PhRMA

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VIA ELECTRONIC SUBMISSION

Ted Wackler
Deputy Chief of Staff
Office of Science and Technology Policy
Executive Office of the President
725 17th Street, Room 5228
Washington, DC 20502

RE: Request for Information: Building a 21st Century Bioeconomy

Dear Mr. Wackler:

The Pharmaceutical Research and Manufacturers of America (PhRMA) appreciates the opportunity to respond to the Office of Science and Technology Policy's (OSTP's) Request for Information to inform the development of a robust bioeconomy. PhRMA represents the country's innovative pharmaceutical research and biotechnology companies, which lead the world in the pursuit of new, life-saving and life-enhancing medicines. Consistent with the Congressional Budget Office's finding that the pharmaceutical sector is one of the nation's most research-intensive sectors,[1] industry-wide investment in discovering and developing new medicines reached a record $67.4 billion in 2010. PhRMA members alone accounted for nearly $50 billion of this amount. Medicines developed by the sector have produced large improvements in health across a broad range of diseases, with the rapid growth of biological knowledge creating growing opportunities for continued profound advances against disease.[2]

Today, more than 3,000 medicines are in clinical trials or under review by the Food and Drug Administration (FDA) in the U.S. versus about 2,200 medicines in development for the rest of the world combined. The need for continued development of new treatments is as important as ever—for instance, the annual cost of Alzheimer's disease alone will increase from $183 billion in 2011 to $1.1 trillion in 2050 unless new treatments are found that delay its onset or slow its progression.[3]

U.S.-based biopharmaceutical research makes important economic contributions to U.S. gross domestic product, contributions likely to grow if the underpinnings for large-scale research and development (R&D) investment remain intact. A recent study[4] by the Battelle Technology

1 Congressional Budget Office, "Research and Development in the Pharmaceutical Industry," 2006.

2 See, e.g., CASCADE Collaboration, "Determinants of Survival Following HIV-1 seroconversion after introduction of HAART," *The Lancet*, 362 (2003):1267-1274;. F. R. Lichtenberg, "The Expanding Pharmaceutical Arsenal in the War on Cancer," National Bureau of Economic Research Working Paper No. 10328 (Cambridge, MA: NBER, February 2004); Tufts Center for the Study of Drug Development, "Personalized Medicine Is Playing a Growing Role in Development Pipelines," Impact Report, 12 (Nov/Dec 2010): 6.

3 Alzheimer's Association, "2011 Alzheimer's Disease Facts and Figures: Use and Costs of Health Care, Long-Term Care and Hospice," 2011.

4 Battelle Technology Partnership Practice, "The U.S. Biopharmaceuticals Sector: Economic Contribution of the Nation," Battelle Memorial Institute, Prepared for the Pharmaceutical Research and Manufacturers of America, July 2011.

Partnership Practice reports that, the U.S. biopharmaceutical sector "is well recognized as a dynamic and innovative business sector generating high quality jobs and powering economic output and exports for the U.S. economy." According to Battelle, the U.S. biopharmaceutical sector supported a total of 4 million jobs in 2009, including nearly 675,000 direct jobs. Battelle also reports that the U.S. biopharmaceutical sector has a high multiplier effect--in 2009, each job in a biopharmaceutical research company supported almost five jobs across the economy, ranging from biopharmaceutical manufacturing jobs to construction and other building service jobs, to contract researchers and child care providers. Battelle found that across all occupations involved in the biopharmaceutical sector, the average wage is higher than across all other private sector industries, due to the sector's role as a "high value-added sector." In 2009, the average total compensation per direct biopharmaceutical employee was $118,690, compared to $64,278 in the overall economy.

