



Industry-Academia NOST Conclave
September 13-14, 2022
Venue: EMBA Hall, SJSOM, IIT Bombay



Abstract Book



NOST Trustees



Prof. Ganesh Pandey



Dr. K. Nagarajan



Prof. Vinod K Singh



Dr. Nitya Anand



Prof. S. Chandrasekaran



Prof. Sukh Dev



Prof. S.V. Kessar



Prof. Goverdhan Mehta



Dr. J. S. Yadav

NOST Council



Dr. S. Chandrasekhar



Prof. Sandeep Verma



Prof. Krishna P. Kaliappan



Dr. Prathama S Mainkar



Prof. T Punniyamurthy



Dr. D. Srinivasa Reddy



Prof. Akhila K Sahoo

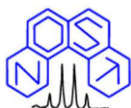


Prof. G Sekar



Prof. Mayashankar Singh

Program Schedule



Industry-Academia NOST Conclave
Venue: EMBA Hall, IIT Bombay (September 13-14, 2022)



Program Schedule

Arrival: Monday, September 12, 2022

Dinner: Gulmohar, IIT Bombay, 3rd floor- 7.30 to 10.30 PM

Tuesday, September 13, 2022

9.30 to 9.35 AM
9.35 to 9.50 AM
9.50 to 10.00 AM

Welcome by Krishna P. Kaliappan
About the NOST- Ganesh Pandey
Theme Introduction by NOST Co-Chairs
S. Chandrasekhar and Sandeep Verma

10.00 to 11.15 AM

Agrochemicals/Catalysis
(Chairperson: Bhanu Manjunath/Vijaya Anand)

10.00 to 10.20 AM

Samir P. Dave (AIMCO Pesticides, Mumbai)
*'Challenges and Opportunities for Industry-Academia
Collaboration in Agrochemical Industries'*

10.20 to 10.40 AM

Buddhadeb Chattopadhyay (CBMRI, Lucknow)
*'Catalysis for C-H Functionalization-Future
Technology: Scope & Gap'*

10.40 to 11.00 AM

Ramanan Thirumoorthy (Laurus Bio, Hyderabad)
'The role of biocatalysis in organic synthesis'

11.00 to 11.15 AM

Q & A

Tea Break: 11.15 to 11.45 AM

11.45 to 1.00 PM

New Platform Technologies
(Chairperson: Vibha Tandon/Rakeshwar

Bandichhor)

11.45 to 12.05 PM

Srividya Ramakrishnan (Dr. Reddy's, Hyderabad)
'Advanced Manufacturing with Emerging Technologies'

12.05 to 12.25 PM

Vishal Rai (IISER Bhopal)
*'Platforms for Precisely Engineered Protein- and
Antibody-Conjugates'*

12.25 to 12.45 PM

Sitaram Pal (Syngenta, Goa)
*'Addressing Sustainability through New Platform
Technologies at Syngenta'*

12.45 to 1.00 PM

Q & A

Lunch Break: 1.00 to 2.00 PM

2.00 to 3.15 PM	Polymers and Materials (Chairperson: Sunil Deshmukh/T. Punniyamurthy)
2.00 to 2.20 PM	Gopi Chandran (AMAT, Mumbai) 'Chemistry: A key contributor for solving High Value Problems'
2.20 to 2.40 PM	Satish Patil (IISc, Bangalore) ' <i>Organic Materials for Energy Generation and Storage Devices</i> '
2.40 to 3.00 PM	Anubhav Saxena (Pidilite, Mumbai) ' <i>NextGen Adhesives and Sealants based on Hybrid and Sustainable Materials</i> '
3.00 to 3.15 PM	Q & A
3.15 to 3.35 PM	Session on Funding Opportunities for Industry-Academia Collaboration (Chairperson: Govindasamy Sekar)
3.35 to 3.45 PM	Sandeep Verma (SERB-Secretary) Q & A
Tea Break: 3.45 to 4.15 PM	
4.15 to 5.50 PM	Pharma for Well-being (Chairperson: C. V. Ramana/D. Srinivas Reddy)
4.15 to 4.35 PM	Mukund K. Gurjar (Emcure, Pune) 'Process chemistry of complex generic drugs and beyond'
4.35 to 4.55 PM	Naresh Jain (NJ Bio, USA) ' <i>Accelerated Pathway from Antibody to ADC</i> '
4.55 to 5.15 PM	Ganesh Sambasivam (Anthem Biosciences) ' <i>Green Chemistry-A New Order of the Day</i> '
5.15 to 5.35 PM	Navaratna Vajpai (Biocon, Bangalore) ' <i>Biosimilar-Opportunities and Challenges</i> '
5.35 to 5.50 PM	Q & A
Conclave Dinner @ 7.30 PM	Global Fusions

Wednesday, September 14, 2022

9.30 to 10.00 AM	Special Lecture (Chairperson: Harinath Chakrapani)
	Dietmer Hueglin (BASF, Mumbai) ' <i>Bridging the gap between Chemical Industry and Academia through Open Innovation</i> '

10.00 to 11.15 AM

**Perfumery/Chemical Biology
(Chairperson: Prathama Mainkar/Srihari Pabbaraja)**

10.00 to 10.20 AM

Avani Mainkar (Keva, Mumbai)
'Chemistry & the Future of Fragrance Industry'

10.20 to 10.40 AM

Suvarn Kulkarni (IIT Bombay)
*'Rare Sugar Containing Glycans in Pathogenic Bacteria –
Synthesis and Applications'*

10.40 to 11.00 AM

T. Govindaraju (JNCASR, Bengaluru)
*'Disease diagnostics and therapeutics through
laboratory-innovation and translation'*

11.00 to 11.15 AM

Q & A

Tea Break: 11.15 to 11.45 AM

11.45 to 1.00 PM

**New Platform Technologies
(Chairperson: Akhila K. Sahoo/Alakesh Bisai)**

11.45 to 12.05 PM

Arijit Roy (TCS, Hyderabad)
*'Artificial Intelligence for Drug Discovery: Science
Fiction or Scientific Fact?'*

12.05 to 12.25 PM

Raji Reddy (CSIR-IICT, Hyderabad)
*'Sustainable Strategies for New Molecular Entities and
APIs: Recent Endeavours'*

12.25 to 12.45 PM

Kishan Gurram (Sravathi, Hyderabad)
*'Flow Technology & AI Platform-A Unique Approach
for Quicker Commercialization of Process
Technologies'*

12.45 to 1.00 PM

Q & A

Lunch Break: 1.00 to 2.00 PM

2.00 to 3.00 PM

**Session on Funding Opportunities for Industry-
Academia Collaboration
(Chairpersons: Raghu Palle/C. S. Venkatesan)**

2.00 to 2.25 PM

S. Chandrasekhar (Secretary-DST)

2.25 to 2.50 PM

Santosh J. Gharpure, PIC-SINE, IIT Bombay)
'Promoting Entrepreneurship in Academia'

2.50 to 3.00 PM

Q & A

3.00 to 3.30 PM

Special Lecture
(Chairperson: B. Gopalan)

Anjan Ray (CSIR-IIP, Dehradun)
'Green Processes and Fine Chemicals'

3.30 to 4.00 PM

High Tea

4.00 to 5.00 PM

Session X- Fireside Chat
(Chairperson/Moderator: Srinivas Oruganti)

5.00 to 5.15 PM

Concluding Remarks & Departure

ABSTRACTS

Agrochemicals/Catalysis
Chairperson:
Bhanu Manjunath
Vijaya Anand

BHANU MANJUNATH NARAYAN

**DIRECTOR R & T CENTRE, Syngenta
Biosciences Pvt Ltd.**



Education

1994 Ph.D “DOCTORATE IN CHEMISTRY” From Jawaharlal Nehru technological University (JNTU) Hyderabad and worked at IICT, HYDERABAD under the guidance of Padmabhusan Dr A V Rama Rao

1989 M Pharm MATER OF PHARMACY, Institute of Chemical technology ICT, Formerly UDCT, Mumbai University

2004 PGDIPM Post graduate diploma in Intellectual property Management from National Law school Bangalore

1994 Ph.D “DOCTORATE IN CHEMISTRY” From Jawaharlal Nehru technological University (JNTU) Hyderabad and worked at IICT, HYDERABAD under the guidance of Padmabhusan Dr A V Rama Rao

1989 M Pharm MATER OF PHARMACY, Institute of Chemical technology ICT, Formerly UDCT, Mumbai University

2004 PGDIPM Post graduate diploma in Intellectual property Management from National Law school Bangalore

Work Experience

2011 – till date – Director Syngenta Biosciences Pvt Ltd
and Chairman of the Board of Directors of SBPL.

2006 to 2011 Vice President API R & D Watson Pharma Pvt Lts,
Head of process R & D and Analytical Development

2003 to 2006 Assistant Director, Lupin labs Pvt Ltd, Pune

1994 to 2003 Researcher at Cipla ltd, Mumbai

Ramasamy Vijaya Anand

**Associate Professor (Chemical Sciences) &
Dean of Research & Development
Indian Institute of Science Education & Research
(IISER) Mohali
Sector 81, Knowledge City, SAS Nagar, Manauli
(PO) Punjab – 140306, India.**

Email: rvijayan@iisermohali.ac.in

WWW:

<http://www.iisermohali.ac.in/html/faculty/vijaya.html>



Ramasamy Vijaya Anand obtained Ph.D. in synthetic organic chemistry from the Indian Institute of Technology Kanpur in 2003. Subsequently, he moved to Glasgow, UK to take up a postdoctoral position at the University of Strathclyde, where he worked for two years. He held another postdoctoral stint at the Texas A&M University, College Station, USA prior to joining Dr. Reddy's Laboratories at Hyderabad in 2006. During his three years of stay at Dr. Reddy's, he served as a group leader in 'complex molecules development' team and involved in developing cost-effective route to a few anti-HIV agents. In 2010, he moved to IISER Mohali, where he is currently working as an associate professor. He is also serving as the Dean of Research and Development. His research interests include nucleophilic carbenes catalyzed enantioselective transformations, electrophilic annulation reactions leading to heterocyclic systems, and synthesis of natural and unnatural biologically active compounds. He has received the prestigious Bronze Medal for the year 2022 from the Chemical Research Society of India (CRSI).

Dr. Samir P. Dave

Director, Aimco Pesticides Limited
"Akhand Jyoti" 8th Road,
Santacruz (East)
Mumbai - 400 055, India.
Tel No: +91 22 6760 4000

Email: spd@aimcopesticides.com



Qualification:

- 1) Bachelor of Science in Chemistry at Mithibai College, Mumbai, attached to the University of Bombay.
- 2) Master of Science in Organic Chemistry at Mithibai College, Mumbai, attached to the University of Bombay.
- 3) Doctor of Philosophy in Synthetic Organic Chemistry in Stereoselective & Asymmetric Synthesis of Chiral compounds, at Indian Institute of Chemical Technology, Hyderabad, attached to the University of Bombay, under the guidance of Padma Bhushan Dr A. V. Rama Rao.

Present Responsibilities:

- *Executive Director of AIMCO Pesticides Ltd.
- *Overall, in-charge for the Production & Quality Control, Department of Science & Technology approved R&D department & pilot plant operations, the Environment, Health & Safety department of the company.
- *Member of the Society for Chemical Industries. London, U.K. & of the University Department of Chemical Technology Alumni, Mumbai.
- *Attended the diploma course organized by Royal Society of Chemistry, UK on "Advances in the chemistry of crop protection" at the Churchill College, Cambridge in September 1996.
- *Member of the United Nations Development Program (UNDP) team on study on better Pesticides formulations technology in Austria & Pesticides Applications & Residue analysis & control methods in Hungary in June - 1997.
- *Attended IUPAC-1998 & 2001 on Pesticides Chemistry at London, U.K. & at San Francisco, U.S.A. in 2014.
- *Regularly attend CIPAC-FAO-WHO joint conferences on Specifications of Agrochemicals.
- *Has contributed to more than 5 International and Indian Process Patents.
- *Managing Committee member & Secretary of Pesticides Manufacturers & Formulator Association of India (**PMFAI**), the largest Indian Pesticide Association.
- *Founding member and the President of the **AgroCare** a Global Association registered at Belgium representing the Generic Crop Protection Industry, the largest Generic Crop Protection Industry Association in the World.
- *Member of the American Chemical Society (**ACS**).
- *Member of The Research Advisory Council of CSIR Indian Institute of Chemical Technology (**IICT**), Hyderabad, a Govt. of India Institute.
- *Member of the Committee of Administration, **CHEMEXCIL**, BASIC CHEMICALS, COSMETICS & DYES EXPORT PROMOTION COUNCIL. (Set-up by Ministry of Commerce & Industry, Government of India).
- * Founding member & Director of the Board of Agriculture Skill Council of Govt. of India (**ASCI**) under the aegis of Ministry of Skill Development & Entrepreneurship (MSDE)

Opportunities for Industry and Academia to work together to address some of the major challenges over the next decade in the Indian Agrochemical Industry

Dr. Samir P. Dave
Director, Aimco Pesticides Limited

Indian Agrochemicals industry is one of the fastest growing industry in the world with growth rate of over 5% and market size of US\$ 6 Billion, employing around 60% of the population. Use of integrated pest management techniques along with improved seed and soil nutrition techniques have made India import dependent to food surplus economy with US\$ 40 Billion worth exports of Agriculture commodities. Use of Agrochemicals is highly essential for India's food security.

Indian agriculture holds huge potential for improvement & growth as we have one of the lowest per hector Crop yield coupled with lowest per hector Agrochemicals use in the world. As per the Govt estimates annual crop losses in India due to Insects, weeds & rodents are in the excess of US\$ 19 Billions.

Indian Agrochemical Industry is highly dependent on imports of raw materials, intermediates and finished products, largely from China.

The Academia can support the industry in development of better innovative Chemistry and manufacturing technology capabilities by using latest technologies like Flow, Electro Chemistry etc. This can give us edge by making Generic products cheaper and better in quality. Area of Developing Cleaner Greener sustainable Production technologies and Technology for Hazardous Waste Management system is another area where Academia can support the agrochemical manufacturing sector.

