In Search of Biosecurity

The changing nature of biological threats, both natural and human-made, has made these challenging and unsettling times. As progress in life sciences research accelerates, it expands the scope of potential biological weapons, whose use for political purposes seems increasingly likely in a post-9/11 world. A recent report from the U.S. National Research Council and Institute of Medicine, Globalization, Biosecurity, and the Future of the Life Sciences (http://fermat.nap.edu/books/0309100321/html),* concludes that the breadth of potential biological threats is far wider than is commonly appreciated and will continue to expand in the future.

In the face of these challenges, the United States has made efforts to control, contain, and regulate research that involves certain biological agents and toxins that pose a special threat to public health and safety: the so-called "select agents." Proposals by several federal agencies call for more stringent measures, such as strict interpretation of the "deemed export" rule. These efforts are intended to limit the risk of research by restricting the involvement of foreign nationals and the communication of scientific information. However, they are impractical, counterproductive, and even dangerous.

Research on select agents now requires rigorous security safeguards, including background checks of personnel by the Department of Justice, restricted access to laboratories, and even armed guards at some institutions. Regardless of their merits, such measures segregate scientists from their peers and complicate efforts to recruit the best and brightest to important research. More troublesome is the mandate to extend such rules to collaborating labs abroad that receive U.S. federal funds. In such foreign settings, the select agents that these rules seek to control may be endemic and otherwise readily available, making these measures impractical and politically unpalatable. The result is an unfortunate loss of foreign collaboration in critically needed surveillance of newly emerging infectious diseases.

Of even greater concern are potential constraints on the flow of scientific information stemming from fundamental research on dangerous pathogens. In a world concerned with the threat of terrorism, it is understandable that politicians and their constituents might feel safer if pathogens were locked up, tight regulations imposed on research, and strict controls placed on the dissemination of research results. Unfortunately, such measures won't reduce risks and may cause a false illusion of security. The risk of malevolent dual use goes far beyond infectious agents, let alone a select subset, and extends into virtually every aspect of the life sciences. Moreover, U.S. regulations will have no effect on a large and increasingly successful global life science enterprise. Stricter regulations will simply make it more difficult to exploit the benefits of the life sciences, threaten the vitality of biodefense research, and ultimately weaken our national security. Society has gained from the open exchange of scientific advances, and this tradition should not be lost.

In the early 1980s, the Reagan administration sought to restrict scientific communication in some fields. In the face of subsequent controversy, Reagan issued National Security Decision Directive 189 (NSDD-189). The directive states that "no restrictions may be placed upon the conduct or reporting of fundamental research that has not received national security classification, except as provided in applicable U.S. statutes." Where restriction is deemed necessary in the interest of national security, the proper control mechanism is classification. Although NSDD-189 remains in effect today, it is now being eroded by pervasive efforts to promote a class of information called "sensitive but unclassified."

The societal concerns that are driving these changes cannot be ignored. The risk that knowledge emerging from life sciences research could be misused, either intentionally or otherwise, needs responsible attention. Some life scientists argue that the benefits of dual-use research always outweigh the risks; others don't stop to consider the issue. Neither position is in the public interest. The scientific community needs to show that it can assume greater responsibility for research that presents potential security concerns. Those working in the life sciences must gain a greater awareness of the potential threats and learn to recognize, discourage, and report misuse or irresponsible behavior. Unless we adopt a shared culture of awareness and responsibility, we will face increasing restrictions on research and stricter controls on information. In this undesirable scenario, we will have gained little protection but done great harm to the research enterprise and threatened scientific progress.

— David A. Relman, Eileen Choffnes, Stanley M. Lemon

10.1126/science.1127725

*The authors participated in the U.S. National Research Council/Institute of Medicine study described here.