

April 21, 2008

**VIA ELECTRONIC DELIVERY**

Marc G. Stanley  
Director of the Technology Innovation Program  
National Institute of Standards and Technology  
Technology Innovation Program NPRM  
100 Bureau Drive, Mail Stop 4700  
Gaithersburg, Maryland, 20899-4700

RE: Comments on Proposed Regulations on Implementation of the  
Technology Innovation Program,  
Docket Number 071106659-7661-01

Dear Mr. Stanley:

On behalf of its members, the Biotechnology Industry Organization (BIO) is pleased to provide comments on the proposed rulemaking by the National Institute of Standards and Technology (NIST) which prescribes policies and procedures for awarding financial assistance under the Technology Innovation Program (TIP).

BIO represents over 1,180 biotechnology companies of all sizes, as well as academic centers, state biotechnology centers and related organizations across the United States and in more than 30 other nations. BIO member companies are engaged in the research and development of new products that are on the cutting edge of innovation in health care, industry and environment, energy, and agriculture.

BIO members are advancing the vision of using biotechnology to improve health, feed a growing population and develop more efficient manufacturing processes and sustainable energy sources. The biotechnology industry has provided jobs for well over 200,000 people in the United States and has generated hundreds of drug projects, medical diagnostic tests, biotech crops, and environmental products. For example, in the healthcare sector alone, the biotechnology industry has developed and commercialized over 300 biotechnology drugs and diagnostics and there are over 370 products in the pipeline. Biotechnology innovation has the potential to provide treatments for some of the world's most intractable diseases and transforms the Nation's capacity to deal with major societal challenges. The biotechnology industry's success is illustrated by the increased growth rate in biotechnology products coming from the industry that have been approved by the FDA in recent years.



As the United States leads the world in biotechnology research and development, the development of complex new biotechnology products is an incredibly capital-intensive undertaking, requiring increasingly large expenditures on research and development. The vast majority of America's biotechnology companies are small, research and development focused companies with fewer than 100 employees. Despite these daunting challenges, U.S. biotechnology companies in 2006 spent \$27.1 billion on research and development.

Dramatic advances in these fields require substantial investment and biotechnology companies are heavily dependent on financial assistance through research grants and the capital markets. In that spirit, we are committed to working with the NIST toward the implementation of the TIP and offer the following comments on the NIST's proposed regulations on the TIP.

1. **While BIO commends NIST on its efforts to focus the TIP competition to specific societal challenges within "critical national need" areas, we would like to take this opportunity to highlight the biotechnology industry's commitment to high-risk, high-reward research.**

The proposed regulations provide that for each TIP competition, the TIP may solicit input within NIST, the TIP Advisory Board and from the public proposals which areas of "critical national need" will be addressed in the competition. "Critical national need" is defined as an area where government attention is demanded because the magnitude of the problem is large and the societal challenges that need to be overcome are not being addressed but could be addressed through high-risk, high-reward research.

The biotechnology industry has demonstrated its commitment to advancing high-risk, high-reward research in areas ranging from delivering therapeutics for critical diseases to providing for our national defense and security. Below are just a few examples of the innovative work our members are doing to transform some of our Nation's major societal challenges.

### **Therapeutics**

The biotechnology industry has emerged as a leader in providing effective therapeutics and diagnostics for some of the most critical diseases in this country. For example, an estimated 4.5 million Americans have Alzheimer's Disease and the number of Americans with Alzheimer's disease will continue to grow. By 2050 the number of individuals with Alzheimer's could range from 11.3 million to 16 million. The Alzheimer's Association recently conducted a study which determined that within five years of a breakthrough, 1.6 million fewer people would have Alzheimer's, which would result in \$51 million annual savings to Medicare and in \$10 billion annual savings to Medicaid. In its efforts to battle Alzheimer's, the biotechnology industry is responsible for the largest Alzheimer's drug trial ever with a company recently performing a 1,600-patient, 18-month clinical trial testing an experimental drug. Only by using multiple and diverse strategies, including new novel innovative therapies, will an ultimate cure be

identified. Many of our member companies are researching and developing different strategies, including developing vaccines, targeting amino acids thought to be instrumental in advancing Alzheimer's and developing small molecules with disease-modifying potential.