Academia can also help in bridging the knowledge gaps in Biopesticides Bio stimulants Bio based nutrients. As the central govt's will is to reduce synthetic Agrochemicals and promote natural farming with allocating large budgets. Drone revolution in agriculture is the current buzz word but Most drones are still imported. Finally we need to create an environment to promote basic research in development of India centric New Agro Chemical entity.

Prof. Buddhadeb Chattopadhyay

**Department of Biological & Synthetic
Chemistry
Centre of Biomedical Research (CBMR),
SGPGIMS Campus, Lucknow.**

**E-mail: buddhadeb.c@cbmr.res.in;
buddhachem12@gmail.com**



Buddhadeb was born and raised in Insura-Hooghly, West Bengal. He obtained his B.Sc. (2001) in chemistry from the Burdwan University and M.Sc. (2003) in chemistry from Visva-Bharati University. In 2003, he left Visva-Bharati and enrolled in Kalyani University for his Ph.D. in the laboratories of Professor K. C. Majumdar. In 2009, he accepted a postdoctoral research associateship from the University of Illinois at Chicago, USA in the group of Professor Vladimir Gevorgyan. Spending two years at Chicago, he then moved to the Michigan State University, Michigan, USA for his next postdoctoral research program in the laboratories of Professor Milton R. Smith III. Group (2011-July 2014). In August 2014, he moved to the Centre of Bio-Medical Research (CBMR) Lucknow, India as a DST-Ramanujan Fellow to start his independent research career. In November 2016, he joined as an Assistant Professor and promoted to Associate Professor in November 2019. His research interest includes the development of transition metal-catalyzed C–H activation/functionalization, design and synthesis of new ligands for organic synthesis and metal-nitrene chemistry for the construction of biomedical molecules.

Catalysis for C–H Functionalization–Future Technology: Scope & Gap

Prof. Buddhadeb Chattopadhyay
Department of Biological & Synthetic Chemistry
Centre of Biomedical Research (CBMR), SGPGIMS Campus, Lucknow

As a faculty of chemistry, I believe that each college student of chemistry, chemical engineering and material science should be trained in catalysis and catalytic reactions. The aim is pretty simple; maximum products manufactured in the chemical, petroleum and other industries utilize catalysts to enhance the rate of reaction and selectivity to desired products. Catalysts are also greatly employed to minimize harmful byproduct pollutants in environmental applications. When a highly selective catalyst is employed, large volumes of desired products are produced with virtually no unwanted byproducts. Thus, catalysis research is one of the most important topics that can be utilized to address several issues. In this context, among many catalysis research areas, the direct C–H bond functionalization using transition metal catalysts is one of the key emergent methods that is currently drawing remarkable attention owing to the rapidly expanding abundant chemical feedstocks to achieve high-valued materials. Innovative catalyst design help to deliver the sustainable green chemistry by minimizing extra steps and hazardous toxic materials for a particular reaction. Importantly, direct C-H activation is such innovative idea which originated to eliminates lots of serious problems, now taken a special place towards the sustainable development. Several natural products/chemicals that required multi-step sequences now have been performed with shorter route with improve process through the C-H activation methodology. Personally, I believe that for the mainstream chemical synthesis via C-H functionalization, an industrial and academic collaborations need to be established, as this establishment could deliver more improve results by the process chemistry and innovative reactor design. In modern days, pharmaceutical industry started to connect with academician for the better improvement of some chemical synthesis and they started deliver cost effective procedure. This establishment could down the cost of the marketed drug, various materials which will be beneficial for the mankind. In this talk, I would like to discuss the importance of the CH functionalization method that has now been considered as a future technology to solve many issues related to the chemical industry. Moreover, I also would like to discuss the gap between the academic and industrial research in the context of the CH functionalization chemistry. Finally, a brief overview of our group research activity (catalysis research) will be presented in this conclave.

Dr. Ramanan Thirumoorthy

**Head R&D and Production (Technical)
Laurus Bio Pvt. Ltd. (formerly Richcore
Lifesciences Pvt. Ltd.), Bangalore
Since Oct'20 – President (R&D)
Oct'15 – Sep'20 – Vice-president (Technical)**

Email: ramanan.t@laurus.bio



EMPLOYMENT PROFILE

Laurus Bio Pvt. Ltd. (formerly Richcore Lifesciences Pvt. Ltd.), Bangalore Since Oct'20 – President (R&D) Oct'15 – Sep'20 – Vice-president (Technical)
Richcore Lifesciences Pvt. Ltd., Bangalore Oct'13 – Sep'15 Group Manager, R&D
Orchid Chemicals and Pharmaceuticals Ltd., Chennai Apr'10 – Oct'13 Chief Research Scientist, Biotechnology
Apr'06-Mar'10 Senior Research Scientist, Biotechnology – Orchid
May'05-Mar'06 Research Scientist, Biotechnology – Orchid
York University, Toronto, Canada Jul'04-Mar'05 Postdoctoral Fellow
State University of New York, Buffalo, USA Jun'02-Mar'04 Postdoctoral Fellow

ACADEMIC CREDENTIALS

Ph.D., Biochemistry in 2002 University of Florida, Gainesville, Florida, USA Thesis: Structure and Dynamics study of GPCR related cyclic peptides using high resolution NMR. M.Sc. Chemistry in 1996 Indian Institute of Technology Madras, Chennai, India

MERITS, HONORS & OTHER ACHIEVEMENTS

- » Rich Star – Richcore star employee for outstanding achievement impacting the future of the company – 2015.
- » Visiting faculty – SRM University, Kattangulathur, Tamil Nadu 2012.
- » Member Board of Studies - Biotechnology, Bannari Amman Institute of Technology, Coimbatore from 2007-2011.
- » Member Board of Studies - Biotechnology, Anna University, Coimbatore from 2007-2010.
- » All India rank 11 in GATE 1996 (Chemistry).
- » Indian Institute of Technology scholarship for academic excellence from Aug 1994-May 1996.
- » Jawaharlal Nehru University Summer Research Fellowship from Jun-Aug 1996.
- » Tata Institute of Fundamental Research Summer Research Fellowship from Jun-Aug 1995.

The role of biocatalysis in organic synthesis

Dr. Ramanan Thirumoorthy

Head R&D and Production (Technical)

Laurus Bio Pvt. Ltd. (formerly Richcore Lifesciences Pvt. Ltd.), Bangalore

Biocatalysis has become a key part of organic synthesis, especially in reactions where the high-yielding chemo-, regio-, and enantioselectivity are needed. Due to their high selectivity, enzymes need to be specifically modified and developed for each substrate. The time, cost and effort needed to design and develop an enzyme is among the key drawbacks to wider application of biocatalysis in organic synthesis. The talk briefly previews the process of enzyme development and consequently how is an ideal technology for academic-industrial collaboration.

New Platform Technologies
Chairperson:
Vibha Tandon
Rakeshwar Bandichhor

Prof. Vibha Tandon

**Professor & Coordinator Ayurveda Biology
Integrated BS-MS Program, SSIS, JNU**

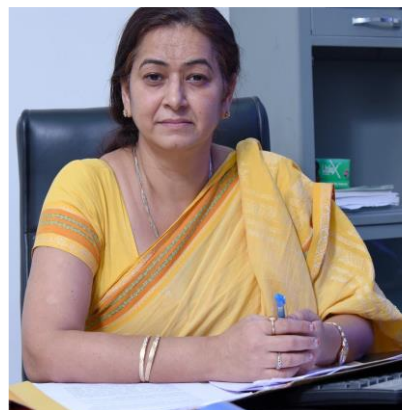
Special Centre for Molecular Medicine

Jawaharlal Nehru University

New Delhi-110 067.

**Email: vtandon@mail.jnu.ac.in,
vibhadelhi6@gmail.com**

Website: <https://vibhatandon.org>



PROFESSIONAL DETAILS

Present Position: Professor, Special Centre for Molecular Medicine, Jawaharlal Nehru University, 2014- till date & **Coordinator Ayurveda biology Program, SSIS, JNU**

Earlier Academic Positions: Professor, Department of Chemistry, Delhi University, New Delhi: 2013-2014.

Associate Professor, Department of Chemistry, University of Delhi: 2009 – 2013

Assistant Professor (Research Scientist), Dr. B. R. Ambedkar Centre for Biomedical Research: 1998 -2008

Industry Experience: Unit Incharge of 100% EoU Latex Gloves Unit at NEPZ,Noida,

Post-Doctoral Fellow: Year 1993-96 : Indian Institute of Technology, Kanpur at Deptt. of Chemistry.

Topic of Ph.D. Thesis, Year 1991: *Synthesis of sequential Oligonucleotides using special Protecting Groups* from Allahabad University

Rakeshwar Bandichhor**PhD, FRSC, CChem****Vice President and Head of Chemistry, API-PR&D****Vice Chair, ACS-India Chapter (South)****Innovation Plaza, IPDO****Bachupally, Dr. Reddy's Laboratories Limited****Hyderabad-500090, India.****email: rakeshwarb@drreddys.com**

Dr. Rakeshwar Bandichhor is working as a Vice President and Head of Chemistry, API-PR&D at Dr. Reddy's Laboratories, Hyderabad, holds a doctorate in Chemistry from University of Lucknow/University of Regensburg, Germany and worked as Postdoctoral Fellow at University of Regensburg, Germany, University of Pennsylvania and Texas A&M University. He has co-authored more than 200 papers including patents and book chapters published/accepted in various International Journals and contributed to more than 100 academic national and international conferences. He has won various awards and honors in his career; few of them are like Chairman Excellence Award 2010, Best Cost Leadership Award 2010, Anveshan Award 2011, ISCB Award of Appreciation for Industry Scientist 2012, Bharat Jyoti Award 2012, Roll of Honor Award by Green Chemistry area 2012, Travel grant award, UK 2013, Green Innovation Award 2013 by IGCW-2013, FRSC 2014, CChem 2014, Vice Chair, ACS-India Chapter (South India Section) onwards 2016, CRSI Council member onwards 2017, CRSI Bronze Medal 2018 etc. He is currently serving as a Honorary Member Chair-BMGT section of ACS onwards January 2022. He was also nominated for Shanti Swaroop Bhatnagar Award for the years 2017 and 2018. He has won STE Green Excellence Award in 2019. His

He was invited as a Chief Guest in RSC-DST sponsored Green Chemistry workshop at Delhi University, 2011 and instrumental to organize Catalyst 2013 Symposium featuring Noble Laureate at Dr. Reddy's. His interview was published in Nature Medicine 2013, 19, 1200-1203, in Process India (February issue 2014) and Business Standards (March 2014). He has also contributed in a concept paper "Reengineering Chemistry" by Tata Strategic Management Group and IGCW-2013.

He is also an industry advisor to Deccan and North India section of RSC. Recently, he became six sigma certified white belt, black belt and master black belt practitioner.

He has become a BoS (Board of Studies) and BoG (Board of Governors) members of Institute of Science and Engineering, Jawaharlal Nehru Technological University, Hyderabad (JNTU-H) starting from December 2017. He is also serving as an International Advisory Board Member of European Journal of Organic Chemistry. He is a visiting faculty at Department of Chemistry, Delhi University, KNI Sultanpur, JNTUH campus, NIPER Hyderabad, Manipal Institute of Technology and IIT Bombay. He has recently become EAB member of OPRD which is a synthetic organic and process chemistry flagship Journal of ACS.

Dr. Srividya Ramakrishnan

**Head, API Process Engineering
Dr. Reddy's Laboratories Ltd.**



Dr. Srividya Ramakrishnan earned her B.Tech from Indian Institute of Technology, Madras, and Ph.D. from Princeton University in Chemical Engineering. After completing her Ph.D., she joined Unilever Research, New Jersey, where she spearheaded the research effort to reduce the irritation of skincare actives through a material science approach. She subsequently moved to the Process Research and Development group at Bristol-Myers Squibb, where she worked on crystallization process development and lead a multi-disciplinary team to identify and tailor the powder properties of an API.

She returned to India to join Dr. Reddy's Laboratories Ltd. in 2008, and currently heads Process Engineering (API). Her team is responsible for the scale-up of chemical processes from lab to plant through rigorous engineering optimization with the use of Process Analytical Technologies (PAT), modeling and simulation, automation, digitalization, and new technologies. She is passionate about advanced manufacturing technologies that support sustainability and enable robustness.

Srividya has presented her research at international conferences, has several publications and patents to her credit and has co-chaired sessions at the AIChE annual meetings. She is also an ASQ-certified Six Sigma Black Belt.

Srividya has taken up an additional role as Chief Diversity Officer at Dr. Reddy's, and is championing diversity (gender and beyond) within the organization. She has been recognized for Leadership Commitment at *UN Women India 2020 WEPs (Women's Empowerment Principles) awards*. She has actively participated in panel discussions at CPhI events such as *Women in Leadership Forum* and *Women in Pharma*.

Srividya is one of the 51 women featured in "WiSTEM 2021", an e-book released by the Confederation of Indian Industry (CII) on Indian women in STEM.

Advanced Manufacturing with emerging technologies

Dr. Srividya Ramakrishnan
Head, API Process Engineering
Dr. Reddy's Laboratories Ltd

Advanced manufacturing technologies such as continuous flow transform the traditional step-wise manufacturing process into a single system where raw materials are continuously added and the product is continuously collected. For a multi-step synthesis, all the reactions and unit operations can be combined into an integrated continuous equipment train or a hybrid approach could be adopted where only certain critical reactions or operations are converted into a continuous mode. The advantages of such advanced manufacturing technologies over traditional batch manufacturing are multi-fold: greater robustness with a consistent product enabled by rigorous control philosophy, process safety, smaller footprint, access to novel process windows, and easier to scale manufacturing operation to meet demand with supply. There has been a surge in the number of publications and conferences on continuous manufacturing in the last decade. However, the industry faces challenges for the adoption of continuous manufacturing as the sunk capital in batch manufacturing and the upfront investment required to implement complex new technologies serve as a deterrent. A reasonable return on investment necessitates identifying cases where flow provides a significant cost advantage over batch. Also, there is a steep learning curve associated with building expertise in continuous manufacturing. While many academic groups work on flow chemistry, there are few experts to provide guidance on implementation. For the pharmaceutical industry, regulatory guidance is required on some aspects though the *ICH Q13 Quality considerations for continuous manufacturing: Guidance for Industry* serves a good starting point.

