Crossing the Valley of Death: Bringing Promising Medical Countermeasures to Bioshield
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Mr. Alan P. Timmins
AVI BioPharma
President, Chief Operating Officer
Testimony

Chairman Burr, Senator Kennedy, and Members of the Committee:

My name is Alan Timmins and I am the President and Chief Operating Officer of AVI BioPharma, Inc. AVI is a biotechnology company based in Oregon, which was founded in 1980 on the premise that genes could be the target for drug intervention. AVI has developed a proprietary third-generation technology, distinct from that of any of our peers, which we focus on unmet medical needs. We have conducted 11 human clinical trials with this technology in over 300 patients and shown our technology to be safe and efficacious in cardiovascular disease and drug metabolism.

AVI is currently pursuing commercial applications of its technology in infectious disease, cardiovascular disease, and cancer. More germane to this hearing, AVI is currently pursuing biodefense and public health applications of its technology against Ebola, Marburg, and influenza viruses, and ricin and anthrax toxins.

Applicability of technology

AVI's proprietary technology is particularly well-suited to rapid response in biodefense and public health settings. This was perhaps best illustrated by an incident approximately sixteen months ago at the US Army Medical Research Institute of Infection Disease (USAMRIID) located within Fort Detrick, Maryland. There, a researcher experienced an accidental needle stick from a syringe while working with Ebola Zaire virus. Ebola is a very lethal virus, historically fatal in more than 80% of infected individuals. Upon receiving a call from scientists at USAMRIID requesting our assistance, AVI found relevant genetic sequences, synthesized two drugs, assisted USAMRIID in securing an emergency IND from the FDA, and delivered those drugs to USAMRIID within 5 days of the original request. Fortunately, the researcher showed no Ebola symptoms and was released, after twenty-one days of isolation, without requiring drug intervention. The same drugs delivered to USAMRIID, however, were successfully put to use in ongoing research at USAMRIID under a Collaborative Research and Development Agreement (CRADA) between AVI and USAMRIID.

AVI has ongoing programs with outside investigators in other infectious disease and toxin areas including efforts in Marburg, Dengue, Rift Valley Fever, Crimean Congo Fever, Ricin, E coli, Yellow Fever, influenza, Hantaan virus, and SARS. Clearly, all of these diseases or infectious agents are considered to be potential bioterror threats.

Specific successes have been achieved in collaboration with government scientists, primarily from USAMRIID, in programs targeting Ebola, Marburg, ricin, anthrax, dengue, and influenza.

In addition to efforts in these areas, we believe that we are able to currently effectively address more than 75% of the viruses on the CDC's list of bioterror agents. Further, the lessons learned from studies involving such an array of viruses to date offer the potential to create drugs for rapid response to engineered viruses designed as bioterrorism agents.

Challenges to biodefense implementation

As you might imagine, we have encountered numerous challenges along the way as we have pressed forward with our biodefense efforts over the last sixteen months. The most daunting challenges we have faced in this endeavor are not in the research or medical areas, as we have met those challenges in the past, and we will continue to surmount them in the future. The most daunting challenges that we have faced, and cannot solve, are those of bureaucratic confusion. There are three main areas of bureaucratic confusion, or gaps, that I will briefly outline.

First, there is a funding gap for smaller companies between the point of reaching scientific proof of principle and the point of having a product ready for Project BioShield consideration. As a small company with limited resources, we must access the capital markets for operating funds. These funds are provided by our investors as risk capital, not as seed capital for government research. Because we do not yet have sales, we have no alternative funding mechanisms for government directed research, and, apparently such funding mechanisms do not readily exist within the government. As a specific example, in our case, we have been told that we are "too far along" for funding opportunities via DARPA or NIH, but not yet "far enough along" for BioShield. Thus, promising biodefense solutions that have no commercial markets, but have a high level of biodefense relevance or public health applicability, like our Ebola virus compounds, might simply die on the vine because there is no government funding mechanism to get us to the point where we can provide you a potential BioShield product. In our opinion, it would not be inconsistent with the overall approach of BioShield to provide a funding mechanism to span this gap between proof of principle and BioShield product acceptance.

We believe a second gap exists in the understanding and implementation of BioShield. The award process appears to be a "black box," with no clear pathway to success for interested companies. For example, it appears that HHS is requiring that companies secure an IND (Investigational New Drug filing with the Food and Drug Administration) before bidding on a BioShield contract. In fact, the original BioShield legislation, S. 975, makes it clear that an IND in hand is not a prerequisite to contract bidding, nor was it Congress' intent that it should be. This lack of understanding (or understandability) of the playing field, in our opinion, will drive qualified, yet frustrated, companies away from participation in the BioShield effort. Coupled with the funding gap described above, a significant barrier to participation in Project BioShield evolves. Clearly, the losers in each

scenario taken separately, and both scenarios combined, are the American people, and whether that loss occurs in biodefense versus in public health is irrelevant.

The third, and perhaps the greatest gap which exists with regard to BioShield is the incentive gap between the risks and rewards for companies considering participation in biodefense. Specifically, the potential rewards which could accrue to a company which successfully bids on, is awarded, and completes a BioShield contract, are not enough to motivate an appropriate number of large and small biotechnology and pharmaceutical companies to participate. The risks of participation are considered too great by most companies due to the gaps described above. These risks could be more than adequately addressed by the proposed BioShield II and related legislation. That legislation, as currently proposed, would offer tax incentives, patent incentives, and liability and intellectual property protection. All of these provisions would be seen to have admittedly different relative values, dependent upon the company considering them; but, in the aggregate, all would be seen as having significant value, and perhaps be the motivating factor which would encourage more companies to actively seek to participate in BioShield.

Conclusion

We believe that the items addressed in the above testimony represent major hurdles for this country to overcome in its desire for a much-needed system of biodefense. Solutions are, however, available. To summarize: first, a system of financial support for smaller companies must be defined and funded to span the gap experienced by small companies between proof of scientific principle and contract consideration in BioShield, particularly for those compounds which have only biodefense or public health viability. Second, the BioShield process, as enacted by Congress, must become more transparent, interpretable, and understandable, thereby becoming more efficient and effective in achieving the goal of biodefense. Finally, BioShield II should be enacted to provide several important protections to companies providing essential biodefense tools for the best interests of the country. These solutions, taken together, will awaken and direct the entrepreneurial spirit of the biotechnology and pharmaceutical industries toward genuine progress in biodefense. By being proactive here, we as a nation can avoid the potential terrible outcomes and costs of merely being only reactive in a biodefense emergency.