These characteristics reinforce the importance of fostering an environment that will improve the private sector's ability to harness research innovations to meet national health challenges and continue to create high-wage, high-skill jobs. America's innovative biopharmaceutical companies face increasing challenges ranging from the cost and increased complexity of bringing new medicines to patients, the prospect of attracting and sustaining the capital needed to develop tomorrow's new treatments and cures, the increasing uncertainty related to coverage and reimbursement of innovative medicines, and intensifying competition from other countries. Continued innovation is fundamental to U.S. economic well-being. A long-term commitment to science, technology, and innovation is vital to enabling U.S. biopharmaceutical companies to improve health outcomes and establish the foundation for economic growth and jobs of the future.

Achieving growth in the bioeconomy that benefits all Americans calls for recognizing medical innovation as a valued part of the health care and economic solutions available to the United States, rather than as developments that should be suppressed. Medical advances are needed to help us innovate our way out of a myriad of systemic health system problems. Better treatments, which have yielded longer, healthier lives, are based on intensive R&D-- the lifeblood of the sector's economic value and growth. Because of their high added value, medical advances generate valuable jobs that help support vibrant communities across the country.

In order to create a more favorable environment for innovation, PhRMA believes the public and private sectors must work together to:

- Strengthen the science base to meet 21st century challenges;
- Advance medical innovation policies as a solution to health system problems;
- Sustain U.S. global leadership in the biosciences through economic trade, and related policies;
- Support strong intellectual property (IP) rights and enforcement in the U.S. and abroad; and
- Build a highly skilled and educated biosciences workforce.

PhRMA's comments are offered as a contribution to the national dialogue about how to spur innovation to address a broad range of health challenges, grow jobs, and strengthen the U.S. economy. As the bioeconomy blueprint and action plan are developed, it is critical that OSTP and other Federal agencies recognize the importance not just of identifying new ways to better

leverage public and private sector investments, but also of identifying and addressing challenges that increase the uncertainty for biopharmaceutical companies in the U.S. and restrict or reduce patient access to medical innovations.

Identification of Grand Challenges

It is laudable to seek to identify a limited number of "grand challenges" on which to focus public and private sector investment. There are unmet medical needs across a wide range of conditions and diseases that would be considered grand challenges. While recognizing these imperatives for sustaining biomedical advances, the RFI's "grand challenges" approach could inadvertently fail to recognize, and thereby disincentivize, the multiple paths needed to meet and overcome those challenges. At times, there are obvious paradigm-changing breakthroughs, quickly recognized as such. However, it is much more often the case that profound improvement in treatment and outcomes is the result of cumulative steps, no one of which is "the" breakthrough but the absence of any one of which could sever the route to advancements. Moreover, whether progress occurs through one breakthrough or through cumulative steps, typically, the full value of new treatments emerges over a period of time rather than at the time of product approval. Thus, a construct that would value only the rare and obvious paradigm-changing breakthroughs and discount other advances would cut off a common route to highly valuable advances and create very significant disincentives for innovation. As noted in a recent Boston Healthcare Associates white paper on progress against cancer, "Because of the nature of the research process, initial trial data alone cannot reflect the clinical value of a therapy earlier in treatment or disease state, across different diseases, in combination with the complete array of other therapies, or within target populations identified through specific biomarkers." [5]

Strengthen the science base to meet 21st century challenges

In this section we highlight two areas for consideration in the bioeconomy blueprint: the pending Prescription Drug User Fee Act-V (PDUFA-V) and public-private partnerships. A key focus of the bioeconomy blueprint must be efforts to advance regulatory science and to ensure that the FDA, National Institutes of Health (NIH), and related federal research agencies are sufficiently funded and remain up to date on the leading science and technological advances. In terms of reducing regulatory barriers which impede or prevent biomedical innovation, many of the topics within the purview of the FDA are to be addressed in the pending Prescription Drug User Fee Act-V (PDUFA-V), which is scheduled for reauthorization in 2013. The PDUFA-V agreement will, if enacted as published, continue to provide the FDA with resources and management tools to support patient safety and to promote innovation. Specific provisions that will enhance the FDA's reviewing capabilities include:

- An enhanced review model for new molecular entity new drug applications and biologics license applications to improve the efficiency and effectiveness of the regulatory review process for innovative medicines and biologics. This new model will also help avoid unnecessary delays in the availability of new treatments to patients for unmet medical needs, while still retaining FDA's high review standards. The enhanced review model allows for increased meaningful communication between FDA and sponsors prior to and

5 Chan, S, et al., "Recognizing Value in Oncology Innovation," White Paper, Boston Healthcare Associates, March 2010, Available at: http://www.bostonhealthcare.com/objects/PDFs/OncologyWhitePaper.pdf

throughout the regulatory review process and provides the FDA with management tools which emphasize completion of agency work within the first review cycle.