At Dr. Reddy's, the motivation to venture into CM includes safety, quality, on-demand manufacturing and greener processes. We have invested in a modular, multi-purpose, continuous manufacturing plant, and have also set up a continuous rig for cryogenic, hazardous reactions. This presentation will describe the development of a continuous process for one of our flagship molecules, encompassing multiple reactions as well as downstream unit operations such as crystallization, filtration and drying; all in an integrated continuous, balanced train. In addition, challenges for wide-spread adoption of this technology will be discussed. For example, while several publications describe the feasibility of running various reactions in flow, few quantitatively describe the advantage of flow beyond safety. A few case studies where we have not been successful in demonstrating a *significant* cost advantage with flow will be presented. This is a ripe area for collaboration as industries will rapidly adopt new technologies only if there is a tangible cost benefit with a viable return on the investment.

Dr. Vishal Rai

Professor, Swarnajayanti Fellow, FRSC
Department of Chemistry
Coordinator, SERB-PACE
Indian Institute of Science Education and Research, Bhopal.
Contact Number: 0755-269-1339

e-Mail: vrai@iiserb.ac.in
Homepage: <http://home.iiserb.ac.in/~vrai>



Dr. Vishal Rai obtained his Ph.D. in Chemistry from IIT Bombay (2003-2008). He subsequently held a postdoctoral position and MITACS-Elevate fellow position at the University of Toronto, Canada (2008-2011). His contributions to peptide macrocycles created the platform for Encycle Therapeutics. Later, he joined the Department of Chemistry at IISER Bhopal in 2011.

Positions, Awards, and Honours: He is the Founder and Director of *Plabeltech Private Limited*. The state-of-the-art protein and antibody engineering technologies such as LDM[®], Gly-Tag[®], and Maspecter[®] empower the company. Recently, his team established the Precision Antibody Engineering Center (*SERB-PACE*) to meet India's technological demands in biologics. Also, he is the recipient of the Swarnajayanti Fellowship, Ramanujan Fellowship, CRSI Bronze Medal, CDRI Award for excellence in drug research, SERB Technology Translation Award, RSC-WIS Young Scientist Award, and DAE Young Scientist Award. Recently, he joined the *ACS Chemical Biology* team as an Early Career Board member. He has been involved in scientific outreach activities as national co-chair (India) for the International Chemical Biology Society (ICBS). Also, he is an invited Fellow of the Royal Society of Chemistry (FRSC), UK.

Research interests: His research group is leading the development of chemical technologies for the *precision engineering of proteins*. They are also involved in synthesizing homogeneous therapeutic proteins, antibody-conjugates, protein immobilization, and analytical tools for peptides and proteins. His research team wants to contribute to Society through homogeneous bioconjugates for directed cancer chemotherapeutics and surgical oncology. Besides, they are investing efforts to make small-molecule precision therapeutics possible in the future.

Platforms for precisely engineered protein- and antibody-conjugates

Dr. Vishal Rai

Professor, Department of Chemistry

Indian Institute of Science Education and Research, Bhopal

The chemical toolbox to enable biologics such as therapeutic proteins and antibodies requires the precise covalent attachment of tags. In this perspective, we have been leading the efforts toward chemical technologies to enable precise control over the site of bioconjugation. The critical barrier involves the simultaneous deconvolution of multiple challenges associated with reactivity and selectivity. In this perspective, we have developed a DisINtegrate or DIN theory that allows us to create new reactivity landscapes on a protein's surface. It enabled the development of methods for targeting reactivity hotspots,^{1,2} N-Gly residue-specific labelling (Gly-Tag[®]),³ and modular Linchpin-Directed Modification (LDM[®]) platform.⁴ Our state-of-the-art platform offers homogeneous antibody-drug conjugates (ADCs) for directed cancer chemotherapeutics and fluorophore conjugates (AFCs) for imaging-guided tumour surgery.^{4,5} Besides, our findings create a hope that we will make precision therapeutics with small molecules possible one day. *The talk would highlight the technological platforms that offer unprecedented control over the homogeneous construction of therapeutic protein- and antibody-conjugates.*

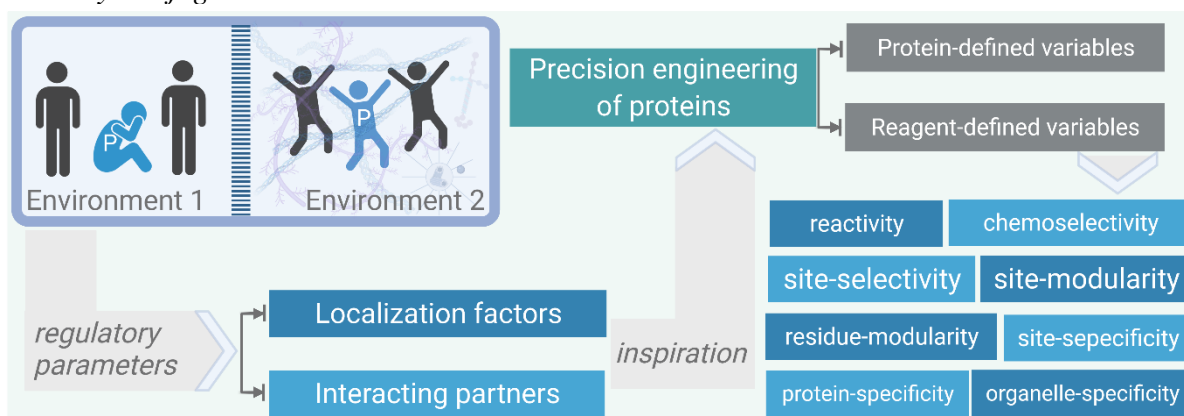


Figure: Chemical technologies for precision engineering of proteins and antibodies.

References and Notes:

1. For N-targeting, see: (a) *Chem. Commun.* **2015**, 51, 473. (b) *Org. Biomol. Chem.* **2018**, 16, 9377. (c) *Chem. Commun.* **2021**, 57, 7083.
2. For reactivity hotspots, see: (a) *Chem. Commun.* **2019**, 55, 1100. (b) *Chem. Commun.* **2018**, 54, 7302. (c) *Chem. Eur. J.* **2017**, 23, 3819. (d) *Chem. Commun.* **2017**, 53, 959.
3. Gly-Tag[®]: (a) *Nat. Commun.* **2019**, 10, 2539. (b) *Chem. Sci.* **2020**, 11, 13137.
4. LDM[®] platform and ADCs: (a) *J. Am. Chem. Soc.* **2018**, 140, 15114. (b) *Angew. Chem. Int. Ed.* **2020**, 59, 10332. (c) *Chem. Sci.* **2021**, 12, 6732. (d) *Chem. Commun.* **2022**, 58, 1768.
5. Our other ADCs: (a) *Nat. Biomed. Eng.* **2019**, 3, 917. (b) *Chem. Commun.* **2019**, 55, 9979.

Dr. Sitaram Pal

**Head
Process Research & Analytical
Syngenta Biosciences Private Limited Goa
R&T Centre, Goa, India.**

E-Mail: sitaram.pal@syngenta.com



Dr. Pal got his M.Sc. degree from **University of Burdwan** and Ph.D. from **IACS**, Jadavpur University in Organic chemistry in the year 1987, 1993 respectively.

He did his postdoctoral research in the department of chemistry, **National Tsing Hua University**, Twain (2001-2002) and Department of Chemistry, **University of Kentucky**, USA (2003-2004), both in synthetic organic chemistry.

He works as group leader in **CIBA**, Mumbai R&D Centre (1997-2001) and as Principal Scientist, Chemgen Pharma International, Kolkata.

He joined **Syngenta Biosciences Pvt. Ltd** in 2006 as group leader AI research and analytical department.

His research interests are synthetic method development, natural product synthesis and heterocyclic chemistry and cost-effective sustainable route for new AI.

- **He published 30 papers in reputed international Journal and 6-patent.**
- **Wrote one book chapter of 'The Alkaloids'.**
- **Guided five Ph.D. students.**

Awards & Honours

- 1) **Syngenta Endowment lecturer 2013, Mangalore University**
- 2) **Plenary Lecturer International Conference on Chemistry for Human Development (ICCHD2020) , Kolkata**

New Technology Platform in Syngenta: Addressing Sustainability

Dr. Sitaram Pal
Head, Process Research & Analytical
Syngenta Biosciences Private Limited Goa

Sustainability by using new technology is the *mantra* of modern science, may it be in industry or in academia. Syngenta is a crop protection conglomerate dedicated to feed the world safely.

While food production will continue to grow to meet the demand of a world population projected to increase to almost 10 billion by 2050, its environmental impact, estimated at one quarter of total anthropogenic greenhouse gas (GHG) emissions, is a major concern. Innovation in agriculture and particularly crop protection has allowed to increase the overall yield output in farm fields by ca. 60% since the 1970s, while agrochemical inputs per square meter have been reduced by more than 90% during the same period. However, still there is a need for further improvement in overall approaches towards more sustainable production and application of agrochemicals at large.

In 2020, Syngenta committed to ambitious sustainability goals through the Good Growth Plan Initiative, which were articulated with specific objectives at every level of the organization and particularly in Research and Development. With increasing knowledge and available new technology in the last decade, we realized that continuous flow technology, especially second-generation flow technology is a technology, which can address some of these sustainability issues. Second-generation flow is nothing, but the combination of so-called new technologies with flow, e.g. photo-flow, electro-flow, mechano-flow. Obviously enzymatic or biotransformation is another way!

In this presentation I will report some of our effort to establish these technologies in Syngenta AI innovation.

References:

1. Pütter, H. Industrial Electroorganic Chemistry. In *Organic Electrochemistry*, 4th Edition; Lund, H., Hammerich, O., Eds.; Marcel Dekker: Basel, Switzerland, **2001**; pp 1259–1307.
2. Wiebe, A., Gieshoff, T., Möhle, S., Rodrigo, E., Zirbes, M. and Waldvogel, S.R., 2018. Electrifying organic synthesis. *Angewandte Chemie International Edition*, **2018**, *57*, 5594-5619.
3. McDougall, P. Evolution of the crop protection industry since 1960. *Midlothian, UK.*, **2018**.
4. Cassayre, J. Crop Protection Chemistry: Innovation with Purpose: Perspectives on Chemistry and Society, *Chimia*, **2021**, *75*, 561-561.
5. Dutta, P., McGranaghan, A., Keller, I., Patil, Y., Mulholland, N., Murudi, V., Prescher, H., Smith, A., Carson, N., Martin, C. and Cox, P. A case study in green chemistry: the reduction of hazardous solvents in an industrial R&D environment. *Green Chemistry*, **2022**, *24*, 3943-3956.
6. Godineau, E., Battilocchio, C. and Lal, M. Building up a Continuous Flow Platform as an Enabler to the Preparation of Intermediates on Kilogram Scale. *Chimia*, **2019**, *73*, 828-828.

Polymers and Materials
Chairperson:
Sunil Deshmukh
T. Punniyamurthy

Sunil Deshmukh

CEO Ind-swift laboratories Limited.



An accomplished experience in field of Pharma industries and leading the various company with different portfolio as Quality control, Quality Assurance, Regulatory affairs, Operations of giant group. Post Graduate from Bhopal University in Organic Chemistry having 36+ years of experience in pharma industries. Business leader with extensive experience in both domestic and international pharmaceutical framework and has expanded the CRAMS business on behalf of company and delivered the low cost with good quality material to the customer. Leadership helped company business grown YOY. Now as a part of industrial journey I am now leading Ind-Swift's transformation and successfully driving the group through series of expansion strategy as CEO. providing the overall strategic direction to the organization from top terminal and directly leading the strategic investments in new products, new markets, and technologies to always keep the organization at a competitive advantage for attaining its targeted strategic objectives. Being a Task master and sharp focus of technical competencies, helping the group to establish itself as a leading bulk drug manufacturer of India and world over. Direct the company in keeping with the vision outlined by Chairman. Partner with high-level officers to grow the company, strengthen it and ensure its sustainability in domestic and international market. Green field project expansion and execution planning and investment to high level business requirement etc.

Tharmalingam Punniyamurthy

**Dean of Faculty Affairs and Professor of
Chemistry
Indian Institute of Technology, Guwahati
-781039,**

Email: tpunni@iitg.ac.in

<https://www.tpunnigroup.com/>



Punniyamurthy completed his graduate studies at Bharathidasan University and doctorate at IIT Kanpur under the supervision of Professor Javed Iqbal. He then pursued postdoctoral research at North Dakota State University (Prof. M P Sibi), Kyushu University (Prof. T Katsuki), Montpellier University (Professor Andre Vioux) and National School of Chemistry, Montpellier (Prof. J E Moreau). Since July 2001, he is in IIT Guwahati and his research interest is Sustainable Organic Synthesis. He has produced 7 Postdocs, 25 Ph.D. Scholars and 36 M.Sc. students, and edited a book with a co-editor entitled “*Transition-Metal-Catalyzed C-H Functionalization of Heterocycles*” for Wiley publishers, which is under press. He is also Guest Editor along with a Co-editor for Synthesis Special Issue on “*C-H Bond Functionalization of Heterocycles*” which is under progress. He has published 160 papers in peer-reviewed Journals along with Seven Book Chapters for Wiley and Oxford University Press publishers, having citations of 9300 and h-index 48. He served as the Head, Department of Chemistry and Chairman JAM, and is presently the Chief Vigilance Officer as well as Member of Board of Governors, IIIT Guwahati. He has received the Distinguished Alumni Award, Bharathidasan University. He has been also Visiting Professor at Oxford University, Kyushu University and The Scripps Research Institute, San Diego and the recipient of JSPS, Fulbright and UKIERI Research Fellowships and CRSI Bronze Medal. He is the elected Fellow of the Indian Academy of Sciences, the National Academy of Sciences, India and the Royal Society of Chemistry.

