Frontiers in Cell Biology – a two day lecture-workshop organized in Udaipur on 14th-15th February, 2013

The two day lecture workshop on ‘Frontiers in cell and molecular biology’ organized by Indian National Science Academy, Indian Academy of Sciences, Vidya Bhawan Society, and The National Academy of Sciences introduced undergraduate students from the region to some great minds from various countries including the Nobel laureate Martin Chalfie. While the interaction was aimed at students, senior faculty members from different universities also availed of this unique and rare opportunity to hear speakers talk about the decreasing boundaries between various science disciplines.

Day 1 - The proceedings were inaugurated by Shri Riaz Tehsin, President, Vidya Bhawan Society who set the tone of the two days by talking about the relevance and importance of the seminar for young minds in today’s context. The first day saw talks by three speakers.

Professor L.S. Shashidhara, IISER, Pune gave the first talk entitled Science and Career Opportunities in 21st Century, India. The audience was introduced to the nature of science - how it starts with curiosity and questioning and is about analytical and critical thinking. Therefore, science is not limited to certain scientific projects, rather it finds its roots in all areas of the life. It has implications for the society, not just in terms of the technology associated but more in terms of thinking, especially that of the higher level of officials and politicians who need to be scientific, rationale and logical as their actions affect a large section of society. It was a novel way of viewing the nature and role of science in society.

The talk mentioned the sorry state of education and teaching methodology in Indian education system. Students are filled with information, but do not know how to create or gain knowledge through scientific methods/thinking. 50-70% of students in India don’t have access to science and scientific research projects. The Indian examination system and schools fail to give an insight into the thinking process of the students. However in the last few decades India has seen a major development in science and technology. This is inspiring many foreign investors to invest in India. India is transforming into a knowledge economy which is expected to change the Indian economic scenario. The Indian Govt. has schemes like INSPIRE which encourage and help students to immerse in scientific methods and thinking. He also talked about the help of various people involved in the field of sciences.

In his second lecture Dr. Shashidhara discussed Evolution of Human Cognition. In short, humans are more complex than any other species for the following reasons: 1. Ability to use syntactical language and surreal forms of expression; 2. Better tool users; 3. Complex analytical abilities of the human brain. Thus humans have the highest order of consciousness among all the existing species.

The second speaker of the day was Professor Aakash Gulyani from inStem, NCBS, Bangalore whose talk was on ‘Cells on the move: What is happening inside’. He talked
in detail about the dynamics of cells and its classical understanding how they are
moving around them. But more importantly he discussed how cell and molecular
biology is emerging as an interdisciplinary area of study, where frontiers of different
fields are tumbling which is enabling a holistic and rich discourse. Biology is a dynamic
subject where understanding constantly keeps on evolving.

The last speaker of the day was Professor Farhat Habib from IISER, Pune. As a
once resident of Udaipur, he was an object of interest to the audience. He
elaborated the science and researches in the field of genomics - a branch of science
which deals with the techniques which are related to genetic materials of the cell.

Day 2 - Kamal Mahendroo, Vidya Bhawan Society initiated the discussion by speaking
on the role of VB in science and mathematics education.

The first session began with the lecture of Professor Richard M. Losick, Harvard College,
who shared his research on the topic of ‘Are we more microbial than human’. He shared
that we live in an invisible world of microbes; where human body contains 10 times
more bacterial cells than human cells and 100 times more bacterial genes than human
genes!

The second lecture was delivered by Professor Vivek Malhotra in which he talked about
the conventional and unconventional types of permeability with the help of animation
under the theory of central dogma. He also threw light on intracellular transporting of
proteins in some exciting ways. This was followed by the lecture of Professor Graham
Hatfull where he talked about his ongoing researches on bacteriophage. He dwelled
deep into the topic thereby also sharing some interesting facts like there are 10^6 or 10^7
bacteriophage in 1ml of water! If all the bacteriophage in the biosphere are put one over
the other in a linear fashion then their length will be as much as 200 million light years.
He also talked in detail about the contribution of studies of bacteriophage in the field of
health and biotechnology.

Professor Tulle from Columbia University gave insights into the Virosphere. Students got a
chance to hear about stem cell research during this talk.

Nobel laureate Professor Martin Chalfie gave an engaging lecture on his research about
the GFP i.e Green Fluoroscent Proteins and how it brought a revolution in biotechnology
researches. He also talked about his childhood where he never scored great grades
in examination but he never compromised on his curiosity. He filled students with
inspiration by saying that science does not need extraordinary intelligence but passion
and curiosity. He also stated that science should be viewed and studied holistically in
education system. It can and should not be seen in isolation but it always is a group
effort.

The workshop ended with the lecture of professor Ron Vale on ‘How living organisms
move’ which was infused with insights into the inter and intracellular movements
within the body. He ended the workshop by opening a new dimension by saying
“Science is social and the lab is like a family.”
Conclusion

Although it was examination season, it was pleasant surprise to see students from Mohan Lal Sukhandia University, Modi Institute, Padampath Singhania Institute, Rajasthan University, and APF faculty turn up in great numbers. Students from different academic background - physics, biology, biotech, pharma and chemistry - were not deterred by the technical heading Frontiers in Cell Biology. They were rewarded as the speakers talked in an accessible and interesting manner. More than lectures, the different ways of interaction- lecture, question-answer session between the session and at the end of session, group discussion - gave them a chance to interact more closely with the speakers. The emphasis on interdisciplinary approach to understand nature and it's phenomenon in a complete way was also helpful. It was an exciting way of getting an idea about how scientists work and new innovation occurs in the field of science.
What is lacking?

A critical mass of academic excellence