

Response to Request for Information Regarding a National Bioeconomy Blueprint
University of Houston
December 2011

This document is submitted in response to the White House Office of Science and Technology Policy's (OSTP) request for information to inform the upcoming National Bioeconomy Blueprint. Located in the country's fourth-largest city, the University of Houston (UH) is a thriving Tier-One research institution pursuing innovative discoveries in the biological sciences. What's more, UH is one of the nation's most diverse research institutions, having recently been designated as a Hispanic Serving Institution by the Department of Education. Enrolling over 39,000 students, UH is also the second largest institution of higher education in the state of Texas and a driving force behind the greater Houston area's thriving life sciences industry.

Research is not only an element of the nation's bioeconomy, but is the foundation on which our biological sciences industries are built. None of the technologies which support countless jobs across the energy, agricultural, and health sectors would be possible without the early-stage basic and applied research carried out at institutions like UH. With this in mind, it is critical that the Blueprint include research as a fundamental piece of a strong bioeconomy. Further, UH encourages OSTP to include in the Bioeconomy Blueprint its support for a robust federal biological research enterprise to catalyze future advances that will ensure our global competitiveness. Sustained federal support for biological research will drive solutions to national issues in energy, health, and national security while at the same time supporting thousands of new jobs. For example, at UH, faculty Jeffrey Rimer and Peter Vekilov have recently received a grant from the Department of Defense to develop a completely new method to develop anti-malarial drugs.

In addition to basic research activities, it is important for federal biological research initiatives to be interdisciplinary, as many game-changing advances lie at the nexus of biology and other fields. For example, the UH Department of Electrical and Computer Engineering is working with medical researchers to develop software that can quickly recognize tissue images to help diagnose and treat disease. Projects like these illustrate that creative interdisciplinary approaches are necessary to leverage all available resources and expertise in support of the nation's bioeconomy. This includes adopting complementary approaches at the federal level which bring together multiple agencies working towards innovative solutions in the biological sciences.

Finally, implicit in this effort is the need to ensure support for high-risk, high-reward projects despite overall budget constraints. Pursuing potentially disruptive discoveries requires that federal agencies support projects which carry greater risk, but also offer the potential to transform an industry or overcome a challenge if successful. Projects such as those supported by the Advanced Research Projects Agency-Energy (ARPA-E) hold the ability to stimulate quantum leaps towards overcoming national concerns. At UH, the Center for Nuclear Receptors and Cell Signaling is using the basic science of cell biology to find ways to treat diseases such as cancer, Alzheimer's, and Multiple Sclerosis.

Beyond research, it is important that the Bioeconomy Blueprint include measures to speed the transfer of innovative discoveries from the laboratory to the commercial marketplace. Effective technology transfer policies are essential to helping the nation's research universities contribute to the strengthening of the bioeconomy through the creation of new companies and partnerships which drive economic growth. UH is aggressively moving forward in the technology transfer arena, and these efforts

are directly enhancing the already burgeoning energy and life sciences industries in the greater Houston area.

UH is investing in a Center for Industrial Partnerships to transfer technology to the bioeconomy. This Center is helping to overcome barriers to the successful transition of new technologies from the research laboratory to the commercial marketplace. In addition, federal policies such as increased proof of concept funding to bridge the “valley of death” and encourage investors to be more active in smaller markets will more fully leverage university resources in support of the bioeconomy.

As one of the country’s most diverse research institutions, UH is playing an important role in preparing the next generation workforce to participate in the bioeconomy. UH strives to foster skills in its students at both the undergraduate and graduate levels which will translate directly to fields including energy and the health sciences. Specifically, UH trains its graduates to work on diverse teams that contain the range of expertise necessary to solve the country’s most urgent challenges. Scientists and engineers in both academia and industry will need appropriate awareness of the interdisciplinary research questions central to the bioeconomy. It will be critical to train biological scientists with highly developed quantitative skills as well as physical scientists and engineers with appropriate awareness of challenges in the life sciences.

In addition, UH believes that federal programs should support university efforts to develop curricula and programs focused on horizontal integration of training across disciplines while maintaining appropriate in-depth training in students’ core research areas. For example, Dr. Rupa Iyer of the UH College of Technology has recently received an NSF grant titled “From Nature to Lab to Production-Infusing Cutting Edge Technology into Undergraduate Biotechnology Curriculum.”

UH is also committed to utilizing its extensive relationships with the private sector in support of developing a top-quality workforce for the bioeconomy. The UH System produced 3500 health and biology related degrees in 2010 in areas such as nursing, biology and biochemistry, pharmacy, and lab technicians that will support local industries. Effective federal policies such as promoting fellowships that allow students to spend part of their graduate careers working in industry or other sectors help create networks between academia and industry, foster real-world learning, and provide students with greater understanding of workforce opportunities beyond the lab. Supplements to research grants for appropriate commercialization activities can also be important in developing the workforce which is the lifeblood of industries grounded in the biological sciences.

Institutions like UH are important actors in the expansion of the nation’s bioeconomy. Our research, technology transfer, and workforce training initiatives contribute to all levels of the bioeconomy and our partnerships with industry spur economic development in our home region. UH appreciates the opportunity to comment on this important topic.