Gopi Chandran

**Deputy Director (R &D)
Applied Materials
Mumbai, Maharashtra, India.**



Advanced materials science thought leader and prolific innovator with 30 US patents (& 20+ in other countries) having deep knowledge of materials, processing & additive technology. Proven track record of providing innovative solutions from lab scale to manufacturing on diverse suite of materials (Phosphors, scintillators, Structural ceramics, Coating (TBCs & EBCs), materials processing and advanced manufacturing technologies. Innovation coach enabling teams to think out of the box leading to differentiating intellectual property in diverse areas beyond Materials. Inclusive and empowering leader in building high performing teams. Current interest in additive manufacturing and additive analytics besides material design. Focused on advancing state of art by collaborating with academia in India and outside on programs of industrial importance. Over 20 years of corporate research experience in materials, establishing new research capabilities, building teams & growing talent. Six Sigma Black Belt & Associate Value Specialist (SAVE International). Leading efforts for the organisation on expanding collaboration with academic institutions on joint studies to advance the state of art of materials and allied technologies.

Satish Patil

Professor
Solid State and Structural Chemistry Unit
Indian Institute of Science, Bangalore-560012

E-mail: spatil@iisc.ac.in Web: <http://oesscu.in>
Telephone: 080-22932651 (Office), 080-23671378 (Res)



Academic Qualifications:

Bachelor of Science (Chemistry), Dr. BAM University, Aurangabad (1996)

Master of Science (Organic Chemistry), Dr. BAM University, Aurangabad (1998)

Ph.D. (Polymer Chemistry), Bergische University of Wuppertal, Germany (2004)

Details of Employment:

Research Fellow: University of Wuppertal, Germany 2000-2004

Post-Doctoral Fellow: University of California, Los Angeles CNSI-HP 2004-2006

Assistant Professor: Indian Institute of Science, Bangalore 23 June 2006-June 2012

Associate Professor: Indian Institute of Science, Bangalore 23 June 2012-23 Sept 2017

Professor: Indian Institute of Science, Bangalore September 2017 till Date

Honors and Awards:

❖ SwarnaJayanti Fellow for the year 2013-14 ❖ Young Affiliates of the World Academy of Sciences, 2013 ❖ INSA Young Scientist Award, 2009 ❖ Young Associate of the Indian Academy of Science, Bangalore (2009-2012) ❖ Chemical Research Society and Materials Research Society of India Bronze Medal ❖ Professor Kaushal Kishore Memorial Award of the Society of Polymer Science, India ❖ A V Ramarao Research Foundation Young Scientist Award 2012 ❖ Microsoft Research (MSR) India Outstanding Young Faculty Award

Organic Materials for Energy Generation and Storage Devices

Satish Patil

**Professor, Solid State and Structural Chemistry Unit
Indian Institute of Science, Bangalore-560012**

The transition of the energy sector towards renewable energy will have a profound impact on the demand for critical materials. In this context, organic materials are promising candidates owing to their abundance and high structural diversity. This has provided a new platform for the synthetic chemistry community to rationally design and synthesize new organic materials for eco-friendly and sustainable energy storage and conversion systems. In this talk, I will discuss research and innovation in clean energy research, especially in energy generation and storage by utilizing organic materials.

Dr. Anubhav Saxena

**R&D President
Pidilite Industries, Mumbai.**

Email: anubhavs.iit@gmail.com



EDUCATION

Post-doc Nara Institute of Science & Technology, Japan 2002-2004
Ph.D. Chemistry, Indian Institute of Technology (IIT), New Delhi, India
1998-2002
M.Tech. Modern Methods of Chemical Analysis, IIT Delhi, New Delhi, India
1997-1998
M.Sc. Organic Chemistry, IIT Roorkee, Roorkee, India 1995-1997
B.Sc. Chemistry, Physics & Maths, University of Rohilkhand, Bareilly, India
1992-1995

PROFESSIONAL EXPERIENCE

R&D President – Pidilite, Mumbai, September 2018 – present

Global Technical Director – Corporate R&D (CRD), Momentive Performance Materials (Former GE Advanced Materials), Bangalore, October 2014 to September 2018.

Program Leader, Momentive Performance Materials (Former GE Advanced Materials), Bangalore, India, Jan 2007 to September 2014.

Lead Scientist, General Electric India Technology Centre, Bangalore, India, 2006 to 2007

Research Scientist, General Electric India Technology Centre, Bangalore, India, 2004 to 2006

NextGen Adhesives and Sealants based on Hybrid and Sustainable Materials

Dr. Anubhav Saxena
R&D President
Pidilite Industries, Mumbai

Adhesives and sealants are an integral part of our daily life: Starting from our early days using school stationary glues and sticking small items at home to industrial applications like packaging, mattress assembly, paper converting adhesives, and structural adhesives for highly demanding automotive, construction and aerospace industries.

At Pidilite, we offer adhesives and sealants products with application focusing on wood working and furniture applications in the retail segment; Waterproofing, tile adhesives and sealants for construction industries; Household and general-purpose adhesives for consumer market segment and various industrial adhesives, coatings, and sealants for automotive, packaging, footwear, and textile segments.

As a responsible leader in driving sustainability, we have created products that qualify green building requirements and are focusing on integrating bio-based products, making our products and packaging environment friendly. We have also developed our new adhesives, sealant and coating products by combining the organic, inorganic and nanomaterials to produce differentiating products with unique value proposition for our customers.

Innovation by collaboration is our key to success in the market. We want to move away from 'not invented here' syndrome and actively partner with academia, start-ups and suppliers to develop new sustainable products and processes that can help us develop products faster and scale them quickly to have a first mover advantage.

**Session on Funding Opportunities for
Industry-Academia Collaboration:
Sandeep Verma (SERB-Secretary)
Chairperson: G. Sekar**

Dr. G. Sekar
Professor

Department of Chemistry
IIT Madras

Contact Number: 044 22574229
E-mail: gsekar@iitm.ac.in
Homepage: <http://sekargroup.com/>



Prof. G. Sekar obtained his Ph.D. from IIT Kanpur in 1999 under the guidance of Padma Shri, Prof. Vinod K. Singh. Sekar was a JSPS postdoctoral fellow at TUT Japan, and an AvH postdoctoral fellow at Goettingen University, Germany. He also carried out postdoctoral research at Caltech, USA.

He is the recipient of the Senior Scientist Award-2021 by the Academy of Sciences Chennai, CRSI bronze medal-2015, and Institute Research and Development Award (Mid-Career)-2017. He is a Fellow National Academy of Sciences (2019), a Fellow of the Royal Society of Chemistry, and a Fellow of the Academy of Sciences, Chennai. He is a council member of the NOST, CRSI (Joint Secretary), and the Academy of Sciences, Chennai.

Prof. Sekar's research activity on organic synthesis focuses on developing new synthetic methodologies employing environmentally benign homogeneous catalysts, metal nanocatalysts, and halogen bonding catalysis.

Prof. Sandeep Verma

FASc, FNASc

Shri Deva Raj Chair Professor

Department Of Chemistry

DST Unit of Excellence on Soft Nanofabrication

Center for Environmental Sciences and

Engineering

Indian Institute of Technology-Kanpur

Email: sverma@iitk.ac.in



Sandeep Verma completed his doctoral work from University of Illinois Medical Center, Chicago (1994), followed by postdoctoral stints at Johns Hopkins Medical Institutions, Baltimore, USA, and at Max-Planck-Institute for experimentelle Medizin, Goettingen, Germany. He joined Department of Chemistry, Indian Institute of Technology Kanpur, in 1997, where he currently holds the positions of Professor of Chemistry and Shri Deva Raj Endowed Chair Professor. He is also an affiliated faculty in DST Thematic Unit of Excellence on Soft Nanofabrication and Center for Environmental Science and Engineering, at IIT Kanpur. His work has been recognized by DAE-SRC Outstanding Investigator Award (2012), Shanti Swarup Bhatnagar Prize in Chemical Sciences (2010), CDRI Award for Excellence in Drug Research (2009), Swarnajayanti Fellowship (2005), B M Birla Science Prize (2004), to name a few. He is an elected Fellow of Indian Academy of Sciences and National Academy of Sciences, India, and also a Senior Fellow, The Zukunftskolleg, University of Konstanz, Germany. He serves on the editorial advisory boards of Chemical Communications, Chemistry & Biology and Journal of Chemical Sciences. His research interests include metal-nucleobase interactions, peptide/protein self-assembly, and programmable soft matter.

Pharma for Well-being
Chairperson:
C. V. Ramana
D. Srinivas Reddy

C. V. Ramana

Scientist

Division of Organic Chemistry, CSIR-National Chemical Laboratory

Dr. Homi Bhabha Road, Pune-411008, India.

e-Mail: vr.chepuri@ncl.res.in

Homepage: <http://academic.ncl.res.in/vr.chepuri/home>



Dr. Ramana obtained his MSc. from Andhra University, Waltair (1991) and PhD from University of Hyderabad under the supervision of Professor M. Nagarajan (Synthetic Carbohydrate Chemistry). From 1998 to 2001 he was associated with Professor Andrea Vasella at ETH Zurich as a post-doctoral researcher (glycosidase inhibitors). From May 2001 onwards, he had been associated with National Chemical Laboratory (CSIR, India). At NCL, the focus of Ramana's group includes small molecules synthesis by employing transition metal complexes and developing new catalytic methods. The major focus of Dr. Ramana's group is the total synthesis of natural products and biologically important targets with a keen insight into developing new methods and extending the platform for the synthesis of pharmaceutically relevant small molecules. In general, his group is known decorating the total synthesis canvas with metal reagents and demonstrate designing of new synthetic tools involving the orchestration of sequential events in one-pot with one catalyst. In addition to this, his group also works in the areas of beta-peptides, C-saccharides synthesis, glyconanoparticles and application of C-H activation in non-infringing processes development.

He is a recipient CSIR Young Scientist award in Chemical Sciences (2003), NCL's Scientist of the Year award (2009), Professor D. K. Banerjee Memorial Lecture Award - IISc Bangalore (2011) and CRSI Bronze Medal in chemical sciences (2013) and Dr. A.V. Rama Rao Foundation Prize Lecture in Chemistry (2016) and CNR Rao National Prize in Chemical Sciences (2017). He is the fellow of Indian Academy of Sciences (2014, Bangalore). To his credit, he had about 150 publications, 17 patents and 27 students have been awarded PhD. degree under his supervision.

D. Srinivasa Reddy

Director

**CSIR- Indian Institute of Chemical Technology,
Hyderabad**

Director (additional charge)

CSIR- Indian Institute of Integrative Medicine, Jammu

Director (additional charge)

CSIR-Central Drug Research Institute, Lucknow.



Background/Experience

- Ph.D., University of Hyderabad, 2000 (Advisor: Professor Goverdhan Mehta).
- Post-doctoral with Prof. Sergey A. Kozmin (University of Chicago, USA) and Prof. Jeffrey Aubé (University of Kansas, USA)
- 20+ Years of research experience (post-PhD) in total synthesis of natural products/ medicinal chemistry/ drug discovery
- 7 Years of experience in pharmaceutical industry (Dr.Reddy's & TATA Advinus), A molecule discovered by his team at industry is currently in human phase-II clinical trials (Licogliflozin)
- Out-licensed patent/technology (two nos.) developed by team at CSIR-NCL
- Author of ~120 publications and an inventor in ~35 patents

Awards/Recognitions

- J. C. Bose National Fellowship by SERB, DST, Govt. of India
- Shanti Swarup Bhatnagar Prize in chemical sciences
- Fellow of the Indian Academy of Sciences, India (FASc)
- Fellow of the National Academy of Sciences, India (FNASc)
- NASI-Reliance Industries Platinum Jubilee Award in the field of physical sciences
- Sun Pharma Research (Ranbaxy) Award in the field of pharmaceutical sciences
- OPPI Scientist Award for contributions in pharmaceutical sciences
- Nominated member of the scientific body of Indian Pharmacopoeia, Govt. of India
- CRSI Bronze Medal in chemical science
- CDRI Award for Excellence in drug discovery research - chemical sciences
- Editor of Bioorganic & Medicinal Chemistry Letters (BMCL), an Elsevier journal

Dr Mukund K. Gurjar

**Chief Scientific Officer
Emcure Pharmaceutical Ltd., Pune.**



Dr Mukund Gurjar is currently working with Emcure Pharmaceutical Ltd., Pune as a Chief Scientific Officer. Prior to this assignment, Dr Gurjar was associated with CSIR-National Chemical Laboratory, Pune.

Dr Gurjar obtained his Ph. D. from the King's College, London and received Post-Doctoral training in the York university, Toronto, Canada.

Process chemistry of complex generic drugs and beyond

**Dr Mukund K. Gurjar
Chief Scientific Officer
Emcure Pharmaceutical Ltd., Pune**

This presentation will narrate synthetic processes of a few complex generics. The issues of conventional batch processes for highly complex synthesis and proposed solutions will form the basic objective.

Dr. Nareshkumar Jain

**Founder and CEO
NJ Biopharmaceuticals LLC (NJ Bio)**

Email: drnfjain@gmail.com



Dr. Jain is a scientist, mentor, and entrepreneur with a passion for finding innovative solutions to challenging chemistry problems. He is the founder and CEO of NJ Biopharmaceuticals LLC (NJ Bio) and co-founder of Amar Chemistry Pvt. Ltd., which specialize in complex and flow chemistry. At NJ Bio and Amar Chemistry, Dr. Jain has hired, trained, and developed more than 100 young scientists in last two years, and plans to double the number by the end of 2023. Dr. Jain is also a member of Robin Hood Ventures, a leading Mid-Atlantic investment group for the pharma sector.

In 2009, Dr. Jain founded a chemistry based CRO, The Chemistry Research Solution LLC (TCRS), serving for six years as Managing Director. During that time, he grew the company to 50 employees, worked with more than 200 leading biopharmaceutical clients, and secured long-term contracts with the National Cancer Institute (NCI). In 2015, Abzena plc acquired TCRS, with Dr. Jain serving as Senior Vice President and Global Head of Chemistry.

Dr. Jain started his pharma industry career at Johnson & Johnson, where he gained more than ten years of medicinal chemistry experience while advancing new drug molecules from hits to leads and into clinical trials. Among his notable chemistry achievements are the total syntheses of the complex antibiotic natural products vancomycin and rutamycin. Over the past three decades, Dr. Jain has co-authored more than 60 publications, patents, and book chapters in medicinal and synthetic chemistry. His work has been cited more than 2,700 times, and his publications have an overall h-index of 27.