- Appropriate staffing and resources for the FDA that will advance regulatory science through the integration of emerging scientific data and innovative approaches to the development and review of new medicines more efficiently, promoting public health in areas such as biomarkers, pharmacogenomics and rare and orphan drug development.
- Enhancements to FDA's regulatory decision-making and transparency through the development of an organized, structured framework for evaluating the benefits and risk of new treatments in a consistent manner. The development and implementation of a patient-focused, structured framework will help ensure that FDA's regulatory decisions are based on the best available science and facilitate the balanced consideration of the benefits and risks of new medicines.
- Enhancement and modernization of the FDA drug safety system through a public process to help standardize risk evaluation and mitigation strategies, with the intent to assess and reduce burden on healthcare providers and patients, as well as the continued evaluation of the feasibility of using the agency's Sentinel Initiative to actively evaluate post-marketing drug safety issues.

The rapid pace of development and scientific advancement can make it difficult for the agency to stay current across all areas of science. Such advancements highlight the importance of ensuring the ability for both the private sector and regulators to have access to qualified external expertise.

PhRMA agrees there is a shared need and interest for both the private sector and FDA to interact with the best scientific thinking. This need should not be viewed as constituting an inherent conflict of interest. Existing conflict of interest rules that appear to only consider financial agreements between experts and companies without regard for scientifically legitimate involvement in research and product development activities may unnecessarily limit access to high-quality external scientific expertise. The present statutory and regulatory approach for resolving potential conflicts of interest significantly reduces any flexibility FDA has for gaining access to scientific expertise when experts have worked with biopharmaceutical companies on matters related to FDA's need for expert input. It is especially concerning that scientists and physicians who participate in clinical trials or provide expert scientific advice to companies may be prohibited from serving on relevant FDA advisory committees or in other roles where FDA has to rely on the best scientific and medical advice. PhRMA urges a careful examination of the FDA Advisory Committee process to ensure that FDA's access to needed scientific and technical expertise occurs in a more facile and timely manner. For example, a more consultative approach throughout the review and evaluation as scientific questions and issues are identified may render conflict of interest debates less important and provide the agency with more timely and useful scientific expertise. The FDA should also utilize scientific expertise in new ways by establishing "Centers of Excellence" for regulatory science where FDA can tap external resources to augment/enhance regulatory evaluative work.

Advance medical innovation policies as a solution to health system problems.

Biopharmaceutical innovation represents an important part of the solution to the health care challenges facing our nation. The continued discovery and development of new treatments saves and improves patient lives. It also produces savings through the avoidance of costly

hospitalizations and complications, increases in patient quality of life, and improvements in productivity.[6] As described above, major medical progress is often realized over time through a series of steps. Indeed, such "step-wise transformation" is frequently a fundamental characteristic of innovation. In addition, understanding of a medical advance's value frequently evolves over time and varies from patient to patient. To help realize the potential of medical innovation as a solution for improving patient outcomes and controlling rising health care costs, it is important to recognize across all policy areas that the full value of medical advances emerges over time and to support the ability of physicians and patients to choose from the full range of medically appropriate treatment options. The bioeconomy blueprint should also recognize personalized medicine and adoption of targeted therapies in medical practice. The emergence of personalized medicine illustrates how innovation is a solution, and underscores the importance of policy approaches that support physicians and patients in choosing from a range of treatment options to optimize care for the individual. For example, economists at the FDA estimated that the use of a genetic test to properly dose the blood thinner warfarin could prevent 17,000 strokes and 85,000 "serious bleeding events" each year and avoid as much as 43,000 visits to the emergency room.[7]

