



BROWN TECHNOLOGY INNOVATIONS

2021 Annual Report



The Year in Review

Dear Colleagues,

Brown Technology Innovations — the University’s resource for patenting, startups and industry-sponsored research — had a fantastic fiscal year 2021, with double-digit percentage growth in three core areas: invention disclosures, deals and industry-sponsored research agreements. With 90 invention disclosures, Brown innovation has benefited from the accumulated growth in University research funding. Our licensing and option deals have reflected faculty and investor interest in startups as the preferred vehicle for commercialization of early-stage technologies. And, finally, the massive 87% increase in industry-sponsored research agreements was distinguished by significant multiyear industry collaborations.

Special thanks go to three groups within the Tech Innovations ecosystem: naturally, the Brown faculty inventor whose insights form the basis of this enterprise; our advisory board of executives and investors who have contributed their experience to guide our efforts; and, finally, the Brown Technology Innovations team (highlighted below), whose members have executed our customer service and transactional mission with a high level of accountability, creativity and sophistication.

As we look to FY22, our strategy is to increase the size and scope of Brown innovation and address a key unmet area: technical support for startups. We trust that these two focus areas, in addition to our continued commitment to operational excellence, will advance our mission of putting Brown technology first to drive commercial outcomes that benefit the University and society.

Sincerely,

Neil Veloso
Executive Director

Brown Technology Innovations Industry and Investor Advisory Board

Our advisory board members are experienced executives, investors and entrepreneurs who inform our strategy and connect us to entrepreneurs who can help develop commercial pathways for Brown faculty inventions. They represent a variety of disciplines and perspectives that help shape the trajectory of our growth.

Kristopher Brown, Partner, Goodwin Law

Neil Cohen, Chairman, Emerald Development Managers

Rich Ganz, Executive Chairman, Sentien Biotechnologies Inc.

Walter Jin, Chairman and Chief Executive Officer, Pager Inc.

Keith Kerman, M.D., Operating Partner and Senior Advisor, The Riverside Company

Rajiv Kumar, M.D., Co-Founder, Brown Angel Group

Kirsten Leute, Partner, University Relations, Osage University Partners

Annie Mitzak, Principal, Omega Funds

Sara Nunez-Garcia, Co-Founder, Partner, Forty51 Ventures

Jeff Pootalal, Managing Director, Sixth Street Partners

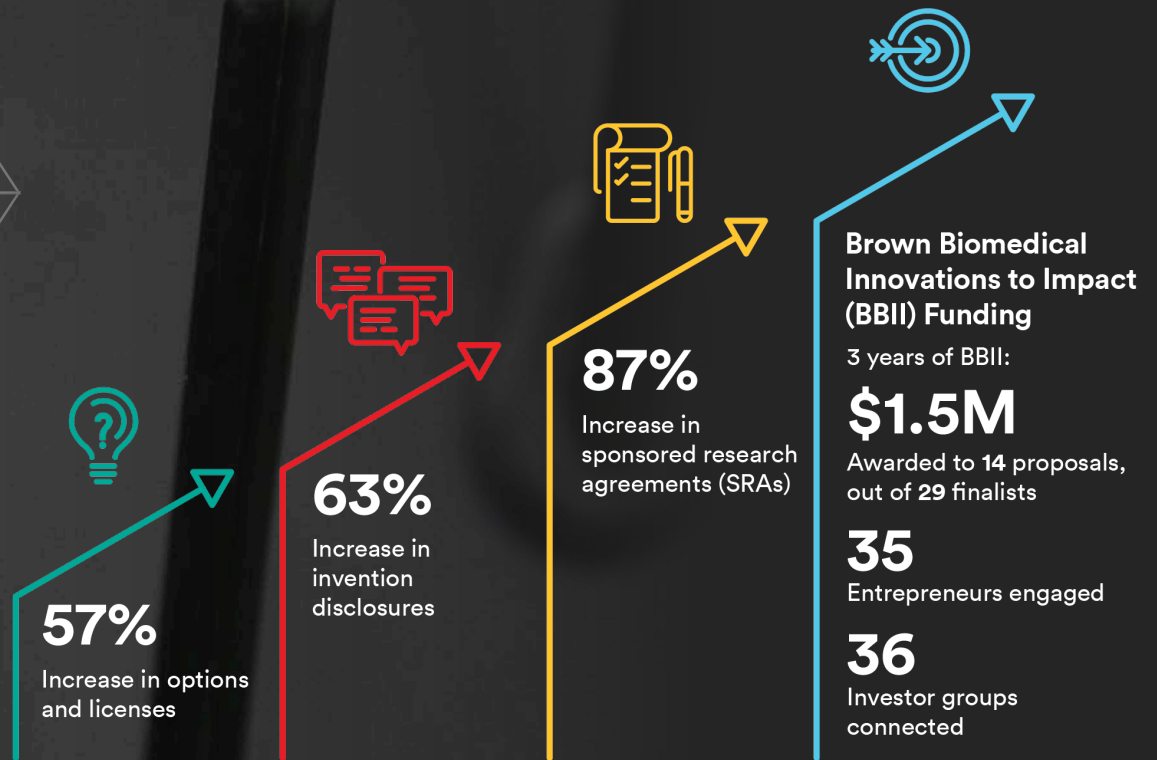
Greg Sieczkiewicz, J.D., Ph.D., Executive Partner and Chief IP Counsel, MPM Capital

