BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

Research, Economic Development, & Innovation Committee

Thursday, December 9, 2021
10:45 a.m. to 12:00 p.m.

Gordon Dining & Event Center
Overture Room, 2nd Floor
770 W. Dayton St., Madison
and Via Webex Videoconference

A. Call of the Roll

B. Declaration of Conflicts

C. Approval of the Minutes of the October 7, 2021 Meeting of the Research, Economic Development, and Innovation Committee

D. UW-Madison: Driving Human Health Advances Through Groundbreaking Biotechnology Research

E. University-Industry Leadership Panel: Honing Wisconsin's Competitive Edge for Ultimate Success in the Competition for Funds to Support the Growth of Technology Hubs Across the U.S. Heartland.

Research, Economic Development, & Innovation Committee **Item D**

December 9, 2021

UNIVERSITY OF WISCONSIN-MADISON: DRIVING HUMAN HEALTH ADVANCES THROUGH GROUNDBREAKING BIOTECHNOLOGY RESEARCH

REQUESTED ACTION

For information only.

SUMMARY

Research activities at UW-Madison surpass $1.3 billion annually, placing the flagship campus among the top ten in research expenditures nationally. UW-Madison researchers produce cutting-edge research results across a wide range of areas, from data science to quantitative cell imaging to clean energy and beyond. A particular area of strength is research focused in biotechnology, including biomedical research that leads to significant human health impacts.

UW-Madison Chancellor Rebecca Blank will introduce Vice Chancellor Steve Ackerman and two university researchers engaged in cutting-edge biomedical research driving health care advances in cancer and in fighting the COVID-19 virus.

Presenters:

- Rebecca Blank, Chancellor
- Steve Ackerman, Vice Chancellor for Research and Graduate Education
- David Beebe, John D. MacArthur Professor and Claude Bernard Professor of Biomedical Engineering
- David O'Connor, UW Medical Foundation Professor of Pathology and Laboratory Medicine

BACKGROUND

David Beebe is the John D. MacArthur and Claude Bernard Professor in the Departments of Pathology and Laboratory Medicine and Biomedical Engineering. His research is focused on a holistic approach to understand cell behavior that will provide biological insights, aid in diagnosis and treatment, and enhance discovery.

He is particularly interested in cancer biology. Professor Beebe holds a Ph.D. from the UW-Madison and was a faculty member at the University of Illinois Champaign-Urbana before returning to Wisconsin.

Dr. Beebe will talk about his cancer research with the goal of improving in-clinic treatment decisions. He invents and applies novel, micro-scale technology to create improved models of a cancer. A unique aspect of this approach is the use of primary cells taken from the patient's own tumor tissue. His lab breaks down the tissue into functional components and rebuilds "mimics" of the patient's tumor in a micro "dish".

Working with clinicians, these "mimics" are treated with candidate treatments to aid the clinician in choosing the best treatment for that specific patient. The approach holds the promise of further personalizing treatment for each patient to reduce side effects, increase treatment response, and improve patient outcomes.

In addition, Dr. Beebe will briefly describe how the same technologies used for cancer are being applied to improve COVID testing (in collaboration with Dr. O'Connor). This collaboration has led to the creation of a start-up company that is developing a novel mobile COVID testing laboratory.

David O'Connor is a UW-Madison Professor of Pathology and Laboratory Medicine, a leader in HIV vaccine research, and a leader of the University of Wisconsin's Zika project, where he developed the first nonhuman primate model for the Zika virus. When COVID-19 arrived, he and his colleagues formed a global research group to quickly develop similar animal models for this novel disease.

Dr. O'Connor will talk about leveraging research innovation from UW-Madison to improve the health of Wisconsinites throughout the ongoing COVID-19 pandemic. He and his colleagues use advanced genomic tools to track the virus through space and time, showing how the early COVID-19 pandemic was different in Milwaukee County and Dane County, providing reassurance that hospital PPE effectively protects healthcare workers from infection, and demonstrating that the surge of UW-Madison cases in fall 2020 did not spill over into the broader community.

