IBBR Receives Award to Develop Drought-Tolerant Plants

(Rockville, Maryland) The Institute for Bioscience and Biotechnology Research has been awarded a $100,000 grant to test the broader applicability of a technology platform invented by one of its leading scientists towards engineering drought-tolerant, agriculturally important crops. The grant is funded by the Maryland Innovation Initiative (MII) as part of the Technology Council of Maryland’s (TEDCO) effort to support commercialization of academic-based scientific research as part of the state’s efforts to foster economic development in Maryland.

IBBR Fellow, Shunyuan Xiao, Ph.D., an associate professor in the Department of Plant Sciences and Landscape Architecture at the University of Maryland, invented and patented a technology to induce drought tolerance in the model plant Arabidopsis by sequestration of a conserved regulatory protein involved in regulation of stomatal movement using a synthetic protein. The goal of the award is to explore the utility of this technology by generating proof-of-concept in additional plant models and ultimately applying this platform into commercially relevant crops such as wheat, barley, rice, corn, and sugarcane. The platform will initially investigate utility into non-human consumables such as turf grasses and ornamental nursery crops, which have fewer regulatory hurdles and a potentially quicker path to market.

Water scarcity is the most important natural factor that limits crop production. This problem has been exacerbated by global climate change, representing global losses estimated at $40 billion. For example, according to the United States Department of Agriculture’s Risk Management Agency, yearly losses due to drought in the United States averaged $4.7 billion from 2009 to 2013, and were $12.9 billion in 2012 alone. Breeding drought-tolerant plants to improve crop performance under drought conditions is an urgent need in the United States and globally.

“We’re excited to have this opportunity to test whether this approach also can be applied to commercially-relevant, drought-tolerant crops,” said Xiao. “If so, it is very likely that this technology will find application in a wide range of plant species thereby positively impacting the nation’s agricultural economy and global food supply chain.”
“MII’s funding of this technology supports their commitment to address Maryland’s crop production challenges as well as the technology’s commercialization potential. That’s why the MII program is so vital for our region as it facilitates the translation of scientific research into practical and commercial applications,” said Thomas Fuerst, Ph.D., IBBR Director. “Through Dr. Xiao’s groundbreaking research and TEDCO’s support, IBBR looks forward to collaborative development, creating partnerships, and working with leading agro-biotech companies to identify market needs.”

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About IBBR
IBBR is a University System of Maryland joint research enterprise among the University of Maryland College Park, the University of Maryland Baltimore, and the National Institute of Standards and Technology. With a long-standing scientific focus on structure-function relationships of biomolecules, genetic systems, and applications, e.g., vaccines, therapeutics, drug delivery technologies, and biomanufacturing, IBBR’s mission is to leverage its unique capabilities and infrastructure to marshal innovative technologies and expertise across its partnering institutions, to foster integrated, cross-disciplinary team approaches to scientific research and education, and to pursue translational programs and projects aimed at advancing innovations to commercialization in real world applications. The Institute also serves to expand the economic base of science and technology in the state of Maryland and at the national level.