



FALL  
INTO  
INNOVATION



8th Annual Brandeis

# INNOVATION SHOWCASE

Event Guide



Brandeis

INNOVATION

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## Poster #1: Assessing emotion regulation ability through a portable mental health care system

PI: Jennifer Gutsell, PhD, Faculty

Sprout Team: Tong Lin, PhD '25 (Psychology); Xiaodong Qu, PhD '22 (Computer Science); Robert Sekuler, PhD, Faculty

I-Corps Team: Tong Lin, PhD '25 (Psychology); Bhavya V. Kondamuri, MSBA '23, International Business School; Yaxuan Wen, PhD '23, (Economics and Finance), International Business School; Victoria Melbourne, MBA/MPP '25, Heller

**Summary:** Mood disorders like depression and anxiety are debilitating a large percentage of Americans. Approximately 9.5% of American adults suffer from a depressive illness each year. The COVID pandemic has further exacerbated this mental health care crisis while at the same time, shifting the norms to remote health care. The ratio of patients that received care via telehealth was as high as 63.1% during the pandemic. In 2022, there are still 38% of patients receiving care via telehealth. Many patients today receive remote behavioral therapy from home, so the assessment on their mental states is only based on conversations with them and lack a more objective neural measurement.

Using neural signals from mobile EEG in combination with machine learning and deep learning (e.g kNN classifier, recurrent neural network) to assess emotions can provide reliable data on mood and mood dysregulation, opening the way to more effective remote therapy for mood disorders. So far, we have finished the first stage of data collection for a feasibility study that tests a methodological approach for the unified collection of robust EEG recording that handles the time-synchronization and centralized recording of neural and behavioral data. In the long term, this invention aims to implement a multisensory system in a mobile health care app that assesses and tracks users' emotion regulation ability.

## Poster #2: Optical-controlled reusable nano-porous material for water purification

PI: Grace Han, PhD, Faculty

Sprout Team: Xiang Li, PhD '23 (Chemistry); Sungwon Cho, BS '23 (Biology)

I-Corps Team: Mingrui Qi, MSF '22, International Business School; Scarlett Ren, BA '24; Tianyu Gao, MSBA/MAIEF '24, International Business School

**Summary:** According to a 2007 World Health Organization (WHO) report, 1.1 billion people lack access to clean drinking water supply; 88% of 4 billion annual cases of diarrheal disease are attributed to unsafe water and inadequate sanitation and hygiene, while 1.8 million people die from diarrheal disease each year. In addition, treatment of oil spills and organic solvent pollution is an important issue for environmental science and technology.

This project is a wastewater treatment device that can complement the conventional pollutant adsorption methods for industrial and household applications by using state-of-the-art nanoporous materials that are capable of adsorbing organic pollutants and releasing them upon light irradiation. It makes wastewater treatment easier, more flexible, and more cost-effective.

## Poster #3: Leveraging phosphatase synergy for tissue specific p38 inhibition

PI: Niels Bradshaw, PhD, Faculty

Sprout Team: Emily Stadnicki, PhD Candidate (Molecular and Cell Biology); Prem Ramasamy, PhD, Staff Research Associate

I-Corps Team: Emily Stadnicki, PhD Candidate (MCB); Khaing Hnin Hnin Oo, MBA '23, Heller; Ci Song, MSBA '23, International Business School

**Summary:** p38 MAP Kinase regulates inflammation and is a major target for drug development for conditions including autoimmune diseases, myocardial ischemia, and cancer. Existing inhibitors of p38 have failed clinically because of on-target toxicity, indicating that tissue- and process-specific p38 inhibitors are needed. Previous efforts

have focused on identifying inhibitors that are specific to particular downstream targets of p38 or particular upstream activating mechanisms. Here, we take an alternative approach, leveraging the native inactivation mechanism of p38 by protein phosphatases. This project exploits synergy between pharmacological p38 inhibition and inactivation by tissue- or condition-specific phosphatases to identify beneficial p38 inhibitors to potentially treat a myriad of diseases.

