



Interface between Nanoparticles and Living Systems: Ethical and Translational Dimensions

Department of Biotechnology,
Motilal Nehru National Institute of Technology Allahabad
Prayagraj, Uttar Pradesh – 211004 (India)

July 15th- 26th, 2019

Course overview

Designing of nanomaterials takes place at molecular level to extract exact advantageous effects of size and novel characteristics that are way more different than the bulky counterpart. At nanoscale level, the physical, chemical, and biological properties of matter can be significantly changed as compared to properties of individual atoms and molecules or bulk matter, particularly under 10-20 nm, because of properties such as the dominance of quantum effects, confinement effects, molecular recognition and an increase in relative surface area. However, it foresees almost unlimited applications; nanotechnology has the potential to become one of the defining technologies of the 21st century. It offers significant benefits to manufacturing, human health, energy conversion and to the environment and can act as a major driver of economic growth. More than 800 products are there in market which uses various types of nanomaterials as their ingredient. Researchers have shown that half of them directly or indirectly have adverse effects on living system. Increasing use of engineered nanomaterials in rapidly increasing products like nanofertilizers, industrial effluents or paints, delivery vehicles for bioactive molecules, field monitoring sensors, monitoring of seed health etc. is paving way to their entry into waste water, sludge and ultimately into soils and then to plants. Besides the normal exposure through soil, there can be direct exposure which cannot be neglected. In recent years, many advantageous and detrimental effects of nanomaterials have been reported with respect to crop growth.

The aim of this course work is to introduce to a general audience the concept of “nanotechnology to living system”- its health effects and ethics. This course will discuss both the potential benefits and harmful effects of the use of nanomaterials in day to day life. The course work will cover various synthesis techniques and their interaction to living beings. Participants will learn about many nanomaterials and their properties which ultimately influence the environment. Also the course will emphasize on bioethics related to the use of nanomaterials. The focus will be on the moral challenges created while using nanomaterials in day to day life and understanding their expansion to general public.

Objectives

- ❖ The objective of the workshop is to facilitate networking, knowledge sharing and idea development on the requirements and implementation of a sustainable knowledge infrastructure for Nano Environmental and Health Safety Assessment and Communications.
- ❖ To bring together students/researchers who are new to nanoscale science, engineering, and technology—as well as those familiar with nanotechnology. Also to exchange views on the future of nanotechnology.
- ❖ The course will cover various synthesis process, properties and application aspects of nanomaterials and to know direct and indirect interaction to living beings. Also it will analyze and evaluate current research areas/technologies related to nanotechnology and the ethics behind it.

Course modules

Nanotechnology - An Overview, Chemical vs Green synthesis techniques, Nanomaterials in diagnostics and imaging, Nanomaterial interaction with living system, Nanobiotechnology, Commercial application of nanomaterials, Nanomaterials in sustainable development, Risk analysis of Nanomaterials, Ethics regarding Nanomaterial use

Registration Fee

Foreign Participants	\$300
Industry/Research Organizations	Rs. 5,000/-
Academic Institutions (Faculty)	Rs. 3,000/-
Academic Institutions (Student/Research Scholar)	Rs. 1,000/-

- ❖ The above fee includes all instructional materials, computer use for tutorials & assignments (if any).
- ❖ Minimum 90% attendance necessary to be eligible for certificate of participation/attendance.
- ❖ Appearing for evaluations/examinations during the course is necessary for certificate of grades in the course.
- ❖ Accommodation in the campus can be provided subject to availability. The accommodation will be on payment and 'first come first served' basis

Last date for registration: To be announced later.

Who can attend

This course is designed for participants from various backgrounds including students, researchers, faculty and scientists working in the field of nanotechnology, biotechnology, microbiology, biochemistry, bioinformatics, human genetics, biomedical sciences, life sciences, genetics, biology, physicians doing research with an emphasis on nanotechnology, professionals from other areas in healthcare such as nurses, health care administrators, bioethics committee members, professionals working in the pharmaceutical industry, Agriculture, professionals in the areas of ethics, philosophy and Ph. D. students undertaking courses of study in any of these areas.

