

UGC-Academic Staff College, Jamia Millia Islamia, New Delhi
3rd 3-Week Refresher Course in Basic Sciences (Interdisciplinary)
(May 9 to May 30, 2013)

The Refresher course in Basic Sciences is aimed to emphasize on the significance of taking interdisciplinary approaches in order to understand innumerable complex issues, which are difficult to be resolved adequately by single discipline based knowledge. Most profound beneficiary of these approaches in the field of research and development had always been the discipline of Life Sciences and their allied areas including the huge horizon of medical sciences. Hence, it is mankind which evidently remained maximally benefited in the past. Similar promising results are expected by the community of scientists of all disciplines by adopting the interdisciplinary approaches in future also. Keeping the track on glorious history of interdisciplinary basic sciences and in view of the tremendous requirement of the same in future, the design of this RC has been proposed as a small step of the long journey for training young faculties, scientists and researchers. Small time of three weeks would be devoted to cover numerous interdisciplinary topics. Maximum efforts will primarily be done to raise the contemporary and challenging scientific issues. However, fundamentals of knowledge relevant to interdisciplinary topics would also be dealt in, as or when needed. But the end point focus will always be pertaining to the application of the knowledge. With these backgrounds, the proposed RC is expected to accommodate following broader areas of interdisciplinary in nature.

1. Biophysics and Structural Biology: How do the physical bases orchestrate the dance of life? What does the thermodynamic stability and mechanism of folding do in providing meanings to proteins? Are the conserved (or semi-conserved) residues of a protein essential in its thermodynamic stability and mechanism of folding? What are the optical and hydrodynamic characteristics of protein folding intermediates? These are some of the questions expected to be addressed by the resource persons.
2. Biochemistry and Bio-molecules: What are the structural bases of enzyme inhibition/catalysis, and its subsequent application in structure based rational drug design? Knowledge related to applications of basics of Chemistry will also be utilized under the heads of appropriate lecture titles by invited speakers.

3. Nanotechnology: Though it is relatively a younger area among other interdisciplinary sciences but future of the field appears to be very exciting and promising. Resource persons will address the recent advances, associated major hurdles and limitations, and future prospects of the nanotechnology. Uses of nanomaterials for novel applications in real life, combination of nano and biomaterials for diagnosis and therapeutics, sensing glucose, urea, vibrio cholera, meningitis and other diseases unlike conventional detection techniques.
4. Systems Biology and Bioinformatics: Simulation techniques to understand cell-cell communication, Computational and mathematical modelling to understand biological processes. Applicability of bioinformatics tools for unravelling the structure and functions of proteins and nucleic acids. Utilization of Bioinformatics for adopting focussed experimental approaches.
5. Biostatistics: Introductory biostatistics with fundamentals of mathematics and statistics are proposed to refresh the memories of young participants.
6. Microbiology and Immunology: In order to help the participants from supporting departments of medical, dental, physiotherapy, and related institutions, topics relevant to microbiology, immunology, molecular biology, virology etc. will be undertaken with particular emphasis over generalized understanding of pathogens, diagnostics and therapeutics.
7. Few topics purely on the basics of Physics and Chemistry have been planned for refreshing the knowledge of participants from the biological sciences background.

Dr. Asimul Islam
(Programme Coordinator)

Dr. Syed Naqui Kazim
(Programme Coordinator)

Prof. Pankaj Sharan
(Director, CIRBSc.)

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Tentative List of Topics and Resource Persons

	Themes and Topics	Speakers
1.	Structural Biology: Protein folding and Stability	Prof. Faizan Ahmad, JMI Dr. S. Gourinath, JNU Dr. Aditya Mittal, IIT Delhi
2.	Biochemistry and Bio-molecules	
	Supra Molecular Chemistry; Applying weak force to design materials.	Dr. Pritam Mukhopadhyaya, JNU
	Crystals to structures-Bimolecules	Prof. Punit Kaur, AIIMS
	Weak Interactions	Dr. P. Mukhopadhyaya, Physical Science, JNU.
	Biochemical techniques in Food analysis	Dr. Rakesh Bhardwaj, PUSA
	Introduction to Biomolecules	Dr. Asimul Islam, JMI
3.	Nanotechnology and Microscopy	
		Dr. Z. A. Ansari, JMI
		Prof. B. R. Mehta, IIT Delhi
		Prof. R. B. Mathur, NPL
		Prof. Harnath, NPL
		Prof. B. D. Malhotra, DTU
		Dr. S. G. Ansari, JMI
		Dr. S. Deka, DU.
4.	Biodiversity	
	Eco friendly management of Plant Diseases	Dr. Zakaullah Khan, PUSA
	Role of quarantine in Plant Biosecurity in India	Dr. Jameel Akhtar, IARI, PUSA
	Ecosystem and Environment	Prof. J. Behari, Dept. of Environmental Science, JNU
	Exploiting natural resources and Biodiversity	Prof. Vikram Soni, JMI
5.	Technological Revolutions- Interdisciplinary platform	Prof. Sneha Annad, IIT Delhi
5.	Biology for Physicists and Chemists	Prof. Srinivasan, AIIMS
6.	Application of fluid mechanics	Prof. Naseem Ahmad, JMI
7.	Introduction to Biostatistics	Prof. R. M. Panday, AIIMS
8.	Role of Mathematics in Basic sciences	Prof. Kalimuddin, AMU
9.	Review and Projects and Research methodology	Prof. S.A.M. Pasha, JMI Dr. Ateequr Rahman, JMI

10.	Bioinformatics and Systems Biology: Stochastic Simulation	Dr. Brojen Singh, JMI
11.	Programming paradigms	Dr. S.A.M.Rizvi, JMI
12.	Applications of Bioinformatics in medicine	Dr. Hari Pasad, AIIMS
13.	Bioinformatics Basics to recent advancements	Dr. M. I. Hasan, JMI
14.	Biotechnology in Human Health and Diseases	Prof. Chinmay Mukhopadhyaya, JNU
		Prof. Moshahid A Rizvi, JMI
15.	Microbiology, Virology, and Immunology	
	Malaria vaccines	Dr. Chetan Chitnis, ICGB
	Immunological Disorders	Dr. Ayub Qadri, NII
	Basics of Immunology	Dr. Rajni Rani, NII
	Immunology and Liver diseases	Dr. Nirupma Trehanpati, ILBS
	Signaling pathways in development of cancer	Dr. Gayatri Ramakrishnan, ILBS
	Basics of Microbiology	Dr. Ekta Gupta, ILBS
	Respiratory viruses	Dr. Shama Parveen, JMI
	A specific pattern in viral life cycle	Dr. S. N. Kazim, JMI

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