## Poster #4: Engagement Analytics for Online Classrooms

PIs: Benjamin Gomes-Casseres, DBA; Pito Salas, BA '76

Sprout Team: Klodeta Janaqi, MBA '21, International Business School; Jason Fan BS '23 (Computer Science/Business); Daniel Hariyanto BS '23 (Computer Science and Applied Mathematics); Jacob Judd MA '20, International Business School, Yousuf Khan, MSBA/MBA '23, International Business School; Nikhil Nama, MSBA/MBA'23, International Business School; Joy Majwega, MBA '22, International Business School; Rezarta Myrtollari, MSBA '21, International Business School; Amanda Quaranto-Schulte, MBA '22, International Business School; Adam Ring, BA '23 (Applied Mathematics and Computer Science)

I-Corps Team: Yousuf Khan, MSBA/MBA '23, International Business School

**Summary:** Teachers are perennially looking for ways to engage better with their students. We try different pedagogies and learn by experimentation and from colleagues. But it's hard to know what is working and not working. With online learning, this concern takes on a new dimension. There are new opportunities for distraction, and it is harder for teachers to read the room.

Engagement is critical because it affects learning success, student retention and completion, and the satisfaction of students (and alums). Better measurement and analysis of engagement can provide early-warnings to advisors, help with student retention, and improve the quality of online courses.

Our technology offers a new level of reliable, objective, and detailed information about student engagement and participation in online synchronous courses. This information helps teachers engage students more equitably and effectively, and gives students actionable feedback on their performance.

## Poster #5: NextZyme

PI: Douglas Theobald, PhD, Faculty

Sprout Team: Michael Sennett, PhD '22, Postdoctoral Researcher; Cris Sharma, PhD candidate (Biochemistry and Biophysics)

I-Corps Team: Michael Sennett, PhD Candidate (Biochemistry and Biophysics); Roshni Ray, BS '24 (Neuroscience); Lah Soukkaseum, MSID '23, Heller; Guilherme Gatti da Silva, PhD, Postdoctoral Researcher in Biology

**Summary:** Biotechnology companies have proposed to deal with plastic waste by using enzymes to degrade PET plastic into its constituent PET monomers, rather than using mechanical recycling to PET pellets and flakes. PET monomers carry a higher market value than pellets or flakes. Unfortunately, current enzymes are unable to degrade solid, highly crystalline PET without expensive preprocessing that accounts for half the cost of biochemical recycling. Nature has evolved enzymes to break down a wide variety of materials, including PET. While the PETase enzyme is sufficient for nature, it is not suitable for industrial applications. Drawing inspiration from nature, this proposed technology allows prediction of alternative enzymes allowing for better breakdown of plastics in the waste stream.

## Poster #6: Expansion of selective cytochrome P450 inhibitors (CancerFighters+)

PI: Thomas Pochapsky, PhD, Faculty

Sprout Team: Nathan Wong, PhD '21 (emeritus), Liam Flynn BA '24 (Chemistry), Eric Jiang (HSSP)

I-Corps Team: Nathan Wong, PhD '21, (Biochemistry); Liam Flynn, Undergraduate, Chemistry; Frank Asamoah, MBA '23, Brandeis International Business School; Aliyu Alghali, BS '22 (Chemistry with Biology Specialization); Alena Thotam, Undergraduate, Hampton University (Communicative Sciences and Disorders)

**Summary:** This invention adds to the catalog of highly specific inhibitors developed for cytochromes P450s (CYPs) in the Pochapsky lab by pursuing non-steroidogenic CYPs that are of clinical importance. By synthesizing inhibitors to significant targets for certain cancer-related targets, the team aims to develop new drugs with reduced side effects.