Dr. Jain received his Ph.D. from Boston University and was a Post-Doctoral Research Fellow at The Scripps Research Institute in La Jolla, California. In 2017, Dr. Jain graduated from the Advanced Management Program at The Wharton School of the University of Pennsylvania. He recently received the Distinguished Alumnus Award from ICT (formally UDCT) in Mumbai.

Accelerated Pathway from Antibody to ADC

Dr. Nareshkumar Jain
Founder and CEO
NJ Biopharmaceuticals LLC (NJ Bio)

The pathway from antibody to ADCs is complex, resource intensive, and time-consuming. There are numerous platform-based solutions including various classes of payloads, differing linker chemistries, and conjugation technologies to evaluate. All of these can seem like a minefield. We will demonstrate how having high-quality material, expertise and the right technology can accelerate your ADC programs.

Dr. Sambasivam Ganesh

**Anthem Biosciences Pvt. Ltd. 49, Canara Bank
Road Bommasandra Industrial area, Phase-I
Hosur Road, Bangalore -560 099**



After completing the Undergraduate course in Chemistry at Madras University in 1986, won a Fellowship from National Chemical Laboratory (NCL) in Poona, for securing a rank in the top 20 at the All-India level. On completing the Master's program in Organic Chemistry at the University of Poona, was awarded a Fellowship in 1988 from the University Grants Commission, Government of India, for the Ph.D. program in the field of Chemistry at NCL. The Ph.D. degree in Chemistry was awarded in 1993. After completing a short stint of post doctoral work at NCL, joined Syngene (Biocon Group Company) in 1994 on its inception. Rose to be VP and CSO in a span of 12 years and built a good cohesive group of 500 chemists with diverse chemistry skills. In August 2006, decided to Co-Found Anthem Biosciences, along with two ex-colleagues. Anthem Biosciences is a CRISP (Contract Research and Innovation Service Provider) located in Bangalore, India.

Green chemistry- A New Order of the Day?

Dr. Sambasivam Ganesh
Anthem Biosciences Pvt. Ltd.

Sustainable and environmentally benign syntheses have become the focal point of research in the recent times. In this direction, a shift from the egregious organic solvents to benign ones is highly desirable. Furthermore, milder, atom- economical and selective transformations with reduced synthetic steps are being widely put into practice.

Biotransformations and chemo-enzymatic syntheses have afforded great selectivity, reduced the need for superfluous protection/ de-protection steps and enabled the conduct of reactions in aqueous media and under much milder conditions.

These synthetic procedures combined with the advantages conferred by the use of flow and electro-chemistry unlock a great potential for highly efficient and green synthetic methods that could quickly change the conventional routes of synthesis in the arsenal of most synthetic chemists.

Dr. Navratna Vajpai

**Chief Scientific Manager (Senior Director)
Project Group Lead for Analytical Sciences
Biocon Biologics Ltd – R&D
Biocon Park, Bommasandra-jigani Link Road,
Bangalore – 560099
Phone: +91-7032913639 (Mobile); +91-80-2808-
5077 (Work)**

Email: Navaratna.vajpai@biocon.com



Dr. Navratna did Master's in Chemistry from Indian Institute of Technology Madras, which was followed by PhD in Structural Biology at Biozentrum, Basel with specialization in Biomolecular NMR spectroscopy. His scientific career (PhD plus more than 14 years) both at academic and industrial institutions (Salk Institute, California; AstraZeneca UK; Biological E. Ltd and Biocon Biologics Ltd) include wide experience of working in Drug Discovery, complex generics, and protein based Biologics.

Research experience:

- 1) During his PhD program at Biozentrum, Basel, he has worked on characterization of protein kinases, which are therapeutic targets (in collaboration with Novartis). The work included identifying its interactions with drugs to understand dynamic mechanistic picture of the binding events **[2004-2008]**. Post PhD, he continued his research in the same lab as a post-doctoral fellow for nearly 2 years. **[2008-2010]**
- 2) During his postdoctoral work in Salk Institute, La Jolla, California he had chance to work on membrane proteins, with special focus on development of novel tools for identifying new inhibitors of GPCRs. **[2010-2011]**
- 3) At AstraZeneca UK, he was part of discovery sciences group where the focus was performing ligand screening, identifying novel hits, and further assessment of hit-to-lead journey. In addition, the work involved assessment of mechanistic events related to protein-drug or protein-protein interactions, all of those were key therapeutic targets. **[2011-2014]**
- 4) Upon his return to India, the first two years were focussed on establishing characterization tools for assessment of complex generics (Heparin, Enoxaparin, Dalteparin, and other Slow-release drugs). **[2015-2017]**
- 5) Five years at Biocon has been all about focussing on supporting affordable drugs for metabolic disorders – biosimilar Insulin and analogues, and biosimilar liraglutide. As a Functional head for all the physicochemical activities for Insulins (and analogues), he spearheaded development of novel methods and tools for characterization of insulins – in chromatography (all the lot release methods, in-process characterization methods), Mass spectrometry as well as for higher order structures. The development of novel methods for Insulin is mainly aided by the detailed understanding of structural biology of insulins. **[2017 onwards]**

Biosimilars – Opportunities and challenges

Dr. Navratna Vajpai
Chief Scientific Manager (Senior Director)
Project Group Lead for Analytical Sciences
Biocon Biologics Ltd – R&D

In the past two decades, Protein based biologics have opened a new wave of pharmaceutical drugs – these molecules are highly specific to their biological targets and hence highly potent. However, due to complexity in the production of these drugs, they are highly cost intensive. The unmet need can be overcome by faster approvals of accessible Biosimilars. With many of the first-generation novel biologics reaching the end of their exclusivity patents, there is high potential for biosimilar companies to successfully launch 'affordable generic version' of innovator biologic drugs. My presentation will discuss on current opportunities and challenges associated with Biosimilar manufacturing and its comparability to the reference innovator product.

**Special Lecture: Dietmar Hueglin (BASF,
Mumbai)**

***"Bridging the gap' between chemical
industry and academia in India through open
innovation"***

Chairperson: Harinath Chakrapani

Harinath Chakrapani

**Professor of Chemistry Indian Institute of
Science Education and Research (IISER) Pune
Dr Homi Bhabha Road, Pune 411 008
Maharashtra, India.**

**Education**

B.Sc. Chemistry Loyola College, University of Madras 1994-1997

M.Sc. Chemistry Indian Institute of Technology, Madras 1997-1999

Ph.D. Chemistry Duke University, USA 1999-2005

Postdoctoral Research Associate Wake Forest University, USA Jan 2006-Aug 2006

Postdoctoral Visiting Fellow National Cancer Institute, Frederick, Maryland, USA Sep 2006-
July 2009

Academic Career

Assistant Professor IISER Pune, Jul 2009-Jul 2015

Associate Professor IISER Pune, Jul 2015- May 2020

Professor IISER Pune, May 2020-present

AWARDS AND HONOURS

- Innovative Young Biotechnologist Award, 2011; DBT
- Young Scientist Award, 2015; Chemical Research Society of India (CRSI)
- Young Scientist Award, 2015; Pune Municipal Corporation, Pune
- Chemical Research Society of India Bronze Medal, 2021.
- S Ramachandran National Bioscience Award for Career Development, 2021, DBT

Dr. Dietmar Hueglin
BASF Chemicals India Pvt Ltd,
Innovation Campus, Thane-Belapur Road,
Navi Mumbai 400 705, India

Email: dietmar.hueglin@basf.com



Dietmar Hueglin holds a Diploma in Chemistry and a PhD in Natural Sciences, both from University Freiburg im Breisgau, Germany. During his 32 years of career in industrial research, he assumed scientific and management positions in Germany, Switzerland, and India. Photopolyimides for semiconductors, developed for OCG, Rhode Island, USA, and cosmetic UV absorbers are key products from his own research activities.

Dietmar Hueglin is key author of 45 US patents and numerous written and oral papers. For his contributions to progress in applied chemical sciences he received the Sandmeyer Award 2004 from the Swiss Chemical Society. In 2011 he was honoured with the BASF Innovation Award, in 2013 with the BASF Business Excellence Award. Starting 1992, Dietmar regularly visited India for R&D projects, business support and the relocation of a R&D centre. In 2001 he took over responsibility for Ciba's Research Centre in India. Dietmar commenced his present role as Director of BASF's Innovation Campus Mumbai in January 2018.

‘Bridging the gap’ between chemical industry and academia in India through open innovation

Dr. Dietmar Hueglin
BASF Chemicals India Pvt Ltd,
Innovation Campus, Thane-Belapur Road,
Navi Mumbai 400 705, India

In the introduction, the fundamental role of collaboration between industry and academia for successful market-oriented innovation will be outlined. Examples from the chemical industry will be given to demonstrate that collaborative innovation strongly enhanced the progress of society and the prosperity of nations. The examples illustrate the importance of an open innovation culture, supporting collaboration between industry and academia.

For an important and populous country like India, innovation holds the key to increase the nation’s prosperity and to overcome poverty. Unlike developed nations, India lacks a track record of world-class innovation, in particular patented products and technologies for global markets.

With its huge domestic market and extensive talent pool, India offers a thriving breeding ground for industrial innovation, yet its potential remains largely untapped. While instances of market-relevant innovations are few in the country, there is much to be learnt from countries leading in translational research.

In the main part of the talk issues and hurdles facing both, the Indian chemical industry and the Indian academia, are explored and solutions to help promoting collaboration between the two are offered. Open innovation, inviting collaboration between industry, R&D institutes and academia, have proven to be very successful as it helps to overcome the traditional silo mentality of corporate research units and academic institutions.

Perfumery/Chemical Biology
Chairperson:
Prathama Mainkar
P. Srihari

Dr Prathama S. Mainkar

**Chair & Senior Principal Scientist
Department of Organic Synthesis & Process
Chemistry
CSIR-Indian Institute of Chemical Technology
Ministry of Science & Technology, Government
of India
Tarnaka, Hyderabad-500 007, Telangana**

**Email: prathamam@gmail.com
prathama@iict.res.in**



PROFESSIONAL HISTORY

- Senior Principal Scientist & Head, Department of Organic Synthesis & Process Chemistry, CSIR-Indian Institute of Chemical Technology (September 2016 till date)
- Management Committee Member NIPER-Hyderabad (2016-2018, additional)
- QRS Fellow, CSIR-IICT (2013-2016)
- Consultant OSDD (Open Source Drug Discovery-CSIR) 2013
- DST-WoS-A, PI (2010-2013)
- Evolva Biotech, Head Chemistry (2006-2010)
- Sai Life Sciences Assoc. Director, MedChem (2002-2006)
- Penn Biotech, General Manager, R&D (2001-2002)
- Dai-Ichi Karkaria, Manager R&D (1996-2001)
- AVRA Laboratories (1995-1996)

EDUCATION

- B. Sc from Osmania University (Botany, Genetics & Chemistry) 1984
- M. Sc from Osmania University (Specialization in Organic Chemistry), 1986
- Ph. D from Osmania University (Chemistry, work at IICT), 1993 under mentorship of Dr. M. K. Gurjar.

AWARDS:

- ❖ CRSI Bronze Medal 2023
- ❖ National tech Excellence Award for Women by TDB, GoI, 2022
- ❖ CSIR Technology Award 2021 (for Covaxin® adjuvant)
- ❖ Best Woman Scientist Award 2021 by Genesis of Education Institute
- ❖ CSIR Technology Award 2020 (for process of Favipiravir)
- ❖ CSIR-IICT Best Woman Scientist of the year 2017
- ❖ OPPI Woman Scientist Award 2016
- ❖ CSIR-IICT Best QRS Fellow 2014

Dr. P. Srihari**Chief Scientist**

**Department of Organic Synthesis and Process
Chemistry
Genetic Chemistry Laboratory 1st Floor
CSIR-Indian Institute of Chemical Technology
Hyderabad 500 007, India.**

Tel No.: +914027191815

Email: srihari@iict.res.in

**Education**

M. Sc. Osmania University, Hyderabad (1995-97)
M.Phil. Hyderabad Central University, Hyderabad (1997-98)
Ph. D. CSIR-Indian Institute of Chemical Technology (Mentor: Dr. J. S. Yadav)/
Osmania University, Hyderabad (2003)
PDF Rutgers, The State University of New Jersey, USA. (2003-2005)
(Mentor: Prof. Spencer Knapp)

Professional career:

Senior Scientist at CSIR-IICT (2008-2010)
Principal Scientist at CSIR-IICT (2010- 2015)
Senior Principal Scientist (2015-2020)
Chief Scientist (2020 to till date)

Research Interests

Asymmetric Synthesis, Total synthesis of macrolides, Synthesis of New Chemical entities for various therapeutics, Medicinal Chemistry, Development of new methodologies involving C-C bond formation reaction. Flow Chemistry for API synthesis.

Honors and Awards

CSIR Young Scientist Award in Chemical Sciences, 2009.
OPPI Young Scientist Award in Pharmaceutical Sciences, 2009.
AVRA Young Scientist Award, 2014.
Dr. A K Singh Memorial Young Scientist Award 2016.
CDRI Award for Excellence in Drug Research in Chemical Sciences 2018.
Acharya P. C. Ray Flow Chemistry Technology Award, 2021
CRSI Bronze Medal, 2021

Achievements

Publications: 128: Patents: 14
Ph. D.s: 12 Awarded, 2 Submitted, 5 (working)

Dr. Avani Mainkar

**Chief Scientific Officer
Keva Fragrances Flavours & Aroma
Ingredients**



Dr. Avani Mainkar is a technology leader in the FMCG industry, with over 20 years of experience in bringing to life, innovations based on Science & Technology. A Ph.D in Pharmaceutical Technology, Avani had an illustrious career of over 16 years at Marico Ltd, with many leadership roles, culminating in Exec. Vice-President & Head-R&D.

Currently, she is Chief Scientific Officer at Keva Fragrances Flavours & Aroma Ingredients, where she leads a 75-member strong Science & Technology team in diverse areas like discovery of new fragrance molecules, creating novel fragrance delivery technologies, Natural Cosmeceuticals and converting unique concepts into cosmetic innovations.

She is passionate about developing consumer centric technology innovations that lead the business.

