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Testimony of
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Hearing on "State of BioDefense in the United States"

Mr. Chairman, members of the Subcommittee, thank you for the invitation to appear before you today on behalf of Human Genome Sciences. I am Dr. Jim Davis, Executive Vice President and General Counsel of Human Genome Sciences. In this capacity, I have been extensively involved with the business development, regulatory approval process, and federal procurement issues related to the anticipated sale of Human Genome Sciences' innovative therapeutic treatment, ABthrax, for victims of anthrax exposure. I have been involved with this project since we undertook to develop this product on our own initiative and at our own expense immediately following the anthrax attacks of 2001.

Human Genome Sciences is a biopharmaceutical company located in Rockville, Maryland, that discovers, develops and manufactures gene-based drugs to treat and cure disease. Currently, we have seven drugs in clinical development, including six monoclonal antibodies,

and a broad pipeline of preclinical compounds. These include novel human protein and antibody drugs discovered through our genomics-based research, as well as new, improved, long-acting versions of existing proteins created using our albumin fusion technology.

ABthrax™

Let me be clear. The primary focus of Human Genome Sciences has *not* been the development of drugs to protect against attack by biological and chemical weapons. The principal focus of our company has been, and remains, pursuit of innovative bio-pharma products for the commercial market. We are not a "bio-defense" company as that term has come to be known in the post-9/11 environment. Our business plan, our executives, and our investors do not see the primary focus of Human Genome Sciences, now or in the future, to be the federal market place.

Nevertheless, just over three years ago, we realized that our company had the technology and capability to develop an effective, near-term countermeasure against one of the nation's most immediate and serious bioterrorism threats – anthrax. As a company headquartered just outside Washington D.C., we witnessed first-hand the potentially devastating effects of the use of anthrax as a terrorist weapon in late 2001. Thus, using our own funds, Human Genome Sciences developed a fully human monoclonal antibody drug – called ABthrax – that specifically binds to a key anthrax toxin, thereby preventing or treating the lethal effects of anthrax infection.

The drug can be given prior to or after exposure; and it could be used alone or in conjunction with the current vaccine and antibiotics. We have shown, in animals, that ABthrax is effective against high doses of anthrax, and have demonstrated initial safety in humans, and have been ready to begin manufacturing of this product and to initiate additional human safety trials for over a year and a half. In order to move forward, however, we need to bring to a favorable conclusion the lengthy procurement process now underway for the federal government to enter into a contract under the Project Bioshield Act of 2005 to purchase the drug for the Strategic National Stockpile. Once this contract is signed, this key biodefense countermeasure could be available for emergency use as early as next year. While this is an exciting prospect for our company – and a valuable benefit to the Nation – our frustration remains that the federal

government could have had this product in the Strategic National Stockpile already if the full authority of Project Bioshield been used as intended.

As you know, anthrax infection is caused by a spore-forming bacterium, *Bacillus anthracis,* which multiplies in the body and produces lethal toxins. Most anthrax fatalities are caused by the irreversible effects of the anthrax toxins. Research has shown that protective antigen is the key facilitator in the progression of anthrax infection at the cellular level. After protective antigen and the other anthrax toxins are produced by the bacteria, protective antigen binds to the anthrax toxin receptor on cell surfaces and forms a protein-receptor complex that makes it possible for the anthrax toxins to enter the cells. Human Genome Sciences' ABthrax antibody blocks the binding of protective antigen to cell surfaces and prevents the anthrax toxins from entering and killing the cells.

Currently, two options are available for the prevention or treatment of anthrax infections – a vaccine and antibiotics. Both are essential to dealing with anthrax, but both have limitations. The anthrax vaccine takes several weeks following the first doses before immunity is initially established. The vaccine also requires multiple injections over a period of eighteen months, in addition to annual boosters, to maintain its protective effect. Antibiotics are effective in killing anthrax bacteria, but are not effective against the anthrax toxins once those toxins have been released into the blood. Antibiotics also may not be effective against antibiotic-resistant strains of anthrax.

In ABthrax, Human Genome Sciences has discovered a third critical defense against anthrax infections. In contrast to the anthrax vaccine, a single dose of ABthrax confers protection immediately following the rapid achievement of appropriate blood levels of the antibody. In contrast to antibiotics, ABthrax is effective against the lethal toxins released by anthrax bacteria. It may also prevent and treat infections by antibiotic-resistant strains of anthrax.