Cancer Fighters+ is an ambitious group of researchers, business strategists, and students of medicine working together to address unmet needs in the treatment of cancers such as breast cancer and prostate cancer. Their focus is to synthesize isonitrile based inhibitors of clinically significant cytochromes P450, developed in the Pochapsky laboratory, and then bring these impressive new tools to industry partners to enable its development into a novel therapeutic. They hope to bring selective, effective treatments to market that minimize side effects for patients, leading to simplified care and increased quality of life

## Poster #7: CapGun Genomics

PI: Paul Garrity. PhD, Faculty

Sprout Team: Willem Laursen, PhD, Postdoctoral Fellow, Rachel Busby, BS '22, Research Technician

I-Corps Team: Manny Glinsky, BS '24 (Neuroscience and Philosophy); Omer Barash, BS '25; Viraj Gandhi, MSC '23, International Business School

**Summary:** Sterile Insect Technique (SIT) is a powerful, cost-effective, and environmentally friendly strategy for controlling and even eradicating invasive species, crop pests, and vectors of disease. In SIT, sterile males are released into the environment to seek out and mate with wild females of the same species. Many insect species exhibit mating refractory periods, during which females will not re-mate for a defined amount of time following an initial mating event regardless of male fertility status. Thus, the presence of competitive sterile males can cause a notable population reduction in future generations. A major bottleneck in implementing SIT is the difficulty in generating large numbers of sterile males that are otherwise competitive for mating. Sterility is currently most commonly induced using irradiation. However, this method has a number of potential drawbacks including inter-batch variability, limited developmental window of efficacy, and damage to non-germline cells that can decrease competitiveness. Genetic engineering can specifically disrupt genes required for fertility,



leaving the rest of the animal largely unaffected and healthy. Yet even with gene-editing technology, identifying sterile mutants and propagating these strains at scale remains challenging. To address this limitation, this project uses a simple generalizable strategy to create and identify sterile individuals at scale. The lab has successfully used this approach to create identifiable sterile strains of fruit flies (*Drosophila melanogaster*) and the dengue fever mosquito (*Aedes aegypti*). Sterile male *A. aegypti* are capable of inducing mating refractoriness in females and competing with wild males for mates, suggesting they will be effective in SIT approaches. To improve on our first-generation strains, we are currently optimizing tools to enable high-throughput identification of sterile animals at all developmental stages and strategies to facilitate the removal of sterile females prior to release.

## Poster #8: Palm to Calm

PI: Kenneth Hayes, PhD, DVM, Inventor

I-Corps Team: Shayna Mazel, PhD Candidate, Heller; Cierra Matthews, Undergraduate, Hampton University (Sports Sciences and Wellbeing); Sonam Deki, SID '22, Heller; Manny Glinsky, BS '24 (Neuroscience and Philosophy)

**Summary:** Professor Kenneth C. Hayes is the main inventor of palm fruit juice (PFJ) from Brandeis & has held a patent outlining PFJ's prevention of diabetes and related metabolic imbalances since 2016. PFJ is a cost-effective source for dietary phenolics which are known to delay or prevent the onset of serious cardiovascular and metabolic diseases through their anti-inflammatory and antioxidant effects. PFJ is generated as the water-soluble byproduct in the palm oil production process & can be used as a functional ingredient into foods for humans, pets and farm animals. It can also be further concentrated and delivered in pill, powder, gel or liquid formulations.

## Poster #9: Microfluidic Chip for water quality inspection

PI: Seth Fraden, PhD

I-Corps Team: Michael Stehnach, Postdoctoral Researcher; Dante Sasso, BS '26 (Physics and Business); Yichen Ma, MSBA '24, International Business School



**Summary:** The present invention is an inexpensive, x-ray transparent microfluidic chip for protein crystallization which has applications in drug development and pharmaceutical engineering. This technology was further explored for other applications where its unique features can be more useful than the currently available solutions. Towards this, the team explored a water quality testing application. The team conducted interviews with the professionals involved in the town water departments who need to monitor water quality periodically. The team found that the current method of collecting water samples across the town/city and testing them in a central place is a cumbersome process and the current device can be developed towards this application in order to provide real-time, low-cost and more efficient water testing ability to customers.

