US biosecurity advisory board faces delicate balancing act

Members of the new National Science Advisory Board for Biosecurity (NSABB) convened at the end of June for the first time near Washington, DC, seeking to guard against abuses by bioterrorists of legitimate biotech activities without forfeiting freedom to pursue research, publish findings and develop products. Theirs is a tall order—one that, if mishandled and viewed as even inadvertently bolstering a bioterrorist attack, risks draconian regulatory schemes. Not surprisingly, NSABB members and many other experts often invoke the need for 'balance' in facing this 'dual use' of technology issue.

Although the need for balance extends to biotech efforts in industry as well as universities, the means for bringing companies under this new umbrella are far from obvious. The challenge echoes that faced by the National Institutes of Health (NIH) Recombinant DNA Advisory Committee (NIHRAC), which took shape during the early 1980s, proved pivotal for developing widely embraced safety guidelines and continues to review human gene therapy research. Indeed, based on recommendations from a National Academy of Sciences panel (*Nat. Biotechnol.* **21**, 1261, 2003), NSABB was designed with NIHRAC in mind.

Without formal authority, NIHRAC in effect regulated university scientists because of their dependence on NIH and other federal agencies for research support. More to the point, industry researchers acquiesced to that same *de facto* regulatory system for many years, recognizing that it was being reinforced—and, eventually superseded—by more conventionally recognizable federal regulatory agencies.

Central to the current strategy for dealing with biosecurity-related issues is development of a comparable quasi-regulatory scheme, with NSABB at its hub. But it is far from obvious how NSABB will deal with industry or whether its approach will gain acceptance. "How to engage industry without laws and when you don't have enforceable lines and the rules are not crisp is a difficulty," says Gerald Epstein, a senior fellow with the Center for Strategic & International Studies in Washington. What is being sought is not so much laws and rules as a "culture of responsibility," he suggests, echoing a widely voiced view. "Some deride that idea, but if we try to jam this down peoples' throats, it will fail."

A new NIH-backed panel is charged with balancing freedom to pursue research with the risk of abuse by bioterrorists.

"We need to go very softly about recommendations to regulate research," says NSABB member Barry Erlick, the president of BJE Associates in Alexandria, Virginia and one of the few panel members from industry. However, he adds, "We should worry not just about fundamental research but also engineering aspects. We should worry about everything, including dissemination systems."

Although most of the board's 25 members are from academia, as well as several former military and security-sector officials, "Industry will inevitably become involved," predicts Terence Taylor, director of the International Institute for Strategic Studies-US in Washington. Despite its seeming focus on "leading-edge academic research," NSABB "needs to engage industry because applied science is a great concern."

Taylor and a close ally, Michael Moodie of the Chemical and Biological Arms Control Institute, also in Washington, say that industry representatives are watching NSABB and related developments with keen interest while trying to maintain a low profile because of the potentially negative publicity associated with almost any connection with biowarfare and bioterrorism issues. Although it is "hard to get industry to engage, we see greater awareness and willingness along with changing attitudes—especially if companies can see that their fundamental [business] mission is not being jeopardized," Moodie says. NSABB working groups could expand to include industry reps for their expertise, notes Taylor, adding that industry is taking such matters seriously but in more private forums, such as some convened by the national academies.

One especially sensitive matter for several companies is fabrication of genes and genomes.

"DNA manipulations are at the heart of modern biology," says John Mulligan, president and CEO of Blue Heron Biotechnology in Bothell, Washington, one of several firms that custom synthesize gene segments for a clientele that theoretically could include bioterrorists. "Nefarious uses [of such products] are certainly possible, but direct isolation of pathogens is an easier way to obtain them," he says.

Federal "select agent" rules "need improvement" because they aim at particular microbial species instead of specific gene sequences, Mulligan points out. Overregulating could encumber legitimate efforts to develop vaccines, therapeutics and other countermeasures, while merely driving illicit activity elsewhere. Besides, he notes, gene synthesis activities are international in scope, with groups in Germany, China and India among the top competitors.

Anyone planning "nefarious" activity is unlikely to order genes from Blue Heron or similar outlets, says Craig Venter, president of the J. Craig Venter Institute of Rockville, Maryland, where a major research focus is on assembling novel genomes from fabricated components. "Meaningful research on pathogens is critical…[and] if we're not concentrating our efforts on defensive countermeasures, we're missing the big picture."

Jeffrey L Fox, Washington, DC