

Report

National Seminar on “Integration of Teaching and Research in Biophysics at Graduate & Postgraduate Level” held at All India Institute of Medical Sciences, New Delhi on 11th February, 2014

National seminar on the theme “*Integration of Teaching and Research in Biophysics at Graduate & Postgraduate Level*” was held at All India Institute of Medical Sciences (AIIMS), New Delhi on 11th February 2014 under the guidance of Prof. Moganty R Rajeswari. The seminar was also combined with the launch of textbook ‘*An Introduction to Biophysics*’ authored by Prof. Rajeswari. More than 200 participants representing various academic research institutes and universities in India attended the seminar. Prof. Ved Prakash, Chairman, University Grants Commission, New Delhi was the Chief Guest. The inaugural address was delivered by Prof. M C Misra, Director, AIIMS, New Delhi.

Other dignitaries who participated at the seminar included national and internationally renowned academicians: Prof. P K Julka, Dean, AIIMS, Prof. T P Singh, Distinguished Biotechnology Research Professor, Biophysics Dept., AIIMS & President, Indian Biophysical Society; Prof. V S Chauhan, Director, International Centre for Genetic Engineering & Biotechnology, New Delhi, Dr. Ch. Mohan Rao, Director, CSIR-Centre for Cellular and Molecular Biology, Hyderabad and Dr. Dinakar M Salunke, Executive Director, UNESCO Regional Centre for Biotechnology, Gurgaon. Over all, the one-day event had 25 invited faculty and 175 students and young researchers accommodated optimally in well-arranged scientific sessions. The seminar was designed in a highly interactive manner with optimal time for presentations. This greatly helped opportunity to youngsters to discuss and interact with faculty members.

Prof M C Misra in the inaugural address highlighted the importance of biophysics that has played a central role in the advancement of several research disciplines ranging from biological and physical sciences to the problems of medicine. Prof. Ved Prakash gave a historical perspective of the education system in India evolved from Humboldt model based on distribution of subjects

under different compartments, as maths/botany/zoology etc. However, the education is all about addressing problems of nature and solving them without compartmentalisation and further emphasising the same by referring to the branch of biophysics as a best example of interdisciplinary subject. He congratulated Dr Rajeswari for bringing out a comprehensive and introductory biophysics textbook to all those who want to enter the world of biophysics.

Prof P K Julka spoke on the importance of biophysical methods and techniques in the advancement of several research disciplines and their close association with number of medical specialties like clinical biochemistry, physiology, anaesthesia, radiodiagnosis, pharmacology etc. He also thanked Prof. Rajeswari for writing a textbook which includes a lot of experimental data in support of the theory which will be helpful to the reader/students to grasp the concepts.

Prof. T P Singh, renowned biophysicist spoke elaborately and appreciated the efforts made by Dr. Rajeswari in bringing out such a wonderful introductory book on biophysics. Further, he stated that this book is a must for all students of biological and physical sciences because it explains aspects of biology to physics students, as well as aspects of physics to biology students with equal ease. Prof. Singh set the tone for the seminar on the role of biophysics as an interdisciplinary subject which helps in understanding the molecular structure, dynamics and interactions and the events that occur at the cellular level to the whole organism. He recalled the time when UGC created a “Centre for Biophysics” at IISc, Bangalore and urged the UGC to refresh the syllabus of biophysics in the curriculum of UG and PG programs. He also emphasised the need for medical students to understand the subject at molecular level.

Session II: Panel discussion on how to integrate teaching and research in biophysics at college

level was chaired by Dr. Mohan Rao (Director, CSIR-CCMB, Hyderabad) and co-chaired by Dr. Salunke (Director, UNESCO-RCB, Gurgaon). In his introductory remarks Dr Mohan Rao stressed the need to motivate students to recognize the research challenges that biophysics offers. Biophysics explains large number phenomena for example, bird flying in terms of biomechanics or biology at structural level. Dr. Salunke made it clear that many biophysicists of today in fact had their basic education in pure chemistry/physics/computer science, indicating that the passion for biophysics which is more important than the previous science background/degree that one holds. He also appealed the biology students to overcome fear for biophysics and pursue biophysics as a career. Prof. Jagannathan (Head, NMR, AIIMS), who is also the council member of IUPAB recalled the formation of core biophysics syllabus by a team of eminent scientists and was sent to CSIR and UGC and no action is taken till date.