### **Industry and Environment**

The biotechnology industry is committed to creating a viable, large-scale biofuels industry. The recently passed *Energy Independence and Security Act* would require a new renewable fuel standards (RFS) that explicitly supports the production of 36 billion gallons of biofuels, including cellulosic ethanol and advanced biofuels. At these mandated volumes, biofuels would make up for more than 20 percent of total gasoline for road transport in the United States by 2022. These volumes imply a total revenue pool of about \$50 billion to \$70 billion for producers and very significant revenues for farmers and suppliers. The biotechnology industry is taking on the challenge of sustainably increasing production of cellulosic and advanced biofuels to accomplish the goals of the new renewable fuels standards. Biotechnology companies have already improved the technology for making conventional ethanol and cellulosic ethanol. These companies are currently developing new innovative processes using microbes for making advanced biofuels – alcohols like biobutanol, and hydrocarbons that can directly substitute for gasoline in fuel tanks.

### **Defense**

Biotechnology companies are applying the technologies that have transformed mainstream health care to develop products for biodefense, diagnostics, therapeutics and vaccines that could be used to thwart or respond to attacks with biological, chemical or radioactive weapons. While there is no natural “commercial” market for such products because they would be used in the case of a catastrophe, the potential for a bioterror attack demonstrates that the research and development of biodefense products is crucial. For example, one of our member companies is developing a vaccine that allows the vectoring of Protective Antigen (PA) derived from *B. anthracis* to produce a single-dose, live attenuated vaccine against anthrax. The biotechnology industry is meeting the societal need to protect against bioterrorism by researching and developing innovative vaccines and therapeutics that harness the human immune system to prevent and treat potential diseases caused by bioterror.

### **Agriculture**

Biotechnology companies are advancing innovations in the agricultural field by growing the economy worldwide by simultaneously increasing food supplies, reducing pesticide damage to the environment, conserving natural resources of land water and nutrients and increasing farm income. For example, biotechnology companies are researching and developing innovative processes where plant breeders could select genes that produce beneficial traits and move them from one organism to another which opens up a world of possibilities to benefit food production. As an example, biotechnology

companies have developed "Bt" plants that are protected against insect damage which yields and reduces the need for pesticide applications and thus, saving the farmers' time and money. Agricultural biotechnology continues to be a rapidly adopted technology in the history of food production with advances resulting in benefits ranging from reducing operating and input expenses for farmers to providing benefits to health and the environment.

The U.S. biotechnology industry continues to be at the center of innovation on cross cutting critical issues. The different areas of biotechnology highlighted above are some of the advances the industry is currently researching and developing which exemplifies that biotechnology should be considered as an area of "critical national need" for each TIP competition. Furthermore, to ensure that the biotechnology industry is represented as an area of "critical national need," a private biotechnology industry representative should be on the TIP Advisory Board.

**2. BIO recommends that NIST consider an applicant's previous efforts to raise funds, such as through public and private financings, to demonstrate "reasonable and thorough" efforts to secure alternative funds and no other alternative sources are available.**

Under the proposed regulations, a TIP proposal must demonstrate that "reasonable and thorough" efforts have been made to secure funding from alternative funding sources and no other alternative sources are reasonably available. For purposes of determining "reasonable and thorough" efforts to secure alternative funds, the TIP should have applicants demonstrate their attempts to secure public and/or private financing, among other factors, as one avenue to satisfy the requirement to receive a TIP grant. The biotechnology industry, unlike any other industry, relies heavily and continues to grow through public and private financings, licensing and development agreements and strategic alliances. Biotechnology companies vigorously pursue all opportunities, including, among other things, raising substantial capital through initial public offerings (IPOs), subsequent public offerings, and private placements with venture capital firms.

Due to the high-risk nature of the industry, biotechnology companies are continually faced with challenges in obtaining sufficient capital to fund such research and development for novel high-risk products. The majority of BIO members are emerging companies that have fewer than 350 employees and do not yet have a product on the market. In the absence of product revenue, these biotechnology companies are almost entirely reliant on the capital markets or other public sources of non-dilutive financing to fund research and development. Emerging biotechnology companies are particularly challenged because they are at the earliest, highest-risk stages of their research and development.

Promising biotechnology research has a long, arduous road and is estimated to take between 8 and 12 years to bring a biotechnology therapy to market and costs between \$800 million and \$1.2 billion. For biotechnology companies that are without

any product revenue, this lengthy process is very capital intensive which requires substantial financing from both the public and private sectors.