Results from preclinical studies conducted to date demonstrate that a single dose of ABthrax administered prophylactically or therapeutically increases survival significantly in both rabbits and nonhuman primates exposed by inhaling many times the lethal dose of anthrax

spores. In both models, we observed an absence of bacteria in the blood of all ABthrax-treated animals that survived. The rabbit and nonhuman primate models of inhalation anthrax are regarded as sufficient to demonstrate the efficacy of therapeutic and prophylactic agents in treating or preventing anthrax infection. A single dose of ABthrax also fully protected rats against a lethal challenge with the anthrax toxins.

Based on our preclinical results to date, we believe that ABthrax has the potential to be used both prophylactically and therapeutically. For example, ABthrax may be used to protect rescuers entering a contaminated building, soldiers in an infected environment, or exposed individuals after an attack. In addition, post-exposure treatment may lessen the natural progression of anthrax infection and increase survival. Human Genome Sciences has an Investigational New Drug application and has performed an initial Phase 1 clinical trial to evaluate the safety, tolerability, and pharmacology of ABthrax in healthy adults.

Procurement of ABthrax under Project Bioshield

Many companies have the capability and are willing to develop new products to protect against attack by biological and chemical weapons or other dangerous pathogens. A few firms, such as Human Genome Sciences, have already done so. In fact, Human Genome Sciences is among the largest and most qualified companies to participate in Project Bioshield to date. Should Human Genome Sciences prove successful in negotiating a viable business relationship with the federal government to purchase of ABthrax, it will send an extremely powerful, positive signal to similarly qualified companies to enter this market. Of course, failure by Human Genome Sciences in this endeavor could have a negative effect on the goal of stimulating greater interest of large bio-pharma companies.

The primary challenge of bio-pharma companies such as Human Genome Sciences is the absence of a commercial market for such drugs. In most cases, the only viable market is the federal government and, potentially, our foreign allies. Project Bioshield, which aims to harness public and private resources in an innovative effort to develop defenses against bioterrorism, is specifically intended to create such a market. While the Department of Health and Human Services (HHS) has always had the authority to purchase and stockpile drugs such as ABthrax

outside of Project Bioshield, the statute was intended to enhance that authority. It is important to examine the first actions HHS has taken under the Project Bioshield to understand the challenges in implementing the statute, as well as the need for additional procurement reforms.

On October 26, 2004, HHS' Office of Research and Development Coordination received the first proposals to provide therapeutic products for treatment of inhalational anthrax disease in response to Solicitation No. 2004-N-01385 (the "Anthrax Therapeutics Solicitation") under what was the first, true, Project Bioshield procurement. Human Genome Sciences responded to this request with a proposal to supply ABthrax to the government.

As the first Bioshield procurement, the Anthrax Therapeutics Solicitation seeks the acquisition and maintenance within the SNS of therapeutic products to treat US civilians who have inhalational anthrax disease. The Anthrax Therapeutics Solicitation contemplates that the awarded contract(s) will be for 10 grams of an investigational new drug ("IND") final drug product ("FDP"), for use in testing, and for support for this testing. The actual manufacture of anthrax therapeutic product is an optional contract line item, which the government may decide to exercise within 12 months from the date of contract award and after the government reviews and approves IND FDP testing. While this procurement could have utilized the streamlined procurement provisions provided under Project Bioshield, the solicitation includes numerous provisions of the Federal Acquisition Regulation ("FAR") and other detailed requirements for bidders, including detailed rules governing the methods of preparing pricing for the proposal.

This initial Bioshield solicitation was curious in three ways. First, the way the solicitation structures the options in the contract fall far short of the Congressional intent of the Act to provide for a commitment to recommend funding for production for the SNS as contemplated by Project Bioshield. Contrary to the expressed intent of the Act, HHS has not committed to recommend exercise of the options for production quantities of the countermeasure upon successful development of the countermeasure. Rather, the solicitation requires bidders to propose pricing for a broad range of quantities ranging from 10,000 doses to 200,000 doses. It now appears that even if HHS awards this contract and eventually exercises its option to purchase the countermeasure, HHS is unlikely to purchase the full 200,000 doses originally proposed. This is particularly frustrating since the manufacture of this compound requires

significant manufacturing startup costs. In other words, the cost per dose of 200,000 doses is significantly less than the cost per dose of 100,000 doses.

Setting a firm commitment for the quantities to be purchased, as was clearly intended by Bioshield, is critical to advance the Act's purpose of promoting the development of a biodefense industry by informing the markets that there is some certainty that there will be a government market for the product. Also, as noted above, the solicitation failed to use the simplified acquisition authorities that Bioshield makes available to the government, which would have permitted far fewer bidding requirements. As a result, this procurement process, which formally began on April 1, 2004, and has yet to be completed fourteen months later, is simply too long and too burdensome to sustain continued interest in participating in Bioshield by companies such as Human Genome Sciences whose principal focus is not the federal sector. No amount of federal appropriations can make up for the time lost in the delay in getting this contract finalized, thus costing the Nation the ability of having an Anthrax therapeutic in the stockpile until 2006, at the earliest.