A Year in Numbers:

2020–2021

Brown Technology Innovations

Dramatic increases from FY20



Performance Metrics, FY20 vs. FY21

STRATEGIC PRIORITY	Put Brown Technology First	Steward Brown Inventions	Amplify Marketing + Networking Tactics	Streamline Deal Execution		
	Disclosures	Patents Issued	CDAs	Options + Licenses	SRAs	MTAs
Q1	22	7	18	1	6	54
Q2	24	5	20	2	8	97
Q3	18	3	20	5	7	77
Q4	26	2	7	3	7	52
FY20	55	33	41	7	15	343
FY21	90	17	66	11	28	280

CDAs: Confidential Disclosure Agreement; SRAs: Sponsored Research Agreement; MTAs: Material Transfer Agreements

Brown Biomedical Innovations to Impact

The Brown Biomedical Innovations to Impact (BBII) program continues to grow and support academic biomedical technologies that have the potential to become well-defined products that are attractive to industry partners and investors and make a substantial impact in health care. Since the program was launched in 2018, BBII has made 14 awards to Brown faculty, a total of \$1.5 million in funding.

This summer, BBII completed its third annual proposal cycle by making four new awards, funding projects to develop three therapeutics and one medical device. A Brown News article with brief project descriptions of the 2021 award recipients can be found [here](#).

In collaboration with the Brown Technology Innovations office, the BBII team is working to identify commercialization opportunities for BBII-funded technologies. Tech Innovations' Entrepreneur Initiative aligns well with the BBII program; several BBII awardees have already been paired with entrepreneurs who have relevant expertise.



“The third annual proposal cycle has funded four exciting new projects. Showcasing the rich diversity of research at Brown, the awarded topics include tissue regeneration, mRNA therapeutics and novel treatments for rare diseases.”

— Karen Bullock, Managing Director, BBII

Strategy Report

At the beginning of this fiscal year (July 2020), Brown Technology Innovations was only six months into its growth strategy. Amid the changes driven by the COVID-19 pandemic, we focused our goals on the fundamentals of academic technology commercialization. **Spoiler alert:** We not only achieved our goals, we surpassed them. The following describes our FY21 campaign and accomplishments.

➤ Goal 1:

Put Brown Technology First

Prioritize areas of strength and high potential, focus on technology and inventions, and connect to industry interests and market needs

Our most important customer base is Brown’s world-renowned faculty members, whose research drives scientific innovation and discoveries. To open the fiscal year, Brown inventors rebounded from the spring work-from-home order with 22 invention disclosures during the first quarter of FY21. A marked improvement over the first quarter last year (with 14 invention disclosures), the growth trend continued all year. By the end of Q3 we beat the total for the entire previous year (62 vs. 55). By the end of FY21, we had 90 invention disclosures by Brown faculty — a 63% increase over last year and the highest total on record for Brown!

