3), 117-1126	5.207
10	Sashidhara Koneni V, Kumar Manoj, Sonkar Ravi, Singh Bhanu Shankar, Khanna A K and Bhatia Gitika	Indole-based fibrates as potential hypolipidemic and antiobesity agents	Journal of Medicinal Chemistry 55(6), 2769-79	5.207

PATENTS

(October 2011 - March 2012)

Patents Filed Abroad

1. **PCT Patent App. No:** PCT/IN2011/000032 **Date of Filing:** 12 January 2012

   Title: Chiral 3-aminomethylpiperidine derivative as inhibitors of collagen induced platelet activation and adhesion

   Inventors: Dinesh Kumar Dikshit, Madhu Dikshit, Tanveer Irshad Siddiqui, Anil Kumar, Rabi Sankar Bhatta, Girish Kumar Jain, Manoj Kumar Barthwal, Ankita Misra, Vivek Khanna, Prem Prakash, Manish Jain, Vishal Singh, Varsha Gupta and Anil Kumar Dwivedy.

2. **PCT Patent App. No:** PCT/IN2012/000051 **Date of Filing:** 23 January 2012

   Title: Oligopeptides and process for preparation thereof

   Inventors: Tushar Kanti Chakraborty, Gajula Praveen Kumar, Dulal Panda and Jayant Asthana

3. **PCT Patent App. No:** PCT/IN2012/000053 **Date of Filing:** 24 January 2012

   Title: Substituted 1, 2, 3, 4-tetrahydroquinolin-7-yl carbamates, their preparation, and use thereof as acetylcholinesterase (ache) inhibitors for the treatment of alzheimer's and other neurodegenerative disease

   Inventors: Kuldeep Kumar Roy, Santoshkumar Tota, Chandishwar Nath, Rakesh Shukla and Anil Kumar Saxena

4. **PCT Patent App. No :** PCT/IN2012/000145 **Date of Filing:** 01 March 2012

   Title: Substituted 4-arylthiazole-2-hydrazone derivative for the treatment of tuberculosis

   Inventors: Supriya Singh, Kuldeep Kumar Roy, Sandeep Kumar Sharma, Ranjana Srivastava, Vinita Chaturvedi and Anil Kumar Saxena

   Supporting staff: Zahid Ali and Arimardan Singh Kushwaha

Patents Filed in India

1. **Patent App. No:** 3493DEL2011 **Date of Filing:** 05 December 2011

   Title: Triazole substituted terpenyl pyrazolidines and process for preparation thereof

   Inventors: Shivaji Narayan Suryawanshi, Suman Gupta, Avinash Tiwari, Shalini Singh, Monika Mittal and Rahul Shivahare

   Supporting staff: Manju

2. **Patent App. No:** 3494DEL2011 **Date of Filing:** 05 December 2011

   Title: Terpenyl isoxazole based hybrid compounds and process for preparation thereof

   Inventors: Shivaji Narayan Suryawanshi , Suman Gupta, Neena Goyal, Santosh Kumar, Monika Mittal and Rahul Shivahare

   Supporting staff: Manju

3. **Patent App. No:** 3495DEL2011 **Date of Filing:** 05 December 2011

   Title: Heteroterpenoid carboxylic acid and derivatives and a process for preparation thereof

   Inventors: Shivaji Narayan Suryawanshi, Suman Gupta, Santosh Kumar, Monika Mittal and Aditya

   Supporting staff: Manju

4. **Patent App. No:** 0014DEL2012 **Date of Filing:** 03 January 2012

   Title: N-(3-((Diethylamino methyl)-4-hydroxyphenyl)-N-(quinolin-4-yl)sulfonamide derivatives for the treatment of tuberculosis

   Inventors: Supriya Singh, Kuldeep Kumar Roy, Shaheb Raj Khan, Vivek Kumar Kashyap, Sandeep Kumar Sharma, Yasoda Manju Krishnan, Vinita Chaturvedi, Sudhir Sinha, Ranjana Srivastava and Anil Kumar Saxena

5. **Patent App. No:** 0363DEL2011 **Date of Filing:** 17 January 2012

Title: Substituted 1, 2, 3, 4-tetrahydroquinolin-7-yl carbamates, their preparation, and use thereof as acetylcholinesterase (ache) inhibitors for the treatment of alzheimer's and other neurodegenerative disease

Inventors: Kuldeep Kumar Roy, Santoshkumar Tota, Chandishwar Nath, Rakesh Shukla and Anil Kumar Saxena

6. **Patent App. No:** 208DEL2011 **Date of Filing:** 25 January 2012

Title: Chiral 3-aminomethylpiperidine derivatives as inhibitors of collagen induced platelet activation and adhesion

Inventors: Dinesh Kumar Dikshit, Madhu Dikshit, Tanveer Irshad Siddiqi, Anil Kumar,Ravi Shankar Bhatta,Girish Kumar Jain,Manoj Kumar Barthwal, Ankita Mishra, Vivek Khanna, Prem Prakash, Manish Jain and Vishal Kumar

Supporting staff: Surendra Singh, C.P. Pande, Kanta Bhutani and M.S. Ansari

7. **Patent App. No:** 0265DEL2011 **Date of Filing:** 31 January 2012

Title: Novel 3, 3-spiroanellated 5, 6-disubstituted -1, 2, 4-trioxanes as antimalarial agents and a process for the preparation thereof