Chemistry & the Future of Fragrance Industry

Dr. Avani Mainkar
Chief Scientific Officer
Keva Fragrances Flavours & Aroma Ingredients

The fragrance industry is thriving on the back of increased growth in FMCG category. Chemical ingredients have been the back bone of the industry from the past few centuries. However, increased focus on natural, renewable and sustainable materials is leading to a marked change in the focus of the industry. Green chemistry is taking the forefront in the chemistry divisions of fragrance companies. So also biotechnology is starting to play a key role in creating new fragrance ingredients with a better environmental footprint. This talk focusses on the current challenges faced by the fragrance industry and future opportunities of integrating biotechnology with chemistry as the way forward for the fragrance industry.

Suvarn S. Kulkarni

Professor
Indian Institute of Technology Bombay
Powai, Mumbai 400076

E-mail: suvarn@chem.iitb.ac.in
Group web page:
<http://www.chem.iitb.ac.in/~suvarn/>



Suvarn Kulkarni received his Ph.D. in Organic Chemistry from University of Pune in 2001. After his Ph. D., he pursued his post-doctoral research at Academia Sinica, Taipei, and University of California, Davis. He returned to India in late 2008 and held a faculty position at IACS Kolkata prior to joining the Indian Institute of Technology Bombay in 2009. He subsequently rose to the rank of full professor in 2016 and presently working as Institute Chair Professor. His current research interests include devising newer ways for efficient chemical synthesis of complex glycoconjugates implicated in various infectious diseases.

Suvarn was a short term Visiting Professor (MOST) at Taiwan in 2014. He is a Fellow of the Royal Society of Chemistry London and Fellow of Maharashtra Academy of Science. He is a recipient of the CRSI Bronze medal for the year 2017 and Dr. H. C. Srivastava Young Scientist award 2016. He is a member of the editorial board of Carbohydrate Research and guest editor of international journals such as EJOC and Frontiers in Chemistry. Recently he received IRCC research Dissemination Award from IITB. Most importantly, he was selected by the students for the Excellence in Teaching Award at IIT Bombay in 2017 and very recently for the prestigious Prof. S. P. Sukhatme Award for Excellence in Teaching in 2020.

Rare Sugar Containing Glycans in Pathogenic Bacteria – Synthesis and Applications

Suvarn S. Kulkarni
Professor, Department of Chemistry
Indian Institute of Technology Bombay
Powai, Mumbai 400076

Bacterial glycoconjugates are comprised of rare D and L deoxy amino sugars, which are not present on the human cell surface. This peculiar structural difference allows discrimination between the pathogen and the host cell and offers avenues for target-specific drug discovery and carbohydrate-based vaccine development.¹ However, they cannot be isolated with sufficient purity in acceptable amounts, and therefore chemical synthesis is a crucial step toward the development of these products.^{2,3} We recently established short and convenient methodologies for the synthesis of orthogonally protected bacterial D and L-deoxy amino hexopyranoside and glycosamine building blocks starting from cheaply available D-mannose and L-rhamnose.^{4,5} The one-pot protocols rely on highly regioselective nucleophilic displacements of triflates. These procedures have been applied to the synthesis of various bacterial glycoconjugates⁶ as well as metabolic oligosaccharide engineering.^{7,8} The studies led to discovery of selective inhibitors of glycan biosynthesis.⁹

In this talk I will present our recent results on the total synthesis of highly complex and densely functionalized glycoconjugates and the application of rare sugars in selective detection and disarming of pathogens.

1. Dube, D.H.; Champasa, K.; Wang, B. *Chem. Commun.* **2011**, 47, 87-101.
2. Kulkarni, S. S.; Wang, C. C.; Sabbavarapu, N. M.; Podilapu, A. R.; Liao, P. H.; Hung, S.-C. *Chem. Rev.* **2018**, 118, 8025–8104.
3. Emmadi, M.; Kulkarni, S. S. *Nat. Prod. Rep.* **2014**, 31, 870-879.
4. Emmadi, M.; Kulkarni, S. S. *Nature Protocols* **2013**, 8, 1870-1889.
5. Sanapala, S. R.; Kulkarni S. S. *J. Am. Chem. Soc.* **2016**, 138, 4938–4947.
6. Behera, A.; Rai, D.; Kulkarni, S. S. *J. Am. Chem. Soc.* **2020**, 142, 456-467.
7. Clark, E. I.; Emmadi, M.; Krupp, K. L.; Podilapu, A. R.; Helble, J. D.; Kulkarni, S. S.; Dube, D. H. *ACS Chem. Biol.* **2016**, 11, 3365-3373.
8. Luong, P.; Ghosh, A.; Moulton, K. D.; Kulkarni, S. S.; Dube, D. H. *ACS Infect. Dis.* **2022**, 8, 889–900.
9. Williams, D. A.; Pradhan, K.; Paul, A.; Olin, I. R.; Tuck, O. T.; Moulton, K. D.; Kulkarni, S. S.; Dube, D. H. *Chem. Sci.* **2020**, 11, 1761-1774.

T. Govindaraju

Professor

**Bioorganic Chemistry Laboratory
New Chemistry Unit and School of Advanced
Materials (SAMat)**

**Chair, Education Technology Unit
Jawaharlal Nehru Centre for Advanced
Scientific Research, Jakkur
Bengaluru 560064, Karnataka, India.
Tel: +91 8022082969/2556**

Email: tgraju@jncasr.ac.in,

tgraju.jnc@gmail.com

URL: <https://www.jncasr.ac.in/faculty/tgraju>



T. Govindaraju received MSc (2000) from Bangalore University and PhD (2006) from the National Chemical Laboratory and Pune University, Pune, India. He carried out postdoctoral research at the University of Wisconsin-Madison, USA (2005–2006) and Max Planck Institute of Molecular Physiology, Dortmund, Germany (2006–2008). His research interests are at the interface of chemistry, biology, and biomaterials science, include Alzheimer's disease, molecular probes, diagnostic therapy (Theranostics), peptide chemistry, molecular architectonics, and silk-inspired biomimetics and biomaterials. He has more than 150 publications, 35 patents, and four books to his credit. He has co-founded a startup company (VNIR Biotechnologies Pvt. Ltd., <http://vnir.life>) to translate many of the inventions from his laboratory including Alzheimer's disease diagnostics. His group has discovered a novel drug candidate with immense potential to treat Alzheimer's disease and is licensed to biopharma for further development.

Disease diagnostics and therapeutics through laboratory-innovation and translation

T. Govindaraju
Professor

New Chemistry Unit and School of Advanced Materials (SAMat)
Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur
Bengaluru 560064, Karnataka, India

In the introduction, the fundamental role of collaboration between industry and academia for successful market-oriented innovation will be outlined. Examples from the chemical industry will be given to demonstrate that collaborative innovation strongly enhanced the progress of society and the prosperity of nations. The examples illustrate the importance of an open innovation culture, supporting collaboration between industry and academia.

For an important and populous country like India, innovation holds the key to increase the nation's prosperity and to overcome poverty. Unlike developed nations, India lacks a track record of world-class innovation, in particular patented products and technologies for global markets.

With its huge domestic market and extensive talent pool, India offers a thriving breeding ground for industrial innovation, yet its potential remains largely untapped. While instances of market-relevant innovations are few in the country, there is much to be learnt from countries leading in translational research.

In the main part of the talk issues and hurdles facing both, the Indian chemical industry and the Indian academia, are explored and solutions to help promoting collaboration between the two are offered. Open innovation, inviting collaboration between industry, R&D institutes and academia, have proven to be very successful as it helps to overcome the traditional silo mentality of corporate research units and academic institutions.

New Platform Technologies
Chairperson:
Akhila K. Sahoo
Alakesh Bisai

Akhila K. Sahoo, PhD

Professor

**School of Chemistry
University of Hyderabad**

e-Mail: akhilchemistry12@gmail.com

akssc@uohyd.ac.in

Homepage: <http://chemistry.uohyd.ac.in/~aks/>



Education:

Postdoctoral Fellow, Kyoto University, Japan (with Prof. A. Osuka)	2004-2006
Postdoctoral Fellow-JSPS, Kyoto University, Japan (with Prof. T. Hiyama)	2002-2004
Postdoctoral Fellow, RWTH Aachen, Germany (with Prof. H-J. Gais)	2002-2002
Ph.D, National Chemical Laboratory, Pune, India (with Prof. G. Pandey)	2001
MSc (Organic Spl), Utkal University, Bhubaneswar, Odisha	1994

Career:

Professor, University of Hyderabad, India	2016-present
Associate Professor, University of Hyderabad, India,	2013-2016
Assistant Professor, University of Hyderabad, India,	2007-2012
Scientist, Sai Advantium Pharma Limited, Hyderabad, India,	2006-2007

Scientific activities:

- Published over 80 papers and 7 International Patents
- Delivered lectures over 50 seminars in the National Symposiums in India.
- Delivered 15 invited lectures in the International Conference.

Research topics:

- Development of novel synthetic methods for organic synthesis.
- Functionalizations of unactivated sp^2 and sp^3 C-H bond involving transition-metal catalyzed C-H activation. Diastereoselective C-H functionalizations.
- Gold and silver-catalyzed organic transformations.
- Synthesis of fused- π -conjugated heterocycles relevance to pharmaceutical importance and materials.
- Synthesis of nitro and nitrogen-rich insensitive high energetic materials.

Awards:

Fellow of Indian Academy of Sciences (FASc)-2021
Fellow of Royal Society of Chemistry (FRSC)-2020
Fellow of National Academy of Sciences (FNASc)-2019
UGC-BSR-Mid Career Award-2020
Prof. D. K. Banerjee Memorial Lecture Award 2012, IISc, Bangalore.
Japan Society for the Promotion of Science (JSPS) Fellowship 2002.

Supervision and Guidance:

-PhD completed-17, -Currently supervising-8 -Total Citations **4048**
[**h Index = 38; i10 Index = 68**; Google Scholar as on 05/09/2022]

Recognition:

Associate Editor of the New Journal of Chemistry (RSC) from January 2017

Alakesh Bisai

Professor of Chemistry Department of Chemical Sciences IISER Kolkata, Mohanpur, Nadia 741 246, WB.

**Email: alakesh@iiserkol.ac.in;
alakeshb@gmail.com WWW:
<https://www.iiserkol.ac.in/~alakesh/alakesh.html>**



Alakesh obtained his M.Sc. from BHU (May, 2000) and a Ph.D. (Sept. 2006) from IIT Kanpur under the supervision of Professor Vinod K. Singh (in Asymmetric Catalysis). Immediately afterward, he moved to UC Berkeley, where he held postdoctoral position with Professor Richmond Sarpong (Sept. 2006 – Dec. 2009) (in Natural Product Synthesis). Then he joined IISER Bhopal as an Assistant Professor (Dec, 2009) and rose to the rank of Professor of Chemistry (Jan., 2018) and continued till May, 2020. The research focus of the AB research group includes the total synthesis of architecturally interesting biologically active natural products that provide an ideal platform for the invention of new oxidative strategies and highly selective organic transformations. Later, he moved to the Depart. of Chemical Sciences, IISER Kolkata (May, 2019) and set a research lab. on Natural Product synthesis.

His research has been appreciated in various forms, to name a few notable ones: CDRI Award in 2022 (Excellence in Drug Research); Silver Medal, Chirantan Rasayan Sanstha, VU (2021); Bronze Medal, Chemical Research Society of India (2021); Fellow, Indian Chemical Society (FICS-2020); SERB-STAR Award (2020); CRSI Young Scientist Award (2018); DST Young Scientist Research Grant (2013); BRNS Young Scientist Award & Grant (2011); GRC Award to Postdoc. by Chair, 17th GRC on Stereochemistry (2008); Postdoc. Fellowship, UC Berkeley (2006-2009).

Dr. Arijit Roy

**Senior Scientist
TCS Research (Life Sciences Division), Tata
Consultancy Services Limited, Hyderabad.**

Email: roy.arijit3@tcs.com



Research interest

Drug discovery and development: We are developing machine learning methods to design target-specific novel small molecules. We have developed several generative and property prediction models. We are also developing models for forward synthesis and retrosynthesis predictions of small molecules. Our predictive models offer reasoning for predictions using the power of explainable artificial intelligence (AI) models. In line with current technology trends, we are developing models that can recreate all the traditional drug design steps with AI first approach. We hope that these models will help in faster drug discovery with better accuracy.

Understanding disease mechanism: We are integrating various multi-omics data of a disease of interest to construct and analyze biological networks. This allows us to understand disease mechanism and identify drugs for repurposing. We are developing novel methods to identify important proteins and putative drug targets from biological networks.

Molecular modelling and simulations: Our other research interest involves modelling and computer simulation studies of biomolecules. We have used these tools to study protein/RNA dynamics, modeling chemical reactions of biomolecules, protein structure prediction, protein ligand binding free energy.

Experience

Senior Scientist, TCS Research (Life Sciences Division), Tata Consultancy Services, Hyderabad [Feb 2019 – current]

Scientist, TCS Research (Life Sciences Division), Tata Consultancy Services, Hyderabad [March 2015 – Jan 2019]

Postdoctoral Research Associate at Laufer Center, Stony Brook Univ, NY, USA with Prof. Ken Dill [April 2011- Feb 2015]

Postdoctoral Research Associate at Institut de Biologie Structurale, Grenoble, France with Dr. Martin Field [Sept 2009-March 2011]

Education

Ph.D. in Theoretical Chemistry: Indian Institute of Technology Kharagpur, India - August 2009

M. Sc in Chemistry (Physical Chemistry): University of Calcutta, Calcutta, India – 2003

B. Sc in Chemistry (Hons): University of Calcutta, Calcutta, India – 2001

PhD Student (as co-guide)

Sowmya Ramaswamy Krishnan, Indian Institute of Technology Madras, India [2021-]

Artificial Intelligence for Drug Discovery: Science Fiction or Scientific Fact?

Dr. Arijit Roy
Senior Scientist

TCS Research (Life Sciences Division), Tata Consultancy Services Limited, Hyderabad

During the last few decades there has been a surge in the data produced by biology and chemistry. With ever-growing wealth of data, artificial intelligence (AI)-based methods are emerging as promising tools to learn the hidden patterns and gather information from the enormous amount of data in ways, probably no human can do. As a result, AI technologies are showing promise to change the way, we currently approach drug discovery.