The need to control rising health care costs has been especially apparent during the recent economic downturn. Yet too often, approaches are pursued to control rising costs that, whether intended or not, thwart medical innovation and actually lead to higher future health care spending. In fact, many experts agree that medicines are a good investment in terms of lives saved, independence and productivity enhanced, hospital stays reduced, and surgeries and other costly, time-consuming procedures avoided. Likewise, continued development of new medicines is essential to avoiding the high burden of diseases such as Alzheimer's and Parkinson's diseases, diabetes, and mental illnesses.

Sustaining U.S. Global Leadership in the Biosciences through Economic, Trade, and Related Policies

Many countries have recognized the human and economic potential of the biopharmaceutical sector in the 21st Century and are seeking to build domestic industries. Among the approaches that the U.S. should consider are the following:

- Assess current federal policies that affect domestic R&D investments and access to global markets. For instance, the U.S. was one of the first nations to create an R&D tax credit, but has since fallen behind other nations.
- Review innovation strategies and economic blueprints developed by other countries to attract and grow the biopharmaceutical industry to identify potential effective policies and initiatives with implications for U.S. policy. As just one example, the U.K.'s Life Sciences Blueprint outlines a long-term strategy to enhance the U.K.'s global competitiveness in the biosciences.[8]

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6 See, e.g., Roebuck MC, et al. "Medication adherence leads to lower health care use and costs despite increased drug spending, *"Health*, 2011;30(1):91-9; McWilliams JM et al. "Implementation of Medicare Part D and nondrug medical spending for elderly adults with limited prior drug coverage." JAMA 2011; 27;306(4):402-9; Encinosa WE et al. "Does prescription drug adherence reduce hospitalizations and costs? The case of diabetes." *Advances in Health Economics and Health Services Research* 2010;22:151-73.

7 A. McWilliam, R, et al., "Health Care Savings from Personalizing Medicine Using Genetic Testing: The Case of Warfarin," AEI-Brookings Joint Center, 2006, Available online at: http://aei-brookings.org/publications/abstract.php?pid=1127.

8 UK Office of Life Sciences, "Life Sciences Blueprint, HM Government," July 2009; Reuters, "Drug R&D projects win $330 mln from EU, industry," May 18, 2009.

- Assess the adequacy of existing trade, tax, and other public policies impacting the attractiveness of the U.S. as a preferred business location, particularly for R&D-intensive sectors like the biosciences.
- Strengthen and expand state and regional innovation clusters to include an explicit focus on sustaining and growing biosciences. Innovation clusters are critical incubators for innovation, resulting in faster improvement and innovation through competition and cooperation. This synergistic approach makes innovation clusters particularly strong contributors to the economy – through job creation and the rapid development of new technologies – and thus, an ideal target for public policies that promote their expansion.
- Enhance collaboration and build upon existing relationships with foreign regulatory agencies of similar standing. The U.S. should establish cooperation agreements between regulatory agencies of similar standing to eliminate unnecessary redundancies through coordination of activities, and mutual sharing and review of regulatory findings. This is not intended to undermine agency autonomy in regulatory decision-making but to encourage sharing of inspection and review tasks, particularly for applications intended for multiple markets.

Supporting Strong Intellectual Property Rights and Enforcement in the US and Abroad

To continue to foster economic growth and the discovery of medical breakthroughs, the nation must pursue public policies that advance innovation, and that requires the protection of intellectual property (IP) rights. Patents and data protection (also referred to as data exclusivity) provide a degree of certainty that biopharmaceutical companies and their investors will have an opportunity to recoup and secure the benefits of their significant investments. Weak IP protection thus has negative ramifications for both patients and workers here at home and abroad. Strong IP protections incentivize the R&D investment necessary to foster the discovery of innovative medicines that save countless lives around the world and lead to reductions in overall health care costs. Higher investments also support the creation of high-quality, high-wage jobs in the biopharmaceutical sector, boosting the U.S. economy. The U.S. biopharmaceutical sector's successes as well as its challenges highlight the importance of incentives that allow it to continue attracting the resources needed for a large-scale biomedical research enterprise that can deliver the medical advances society needs and desires. It is critical that an appropriate balance be struck between making room for additional competition and maintaining incentives for continued innovation. Patents and data protection, are both important incentives for innovation.

