

## Compartmentalization of science in India – for whose benefit?

In a world where the barriers between various scientific disciplines are being narrowed down, Indian science is being compartmentalized day by day. Whereas in Western countries it is not uncommon for a physical science student to work in a biological science department or vice versa; in India it is a rare phenomenon. Western countries give importance to the interest of the student and the experience, whereas our system gives importance only to the certificates students hold.

With the mushrooming institutions offering courses in so-called advanced streams like biotechnology, proteomics, genomics, bioinformatics, nanotechnology, etc. a situation is created wherein certain disciplines like biotechnology are given undue importance. Because of this, there is a heavy rush for securing admission to these applied branches, even though the fees are above the capacity of a middle-class parent. It is noticed that for a B Sc Biotechnology course, the fee ranges from Rs 10,000 to 25,000 per semester, whereas for M Sc programmes in Biotechnology, it ranges from Rs 10,000 to 100,000 depending on the popularity of the institution.

Students join these courses with a view that the applied branches of science are superior to basic sciences and it would earn them a decent living. In colleges that offer the so-called conventional and advanced courses, it is even noticed that basic science topics like cytology, classical genetics and taxonomy are omitted from courses in biotechnology, so as to make the students believe that these are meant for those pursuing conventional courses. There is also a demand for creating new subjects in the national eligibility tests conducted by UGC/CSIR, as it is felt that the broad life sciences discipline does not offer any added advantage.

Even students who qualify in these national tests face the wrath of our academic and scientific community while choosing their area of research, as it is not the student's interest that fetches him/her a place in a research laboratory. In some national institutes it is mentioned in the advertisement for PhD admissions that M Sc Plant Science students are not allowed for the PhD programme, even if one holds a CSIR fellowship. Such research institutes create barriers between scientific disciplines. This is ridiculous

because, for example, while formulating a new drug from a plant source, where would you fix the limit of each discipline? It involves plant biochemistry, pure chemistry, microbiology animal science, microscopy and fermentation technology. The research community should reap the knowledge of a creative mind, and creativity exists only if one has genuine interest in a specific topic. The scientific community of the West has understood this since ages, as is evident from the history of Nobel Prizes, where most Nobel Prizes in Physiology or Medicine have been won by those from physical or chemical sciences. We are yet to realize this and take necessary action. Research institutions and universities should join hands to solve this problem; otherwise we would still be lamenting the fact that Indians are not getting the coveted prize.

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## Additional recommendations to the UGC task force for basic scientific research in universities

Recently, an article appeared in *The New Indian Express*<sup>1</sup>, highlighting the decreased enrollment in basic sciences and listing out a ten point recommendation by the UGC task force to attract and train students. A professional treatment of the subject is given by Balaram<sup>2,3</sup>. I wish to suggest a few additional points which may be necessary not only to basic sciences, but also to other programmes.

(a) Money should be provided for inviting subject experts from far and near, with provision for air travel and local hospitality. Four to six experts may be needed every semester, for adequate interaction with students.

(b) Efforts must be made to organize video conferencing with eminent scientists.

(c) Practical training is a causality for reasons of lack of facilities, expertise and money. Hence duly planned hands-on-experience of at least 15 days, every semester, must be given to students by inviting relevant experts and/or nominating a group of students to a desirable place where they can have hands-on-experience.

(d) We should have provision for training students at several selected training institutes.

(e) Students must be encouraged and funded to attend international conferences.

(f) Due economic incentives must be given to attract students to basic sciences, both during the training programmes and in various jobs, later on.

1. Suresh Kumar, D., *The New Indian Express*, Education Express Supplement, 10 March 2006, p. 1.
2. Balaram, P., *Curr. Sci.*, 2004, **86**, 1583–1584.
3. Balaram, P., *Curr. Sci.*, 2001, **80**, 601–602.

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