In the practice of the life sciences, safety, security, and ethics are all overlapping elements of a continuum that can be encapsulated as the responsible conduct of science. Similarly, the boundaries between the scientific and technical disciplines involved in the life sciences have largely evaporated. Many people involved in life science research and related activities do not have a biological science background—these include physicists, chemists, engineers, and increasingly information technology specialists in governmental, academic, and private-sector institutions and organizations. Thus, academic and other educational institutions have a special problem in ensuring the proper training and education of individuals at facilities engaged in activities where special precautions are needed. Organizations handling dangerous pathogens have a particular responsibility to ensure that training and leadership in safety and security issues, including international and national laws and regulations, takes into account those staff who may not have received appropriate instructions related to these dangerous organisms, whether they work in a laboratory or are involved in management and other directly related activities. Assuring the responsible conduct of science comes down, in the end, to people and knowledge. Heads of life science institutions and their biosafety officers are increasingly challenged to focus on the abilities of staff in the workplace without assuming that issues of ethics, safety, and security related to dangerous pathogens have been dealt with in the normal course of academic training.

The conduct of responsible science, whether in the life sciences or elsewhere, lies in the first instance with the scientists themselves. Scientists have a duty not only to themselves but also to society as a whole—that is to say to governments, academia, private companies, and to the public-at-large. At the most basic level, science should be conducted to benefit humanity, which requires a conscious calculation of the risks involved in every endeavor. The boundaries between scientific disciplines have become increasingly blurred, for positive reasons, making it harder for specialist societies and other discipline-focused professional organizations to bring rigour to codes of conduct and other methods that help ensure safe, secure, and ethical conduct in their respective fields.

A multi-disciplinary consultation is urgently needed to help chart better ways to ensure the responsible conduct of science without hindering its advance and dissemination. In this process scientists need to find better and explicit ways to connect with policymakers and the public-at-large to build confidence that scientists well understand their responsibilities. This is a vital element in assuring that science is properly funded and that social, cultural, and religious obstacles do not block progress toward society reaping the true health-related, social, and economic benefits of science.

One way to meet this objective is to build and sustain a multi-disciplinary network of scientists that meets, discusses, encourages champions of the cause, and publishes on issues related to the conduct of responsible science. Such a network needs to be sensitive and responsive to cultural, religious, ethnic, and other national characteristics while still acknowledging the international character of advances in science.

Since 2007 scientists from Pakistan have participated in the Biosafety and Biosecurity International Conference (BBIC) Process for the Middle East and North Africa Region. This network is supported by the International Council for the Life Sciences (ICLS) as part of its global mission to advance the cause of biosafety and biosecurity. From this evolving network, Pakistani scientists engaged in life science research and development decided to extend the ethos behind the BBIC process and the mission of ICLS deeper into Pakistan. This idea was carried forward by a number of concerned individuals who felt that building a network of biosafety and biosecurity inside Pakistan would not only bring national benefits but also enhance the possibilities for international collaboration, particularly regionally. An important element in this effort was that it should be locally led and not driven by an agenda specified by external donors, although this did not mean that external expertise and support were not welcome. To promote best practices up to international standards, however, the effort needed to be appropriate to the local technical and societal circumstances.

In 2010, inspired by the approach to biological safety and security promoted by the ICLS, the concerned individuals organized a chapter of ICLS in Pakistan. In June of that year, understanding that all scientific disciplines are in some way involved with the life sciences, they organized a meeting in Islamabad that brought together scientists, engineers, intellectuals, and journalists from a wide range of fields. The participants came from the academic, governmental, and private sectors and from different levels includ-
ing research directors, laboratory management, and the researchers themselves. Included in the gathering were people from the policy community and the media. The meeting had the following objectives:

• To promote the conduct of responsible science among the scientists and engineers
• To promote the ideal that science and technology should not be misused to harm humanity
• To promote respect for the scientific professions in a way appropriate to an Islamic society
• To enhance the contribution of science and technology to the Pakistani community-at-large
• To build a sustainable network in Pakistan that meets regularly on key issues related to the conduct of safe, secure, and ethical science in the context of an Islamic society

This meeting was a great success, and the effort continues under the rubric “Responsible Conduct of Science.” This approach recognizes the multi-disciplinary nature of the life sciences and that its multi-faceted scope includes ethics, safety, and security so that the full spectrum of biological risks is embraced, whether natural, accidental, or a deliberate misuse of science. A website was set up (www.respscience.org) to encourage the development of this network and to publicize a description of the concept as well as reports. A particular effort was made to involve both senior scientists and the younger generation in the academic, governmental, and private sectors.

Since the first meeting in Islamabad, two others have taken place: in Lahore in February 2011 and in Karachi in November of the same year. Attendance has increased as has the geographical reach. At the meeting in Lahore, Indian scientists joined the discussion by video. In Karachi, the international engagement extended further with representatives from Australia, Malaysia, and Nepal participating in person. All the meetings were well covered in the local media through interviews and reporting.

It is important to record that the effort remains in the hands of individuals—but in an increasing number. The support for this project comes largely from the time and effort of the individuals involved. Although there is only a modest amount of funding, initially a significant amount of the financial support came from regional and local sources including the Organisation of the Islamic Conference (OIC) Standing Committee on Scientific and Technological Co-operation (COMSTECH) and the Pakistan Academy of Sciences. Vital support in kind came from the academic host institutions in Islamabad, Lahore, and Karachi. The geographic expansion of the project across South Asia and beyond is particularly encouraging—all of this through personal contacts and networking.

This kind of multi-disciplinary engagement on the fundamental issues of safety, security, and ethics provides an essential framework that will help those responsible for biological safety in their institutions with staff from a variety of academic backgrounds and experience. A lesson from this effort in Pakistan is that national and regional biosafety associations need to reach out and join forces with related professional organizations and individuals. In addition, such associations could also become advocates for increasing the investment in research in the biological sciences directly related to the safety and well-being of humanity. In any case, such a wider discussion of the fundamental issues is essential to the building of confidence among policymakers and the public in general: Scientists and engineers must demonstrate that they recognize their responsibilities to society as a whole and, as individuals, are ready to demonstrate that they fully understand these responsibilities by implementing codes of conduct and best practices to ensure responsible conduct in this fast-moving and dynamic area of science and technology. This can succeed only if a sufficient number of highly motivated individuals are prepared to champion the cause of biological safety, security, and ethical conduct.

References


A group from the Responsible Conduct of Science Project in front of the poster they presented at the Biosafety and Biosecurity International Conference (BBIC-2011) in Amman, Jordan from September 13-15, 2011. Pictured clockwise from the top row, left side, are Anwar Nasim, Terence Taylor, Abid Azhar, Zabta Shinwari, Sikander Azam, and Mohammed Qasim.