A Case to Support the

INNOVATION FUND

TURNING BOLD IDEAS INTO REALITY

University of Maryland
School of Medicine
WE ARE A CATALYST FOR INNOVATION.

Through entrepreneurship we cultivate a community of bold innovators — those who envision and venture beyond the norm to bring about change.

Every day, scientists at the University of Maryland School of Medicine (UMSOM) are finding new ways to transfer the research they are doing in their laboratories into innovative pharmaceuticals, therapeutics, vaccines, and biomedical devices that are helping to further the well-being of patients both in Maryland and around the world.

The UMSOM Innovation Fund will help move this cutting-edge research from the laboratory into groundbreaking medical interventions by investing in promising Maryland-based start-up companies to commercialize intellectual property developed by UMSOM faculty, staff, students, and graduates. Pooled gifts to this philanthropic fund, administered by the University of Maryland Baltimore Foundation, Inc. (UMBF) on behalf of UMSOM, are dedicated to advance these technologies. The returns generated from these investments will be applied to investing in exciting new ventures while also supporting UMSOM’s most critical educational and public health goals.

REALIZING COMMERCIAL POTENTIAL

UM Ventures and the Maryland Momentum Fund (MMF) invest in the University of Maryland, Baltimore’s (UMB) most promising technologies, helping faculty and researchers move their discoveries out of the laboratory and into the marketplace. Early-stage and seed-round investment can provide UMSOM entrepreneurs essential resources when seeking their initial round of funding, which is usually the most difficult to get. These investments can also provide critical support to help start-ups survive the ‘valley of death’ period between laboratory discoveries and company formation.

Staffed by highly qualified UMB personnel and guided by an external Advisory Board of entrepreneurs and venture capitalists with significant investment experience, these teams conduct extensive due diligence on investment candidates. Additionally, ongoing assistance is provided to portfolio companies to help them overcome initial roadblocks, such as advice on capital raising, strategic direction, industry and professional collaborations, obtaining grant support, and facilitating connections to other angel and investor groups.

Decisions on investments will be made collaboratively with UMSOM’s Dean Reece and UM Ventures or MMF. Distribution of investment returns will provide:

- 50% for reinvestment in future entrepreneurial opportunities; and
- 50% to remain with UMSOM to be applied at the discretion of Dean Reece to support our strategic mission areas of clinical care, research, education, and community impact.

In recent years, many researchers at UMSOM have had success with technology transfer. UM Ventures and MMF have invested more than $21 million in UMSOM start-ups since 2014, with investments ranging from $50,000 to $500,000. Led by strong management teams, these companies have raised an additional $50 million from angel investors, venture capitalists, and strategic investors, and produced strong returns.

Our researchers make discoveries every day. These inventions are excellent examples of how new devices and therapies developed here have tremendous worldwide potential for treating patients and ultimately saving lives.”

E. Albert Reece, MD, PhD, MBA
Executive Vice President for Medical Affairs, UM Baltimore
John Z. and Alice K. Bowers Distinguished Professor
Dean, University of Maryland School of Medicine

AN IDEA TO REVOLUTIONIZE PATIENT CARE WITH THE FIRST PORTABLE ARTIFICIAL LUNG

Breethe, founded by Dr. Griffith, has developed a first-of-its-kind portable artificial lung that has the potential to revolutionize care for patients needing an artificial lung. Dr. Griffith and Zhongjun Jon Wu, PhD, the Peter G. Angelos Distinguished Professor in Entrepreneurial Surgical Sciences, designed the core of the innovative extracorporeal membrane oxygenation (ECMO) system in their laboratory at UMSOM. The vision was to help treat patients suffering from respiratory failure that may result from infections caused by viruses such as H1N1, SARS, and COVID-19, along with many other noninfectious causes of pulmonary failure.

Hundreds of thousands of patients die each year from respiratory disease and lung failure, and most must live out their days in a hospital bed tethered to a bulky oxygen machine for critical care situations or as a bridge option while waiting for an organ. Each year, more than 200,000 patients receive ECMO therapy in the United States.

As a transplant surgeon, Dr. Griffith saw a need and has dedicated much of his career to finding a better solution for these patients. This easy-to-use compact ECMO system has an integrated oxygen concentrator that eliminates the need for bulky oxygen tanks promoting easier patient ambulation. The wearable, portable artificial lung system took decades to develop, but it is now one step closer to being available to those who need it most.