## Poster #10: Project Insulin

Spark Team: Eric Moyal BA '17, MA '18, MS '22, Graduate Professional Studies (Strategic Analytics)

**Summary:** Project Insulin, Inc. (“Project Insulin”) is a Cambridge-based, tax-exempt non-profit organization that will develop a biosimilar insulin glargine and distribute it to patients at cost. Three pharmaceutical companies (Eli Lilly, Novo Nordisk, and Sanofi) make 90% of the insulin produced today. Insulin glargine is 3x more expensive than it was 15 years ago despite no scientific breakthroughs in the same period. The burdensome cost of insulin has created a market where 1.3 million people in the United States are rationing their insulin.

As a non-profit, Project Insulin won't provide donors with a financial return on their investment. So, each dollar donated can bring down the price of our insulin. Project Insulin will be the manufacturer and distributor, which will cut out the many intermediary organizations—allowing Project Insulin to enjoy the efficiencies of being a vertically integrated organization. These two factors will enable Project Insulin to provide patients with a significantly cheaper insulin glargine.

## Poster #11: ZZZi Design

Spark Team: Aida Yuen Wong, PhD, Faculty

**Summary:** ZZZ is an AAPI-owned brand of fine jewelry inspired by Asian calligraphy. All the designs begin with the founder's handwritten calligraphy based on historical script types, and carry messages of racial equality and universal humanity. These designs are then crafted into pendants, earrings, bracelets, and other jewelry. Her brand offers something beyond luxury, bringing together Asian culture, couture, and activism. Ever since the pandemic, Asian communities in the U.S. have been scapegoated and suffered heightened racism. ZZZi jewelry, referencing the Chinese character for "word," conveys love speech for many occasions. A percentage of each sale is donated to nonprofit organizations supporting antiracism. As alternatives to fast fashion, the products are made on demand and use 100% recycled gold and natural, conflict-free diamonds.

## Poster #12: Tenant2Tenant

Spark Team: Shiko Rugene, MBA/MPP '23, Heller; Alton McCall, MBA '23, Heller; Samuel Aronson, MBA '23; Andy Mendez, MBA/SID '23, Heller

**Summary:** Tenant2Tenant was founded in November 2021 as the joint start-up initiative of four Social Impact MBA students at the Heller School for Social Policy & Management with the purpose of serving as a resource for local, out-of-state, and international graduate students seeking off-campus housing. Tenant2Tenant provides a platform to evaluate landlords, offers a consolidated place for resources, and connects students with their peers. Relationships with local universities enable us to reach vulnerable students in need of support, while creating a safe ecosystem to exchange information. Tenant2Tenant's purpose is to eliminate the information gap so that renters can wield their spending dollar with dignity and make informed housing decisions.

## Poster #13: Missionable

Spark Team: Douglass Guernsey, MBA '22, Heller; Varun Edupuganti, MBA '23, International Business School

**Summary:** How do you verify what you care about in online communities? *Missionable* partners with mission driven institutions to validate social actions of donors, volunteers and participants by creating unique digital tokens for verified actions which are stored in secure social wallets. *Missionable* seeks to provide greater engagement, transparency and impact for both its partner organization and its users through a unique and accessible digital platform.

## Poster #14: Sowing Seas of Change

Spark Team: Beck Hayes, MBA/SID '22, Heller; Ariel Wexler, MBA/SID '22, Heller

**Summary:** In just a single generation, we have gone from fully stocked seas to 90% depletion of commercial fish species. More than three billion people rely on seafood for their livelihoods, but local fishermen across the globe travel further out to sea only to catch fewer fish. We will need sustainable solutions that meet our rising demand for food. By 2050, there will be 2 billion more people on the planet and food production will need to increase by nearly 50 percent.

So what can be done? Our solution: sustainable seaweed farming.

