The goal is to develop and test a “first-in-class multi-specific antibody”, which could offer dramatic advantages over current treatments for AIDS patients, help eliminate hidden reservoirs of HIV, and potentially deliver on the promise of a long-awaited HIV cure.

The Institute for Bioscience and Biotechnology Research (IBBR) has been awarded a $115,000 grant to further develop and commercialize a multi-specific antibody as a therapeutic for HIV. The grant is funded under the Maryland Innovation Initiative (MII) by the Maryland Technology Development Corporation (TEDCO) that supports the commercialization of academic-based research in the State of Maryland and thereby supports the State’s efforts to foster economic development. The MII program is a collaboration between the State of Maryland and five Maryland Institutions: University of Maryland, Baltimore, University of Maryland, College Park, Morgan State University, University of Maryland Baltimore County, and Johns Hopkins University.

Dr. Yuxing Li, IBBR Fellow and Associate Professor, University of Maryland, Department of Microbiology and Immunology, will aim to test a multi-specific, four-in-one antibody therapeutic, each targeting a distinct site on the HIV viral envelope, called a “tetra-NAb”. The specific aims under this grant include evaluation of improved activity, extended half-life in vivo, and neutralization of resistant HIV variants. Dr. Li, has previously demonstrated in vitro that a tri-NAb (three-in-one antibody) and tetra-NAb were able to neutralize 99.5% of HIV1 viruses in a panel of over 200 types that is representative of all known circulating HIV-1 viruses in the world. “Our research indicates that a tri and tetra-NAbs appear to be an effective way of suppressing the virus. This MII grant will help validate use of this multi-specific antibody approach. We look forward to achieving milestones required to move to the clinical phase,” said Dr. Li.
Extraordinary diversity in HIV virus and its high mutation rate make HIV adept at evading the human immune system and complicate the development of a globally effective vaccine. Current antiretroviral (ARV) treatments, while effective in controlling the HIV load in a patient’s blood and extending life expectancy, have unpleasant side effects, are prone to drug resistance, and require constant patient monitoring. HIV has the further ability to integrate into the human genome, leading to hidden viral reservoirs that make total eradication impossible with ARVs alone.

“The Institute’s mission is to conduct groundbreaking research leading to solutions that address significant scientific and medical needs. MI’s funding supports this mission of innovation and facilitates the commercial translation of great scientific research,” said Thomas Fuerst, Ph.D., IBBR Director and Professor. “As the premier translational science institute for the State of Maryland, IBBR continues to lead commercialization efforts within University of Maryland to generate pioneering products, such as vaccines, drug delivery technologies, and next generation HIV targeting tetra-NAb therapies like Dr. Li’s.”

This project was initially seeded with funds from the MPowering the State initiative. “MPower” is a strategic partnership between UMCP and UMB. The initiative is designed to expand research collaborations, promote innovation and impact, and leverage the research strengths across the campuses to develop novel, multidisciplinary solutions to major unmet medical and public health needs.

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About IBBR

IBBR is a joint research enterprise of the University of Maryland College Park, the University of Maryland Baltimore, and the National Institute of Standards and Technology. The Institute serves as the nexus between academic research and commercial application, bringing together all of the critical elements necessary to pursue solutions for major scientific and medical challenges. Through collaboration and interaction among academia, government and industry, IBBR focuses on structure-based design, characterization and testing of proteins and nucleic acids, and conducting groundbreaking research to develop innovative translational applications. IBBR’s leverages its unique infrastructure and capabilities to advance projects and innovations towards 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.