January 18, 2002

The Honorable Tommy Thompson
Secretary
Department of Health & Human Services
200 Independence Avenue, SW
Washington, D.C. 20201

Dear Mr. Secretary:

Thank you for taking the time to meet with us on December 11 to discuss bioterrorism and related science issues. We were pleased to have the opportunity for a wide-ranging discussion and we value your thoughts on these matters. We hope that we will have the opportunity to continue these conversations with you in the months to come.

Thank you also for requesting that we send you suggestions on ways biological research can contribute to the national fight against terrorism. We were heartened to learn that you have developed a strategic plan against bioterrorism, similar to the one suggested at our meeting by Dr. Tara O’Toole. As Dr. O’Toole suggested, it is critical that the Department of Health and Human Services develop promptly and fund appropriately a plan that invests heavily in research. As the Department works with the President to develop the FY 2003 budget, we trust you will consider your bioterrorism plan to be of the highest priority.

The United States has an obligation to continue and expand research in infectious diseases to enhance our ability to diagnose and treat victims of future bioterrorism attacks at home and throughout the world. In the long run, it would be a serious mistake to focus research efforts exclusively on the relatively small number of pathogens that have been identified as likely candidates for use by bioterrorists, for four reasons:

1. Many other common pathogens may be used as instruments of terror; for example, in 1984 over 700 people fell ill after followers of Bhagwan Shree Rajneesh spread samples of the common bacterium *Salmonella typhimurium* over salad bars in ten Oregon restaurants.

2. As our ability to manipulate living organisms continues to expand, it is highly likely that pathogens that are currently of little concern may be engineered by terrorists to enhance their virulence.

3. New infectious diseases continue to emerge, such as AIDS, Legionnaire’s disease and Ebola virus.
4. Deliberate release of veterinary and agricultural diseases could pose a serious threat to our food supply and economy, with potentially devastating impact that may be comparable to the impact of deliberate release of human diseases.

Therefore, a critical element of the nation’s fight against bioterrorism must include continuing long-term support of research into infectious diseases through the National Institutes of Health and other agencies.

The most powerful long-term strategy for combating bioterrorism would be to bolster research in many complementary areas of science that are relevant to infectious diseases. Three areas of research are particularly important for this effort: 1) studies of the cellular and molecular basis of interactions between pathogens and host cells, 2) genome sequencing of both potential pathogens and their nonpathogenic microbial relatives, and 3) mechanisms of innate and acquired immunity to infectious agents pertinent to vaccine development. We propose a concerted “War on Infectious Diseases,” comprised of these major areas of focus and we give more detail on each in the Appendix to this letter.

We envision this research effort as contributing to a state of national security, scientific and public health preparedness. Advances in these areas will enable rapid identification of a bioterrorism event, diagnosis of the pathogen and genome-based identification of its origin and any relevant modifications, rapid identification of drugs best suited to halt the disease process in people who are already infected, and rapid design and production of safe and effective vaccines to prevent spread. These ambitious goals are all scientifically possible but will require government leadership from the highest levels and significant changes in our national research priorities.

In particular, we will need to recruit a new generation of infectious disease investigators eager to take on the challenge of understanding the pathogenesis of possible terrorist microbes. Today’s students and post-doctoral fellows represent these scientists for tomorrow and must be convinced to re-direct their careers to address this national imperative. The country’s brightest young people have many career options, in science and other professions. It is incumbent upon the U.S. government to assure them that they can safely invest their future in this important research, just as the government invested in attracting the country’s brightest minds to scientific research during the Cold War. This can only be achieved by the encouragement of national leaders and the dedication of new research money.

Research into new vaccines and new antibiotics is suffering heavily since biotechnology and pharmaceutical companies see little immediate profit in these areas and few private foundations in the United States are dedicated to supporting infectious disease research. It is imperative that the federal government steps in to fill this void.
Government leadership on this issue could not be more critical. We propose that the "War on Infectious Diseases" be coordinated by the Department of Health and Human Services, in coordination with the President’s National Security Council and the Office of Homeland Security, and that it incorporate public health, applied medical research and basic biomedical research into our nation’s War on Terrorism. The recent anthrax attacks have served as a valuable if tragic wake-up call to focus the extraordinary expertise of the American biomedical research community on the looming threat of bioterrorism.

Finally, we encourage your Department to take advantage of the large number of experts in these areas of biological research who are ready and willing to share their knowledge in defense of their country. We respectfully suggest that you identify an expert on each potential pathogen that might be used by terrorists. These highly qualified individuals should be ready on short notice to stand with the Secretary to provide our citizens with authoritative information about future bioterrorist attacks. We would be pleased to help you identify such scientists.

Thank you again for the opportunity to meet with you. We look forward to continuing our dialogue. Individually and on behalf of our peers, we welcome the opportunity to contribute our expertise and knowledge in defense of our country.

Yours sincerely,

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The American Society for Cell Biology
Recommendation for the Proposed War on Infectious Diseases

Cellular and molecular mechanisms of host-pathogen interactions: In recent years, research in microbial pathogenesis has shifted from a sole emphasis on pathogens to include a focus on the interaction of the pathogens with host cells. This change in focus to the mechanisms of disease will provide the basis for dramatic improvements in therapy and defense against bioterrorist attacks. Essentially all infectious diseases are now understood to require very specific molecular interactions between proteins encoded by the pathogenic organism and proteins normally present in the host. As we acquire more knowledge of these interactions, it may be possible to design drugs that specifically interfere with host-pathogen interactions and halt the process of disease. It is also becoming clear that many diverse pathogens of humans, animals, and even plants, use similar strategies for interacting with their hosts. For example, the two toxins produced by the anthrax bacterium have some similarities to toxins produced by the bacteria that cause cholera and whooping cough, and the knowledge that we have gained about the mechanisms of these other toxins has greatly accelerated current cutting edge research into the design of anthrax antitoxins. Thus we expect that continued expansion of our understanding of the molecular basis of many infectious diseases, including those not directly suitable for use as bioterrorism weapons, will greatly enhance our ability to combat bioterrorism in the long run.

Genome sequencing of pathogens and other microbes: In the few years since the first whole bacterial genome was sequenced in 1995 by biomedical researchers, dozens of pathogens have been sequenced and many more are underway with funding from NIH and private sources. Comparisons between the genome sequence of pathogens and their closest nonpathogenic relatives have, in many cases, helped to define the genes most critical to the ability of pathogens to cause disease. Furthermore, genome sequencing may be critical for identifying the origin of pathogens used in bioterrorism attacks, and will certainly be necessary to determine the nature of any genetic engineering that has been performed on them. Many of the necessary underlying technologies are already well developed, and the time is ripe for the government to take the lead in encouraging scientists to explore potential applications of large-scale sequencing efforts in the fight against infectious diseases in general and bioterrorism in particular.

Innate and acquired immunity: Vaccines are the best and most cost-effective means of preventing the spread of naturally occurring as well as deliberately released infectious diseases, but we still lack efficacious vaccines for common and devastating infections including malaria, tuberculosis, and AIDS. The human immune system is vastly complicated and still only partially understood. Many of our vaccines, including the anthrax vaccine currently used by the armed forces, rely on medical technologies developed during the ‘50s and ‘60s. Expansion of basic research into immunity will pave the way to the development of entirely new vaccine design strategies that will help us eliminate malaria, AIDS and tuberculosis as effectively as we have eliminated smallpox, and create the knowledge base necessary to rapidly create effective vaccines against newly emerging agents of bioterrorism.

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