Not only does growing seaweed improve local fish stocks and bring health back to our seas, but vulnerable fishermen can benefit economically by transitioning to ocean farming. Sustainable seaweed farming is growing the crops of the future. Seaweed can be broken down into a vegan gelatinous substance which is found in many products ranging from toothpaste to almond milk. The global seaweed market is projected to increase to \$25 billion by the year 2028.

At Sowing Seas, we are connectors bridging vulnerable coastal communities throughout the Caribbean and Latin America with the resources necessary to build sustainable livelihoods through ocean farming. Regenerative ocean farming has zero the inputs of land-based agriculture: no fresh water, fertilizer, or feeds. We provide capital, training, resources, and new channels within the flourishing global seaweed market for vulnerable fishermen, women, and youth.

By building a community-led social enterprise we can offer alternative income streams for families with a new and innovative farming practice. With our SPARK award we had the opportunity to go on an integral research and discovery trip to Belize in April 2022 where we met with more than 20 stakeholders, from farmers, government officials, to NGO partners. Additionally the award helped us to network within the Boston business ecosystem and purchase a website domain name.

## **Poster #15: Written Spells - Articles written by professionals delivered to you daily. Unique, relevant, high-quality, and SEO Optimized**

Spark Team: Sara Landa, MBA '22, International Business School

**Summary:** The problem: Google and other search engines are looking for sources of unique, relevant and recent content. To raise your domain ranking, you need to prove to search engines that you are a reputable source of content (The practice of optimizing your website for search engines is called “Search Engine Optimization” or SEO). Publishing high quality articles frequently and consistently has been proven to be an effective way to improve search engine positioning. However, publishing consistently can be a pain for businesses. Which results in them outsourcing their blog more often than not and having to deal with and manage shady writers hired on Fiverr or Upwork who offer no guarantees of quality and who can disappear any minute.

The solution: With WrittenSpells, there's no need to hire and manage overseas contractors that deliver dubious content. Our articles are guaranteed to be error free, on time, and completely unique.

We have used the SPARK award to create content for our own website and start gaining ranking and credibility for our domain.

## Poster #16: Farmer Foodie

Spark Team: Alison Elliott, MBA/SID '22, Heller

**Summary:** Alison Elliott is the founder and CEO of The Farmer Foodie LLC, a for-profit social enterprise. Alison created The Farmer Foodie ([thefarmerfoodie.com](http://thefarmerfoodie.com)) as her plant-forward food blog in January 2020. It now boasts over 180 sustainable recipes and a network of over 6,000 individuals. Alison is a passionate recipe and product developer. Through the Brandeis Innovation 2022 Spark program, The Farmer Foodie expanded its reach, selling delicious clean label grated cashew cheese alternatives. The Farmer Foodie makes dairy free living attainable by providing delicious, nutritious, and sustainable alternatives to traditional cheese products.

Since May 2022, The Farmer Foodie has successfully been piloting their first product launch, "Everything Cheeze." It's a delicious grated cashew Parmesan alternative. It's a highly differentiated multi-use product that can be used in lieu of Parmesan on foods like pizza, pasta, or popcorn, or simply hydrated with boiling water and blended into a creamy Queso, Ricotta, or Mac & Cheese sauce in 30 seconds. Everything Cheeze is inherently sustainable, shelf stable, and made with fair trade organic cashews that are carbon negative when harvested.

The Farmer Foodie has experienced promising sales traction and consumer interest through seven Massachusetts farmers markets, six retail locations, two food service locations, and online via [eateverythingcheeze.com](http://eateverythingcheeze.com). This has fueled their decision to expand their product line, rebrand, and launch on Amazon. Beginning in 2023, The Farmer Foodie is launching 2 SKUs, a grated Parmesan alternative and a grated Cheddar alternative.