What drove this growth? We increased our outreach to faculty throughout the University and maintained our commitment to grow our team by adding people with deep technical expertise. In January, we were pleased to welcome **Melissa Simon** to the group. She gained her expertise in life science business development through her work with the Rhode Island Department of Commerce and in life science strategy consulting, after completing her Ph.D. at Columbia.



“Since joining Brown Technology Innovations in January, I have developed an understanding of Brown’s expertise in neurotech, medical devices and digital health. Brown’s strengths in these areas help me connect with local industry and national players.”

— Melissa Simon, Director of Business Development, Life Sciences

➤ Goal 2:

Steward Brown Inventions

Provide excellent service to the faculty customer and manage the intellectual property budget to maximize benefit to investors and inventors

To steward Brown inventions, we focus on our two customer bases: faculty inventors and technology developers in industry. For inventors, we seek to increase the speed, transparency and accountability with which we handle invention disclosures and patents. At our team meetings every two weeks, our case managers present technical evaluations of incoming invention disclosures to gather feedback on commercial potential and patent attributes. Then they share these findings with the inventors and map out next steps for commercial venturing.

In summer 2020, we introduced a new program to recognize inventors whose work earned patent awards to Brown. Last year, we awarded certificates of recognition to 37 inventors (see [website](#)). Since June 2020, 16 patents have been awarded to Brown for work by faculty inventors in fields across the spectrum of life science and engineering: chromatography, lighting systems, machine learning, renewable energy, ultrasensitive magnetic sensing and X-ray imaging. (See our news section for details.)

For industry-based technology developers, we highlight key researchers in priority fields based on academic and market analytics such as citation scores, h-index values and the i10-index. The Tech Innovations compliance group, **Len Katzman** and **Jennifer Vieira**, have streamlined the process to license intellectual property from Brown to interested parties. These parallel efforts, when informed by the insights of our inventors, have allowed us to make good patent management decisions, identify potential licensees and trim extraneous filings. Our team's ability to contextualize and record Brown's assets prepares us to quickly connect potential industry collaborators to Brown inventors.



“It is easier now for faculty to disclose inventions, thanks to our newly streamlined database. I look forward to meeting more faculty inventors as they share their discoveries.”

— Jennifer Vieira, Assistant Director, Operations



“Bringing a five-year effort to fruition, we executed the LLC Agreement of the University Technology Licensing Program, launching a consortium of 15 peer research institutions and creating a patent licensing pool for physical sciences technologies.”

— Len Katzman, Director of Business Development, Data and Computer Science

➤ Goal 3:

Marketing and Networking

Connect with high-potential customers through multiple channels and engage advisor network to inform strategy and refer entrepreneurs

We lead our marketing strategy by sharing the story of some of Brown’s best scientific research. Our science writing team, led by **Betsy Stubblefield Loucks**, crafts descriptions of our priority technologies to support business development engagements with potential industry collaborators. The assets they created this winter formed the basis for Brown’s virtual presence at the 2021 J.P. Morgan Health Care Conference in early January. The writing team includes new science communicator **Stephany Foster**, a fourth-year doctoral student, and two experienced contract writers, **Ann Rae Jonas** and **Andrew Moseman**.

We focused our marketing projects on three target audiences: (1) entrepreneurs, (2) venture capital investors, and (3) potential industry partners. Launched last summer, our Entrepreneur Initiative pairs serial entrepreneurs with faculty inventors to create promising startups. Through our outreach efforts, our team has engaged 41 entrepreneurs to date. We also launched an outreach campaign to connect with venture capitalists. Outpacing its original goal of one per month, our venture capitalist marketing campaign has engaged with 36 venture investors in the past 12 months.

Our third marketing target has been to grow industry-sponsored research agreements (SRAs) at Brown. Beyond the pursuit of discrete sponsored research agreements, we sought to grow broad, multiyear research collaborations with industry by employing our team’s alliance management capabilities. Our model (described on Page 10) accelerates the creation of research connections between companies and Brown scientists and identifies shared visions for future collaborations.