Finally, HHS has caused additional uncertainty by, again inexplicably, issuing another request for information for the identical requirement, i.e., anthrax therapeutics, in the midst of the yet-to-be completed first procurement for this process. This leaves companies that responded to the first solicitation left wondering what, exactly, is the government's requirement – that is, what is the size of market, and significantly reduces the opportunity for economies of scale in the manufacture of this therapeutic. This is the very concern Project Bioshield was meant to address.

Proposed Implementation Improvements

HHS can take several steps to implement Bioshield to increase industry participation. To realize fully the legislative intent of the law, HHS should enact regulations required under the Project Bioshield Act that take into account the following issues:

- Specify that Project Bioshield Act procurements include only those FAR clauses specifically required by FAR Part 13, Simplified Acquisition Procedures;

- Provide for determinations of the order in which the government plans to procure countermeasures;
- Require HHS to specify a firm number of doses or courses of treatment in the call for countermeasures stage; and
- Provide for industry participation in market surveys undertaken during the assessment of the availability and appropriateness of countermeasures stage.

Also, as required by Section 319F-2(c)(4)(C)(ii) of the Public Health Act, HHS should, in a call for bio-terrorism countermeasures, provide industry with an estimate of the quantities of a countermeasure (in the form of number of doses or number of effective courses of treatment) that HHS intends to procure upon development of a countermeasure that meets the statutory criteria. Providing industry with wide ranges of potential requirements for a countermeasure, as HHS did in the Anthrax Therapeutics Solicitation, does not serve the statutory purpose of promoting the development of a biodefense industry because it introduces additional uncertainty about the size of the government market for the countermeasure.

HHS and the Department of Homeland Security ("DHS") should provide industry with information concerning the implementation of the Project Bioshield Act. For example, HHS and DHS should provide industry and the public with a status report concerning the governmental processes required by Section 319F-2(c)(2)-(6) of the Public Health Act.

Perhaps most importantly, DHS should inform industry of the progress and priority of the required threat assessments so that companies can make proper business decisions in their planning process. Project Bioshield requires that the DHS, in conjunction with the HHS, conduct a threat assessment to "assess current and emerging threats of chemical, biological radiological, and nuclear agents; and determine which of such agents present a material threat against the United States population sufficient to affect national security" and for which a

countermeasure is needed. As implemented, this threat assessment must be conducted prior to any decision to purchase a needed countermeasure under the Project Bioshield.

In addition to the specific recommendations above that should be taken into account during the regulatory process and in order to carry forth the initiative's legislative intent, we have several policy suggestions that should be considered in implementing Project Bioshield:

First and foremost, HHS should make clear that the statute does not require contractors to comply with burdensome government procurement requirements, including the requirement for certified cost and pricing data, in order to stimulate the maximum interest possible by commercial companies. Similarly, HHS should avoid the use of cost-type contracts or contract line items (thus, eliminating the need for a proposed contractor to adopt non-GAAP accounting practices) wherever possible.

HHS should structure Bioshield contracts to avoid a "staged" procurement approach such as that announced in the recent Anthrax therapeutic request for proposal, wherever possible. While we recognize the need for staged procurements under certain circumstances, using this method where HHS has conducted proper market research will avoid unnecessary delays and unpredictable results, thereby stimulating far greater private sector interest.

Timing is critical. Agencies responsible for administering Project Bioshield should take a proactive approach to identifying, evaluating and procuring effective drugs. I applaud the Subcommittee for its continued oversight of this critical bio-defense program. Near-term delays in evaluating and securing the production of viable countermeasures can disproportionately prolong the procurement of such drugs. In the case of ABthrax, Human Genome Sciences is ready to move the drug into production, which will require significant investment to secure a manufacturing facility and perfect the manufacturing process. Due to the demand for such

specialized facilities, a delay of months now could postpone delivery of the drug by over a year. We are also ready to begin advanced clinical safety trials in humans, having already demonstrated the drug's efficacy in animals and initial safety in humans. To date, ABthrax has been developed entirely with private funds, but in order to move forward the company needs a commitment from the federal government to develop, manufacture and purchase the drug. With sufficient government support, Human Genome Sciences can begin producing significant quantities of ABthrax by the end of next year. We look forward to formalizing this commitment in a contract with HHS in the coming weeks and appreciate every effort to ensure the maximum quantities of ABthrax are purchased for the stockpile as soon as possible without any further delay.

Thank you again for this opportunity to testify and I look forward to answering your questions.