## Partner Tables

### **BETA Club**

BETA's mission is to inspire new start-ups across campus, support early-stage founders, and help individuals find meaningful opportunities to succeed in their fields of interest. Through networking events, innovation labs, consultations with industry leaders, Global Business Trips, and an exclusive jobs-listings board, BETA offers the most ambitious experiences for the most ambitious students. Registered members get the opportunity to participate in all events created by BETA, are eligible to apply to special programs or grants, are open to leadership opportunities, and gain voting rights during elections.



### **Brandeis International Business School**

By teaching rigorous business, finance and economics, connecting students to best practices and immersing them in international experiences, Brandeis International Business School prepares exceptional individuals from around the globe to become principled professionals in companies and public institutions worldwide.



**The Asper Center for Global Entrepreneurship** at the International Business School provides a diverse range of learning experiences through courses, seminars and conferences, internships, business plan competitions, field visits and meetings with global entrepreneurs. The center was established by Leonard J. Asper '86, B.A., L.L.B., L.L.D, president, CEO and majority shareholder of Anthem Sports & Entertainment Corp., a media company that owns and operates content platforms targeting distinct communities in areas including music, combat sports, sports gaming, e-sports and hunting and fishing. Mr. Asper is vice co-chair of Brandeis International Business School's Board of Advisors. In 2004, he led efforts to create the Asper Forum and the Asper Award for Global Entrepreneurship, presented to an entrepreneur who achieves

outstanding success in the global marketplace through creative marketing and business strategies.

### **MassChallenge**

MassChallenge is a non-profit organization dedicated to supporting innovation and entrepreneurship through collaboration and development. They have more than a decade of experience accelerating startups, industry, and innovation ecosystems and work across sectors to drive a stronger future through collaborative innovation. MassChallenge is *the* global network for innovators who are working to solve massive challenges. They connect startups, experts, corporations, and communities to grow and transform businesses and economies.



### **The Brandeis University Graduate Professional Studies**

Graduate Professional Studies (GPS), a division of the Rabb School of Continuing Studies, extends the benefit of a Brandeis University graduate education to a diverse working professional population. We offer 12 fully online, part-time master's degrees and one post-graduate certificate in today's in-demand fields. With four 10-week sessions each year, students benefit from a flexible degree completion timeline that meets their needs as full-time professionals. Our courses are asynchronous, enabling students to engage from anywhere in the world, while our web conferencing tools enable faculty office hours, group work, and presentations. Students learn in classes that are small by design, capped at 16 or 20 depending on the level. Courses are led by industry experts who deliver individualized support and professional insights.



### **The Hiatt Career Center**

The Hiatt Career Center assists students and alumni in developing the skills to transform their unique backgrounds, liberal arts education and experiential learning into meaningful professional futures and relationships. Hiatt





engages employers, colleagues, parents and families and the greater Brandeis community to achieve this mission.

### **Brandeis MakerLab**

Supporting educational, social and technological innovation, the Brandeis MakerLab is oriented around a vision of social justice designed to support makers who mend. They collaborate on computing projects to develop new forms of culture and craft in a community-centered setting.



### **MIT I-Corps - New England Regional Innovation Node (NERIN)**

NERIN is one of 9 NSF I-Corps nodes designed to support regional needs for innovation education, infrastructure and research. The Nodes work cooperatively to build, utilize and sustain a national innovation ecosystem that further enhances the development of technologies, products and processes that benefit society.





# Brandeis | INNOVATION

## The Office of Technology Licensing and the Brandeis Innovation Center

**The Brandeis Office of Technology Licensing (OTL)** serves researchers, inventors, entrepreneurs and industry. We provide support and infrastructure to Brandeis investigators for technology development, commercialization and the development of products. We provide industry with cutting edge technologies for licensing, as well as research collaborations.

**The Brandeis Innovation Center and Virtual Incubator** provide a hub for innovation across the Brandeis campus. The center engages students, faculty, researchers, alumni and staff, promoting collaboration and discovery through research, grants and partnerships, including our signature programs, I-Corps™, SPARK and SPROUT.

Come visit our table for swag, meet the staff and learn more about startups and technologies coming out of Brandeis!