Traditionally, the early stage of drug discovery mainly relies on screening techniques to screen public and commercial small molecule libraries. This is a multi-step process where different parameters, such as activity, physicochemical and pharmacokinetic properties of the drug molecules are optimized sequentially, which often leads to high attrition rate during later stages of drug discovery and development. In addition, the chemical space covered by these libraries is limited, while the actual chemical space of possible molecules is estimated to be in the order of 10^{60} , which remains to be explored.

On the other hand, AI-based methods can explore the vast chemical space and design diverse compounds with on-the-fly property optimization and can even predict the synthesis route of the newly designed molecules. Multi-parameter optimization with various late-stage properties has the ability to reduce late-stage attrition. The community is now offering explainable AI methods that can improve the overall confidence on the designed molecules. In this talk, I will discuss how AI-based drug design has transformed from science fiction to science fact and accelerating the overall drug discovery and development process with improved accuracy.

Chada Raji Reddy

Chief Scientist

**Department of Organic Synthesis & Process
Chemistry**

CSIR-Indian Institute of Chemical Technology

Hyderabad – 500 007

E-mail: rajireddy@iict.res.in



Dr. Raji Reddy has obtained M. Sc. from Osmania University in 1997. After completion of Ph. D. at CSIR-Indian Institute Chemical Technology in 2002, he moved as a post-doctoral fellow to University of South Florida, Tampa, USA (2002) and subsequently to University of Mississippi, USA (2002-2005). He returned India in 2005 and joined as a principal scientist in Sai Life Sciences, Hyderabad. After one year, he joined CSIR-IICT, Hyderabad as a scientist at the Department of Organic Synthesis & Process Chemistry and presently working as a Chief Scientist.

His research interests are both fundamental and applied research, include (i) the chemistry of propargylic alcohols and propiolamides; (jj) enyne-assisted annulation reactions, *ipso*-annulations and synthesis of bio-active natural products; (iii) Process development of APIs. Representative accomplishments are: processes for Favipiravir, Remdesivir, (S)-Pregabalin, key fragment of Eribulin mesylate and TLR 7/8 agonist molecule, used as an adjuvant in COVAXIN[®] (COVID-19 vaccine) have been developed and transferred to pharmaceutical organizations.

He is a recipient of CSIR-Technology Award-2021, NASI-Reliance Industries Platinum Jubilee Award-2020, CSIR-Technology Award-2020, CRSI Bronze Medal-2018, CDRI-Drug Research Excellence Award-2017, Dr. A K Singh Memorial-Young scientist award-2014, AVRA-Young scientist award-2011 and A P Akademi-Young scientist award-2007. He is also Fellow of Telangana Academy of Sciences – 2019.

He is an author of 150-publications, 10-patents, 3-review articles and 2-book chapters. Under his supervision 25-Students have been awarded Ph. D. degree. Presently, 12-research fellows are working for their Ph. D. He has also supervised 22-Master students for their dissertation.

Sustainable Strategies for New Molecular Entities and APIs: Recent Endeavours

Chada Raji Reddy

**Chief Scientist, Department of Organic Synthesis & Process Chemistry
CSIR-Indian Institute of Chemical Technology, Hyderabad - 500007 (TS), INDIA**

Among the bio-active natural products, heteroaryl motif-containing molecules are one of the major classes, which plays key role in drug discovery. Hence, the construction of heteroaryl natural product motifs received considerable attention from the synthetic organic chemists. In particular, the assembly of more than one ring involving domino annulation reactions in one-pot is highly significant in organic synthesis. In this lecture, recent accomplishments on cascade annulations of propargylic alcohols and *N*-arylpropiolamides towards new molecular entities [natural product frameworks and spirocyclic compounds] and approaches towards APIs will be discussed illustrating few representative examples.¹⁻⁷

References:

1. Reddy, C. R.; Aila, M.; Subbarao, M.; Warudikar, K.; Gree, R. *Org. Lett.* **2021**, *23*, 4882-4887.
2. Reddy, C. R.; Srinivasu, E.; Sathish, P.; Subbarao M.; Donthiri, R. R.; *J. Org. Chem.* **2021**, *86*, 1118-1132.
3. Reddy, C. R.; Kolgave, D. H.; Subbarao, M.; Aila, M.; Prajapati, S. K.. *Org. Lett.* **2020**, *22*, 5342-5346.
4. Reddy, C. R.; Patil, A. D., *Org. Lett.* **2021**, *23*, 4749-4753.
5. Reddy, C. R.; Ganesh, V.; Nagender, P. *J. Org. Chem.* **2022**, *87* (in press)
6. Raji Reddy, Ch.; Amol D. Patil.; Subbarao, M.; Nagender, P.; Ramachandra Reddy, D.; Singh, Ajay; Prathama Mainkar; Chandrasekhar, S.; Rajamannar, T. A Process For Preparation of 3,6-Dichlorocycano Pyrazine, 3,6-Dioxopiperazine Derivatives and Production of Favipiravir Thereof (Patent Filed: 202011024682).
7. Raji Reddy, Ch.; Amol D. Patil.; Subbarao, M.; Srinivas, B.; Sukumar, G.; Chandrasekhar, S.; Rajamannar, T. *Process For The Preparation Of Gamma Amino Butyric Acids And Analogs Thereof* (Patent Filed: 202011006475).

Dr. Kishan Gurram

**Founder, MD & CEO, Board of director
Sravathi Advance process Technologies Pvt Ltd
& Sravathi AI Technology Pvt Ltd.**



Dr. Kishan received his Ph.D (Catalysis) from IICT- Hyderabad in 1997. He did his post-doc at International Universities in South Korea (1997-98), The Netherlands (1999-2000) and was also visiting scientist at University of Ulm, Germany.

Kishan has started his career with GE India Tech. Center, Bangalore in 2000, and became Technical Director in 2009. He became Global Technology Leader for Aromatics & chloro-alkali in 2012 (Geleen, Netherlands) and Managing Director, STC Bengaluru (~350+ team) & Board of Director for SRTPL during 2014-2019.

In 2019, he has founded 2 new companies “Sravathi Advance process Technologies Pvt Ltd & Sravathi AI Technology Pvt Ltd”. He is presently Founder, MD & CEO and also Board of director for both Sravathi companies. His team (~150+ people) working on cutting edge Sravathi AI platform for chemistry and flow chemistry.

Kishan’s work in monomers and catalysis have been significant in commercialization of various projects in GE /SABIC.

Kishan has received many accolades over the years, such as CV Raman Innovation Award (2006), Most valuable player award (2008), Supper achiever award (2002), Gold patent award and >20 Management awards received from GE/SABIC.

Kishan has 35 publications, 25 conference papers and >50 are granted patents to his credential. He was invited speaker in National & International conferences. He is also Ph.D thesis examiner and referee for International journals.

Flow Technology & AI platform – A unique approach for quicker commercialization of Process Technologies

Dr. Kishan Gurram

Founder, MD & CEO, Board of director

Sravathi Advance process Technologies Pvt Ltd & Sravathi AI Technology Pvt Ltd

Process intensification is a concept that evolved in the process research/industry in the last few decades, to improve equipment design and process conditions to overcome limitations of heat and mass transfer evident in conventional stirred reactors. There have been a class of new reactor designs classified as “flow reactors” which have innovative reactor design. The designs offer an order of magnitude higher surface to volume ratios and intense interphase mass transfer area. With such reactors we can operate in the kinetic regime of the reactions. Plus, most of these reactors are flow/continuous operations.

The continuous flow reactor allows for intense heat and mass transfer between multiple phases while offering limited back mixing of individual phases in the flow direction. One can develop differentiated technologies in any chemical area using PI concepts with several efficiency advantages with customization of reactor designs for each type of reaction.

Artificial Intelligence is buzz word in Industry and we at Sravathi have applied for various chemistry applications. Sravathi AI platform is developed unique entire “Reaction Platform” in In-silico which reduces experimental efforts significantly. This platform can be adopted to Pharma (New Chemical Entities or Generic); Agrochemical or Specialty Industries. Sravathi AI platform in combination with Process Intensification is unique combination. Few Industry important examples (including commercial examples) will be covered to explain use of these platforms and how Sravathi is able to use these tools to reduce R&D efforts significantly and commercialize technologies.

**Session on Funding Opportunities for
Industry-Academia Collaboration**

Chairpersons:

Raghu Pale

C. S. Venkatesan

Raghu Palle

Head R&D

**Address Glenmark Research Centre, A-607,
MIDC Industrial Area. Mahape, Navi Mumbai
– 400709.**

Phone 91-9620526633

E-mail: raghu.palle@glenmarklifesciences.com



Working as Head - R&D API at Glenmark Lifesciences, Navi Mumbai with a team of about 220 Scientists and engineers responsible for process development and technology transfer of API's and Cost Improvement Programs Published about 30 research papers in various National and International Journals (6 during PhD and rest independently) More than 100 patent applications (filed or published or granted in various countries)

2020 - present Head R&D Glenmark Life Sciences, Navi Mumbai

2014 - 2020 Head - R&D API (Small Molecule Vertical) Biocon Ltd, Bangalore

2013 - 2014 Head R&D (API, CRAMS and CMO) Shasun pharma, chennai

2010 - 2013 Head R&D and Quality Ecologic Technologies, Hyderabad EXPERIENCE

2008 - 2010 Technical Director Haritha Laboratories

2001 - 2008 Director R&D API Dr Reddy's Laboratories, Hyderabad

1996 - 2001 Sr Executive - R&D API Sun Pharma Ltd, Vadodara EDUCATION

2006 - 2007 IIM Calcutta (Senior Management Program) IIM calcutta is ranked number 2 in India in management school category One year program in senior management for working professionals

1990 - 1996 University of Hyderabad - PhD (synthetic Organic Chemistry) University of Hyderabad is ranked number 5 in India in Universities category PhD in synthetic organic chemistry

1988 - 1990 University of Hyderabad - MSc (Chemistry) University of Hyderabad is ranked number 5 in India in Universities category Secured First Class

1985 - 1988 Acharya Nagarjuna Univeristy - BSc (Chemistry) Secured First Class

C. S. Venkatesan, PhD

**Senior Vice-President – R&D
Gland Pharma Ltd.
Hyderabad, India.**



C. S. Venkatesan, is a synthetic organic chemist and has over twenty five years of experience in the pharmaceutical industry. He has worked at various positions in Research & Development divisions and presently the Senior Vice-President – R&D at Gland Pharma Ltd, India. His expertise is synthesis and characterization of complex drug substances. He served as a member of the USP Committee of Experts—LMWH (Low Molecular Weight Heparin) for 10 years.

Dr. S. Chandrasekhar

Chief Scientist

srivari@iict.res.in



Dr. Srivari Chandrasekhar, born in 1964, completed all his primary and higher education in Hyderabad and Joined CSIR, IICT for a Ph. D Programme. After completing his Ph. D (1991) with the then director Dr. A. V. Rama Rao, he moved to USA for a post-doctoral position with Prof. J. R. Falck (1991-94). He joined CSIR-IICT as Scientist C in 1994 and grew up to the level of director in 2015. He is a fellow of all the three Indian Science academies, i.e., National Academy of Sciences, Indian Academy of Sciences and Indian National Science academy. He is also an Alexander von Humboldt fellow. He has made significant contributions in diverse areas of organic chemistry with a special emphasis on chiral chemistry, total synthesis of biologically active natural products and pharmaceutical products. He introduced polyethylene glycol (PEG) as a novel, environmentally benign solvent medium. He has developed technologies for the synthesis of latest anti-tuberculosis drug, bedaquiline; anti-tumor and abortive drug, misoprostol; anti-platelet molecule, beraprost; antidepressive compound, sertraline and drug for treatment of schizophrenia, asenapine. He has more than 285 publications with 7600 citations. 80 students have been already awarded Ph. D. degree under his able guidance and 20 post-doctoral associates have worked in his group. He has received several accolades including Eminent Scientist Award for contributions in the field of Chemistry from Telangana State Government in 2017, CNR Rao National Prize for Chemical Research 2012, CSIR Technology award 2014 and Infosys prize in Chemical sciences 2014 for his contributions in synthetic organic chemistry with special focus on the synthesis of complex molecules from natural sources and innovative, practical approaches to pharmaceuticals of current interest to industry.

Santosh J. Gharpure

**Professor In-Charge SINE &
Rasiklal Hemani Fragrance and Flavour Chair
Professor**

**Department of Chemistry
Indian Institute of Technology Bombay
Powai, Mumbai - 400076, INDIA.**

Email: sjgharpure@chem.iitb.ac.in



Dr. Santosh J. Gharpure graduated with an M.Sc. degree in 1996, from Indian Institute of Technology Bombay, Powai. He obtained Ph.D. from Indian Institute of Science, Bangalore working with Late Prof. A. Srikrishna in 2001. He held a post-doctoral position with Prof. P. Andrew Evans at Indiana University, Bloomington, U.S.A. Subsequently, he joined the Department of Chemistry, IIT Madras, Chennai in the year 2004. In 2012, he moved to the Department of Chemistry, IIT Bombay, Powai, Mumbai as an Associate Professor and was promoted to Professor position in 2016. Currently, he holds the position of ‘Rasiklal Hemani Fragrance and Flavour Chair Professor’. He is also Professor In-Charge of SINE, IIT Bombay’s technology incubator. His research focuses on organic chemistry pertaining to natural and unnatural product synthesis and developing new synthetic methodologies. He is also working on problems relevant to industries from different domains.

Dr. Gharpure is a recipient of INSA Medal for Young Scientist. He was awarded IIT Madras Young Faculty Recognition Award (YFRA) for his contribution in teaching and research in 2010. He received B. M. Birla science Prize in Chemistry for the year 2011. He was selected as one of the Thieme Chemistry Journal Awardees for the year 2013. IIT Bombay conferred on him the Excellence in Teaching Award in the year 2015 and Departmental award for excellence in teaching in 2019. He was selected as Themis Medicare UICT Diamond Jubilee Distinguished Fellow in Pharmaceutical Science for the year 2015-16 of ICT, Mumbai. He was selected for the award of Chemical Research Society of India (CRSI) Bronze Medal in 2018. He is member of the International Advisory Board of European Journal of Organic Chemistry. He is a Fellow of Royal Society of Chemistry (FRSC). Very recently, he was awarded INSA Teachers Award 2021 by Indian National Science Academy, New Delhi.

