

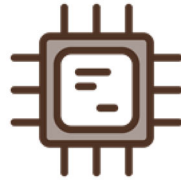
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BROWN TECHNOLOGY INNOVATIONS

Quarter in Review | April - June 2023

Spotlight on BBII



About BBII

Brown Biomedical Innovation to Impact (BBII)

Brown Biomedical Innovation to Impact (BBII) is a biomedical technology development program that accelerates the timeline for turning faculty discoveries into potential products with clinical impact. Since its 2018 launch by the Division of Biology and Medicine in collaboration with Brown Technology Innovations, we have made 21 awards to 19 faculty inventors/technologies totaling \$2.1M in funding. Additionally, four startup companies have been formed to develop and commercialize BBII-funded technologies. These startups, in aggregate, have raised ~\$3M in seed investment or non-dilutive funding. The fifth annual proposal cycle for Brown Biomedical Innovations to Impact

(BBII) yielded awards for three projects: a medical device, a digital therapeutic, and a diagnostic/research tool. Please continue reading for descriptions of these newly funded projects.



New Awards

BBII 2023 Awardees

Kimani Toussaint

Photoplethysmography (PPG) is an optical technique that monitors blood oxygen saturation (SpO₂) levels, typically with the use of pulse oximeters. The technique has been used routinely for decades to noninvasively measure pulmonary health. Conventional pulse oximetry, which estimates the ratio of light absorbed at two wavelengths, has been shown to result in inaccurate estimates of oxygen saturation levels for Black and brown patients because of the interference of the pigment melanin. Kimani Toussaint and his team are attempting to address this fundamental challenge with a novel PPG technique that uses radially polarized light. The team will use the BBII funding to optimize the wavelength and polarization of light used in a prototype of the device to be tested in a clinical trial. Learn more about this technology [here](#) and [here](#).

Frederike Petzschner

Chronic Pain affects 116 million Americans, with back pain the most common, expensive, and disabling type. Frederike Petzschner has developed [SOMA](#), an app that tracks and monitors pain symptoms, treatments, daily activities, and expectations so as to better predict when a condition is worsening or starting to respond to treatment. Recent scientific evidence suggests that chronic pain may be a manifestation of learned pain, which is maintained by beliefs centered around fear, harm, and a lack of controllability. Petzschner will use BBII funding to support the building of SOMARise for Back Pain, a software-based digital cognitive-behavioral intervention program that can be used either as a standalone supportive pain program or as a companion treatment to interventional back pain procedures, with the goal of targeting the cognitive and neural mechanisms underlying ongoing pain perception. Learn more about this technology [here](#) and [here](#).

Anubhav Tripathi and Nikos Tapinos

Anubhav Tripathi and Nikos Tapinos have developed a new method for isolating single cells from tissue samples that uses electric fields. An individual cell from a tumor can be used to perform molecular analyses that reveal important clues about how cancer developed, how it spreads, and how it might be targeted. In recent years, single-cell sequencing (SCS) technologies have been developed to determine the genetic signatures of an individual's cancer. With standard methods, it is difficult to dissociate cancer tissues while preserving the viability of cells to be used in downstream analysis.

To address this issue, Tripathi and Tapinos have developed an advanced method for isolating single cells from complex tissues. The funding for

this project is from a generous gift by the Steven J. Massarsky Charitable Trust. It will be used to further develop the device called TissueToCellsEZ, which automates and combines dissociation and sample purification, allowing the user to simply load the tissue, press a button, and obtain a sample ready for single-cell analysis. Learn more about this technology [here](#).

Read more about the 2023 BBII winners [here](#) and [here](#).



Startup Updates

Startups formed to commercialize BBII-funded technologies

[PedialyDx](#) is a company formed to develop and commercialize diagnostic tools based on acoustic signatures from infants' cries. BBII provided funding to Barry Lester, director of the Center for the Study of Children at Risk at Brown's Warren Alpert Medical School, to develop a handheld device that uses a cloud-based algorithm to determine if an infant's cry meets criteria for neonatal opioid withdrawal syndrome (NOWS). Improving the diagnosis of NOWS would enable better treatment, reduce hospital stays, and lower costs. PedialyDx has received a \$1.8M Phase 2 SBIR grant from the Eunice Kennedy Shriver National Institute of Child Health and Human

Development (NICHD) to further develop the diagnostic tools by conducting a seven-site study to collect more cries from babies at risk of NOWS.