How to apply:

One-Time GIAN Registration: Please visit <http://www.gian.iitkgp.ac.in/GREGN/> and register by paying Rs. 500/- (those who have already been paid, need not pay again). Then proceed for course registration on GIAN website.

Teaching faculty

Shivendra V. Sahi, Ph. D. is presently working as Chair, Department of Biological Sciences, Professor of Biological Sciences, University of the Sciences in Philadelphia. He is a leading researcher in the field of plant mediated synthesis of nanoparticles, remediation and gene expression in plants. He received his M.S. degree from Laurentian University in Canada. Following his Master's, Dr. Sahi pursued his Ph.D. degree at North Carolina State University in Raleigh, NC; it was during this time that he was able to further gear his interests into the field of plant biotechnology. Upon completion of his Ph.D., Dr. Sahi accepted a position at Alabama State University. After a few years, he moved on to Western Kentucky University (WKU) in Bowling Green, KY, which is where he currently resides. Presently, he has published a plethora of peer reviewed articles, presented at a variety of conferences, and has received many research awards at the national, regional, and university levels. Dr. Sahi has been the recipient of > \$ 4 million in grant funding. He has mentored many post docs, technicians and graduate and undergraduate students. Aside from being an innovator and research enthusiast, Dr. Sahi still enjoys teaching and providing mentorship to many students. He continues to amaze the scientific world with his motivation and dedication in developing the cutting-edge research in plant biotechnology.



Host Faculty and Principal Coordinator



Dr. Shivesh Sharma is presently working as a Professor, Department of Biotechnology at Motilal Nehru National Institute of Technology (MNNIT) Allahabad, Uttar Pradesh, India. His research interests include environmental biotechnology, plant-microbe interactions, PGPR and analyzing the effects of nanomaterials on plant growth and promotion/plant physiology, role of nanomaterials in countering biotic and abiotic stress in plants and development of nano-based bioformulations. His teaching interest includes Microbiology, Environment Biotechnology, Food Technology and IPR. He has published number of research papers, supervised many post graduate and doctoral students and executed projects sponsored by various govt. funding agencies viz., DBT, CSIR, UGC and MHRD.

Coordinator

Dr. Durgesh Kumar Tripathi is presently an Assistant Professor at Amity Institute of Organic Agriculture, Amity University, Noida, Uttar Pradesh, India. His research interests include nanomaterial-plant interactions and their effect on plant physiology along with their effects in combating biotic and abiotic stress in plants. Further his interests include localization and tracking of nanomaterials in plants.



Other Feature

Dr. P. Venkatachalam, Professor, Department of Biotechnology, Periyar university, Salem, TN, India working in the field of Nanobiotechnology and **Manish Tiwari, Ph.D., Ramalingaswami Fellow/Scientist-D, CSIR-National Botanical Research Institute Rana Pratap Marg, Lucknow-22601, U.P., India** working in the field of nanotechnology will deliver their lectures during the course.

Contact

Principal Coordinator: Dr. Shivesh Sharma Professor, Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, U.P., India. Phone: 91-532-2271232; 91-9005688273 Email: shiveshs@mnnit.ac.in; ssnvsharma@gmail.com	Coordinator: Dr. Durgesh Kumar Tripathi Present address: Assistant Professor, Amity Institute of Organic Agriculture, Amity University Uttar Pradesh, I 2 Block, 5th Floor, AUUP Campus Sector-125, Noida-201313 Phone: 9453088595 Email: dktripathiau@gmail.com, dktripathi@amity.edu	Local GIAN Coordinator: Dr. G. P. Sahu Professor & Head, School of Management Science, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, U.P., India. Phone: +91-9305508002 Email: gsahu@mnnit.ac.in
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Bank Details	Account Name: INLSETD-2019	Branch: Vijaya Bank, MNNIT Allahabad, Prayagraj, U.P., India
	Account number: 718400301000353	IFSC: VIJB0007184