

## Survey and Awareness of Dual-use Education in Pakistan

Lead academy: Pakistan Academy of Sciences

The Government of Pakistan places a high priority on science and technology and actively supports research. As a result, Pakistani scientists are publishing five times as many research articles in 2011 than they did ten years earlier (> 3,800 papers, compared to just 511 in 2001: ISI Web of Knowledge). A major portion of this increase comes from the life sciences, including biotechnology.

For several years, recognizing this rapid increase in output – as well as the rising number of practicing researchers – the Department of Biotechnology, Quaid-i-Azam University (QAU) in Islamabad, Pakistan, has been actively highlighting issues such as the dual-use concerns of biotechnology, biosafety and biosecurity. Through IAP funding to the Pakistan Academy of Sciences (PAS), the department has initiated numerous activities to raise the knowledge among life science students and researchers about bioethics and the responsible conduct of research.

### Survey

A baseline survey revealed that Pakistan has 133 universities and other degree-awarding institutes, 59 of which offer courses in the life sciences across 230 departments. However, only 22 of these departments offer any course covering bioethics.

From September to December 2013, MPhil and PhD students, young researchers and faculty members from different universities in Pakistan were interviewed to determine their knowledge about bioethics, biosafety, biosecurity and responsible conduct in science. Structured questionnaires were prepared which were distributed among participants under the condition of anonymity. In addition, faculty advisors were also interviewed and their comments recorded. It was found that faculty members possessed a basic understanding of bioethics-related issues, but that greater and more integrated efforts are required in order to improve the basic level of understanding. The results were published in a booklet that was presented at an international conference held under the auspices of the United Nations on the dual-use issue held in Geneva, Switzerland.

A large proportion of comments from survey participants related to student development and the revision of the curriculum to ensure it would cover a broader spectrum of issues like biosafety and biosecurity. Earlier, on 16 May 2013, the Department of Biotechnology, QAU, also participated in a joint online session with a representative from the University of Bradford, United Kingdom. More than 50 students from Department of Biotechnology attended and discussed the quality and relevance of the current curriculum, emphasizing the need for it to be revised and updated.

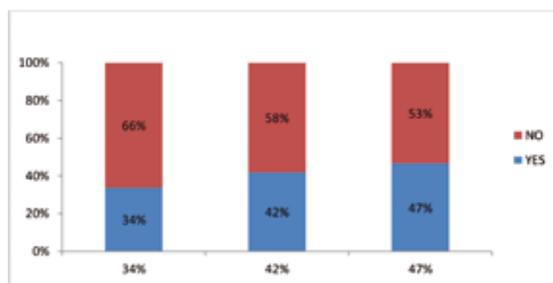
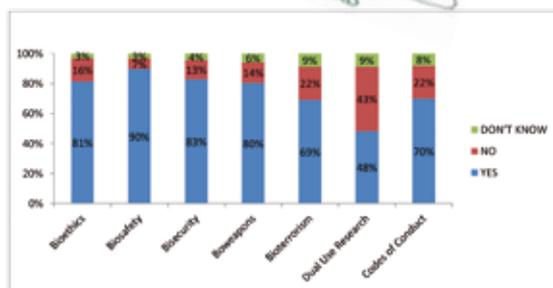


Preparations under way for the international workshop on 'Raising Awareness on Dual Use Concerns in Biotechnology'.

As a result of these studies, it was identified that there is a need for further work with teachers, including both surveying their understanding regarding dual-use research and technologies, and to organize interactive workshops to increase their awareness of the issue.

### Workshops

Two awareness-raising workshops are planned for 2014: one at QAU in Islamabad, and the other in the Valley of Chitral in northeast Pakistan that will reach out to bioscience students studying in remote towns such as Chitral, Dir and Swat.



Results of the survey on 'Awareness about Biosecurity and Dual Use Related Concepts among Educators of Graduate Life Sciences in Pakistan'.