Biotechnology companies generally have a number of products that are in the early to very-early research stage. These companies usually will have a lead product in addition to on average five other product candidates, which are often at the very earliest stage of pre-clinical research. These candidates may be an outgrowth of research on the lead product or a result of utilizing a particular technology to address a different disease.

Biotechnology companies are often lacking funds to further research and development on these non-lead product earliest stage candidates. Despite the extensive efforts to raise capital that these companies will undertake for the lead product, such funds are not interchangeable, that is they are often tied to very specific milestones to support the lead product's research and development. As such, in order to develop secondary or tertiary candidates, a company has to find other sources of capital which are not available. At the very earliest stages of development this is particularly challenging, and it is often times in this capacity that government grants, such as TIP grants, are instrumental in advancing research and development in biotechnology.

Given the lack of interchangeability, NIST should examine the rationale behind a non-lead product failing to receive funding which would allow biotechnology companies to satisfy the requirement that no other alternative sources are reasonably available. For example, a company could submit as part of their proposal an attestation by the company's board, which would usually includes key investors. Such attestation would state that the funds raised are for the more advanced lead products and that there was no allocation in the budget for the proposed project.

**3. BIO requests that the private biotechnology industry be represented on the TIP evaluation panel.**

Under the proposed rules, an evaluation panel(s) would conduct a multi-disciplinary peer review of proposals and presents funding recommendations to a NIST selecting official. The selection official would select the TIP funding recipients based on the evaluation panel's recommendation. The official's selection of proposals will be final. The proposed rules appear to give NIST full discretion on determining the composition of the evaluation panel(s). Given the evaluation panel's substantial discretion over which proposals would ultimately receive TIP funding, members on this panel should have in-depth knowledge of the private biotechnology industry. Because of the unique nature of the private biotechnology industry, it is appropriate to have representatives who understand the nature of the research and development, capital structure and operations of a private biotechnology company.

4. **BIO seeks clarification on the ownership of invention rights in the course of a bankruptcy or dissolution.**

The TIP intellectual property rights and procedure provisions generally appear similar to other federal government grant programs. However, further clarification is needed on ownership of the invention in the course of a bankruptcy or other dissolution process for the last participant in a joint venture. Under the proposed rules, if the participants in a joint venture, who have received a TIP award and cease to exist prior to the expiration of the first patent, such patent *may* be transferred or passed to a United States entity that can commercialize the technology in a timely fashion.

NIST should clarify that in the course of a bankruptcy or dissolution, the last participant in the joint venture would determine whether to retain ownership or transfer a patent for an invention developed with TIP funds. For example, a company in bankruptcy could continue to exist and run its day-to-day operations and therefore, should be able to opt to retain or transfer such a patent for a TIP funded invention.

5. **BIO seeks clarification that that contractors and subcontractors who have contributed to an invention should have ownership rights to the invention if contractually agreed upon by the participants in the joint venture.**

Under the proposed rules, the ownership rights to an invention for contractors and subcontractors are unclear. Contractors and subcontractors who are not a part of the joint venture, but have contributed to an invention, do not appear to have any ownership rights to the invention. The rules would allow only participants in the joint venture to hold ownership rights for the invention until the patent expires. However, the rules also state that a joint venture would be required to provide NIST a copy of their written agreement that defines the disposition of ownership rights among the participants of the joint venture, including the principles governing the disposition of intellectual property developed by contractors and subcontractors.

Since many of our member companies provide contract services to government funded projects, such as TIP funded projects, clarification on the ownership rights of contractors and subcontractors who enter into agreements with TIP funded joint ventures is needed. Contractors and subcontractors who have contributed to a TIP funded invention should be allowed ownership rights to the invention if contractually agreed upon by the participants in the joint venture.

## Conclusion

BIO commends the NIST on the proposed rules to implement the TIP. The biotechnology industry is committed to investing in innovation through high-risk, high-reward research and promoting the competitiveness of the United States. We appreciate the efforts of the NIST and looks forward to continuing to work with the agency to ensure a successful implementation of the TIP. If you have further questions, please contact me or Shelly Mui-Lipnik, Director of Capital Formation and Financial Services Policy at (202) 962-9200.

Sincerely,

/s/

Alan F. Eisenberg  
Executive Vice President  
Emerging Companies and Business Development