Patent protection and an effective patent system are critical to ensuring a favorable environment for R&D investment. At a time when we look toward the job growth the country needs, the Leahy-Smith America Invents Act has the potential to spur job growth by incentivizing investment in the patent-based businesses that provide millions of jobs across the country

To advance the discovery of new medicines, the data protection period, also referred to as a data exclusivity period, must be long enough to allow innovators, who undertake costly and risky R&D and the FDA approval process, to earn a positive rate of return. The Patient Protection and Affordable Care Act created an abbreviated approval pathway for biosimilars and provided for a 12-year period of data protection for innovator biologics. This provision allows innovative medicines to be on the market for a certain period before a biosimilar can be approved based on the innovator's data and protects against the uncertainties caused by patent challenges early in a product's life (but long after R&D investments are made).

In addition, the U.S. must continue to engage with trade partners on free trade agreements – like the Trans-Pacific Partnership – that foster and ensure strong IP rights, such as those found in the Korea-U.S. Free Trade Agreement and U.S. law. Greater emphasis should also be placed on enforcing trade rules to ensure U.S. trade partners meet their obligations, addressing preferential trade policies to improve the ability of U.S. companies to compete globally, and ensuring strong measures to combat counterfeiting. These efforts will ensure the U.S. biopharmaceutical sector's continued economic sustainability and growth.

Building a Highly Skilled and Educated Biosciences Workforce

Central to the Nation's ability to develop needed scientific and technological innovations is a highly skilled workforce. We need to nurture the development of workers in the fields of science, technology, engineering, and mathematics (STEM) for high-growth, high-value industries that are the most powerful engines of jobs growth. Worldwide trends indicate the U.S. is falling behind other countries in developing the educated and well-trained workforce necessary to compete globally and to meet the projected needs of biopharmaceutical companies in the U.S. As part of the bioeconomy blueprint, the U.S. should work to improve U.S. global STEM rankings through such efforts as improving coordination and accountability among federal STEM education programs and expanding federal support for graduate and early-career research in STEM fields. PhRMA also urges an increased emphasis on the biosciences in federal and state workforce training and retraining programs to ensure more Americans would be qualified to fill high-wage, high-quality jobs in the biosciences industry. The Bureau of Labor Statistics predicts 2.7 million STEM job openings in the U.S. by 2016, meaning that 2.7 million American jobs would be unable to be filled by American workers if current trends continue.[9]

In addition, just as other countries are implementing a range of incentives to attract and retain highly skilled workers, the U.S. should explore with the biopharmaceutical and related sectors ways to improve U.S. ability to grow a 21st century biosciences workforce, including attracting and retaining highly-skilled foreign workers.

Ongoing commitment and engagement by both the public and private sectors is critical to addressing the challenges that exist and lay ahead as well as allowing us to collectively serve as sources of continued medical innovation and future economic growth. The increasingly challenging regulatory environment, the uncertainty related to whether innovation will be adequately valued by payers, the increasing complexities of the science and new technologies,

9 Dohm, A, and Shniper, L. "Employment Outlook 2006-2016: Occupational Employment Projections to 2016," U.S. Bureau of Labor Statistics, November, 2007, Available at: http://www.bls.gov/opub/mlr/2007/11/art5full.pdf.

and the uncertainties related to IP protections and the changing economics of industry underscore the need for a national strategy to strengthen the U.S. bioeconomy. We look forward to discussing these ideas and working with Federal agencies and other stakeholders to create a more favorable environment for medical innovation in the U.S.

Sincerely,

Richard I. Smith
Executive Vice President, Policy and Research