Promoting Entrepreneurship in Academia

Santosh J. Gharpure
Professor In-Charge SINE &
Rasiklal Hemani Fragrance and Flavour Chair Professor
Department of Chemistry
Indian Institute of Technology Bombay

Today India has emerged as the third largest start-up ecosystem in the world. Academia being the hub of innovation, its research from the lab often has the potential for commercial applications in the world. The need is to make students competent with knowledge and skills, more accustomed with the outer world and give them a market-oriented mindset. The role of academia is restricted not just to prepare young people for roles in an emerging economy, but its higher mission is to be innovative and 'discover and invent the future.'

Incubators are early partner in sharing risk with entrepreneurs, effective link between research and technology, capital and know-how to exploit the entrepreneurial talent. TBIs help in growth of technology based new enterprises and improve their survival rate. They offer services ranging from marketing assistance, Business planning, obtaining statutory approvals, Syndicating finances, legal and IPR services, etc.

IIT Bombay has been a witness to this evolution. It had set up Society for Innovation and Entrepreneurship (SINE) for promotion of entrepreneurship in 2004.

SINE is one of the earliest incubators in academia with a potential to create economic growth, strategic value and social relevance. As an incubator, SINE provides Start-to-End support to innovators and entrepreneurs. It runs programs which include prototyping grants, entrepreneur fellowships, bootcamps for innovators and early-stage entrepreneurs.

In its journey since inception SINE has incubated over 200+ Start-ups founded by 850+ entrepreneurs who in-turn created more than 5500+ employment opportunities. Nearly 28% of its start-ups are based on IPs spun out of IIT Bombay.

This growth has been enabled by active participation of various stakeholders in their engagement with entrepreneurs and start-ups. Government and Corporate/Industry have serious focus on incubators and accelerators.

Corporate/Industry plays a key role in creating or strengthening the start-ups. Resources and inputs like skills, time, feedback, validation and money are essential components of a start-up ecosystem which are obtained primarily from industry. Industry leaders play many roles as mentors, investors and more to new entrepreneurs. SINE actively collaborates for various initiatives with Corporates, Government, Institutions and International organisations.

Several Govt departments have been launching schemes and policies promoting start-ups, conducting challenges, rewarding start-ups, providing financial and procedural support.

Programs like Plugin are the best examples of Industry, Academia and Government (intel, SINE-IIT Bombay and Department of Science and Technology) coming together to accelerate and scale Emerging technology solutions.

**Special Lecture - Anjan Ray (CSIR-IIP,
Dehradun)**

"Green Processes and Fine Chemicals"

Chairperson: B. Gopalan

Dr. Balasubramanian Gopalan

**Orchid Research Laboratories
Chennai.**



Doctorate Degree (1976) in Synthetic Organic Chemistry, University of Madras.

HARVARD University, USA (1977-79): Post Doctoral Fellow, Department of Chemistry. Worked with Professor E.J.Corey (Nobel Laureate in Chemistry) on the Total Synthesis of Gibberellic acid.

Syntex Research Inc., California, USA (1979-80): International Post-Doctoral Fellow. Synthesis of unnatural amino acids using Chiral transformation reagents.

Bristol-Myers Squibb, Princeton, New Jersey, USA (1980-82): Research Associate in the Division of Organic Chemistry. Engaged in the design and development of Mono bactam Antibiotics and ACE inhibitors.

Boots Pharmaceuticals (India) Ltd (1982-92),Mumbai. Manager (Chemical Research), Drug Discovery Research Division. Drug design and development of oral antidiabetic agents, oral anti-amoebic agents and anti-inflammatory agents (inhibition of Monocyte chemotaxis).

Sun Pharma Advanced Research Centre, Baroda. Vice President (1992-93), R&D (Organic Synthesis). Engaged in Process Development Research on Pharmaceuticals.

Glaxo (India) Ltd, Mumbai (1993-1999).General Manager, Process R&D & Drug Discovery (Glaxo- France, in the Cardiovascular Therapeutic segment)

Glenmark Research Centre (Dec 1999-2005), Mumbai. Sr. Vice President, R&D.

Involved in the Design & Development of PDE IV Inhibitors (Asthma, COPD, RA & MS), DPP IV inhibitors (Type 2 Diabetes) and CB2 Agonist (Neuropathic Pain).

Matrix Laboratories Ltd (2005-2008) CSO & Executive Vice President (Drug Discovery Research). Developed Leads MX-4007 (a novel PDE4 Inhibitor). MX-6001 (a novel selective, DPP4inhibitor).

Orchid Chemicals & Pharmaceuticals Ltd (Feb 2008-Sep 2017), Chennai. Chief Scientific Officer and Executive Director. Drug Design & Development in the Therapeutic segments of Oncology, Anti-infectives, Anti-inflammatory & Metabolic Disorders.

Indian Institute of Chemical Technology (IICT), Hyderabad (Oct 2017-June 2020), Scientific Advisor, Division of Crop Protection Chemicals.

ANJAN RAY

**Director
CSIR-Indian Institute of Petroleum
Dehradun, India**



Anjan Ray received his Doctorate in Chemistry from the University of Pennsylvania under the guidance of Nobel Laureate Prof. Alan MacDiarmid and worked thereafter for over 25 years in the Chemicals and Energy Industries across functions ranging from Quality Control, Technical Service, R&D and Marketing to General Management, Mergers & Acquisitions and Corporate Strategy. Subsequently, he took up his current position as Director, CSIR-Institute of Petroleum (CSIR-IIP), Dehradun in November 2016. He has also held additional charge within CSIR of the organization's Research Planning & Business Development Group, and of its Human Resources Development Group. Currently, he is entrusted with additional charge of CSIR-Central Building Research Institute, Roorkee in addition to his primary assignment at CSIR-IIP.

Dr. Ray's professional interests have spanned fields as diverse as surfactants, lubricants, oleochemicals, cosmetics, pharmaceuticals, oil and gas, energy efficiency, biofuels, biotechnology, sustainable supply chains and renewable energy policy. His doctoral students are engaged in multidisciplinary research across thesis topics in catalysis, tribology, polymers, reaction engineering in gas-liquid systems and environmental biotechnology. He dreams of a future India where all fossil fuel and organic chemicals imports would be displaced by products derived from domestic carbon atoms and sustainable energy sources, and decentralized pursuit of the nation's climate goals would be practiced widely under enabling policies.

Apart from his professional career in chemical technology, Anjan has had an active interest in media, education, heritage and environmental conservation for over 4 decades. He is a recipient of the Indian Federation of Green Energy Jury Choice Award for Outstanding Green Energy Activist in 2021, has been felicitated with the Uttarakhand Ratnashri award, and was recently a member of India's delegation to the 56th IPCC Working Group 3 deliberations.

Session X- Fireside Chat
Chairperson/Moderator:
Srinivas Oruganti

Srinivas Oruganti, Ph.D, FRSC

**Dr. Reddy's Institute of Life Sciences,
University of Hyderabad Campus, Hyderabad
500 046, Telangana), INDIA.**

Email: soruganti@drils.org



Dr. Srinivas Oruganti is the whole-time Director of Dr. Reddy's Institute of Life Sciences since 2018. He also heads the Center for Process Research & Innovation, an industry-oriented chemistry research department of Dr. Reddy's Institute of Life Sciences. Dr. Oruganti received his Ph.D. in 2004 from the Indian Institute of Science, Bengaluru, in the area of photo switchable cluster glycosides, and did his postdoctoral research at the Centre de Biophysique Moléculaire, CNRS in the design and synthesis of glycocluster–tumor antigenic peptide conjugates for glycotargeting of dendritic cells. He has contributed significantly to various aspects of early stage process development of active pharmaceutical ingredients ranging from therapeutic areas like diabetes, cardio-vascular, multiple sclerosis and cancer. His pivotal contributions pertain to bringing an active pharmaceutical ingredient to market as a generic drug through innovation in chemical process development and offering a strategic vantage point to any pharmaceutical company in its efforts to carve out a niche for itself in ever challenging generic drug market. Recently, with support from Government of Telangana, Dr. Oruganti spearheaded the setting up of a multi-industry centric 'Flow Chemistry Technology Hub (FCT-Hub)' at DRILS to reiterate the commitment to chemical process development with guiding elements of sustainability and circular economy. He is an inventor in more than 100 patents and has published over 40 research papers in leading international journals.

<https://www.chem.iitb.ac.in/NOST/>

PARTICIPANTS

Name of the Guest	Affiliation
Prof. Goverdhan Mehta	Trustee, University of Hyderabad
Prof. S. Chandrasekaran	Trustee, Indian Institute of Science
Prof. Ganesh Pandey	Trustee, Banaras Hindu University
Prof. Vinod K. Singh	Trustee, IIT Kanpur
Prof. J. S. Yadav	Trustee, Indrashil University
Dr. S. Chandrasekhar	Co-Chair, Secretary-DST
Dr. Sandeep Verma	Co-Chair, Secretary-SERB
Dr. Krishna P. Kaliappan	Council Member, Convener, IIT Bombay
Dr. Prathama S. Mainkar	Council Member/Chairperson, CSIR-IICT
Dr. D. Srinivasa Reddy	Council Member/Chairperson, CSIR-IICT
Prof. Akhila K. Sahoo	Council Member/Chairperson, UoH
Prof. T Punniyamurthy	Council Member/Chairperson, IIT Guwahati
Prof. G. Sekar	Council Member/Chairperson, IITM
Prof. R. Vijaya Anand	Chairperson, IISER Mohali
Dr. Rakeshwar Bandichhor	Chairperson, Dr. Reddy's
Prof. Alakesh Bisai	Chairperson, IISER Kolkata
Prof. Harinath Chakrapani	Chairperson, IISER Pune
Dr. Sunil Deshmukh	Chairperson, Ind-Swift Lab
Dr. B. Gopalan	Chairperson, ORL, Chennai
Dr. Bhanu Manjunath	Chairperson, Syngenta
Dr. Srinivas Oruganti	Chairperson, DRILS, Hyderabad
Dr. Srihari P	Chairperson, CSIR-IICT
Dr. Raghu Palle	Chairperson, Glenmark Lifesciences
Dr. C. V. Ramana	Chairperson, NCL Pune
Prof. Vibha Tandon	Chairperson, JN University
Dr. C. S. Venkatesan	Chairperson, Glandpharma
Dr. Gopi Chandran	Speaker, AMAT
Dr. Buddhadeb Chattopadhyay	Speaker, CBMR, Lucknow
Dr. Samir Dave	Speaker, AIMCO Pesticides
Dr. Santosh J. Gharpure	Speaker, IITB
Dr. T. Govindaraju	Speaker, JNCASR
Dr. M. K. Gurjar	Speaker, Emcure
Dr. Kishan Gurram	Speaker, Sravathi
Dr. Dietmar Hueglin	Speaker, BASF
Dr. Naresh Jain	Speaker, NJ Bio
Prof. Suvarn S. Kulkarni	Speaker, IITB
Dr. Avani Mainkar	Speaker, S. H. Kelkar
Dr. Sitaram Pal	Speaker, Syngenta, Goa

Dr. Satish Patil	Speaker, IISc
Dr. Srividya Ramakrishnan	Speaker, Dr. Reddy's
Dr. Vishal Rai	Speaker, IISER Bhopal
Dr. Anjan Ray	Speaker, CSIR-IIP, Dehradun
Dr. Raji Reddy	Speaker, CSIR-IICT
Dr. Arijit Roy	Speaker, TCS
Dr. Ganesh Sambasivam	Speaker, Anthem Biosciences
Dr. Anubhav Saxena	Speaker, Pidilite
Dr. Ramanan Thirumoorthy	Speaker, Laurus Bio
Dr. Navratna Vajpai	Speaker, Biocon
Dr. Sarma Bagga	Participant, Sailife Sciences
Dr. Sandip B. Bharate	Participant, IIIM, Jammu
Dr. Amrut Dama	Participant, Jay Chemicals
Prof. D. H. Dethe	Participant, IITK
Prof. Rodney A. Fernandes	Participant, IIT Bombay
Dr. Anant R. Kapdi	Participant, ICT
Dr. Prashant Kini	Participant, UPL
Prof. S. R. Kotha	Participant, IIT Bombay
Dr. Santosh Kulkarni	Participant, Syngene
Prof. Anil Kumar	Participant, IIT Bombay
Prof. Pradeep Kumar	Participant, IIT Bombay
Dr. Nirmal Kumar	Participant, Zydus Lifesciences
Prof. Nandita Madhavan	Participant, IIT Bombay
Dr. Srinivasa Marimganti	Participant, IOL Chemicals & Pharmaceuticals
Prof. Irishi N. N. Namboothiri	Participant, IIT Bombay
Dr. Sivakumar Rallapalli	Participant, R L Fine, Bengaluru
Dr. Kamlesh Ranbhan	Participant, IOL Chemicals & Pharmaceuticals
Dr. Birja Shanker	Participant, UPL
Dr. Sathya Shanker	Participant, Syngene
Dr. Manjinder Singh	Participant, CIPLA
Dr. Popat Shinde	Participant, S. H. Kelkar
Prof. R. B. Sunoj	Participant, IIT Bombay
Dr. Mohamed Takhi	Participant, USP
Prof. Y. Venkateswarlu	Participant, IIT Bombay
Prof. Chandra M. R. Volla	Participant, IIT Bombay

SPEAKERS



Navratna Vajpai



Gopi Chandran



S. Chandrasekhar



B. Chattopadhyay



Samir Dave



S.J. Gharpure



T. Govindaraju



M.K. Gurjar



Kishan Gurram



Dietmar Hueglin



Naresh Jain



Suvarn Kulkarni



Avani Mainkar



Sitaram Pal



Satish Patil



Srividya Ramakrishnan



Vishal Rai



Anjan Ray



Raji Reddy



Arijit Roy



Ganesh S.



Anubhav Saxena



Ramanan Thirumoorthy



Sandeep Verma

Sponsors



IOL Chemicals And Pharmaceuticals Limited



DR. REDDY'S
INSTITUTE OF LIFE SCIENCES



United Phosphorus Limited



Integrated Chemistry Service Provider