Inventors: Prem Prakash Yadav, Sunil Kumar Puri, Ranjani Maurya and Awakash Soni

8. **Patent App. No:** 0364DEL2011 **Date of Filing:** 31 January 2012

Title: Aryl aryl methyl thio arenes (aamtas) as antimalarial agents and a process for the preparation thereof

Inventors: Gautam Panda, Priyanka Singh, Sanjit Kumar Das, Subal Kumar Dinda, Manish Goyal and Uday Bandyopadhyay

9. **Patent App. No:** 0732DEL2011 **Date of Filing :** 31 January 2012

Title: Oligopeptides and process for preparation thereof

Inventors: Tushar Kanti Chakraborty, Gajula Praveen Kumar, Dulal Panda and Jayant Asthana

10. **Patent App. No:** 0262DEL2012 **Provisional Date of Filing:** 31 January 2012

Title: Novel Substituted 2H-Benzo[e]indazole-9-carboxylates for the treatment of diabetes and related metabolic disorders

Inventors: Atul goel, Gaurav Taneja, Neha Rahuja, Arun Kumar Rawat, Natasha Jaiswal, Akhilesh Kumar Tamrakar and Arvind Kumar Srivastava

11. **Patent App. No:** 0263DEL2012 **Provisional Date of Filing:** 31 January 2012

Title : Preparation and Antimalarial activity of Novel quinoline derivatives

Inventors : Seturam Bandhacharya Katti, Wahajul Haq, Kumkum Srivastava, Sunil Kumar Puri, Manish Sinha, Awakash Soni and Rajeev Kumar Srivastava

Supporting staff: Kamlesh Kumar Singh

12. **Patent App. No:** 1580DEL2011 **Date of Filing :** 02 March 2012

Title: Substituted 4-arylthiazole-2-hydrazone derivative for the treatment of tuberculosis

Inventors: Supriya Singh, Kuldeep Kumar Roy, Sandeep Kumar Sharma, Ranjana Srivastava, Vinita Chaturvedi and Anil Kumar Saxena

Supporting staff: Zahid Ali and Arimardan Singh Kushwaha

13. **Patent App. No:** 0594DEL 2012 **Provisional Date of Filing :** 02 March 2012

Title: NEF-ASKI interaction inhibitor as novel anti HIV therapeutics Inventors : Raj Kamal Tripathi

Inventors: Raj Kamal Tripathi, Balwant Kumar, Ravishankar Ramachandran, Jitendra Kumar Tripathi, Smrati Bhadauria, Jimut Kanti Ghosh

Major Events Organized

Lecture by Prof. C.N.R. Rao as a part of International Year of Chemistry celebrations

As a part of the International Year of Chemistry 2011 (IYC 2011) celebrations, CSIR-CDRI organized a lecture by Padma Vibhushan Prof. CNR Rao, FRS, National Research Professor and Linus Pauling Research Professor, JNCASR, Bangalore and Chairman, Science Advisory Council to the Prime Minister of India on 21st September, 2011. Function was attended by the Directors of all CSIR labs, more than 225 students of various colleges and universities based at Lucknow and CSIR-CDRI staff. Dr. Rao delivered a lecture on 'Chemistry: Glorious Past and Exciting Future' in which he pointed out how Chemistry is an instrument to alleviate human suffering, to improve the quality of human life and build necessary bridges. He described that Chemistry as the queen and servant of biology as well as material sciences in this lucid and simple booklet on the development and importance of Chemistry. During the event, 'Chemistry Today' a booklet authored by Prof. Rao, to celebrate the IYC 2011, was distributed to the students.

CSIR-CDRI Award-2011 for Excellence in Drug Research

CSIR-CDRI Awards for Excellence in Drug Research has been instituted in the year 2004 to honour the Indian researchers below 45 years of age who have contributed significantly to the broad areas of drug research. The CSIR-CDRI Award for Excellence in Drug Research for the year 2011 in Life Sciences has been awarded to Dr. Shantanu Chowdhury, IGIB, New Delhi for his work on "Genome wide predictions of G-quadruplex as promising drug targets" whereas in Chemical Sciences the award has gone to Dr. Gangadhar J. Sanjayan, NCL, Pune for his work on "Design and development of artificial proteins scaffolds which may be of considerable use in intervening various protein-protein interactions and cell membrane interactions". A presentation ceremony of CDRI Awards - 2011 was held on 26 September 2011. Prof. N. Jayaraman, Department of Organic Chemistry, Indian Institute of Science, Bangalore presided over the function and delivered a lecture on PETIM Dendrimer Gene Delivery Platforms. Dr. Chowdhury delivered the award oration on 'Another dimension to gene regulation: The emerging story of G-quadruplex DNA structure as molecular targets'. Dr. Sanjayan delivered award oration on 'From peptides to foldamers: Use of non-covalent interactions in structural design'.

CSIR Foundation Day Celebrations

The Institute celebrated the 69th CSIR Foundation Day on September 26, 2011. During the day, a Science Exhibition was organized in the CSIR-CDRI Museum which was inaugurated by the Chief Guest of the event Prof. N. Jayaraman, Department of Organic Chemistry, Indian Institute of Science, Bangalore. The exhibition remained open for students and public throughout the day. More than 400 students and teachers from different schools and colleges visited exhibition and some selected laboratories. The main function was organised in the afternoon.