

PNAS policy on publication of sensitive material in the life sciences

On January 9, 2003, the National Academy of Sciences (NAS) and the Center for Strategic and International Studies (CSIS) cosponsored a public meeting with the broad agenda “to bring together scientists and policy-makers to discuss whether current publication policies and practices in the life sciences could lead to the inadvertent disclosure of ‘sensitive’ information to those who might misuse it.” Several journals, including PNAS, had already developed procedures in this regard.

Participants in the January meeting discussed three recent papers (1–3) that some felt might benefit bioterrorists and therefore should have been modified or not published at all. Two of the papers were “Chemical Synthesis of Poliovirus cDNA: Generation of Infectious Virus in the Absence of Natural Template” (2) and “Expression of Mouse Interleukin-4 by a Recombinant Ectromelia Virus Suppresses Cytolytic Lymphocyte Responses and Overcomes Genetic Resistance to Mousepox” (3). The third paper in question, “Variola Virus Immune Evasion Design: Expression of a Highly Efficient Inhibitor of Human Complement” (1), was published last fall in PNAS. At that time, PNAS had no formal screening mechanism for identifying potentially sensitive information in submitted manuscripts. A retrospective analysis of the handling of this paper showed, however, that despite the absence of formal protocols to do so, the review process had screened for potentially sensitive information. First, the author explicitly called attention to the sensitive nature of the work in her cover letter. Second, the NAS member who edited the paper and the two referees also gave thoughtful consideration to potential bioterrorism implications, but both reviewers felt that the benefits clearly outweighed the potential for misuse. Finally, PNAS published a commentary on the paper that dealt directly

with the security concerns and also concluded that publication of the paper was desirable (4).

Thus, issues related to potentially sensitive information were handled naturally, effectively, and responsibly by all concerned. Although the peer review process worked well on its own, in this case, I felt that an articulated and uniform practice should be established. In November 2002, I asked the PNAS Editorial Board to watch for papers that involve diseases and agents from the Centers for Disease Control’s category A list (www.bt.cdc.gov/agent/agentlist.asp) that might pose a risk. In addition, our editorial office staff was asked to flag such papers before sending them to the Board. Over the last 2 months, we have flagged 20 papers, less than 1% of all submitted manuscripts. In all cases, the Board recommended no changes in normal editorial practices, and PNAS did not ask any of these authors to modify their papers. Their publication was not delayed.

PNAS policy on the publication of sensitive information is a work in progress. What would trigger a request to an author to modify a paper? Certainly a cookbook recipe for a weapon would not be permitted. This is, however, not a very useful example, because it is highly unlikely that such a paper would pass peer review, solely on scientific grounds. Predetermining exactly what types of submission would not be published is nearly impossible. Consider, however, the hypothetical example of a manuscript on how to make *Bacillus anthracis* ciprofloxacin-resistant. Because we have known for decades how to make bacteria resistant to this drug, the science behind the paper would seem routine, and the potential for misuse might be argued to preclude publication. But, because the United States is now using ciprofloxacin prophylactically for possible cases of anthrax, it is imperative that we understand the properties of

resistant strains of *B. anthracis* that are likely to arise spontaneously. Therefore, depending on the nature of the science presented, a paper studying antibiotic resistance in anthrax could be suitable for publication. Any work of value to terrorists will also be of value in countering terrorism.

The scientists involved in the publication of the three papers called into question agree that publication of these papers was justified. PNAS Board member John Coffin put it succinctly:

While these papers might be of theoretical value to terrorists, they do not point the way toward the manufacture of instruments of terrorism in any specific way, and their publication is likely to be of much greater value in advancing our efforts toward protection against the relevant agents.

One goal of the NAS/CSIS meeting was to start a dialogue between the life sciences and national security communities that might eventually lead to the development of a common set of publication policies for journals in the life sciences. Accordingly, the following day, publishers, editors, and scientist-authors convened to determine what, if any, formal policy could be articulated. The following editorial is the result (5). This will also be published in *Science* and *Nature*.

We must all recognize that protecting our world against both intentional acts of bioterrorism and the scourge of infectious diseases will depend on the effective communication of the science that we need for our common defense. At the same time, PNAS will continue to monitor submitted papers for material that may be deemed inappropriate and that could, if published, compromise the public welfare. We also urge authors to continue to act responsibly and to consider carefully the potential dual use of their results.

Nicholas R. Cozzarelli, *Editor-in-Chief*

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2. Cello, J., Paul, A. V. & Wimmer, E. (2002)

Science **297**, 1016–1018.

3. Jackson, R. J., Ramsay, A. J., Christensen, C. D., Beaton, S., Hall, D. F. & Ramshaw, I. A. (2001) *J. Virol.* **75**, 1205–1210.

4. Lachmann, P. J. (2002) *Proc. Natl. Acad. Sci. USA* **99**, 8461–8462.
5. Journal Editors and Authors Group (2003) *Proc. Natl. Acad. Sci. USA* **100**, 1464.