

## DATELINE

## BIOLOGICAL WARFARE

## MID-EAST PREPAREDNESS REVIVES FEDERAL SECRECY

WASHINGTON, D.C.—U.S. military officials recently announced that defensive measures against chemical and biological warfare (BW) agents were being deployed in the Middle East just in case Iraq decides to violate international treaties banning use of such agents. Moreover, President Bush issued an executive order last December to control the export of organisms and equipment that might be used in making and storing such agents. This action led the Department of Commerce to reopen deliberations on implementing broad-based export controls over "selected" countries. Aside from several tersely worded formal statements about BW defense plans, however, federal officials early in January insisted on secrecy, even when asked about biological research programs and vaccine production facilities that have been part of a standard Defense Department (DoD) repertoire for many years.

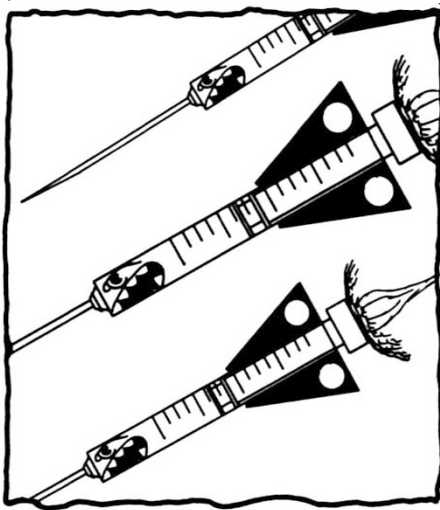
At the apparent top of the military list is a plan to inoculate U.S. forces in the Middle East with a vaccine against anthrax, a potentially deadly disease caused by the bacterium *Bacillus anthracis*. The vaccine is usually produced in small quantities for use mainly by individuals who handle animal products such as wool and hides, where disease-causing spores may be harbored, and also by veterinarians and ranchers, who risk being exposed to infected animals. The vaccine—a killed avirulent strain of the organism—must be administered in several doses over several-month intervals to produce a fully protective immune response.

The Michigan Department of Public Health (Lansing), which also produces vaccines for preventing pertussis and other infectious diseases, is currently the only U.S. facility licensed for producing the anthrax vaccine, according to George Anderson, who is acting chief of the department's Bureau of Laboratories and Disease Control. Another facility in Swiftwater, Pa., run by the Salk Institute, also produces vaccines for DoD and probably could make the vaccine.

How much of the anthrax vaccine is available is not clear, as it ordinarily is not needed in high volumes. Neither Anderson nor DoD officials

would say whether supplies are adequate or if there are plans to increase current production. Moreover, officials of two industry trade associations, the Association of Biotechnology Companies (Washington, DC) and the Industrial Biotechnology Association (IBA, Washington, DC), did not know of plans to enlist member companies in DoD-sponsored vaccine-production efforts.

Meanwhile, some skeptics question



the need for DoD to take such measures. Despite its pathogenic potency, they point out, the anthrax pathogen lacks certain characteristics that would make it an effective tactical weapon. During World War II, for example, both Japanese and U.S. military researchers studied microbial pathogens including *B. anthracis* as potential warfare agents, but neither side developed an effective delivery system for making or using such weapons, according to Raymond Zilinskas of the Maryland Biotechnology Institute (Catonville). "It's still classified whether the U.S. anthrax bomb was ever perfected," he says. According to studies conducted at the University of Pennsylvania (Philadelphia), the organism does not reliably induce disease. Moreover, he adds, because U.S. troops in the Middle East are equipped with special garments and masks to fend off chemical agents, they are likely also protected against any tactical use of anthrax agents.

"Biological warfare is not so much a concern on the battlefield because it's so hard to control," says microbiologist Linda Miller of Holy Redeemer Hospital (Meadowbrook, PA), who is completing a book based on her dissertation on the subject. "But Saddam Hussein may not think along the lines of our [military] strategists." Anthrax is but one of many infectious diseases that might be considered for use in an all-out attack or by terrorists, she notes. A list of potential agents, pieced together from DoD sources, includes many types of bacteria, viruses, rickettsiae, fungi, parasites, and, in a slightly different category, naturally produced toxins (for a discussion of military applications of biotech, see also *Bio/Technology* 7:447, May '89).

Although a Pentagon spokeswoman confirmed DoD plans to implement various measures to protect U.S. forces against at least several BW agents, she said she could say "nothing about the particulars [because] this is a military operation and we don't want to give Iraqis information." According to a statement released by DoD, "Prudence...requires preparedness against the possibility of an Iraqi chemical warfare or BW attack." Unofficial accounts, including stories published in *Army Times*, assert that Iraq has stockpiled effective BW agents, including those that rely on the anthrax pathogen. Other observers dispute the validity of such stories, saying they "sound totally off-the-wall" and full of "hyperbole."

In a related vein, a working group organized by the Federation of American Scientists (Washington, DC) is trying to develop guidelines for procedures for the United States and other countries to verify compliance with the Geneva BW protocols—to which both Iraq and the U.S. are signatories. According to IBA's Alan Goldhammer, who is part of the working group, early drafts of the proposed procedures have included "dicey" requirements for U.S. biotechnology companies, some of which, if implemented, would undermine ordinary proprietary practices. Ironically, DoD, with its current secrecy measures, now seems at odds with other of the still-intact compliance proposals. —Jeffrey L. Fox