The company was founded in 2014, and UM Ventures invested in Breethe in 2015. Breethe obtained exclusive licensing rights to the intellectual property from UMB in 2015. In April 2020, Massachusetts-based Abiomed acquired Breethe and its novel oxygenation device to expand its product portfolio in order to serve a new patient population in the respiratory space.

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Breethe is an artificial lung that has the potential to revolutionize care for patients needing an artificial lung. The artificial lung system requires much more than just monetary investment. People backing you every step of the way and believing in your vision is critical. To receive that support from the University has been invaluable.”

Bartley Griffith, MD
Thomas E. and Alice Marie Hales Distinguished Professor in Transplant Surgery
Director, Cardiac and Lung Transplant Programs
2017 UMB Entrepreneur of the Year
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The UM Ventures investment program has been incredibly successful with 12 investments in nine companies, four of which have had successful exits via acquisition. UMB has seen an estimated five to six times return on these investments to date. On average, these companies were acquired four years after investment.

Breathe and Harpoon Medical are two of these investment success stories.

“UM Ventures investing in Breathe early on shows that the University supports its entrepreneurs not just through words, but through action. Commercializing a device such as Breathe’s wearable, artificial lung system requires much more than just monetary investment — it requires people backing you every step of the way and believing in your vision. To receive that support from the University has been invaluable.”

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Thomas E. and Alice Marie Hales Distinguished Professor in Transplant Surgery
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2017 UMB Entrepreneur of the Year
INVENTED A MINIMALLY INVASIVE DEVICE TO SPEED RECOVERY AFTER HEART SURGERY

Dr. Gammie invented a minimally invasive, image-guided surgical tool to simplify beating-heart mitral valve repair. The device, inserted through a keyhole incision between the ribs, allows patients to avoid open-heart surgery and months of recovery.

An average surgeon does five mitral valve repair operations per year. Dr. Gammie performs nearly 40 times that number. Performing the same operation over and over again, he began to think that there was a better way to insert the special sutures that fasten the Gore-Tex cords to the mitral valve leaflet.

Currently a surgeon must stop the heart to perform this procedure, and it is unknown if the procedure was successful until the heart is restarted. This novel device allows surgeons to see the success of a procedure in real time while the heart is beating — sidestepping the hazardous heart-lung machine and additional risks to the patient.

After seven years of research, collaboration, and development of device prototypes, Dr. Gammie co-founded Harpoon Medical in 2013. UM Ventures made its first equity investment in Harpoon Medical in 2014. Then in 2017, Harpoon Medical was acquired by Edwards Lifesciences to commercialize the device, just two years after Edwards led Harpoon’s funding round.

Dr. Gammie traveled to Europe 27 times within two years before applying the procedure to human patients. Today there are more than 60 patient success stories in Europe. The application of this technology is expanding and clinical trials are expected in the U.S. in the very near future. Approximately 150,000 patients per year worldwide (one-half in the U.S.) could potentially benefit from this device.

BOLDLY INVEST IN THE FUTURE OF MEDICINE

These examples are just the tip of the iceberg. We have wonderful opportunities at UMSOM for biomedical breakthroughs, and many scientists are doing work that has the potential to provide millions of patients with better health and better health care, not only in Maryland but around the world.

You can be a catalyst to fuel the spirit of entrepreneurship. Someone is dreaming up a new invention right now with the power to transform medicine. You can be part of the excitement as your philanthropic investment helps to turn these bold ideas into reality. Your gift to the UMSOM Innovation Fund will help drive breakthroughs by commercializing University discoveries through private-sector partnerships that grow the state’s economy. In addition, you will support UMSOM’s critical mission areas that will improve human health and well-being locally and globally.

medschool.umaryland.edu/InnovationFund

Early investment from UM Ventures was invaluable. It allowed us to continue to develop the technology while helping the company attract its first round of outside investment. Without early seed support, such as this, it would have been difficult to obtain and focus the resources necessary to advance Harpoon.”

James S. Gammie, MD
Professor, Department of Surgery
Chief, Division of Cardiac Surgery
2014 UMB Entrepreneur of the Year