Brian Alverson, former professor of pediatrics and medical science at Brown and Hasbro Children's Hospital, received a BBII award in 2019. His project resulted in [SmölTap](#), a company formed in collaboration with the NEMIC Foundation to commercialize a positioning device to stabilize young infants undergoing lumbar puncture. The BBII funding was used to design and develop a prototype and to test it in a hospital setting. SmölTap has raised \$500K in a seed round and is now manufacturing and selling the device to hospitals.

With the support of BBII, Jeffrey Morgan, Donna Weiss '89 and Jason Weiss Director of the Center for Alternatives to Animals in Testing and professor of engineering and of pathology and laboratory medicine, developed a platform technology that generates injectable, acellular biologics sourced from human 3D cell cultures that can be formulated for specific organs and conditions. Initial focus is on cardiovascular and pulmonary indications with significant additional potential in other diseases. The company [XM Therapeutics](#) was formed to further develop the technology and eventually test the therapeutic in clinical trials. XM Therapeutics is seeking additional seed funding.

For investors, entrepreneurs, and companies interested in seeing other Brown technologies, click [here](#).

BTI Fourth Quarter Numbers for FY23



Put Brown Technology First

Disclosures

FY23 | 19

FY22 | 18



Amplify Networking

Confidentiality Agreements

FY23 | 13

FY22 | 20



Steward Brown Inventions

Patents Issued

FY23 | 5

FY22 | 13



Streamline Deal Execution

Options + Licenses

FY23 | 4

FY22 | 7

Streamline Deal Execution

Sponsored research agreements

FY23 | 6

FY22 | 2

Brown Technology in the News



Vice President for Research Jill Pipher and Executive Director of Brown Technology Innovations, Neil Veloso, presented the award to Professor Maris's wife, Faye, who accepted the award on his behalf at the 7th annual Celebration of Research Ceremony at Sayles Hall.

Humphrey Maris receives inaugural Career and Innovation Impact Award

Humphrey J. Maris, professor emeritus of physics and professor of physics, received BTI's Career and Innovation Impact Award on April 24 for his groundbreaking work in ultrafast ultrasonics and semiconductor metrology and technology. Read more [here](#).

Karniadakis noted as ML "expert to follow" in 2023

Mathematics and engineering professor George Karniadakis was noted as a machine learning [expert to follow](#) by Digilab Academy, based on his groundbreaking work in physics-informed neural networks (PINNs). Read about his work in ML and AI [here](#).

Padture elected to MRS 2023 Fellows Class

[Nitin Padture](#) was elected to the [Materials Research Society \(MRS\) 2023 Fellows Class](#) for his research in advanced composites, high-temperature coatings, and emerging photovoltaics. He has been awarded eight patents in his career.



Visit our website for more detail on these and other stories.

News Stories

Upcoming Opportunities

Registration Open! Innovation@Brown Showcase on October 5

The Innovation@Brown Showcase will highlight startup activity in the Brown/Rhode Island technology ecosystem while providing an opportunity to celebrate groundbreaking inventions and network with like-minded investors, academic researchers, and entrepreneurs. Learn more and register [here](#).

Sony Corporation's 2023 Research Award Program

Solid research is the underlying driving force of creativity and innovation. The Sony Focused Research Award provides an opportunity for university faculty, research institutes, and Sony to conduct collaborative, focused research.

Applications are accepted until September 15, 2023. Learn more [here](#). Please contact your Tech Innovations' director (brian_demers@brown.edu; victoria_campbell@brown.edu; neil_veloso@brown.edu) with any questions.

Calling faculty interested in startups!

The [MIT Faculty Founder Initiative](#) is now accepting applications. This program provides participants with hands-on opportunities to learn from industry leaders about their experiences, ranging from licensing technology to creating early startup companies. MIT has generously allocated three spots in its nine-person cohort for Brown faculty members to apply. The application deadline is August 18, 2023. Interested Brown faculty members can click to apply [here](#). Please let VP_Research@Brown.edu know if you are applying for the program.

Investors, entrepreneurs, and companies interested in seeing other [Brown technologies](#).

Meet the Team

[Reporting an Invention and other resources for Faculty and Staff.](#)

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