In addition to this sequencing work, Dr. Beebe and his colleagues have been involved in trying to make schools safer for in-person instruction. In late 2020 and early 2021, they

taught more than 100 Dane County K-12 schools how to perform on-site testing of symptomatic students and staff. More recently, they have been pioneering the use of air samplers to assess COVID risk in schools without the need for expensive and labor-intensive individual testing.

Dr. O'Connor and his close colleagues, Professors Tom Friedrich and Shelby O'Connor, all received PhDs from UW-Madison and have worked together on multiple projects.

Research, Economic Development, & Innovation Committee **Item E**

December 9, 2021

UNIVERSITY-INDUSTRY LEADERSHIP PANEL: HONING WISCONSIN'S COMPETITIVE EDGE FOR ULTIMATE SUCCESS IN THE COMPETITION FOR FUNDS TO SUPPORT THE GROWTH OF TECHNOLOGY HUBS ACROSS THE U.S. HEARTLAND

REQUESTED ACTION

This item is intended to highlight significant economic development issues and opportunities and to inform future decision-making.

SUMMARY

Beginning before the pandemic and increasing over the past 18 months, national policy discussions have focused on the need to increase federal investment to support world-class university research for the United States to remain globally competitive. As these conversations progress, it is becoming increasingly apparent that public-private partnerships with a high-level university and industry collaboration will become an essential success factor in Wisconsin's ability to compete for the types of R&D "hub" grants that are envisioned for funding across the United States, including the Heartland.

Today's panel discussion provides a forum for the REDI Committee to hear directly from leading academic researchers and employers who will provide diverse and divergent perspectives on topics of importance that can further enable Wisconsin to strengthen its competitive position among the regions being considered for funding.

Tom Still will moderate today's discussion. He is President of the Wisconsin Technology Council, which serves as an advisor to the Governor and the Legislature on matters related to innovation, technology, and research. The Technology Council also updates Wisconsin's congressional delegation from time to time on relevant issues.

Presenters:

- Moderator: Tom Still, President, Wisconsin Technology Council
- Panelists:
    - Erik Iverson, Chief Executive Officer, WARF
    - Dr. Jessica Silvaggi, Vice President, UWM Research Foundation
    - David Vasko, Senior Director, Advanced Technology, Rockwell Automation

BACKGROUND

From discussions with federal legislators and other policy makers, it is apparent that the funding initiatives being contemplated tend to focus on engineering and computer science disciplines, with additional interest shown in health science, energy, and climate-sustainability. Among the numerous research focus areas mentioned are the following:

- Artificial intelligence and machine learning
- High-performance computing, semiconductors and Quantum computing
- Robotics, automation and advanced manufacturing
- Natural and man-made disaster prevention
- Advanced communications
- Biotechnology, genomics and synthetic biology
- Advanced energy technology
- Cybersecurity, data storage and data management
- Materials science and engineering

While Wisconsin isn't nationally competitive in each area, the Badger State's longstanding industry-academic partnerships provide an opportunity to build on current successes to compete successfully. A 2019 report by the Brookings Institution ranked Madison #1 and Milwaukee #17 in a list of the top 35 markets identified as key locations for federal investment to support the growth of technology and innovation.

From a competitive perspective, other Midwestern states are also beginning to gear up for these anticipated federal funding opportunities, with the University of Illinois announcing a $200-million collaboration with IBM and state government. That collaboration includes plans for a Discovery Accelerator Institute on the Champaign-Urbana campus with the long-range goal of spurring breakthroughs in areas such as quantum computing, artificial intelligence, accelerated materials discovery, and sustainability.

For Wisconsin to be successful, the state's technology experts and business partners must focus on areas where the state truly stands out, can draw on available industry expertise, and can identify one or more anchor institutions to attract the attention of federal funders.