Dr. Ram Krishna (Asstt. Prof., TERI) discussed the root problems, such as stereotype learning methods taught at school level and phobia for maths hinder students taking up biophysics and pointed out the need for change of this mind set. Dr. Hemalatha Reddy (Principal, Sri Venkateswara College, University of Delhi, Delhi) discussed the rationale for the developing biophysics which requires exquisitely detailed knowledge of molecular structures, functions and use some of the most powerful tools like X ray, laser spectroscopy, NMR etc. Dr. Reddy also requested the eminent scientists to deliver talks at the college level, so that students can get exposure to the latest advancements in biophysics and are attracted to biophysics.

Prof. H D Khanna (UGC Emeritus, Former Head, Dept. of Biophysics, Institute of Medical Sciences, Banaras Hindu University, Varanasi) shared his experiences of teaching biophysics to medical graduates and shortcomings in this area. He made a few suggestions, including the need for teaching of biophysics at UG level in medical institutions as a part of physiology to be of at least 4 hrs tutorial with 1 hr for practicals. He also emphasized the need to recruit teachers possessing doctorates (non-clinical) along with those with MBBS (Clinical) in medical colleges, as research training is an important aspect of teaching.

Prof. Ashwani Koul (Chairperson, Biophysics, Panjab University, Chandigarh) talked about the current scenario in biophysics research and its potential in solving long-standing problems in medicine, biomedical engineering and agriculture. He addressed the students and assured the career options in India and abroad, for example job opportunities in national science agencies, private foundations and large corporations, including pharmaceutical companies.

Prof. Ritu Bartwal (Head, Dept. of Biotechnology, IIT, Roorkee) spoke about the exciting challenges in biophysics to understand the shape of protein molecules, how the molecules fold and how this folding affects their functions. As a physicist, she revisited the time when she did biophysics which was quite different from the present time with so many new and integrated branches of science making the student learn and research in biophysics with much ease. She also emphasized in pursuing PhD in biophysics after post-graduation, irrespective of their background in physics or mathematics or biology or engineering. By focusing on the current state of education, Prof. Rajeswari suggested that UG students should have a small component of biophysical research in their curriculum. This can be in the form of a small project during their training period which they can run on their own hands. Therefore, as a teacher, by giving the joy of biophysics to students at UG level, we can 'catch them young'.

Session III was an open interactive session involving students from various degree colleges of Delhi university to express their problems regarding the course on "Biophysics/and Biophysical techniques". Further, the teachers at DU colleges who are teaching biophysics also conveyed about measures that can make biophysics interesting. The session was co-chaired by Prof. T P Singh and Prof. K K Deepak Professor, Physiology, Faculty-in-charge of Centre of Medical Education & Training at AIIMS, New Delhi. Prof. Singh talked about the vital role of biophysics, particularly in medicine with examples of proteins. He convinced the students that biophysics is very logical (unlike other biology which is more descriptive and informative based) and, therefore, is easy to relate with. He stated that the enzymatic reactions which constantly regulate tens of thousands of chemical reactions in the living cell can be understood based on biophysics.

Dr. G Hariprasad (Assoc. Prof., Biophysics, AIIMS) who is a clinical biophysicist, talked about biological interaction of physics in health yielding to significant increase in comprehension of medical science in his presentation. He answered various questions raised by the students about biophysics and its role in understanding of molecules, body function and instrumentation. The discussion that followed was very animated and engaged, clearly underlining the fact that research in biophysics is an important and yet unexploited contribution. Prof. Pratik Kumar, (Dept. of Medical Physics, AIIMS, New Delhi) conveyed the students the advantages of biophysics in medical arena citing the examples of application of medicine in radiation biophysics, radiology, radiotherapy and nuclear medicine. Dr. Satish G. Kulkarni (Head, Biophysics) and Dr. Safdar Ali (Asstt. Prof., Shaheed Rajguru College, University of Delhi) who teach biophysics took questions from students regarding the curriculum and information at library, internet and summer training etc.

As per the existing rules of UGC, only those candidates who possess a PG degree in a particular subject (eg. Chemistry) are eligible to be considered for the faculty position in that subject at college/university level. Considering the fact that in India, biophysics course at PG level is offered at only at 7 universities, those with M. Sc. (Biophysics) are finding it difficult to get teaching jobs. Therefore, it was unanimously agreed that to make a request to the UGC to take appropriate measures to consider candidates with M. Sc. (Biophysics) under both "Physics/Chemistry" and "Biology" and also to reintroduce a common "Biophysics syllabus" for all Indian universities. It was also felt that more workshops of this kind should be conducted nationwide to expose students to various biophysical techniques. The discussion also included ways to identify small projects in biophysics at UG and PG level to reinforce learning and build self confidence and to hold workshops in order to train teachers to teach biophysics in new and interesting ways.

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