“Thanks to Brown faculty and collaborators at Hyundai, our office has refined an alliance management model to guide new collaborations with industry partners from California to Korea.”

— Betsy Stubblefield Loucks, Research Partnerships Manager



“I enjoy telling the story of Brown’s research strengths and industry alliances through our many communications platforms, such as our news blog and digital marketing collateral.”

— Stephany Foster, Science Communicator

➤ Goal 4:

Deal Execution

Focus on patent licensing and industry-sponsored collaborations and streamline processes and mechanisms to ensure the highest-quality deals

@BrownURearch



@BrownUniversity

Brown Technology Innovations is partnering with @BridgeBioPharma to advance new treatments for neurological diseases with genetic origins. BridgeBio will work with Brown faculty to develop discoveries into potential treatments for patients.

Brown Technology Innovations continued to pursue the primary route of University commercialization: licensing to startup companies. FY21 was marked by fantastic increases in both licenses/options and industry SRA volume, up 57% and 87%, respectively. Of the 11 patent deals of FY21, seven were to new startups. Tech Innovations executed five patent licenses and technologies originating in biomed; physics and engineering were represented by multiple faculty startups.

A key driver for industry SRA growth was deepened collaboration with our colleagues in the Office of Sponsored Projects, within the Office of the Vice President for Research. Through weekly “SWAT” meetings, the two teams were able to effectively track emerging SRA opportunities and expedite the execution of new agreements.

Over the past year, industry partners have turbocharged their investments and commitments to partner with academic institutions. A new master research agreement with BridgeBio distinguished our industry relationship this year (see our [press release](#)). This unique collaboration capitalizes on Brown’s distinction in neuroscience research and complements BridgeBio’s focus on rigorous science to drive therapeutic innovation. BridgeBio adds to a growing list of industry collaborations that includes Facebook and Hyundai.

Finally, Tech Innovations is proud to announce Brown’s participation in the University Technology Licensing Program (UTLP). The UTLP provides convenient and efficient access to valuable inventions owned by the program’s 15 universities relating to particular technologies, products and solutions in the physical sciences. Nearly five years in the making, UTLP will be a valuable outlet for Brown technologies.



“Multiple years of working with Derek Stein on commercializing novel building material technology has led to the formation of Techstyle Materials and a successful initial funding round. It has been a rewarding and enjoyable experience to work with Derek and support his efforts from Brown Technology Innovations.”

— Brian Demers, Director of Business Development, School of Engineering and Physics

News in Focus: Our Top Stories from FY21

BridgeBio Collaborates with Brown

Brown is partnering with BridgeBio to advance new treatments for neurological diseases with genetic origins. BridgeBio will work with scientists to evaluate discoveries and develop them into potential treatments.

➤ Read: [Press release](#)

Elkurt: Startup Focuses on Malaria Vaccine

Dr. Jake Kurtis of The Warren Alpert Medical School has a promising approach for a malaria vaccine. In a study published in *Nature* in 2020, Kurtis shared his discovery of the presence of antibodies in children who showed some resistance to malaria. To translate these multiple research efforts and impact patients, Kurtis and **Dr. Jack Elias**, Brown University’s dean of medicine, formed a startup called Elkurt, which will commercialize their research work. Recently, Elkurt signed a sub-license to Ocean Biomedical, which has announced plans for a public offering later this year.

➤ Read: [Press release](#)

Hyundai Continues To Fund Flight Lab

Beginning with a three-year master research agreement signed in 2018, Brown has continued working with Hyundai to win sponsored research agreements and funding gifts to researchers in smart mobility. The latest was a gift to the Flight Lab to support a bat flight research collaboration between **Kenny Breuer** (engineering) and **Sharon Swartz** (joint appointment in evolutionary biology and engineering).

Brown Licensee Deeplite Raises Funds to Expand AI Access

Power and processor capacity are two big limitations to artificial intelligence (AI) and deep learning. Deeplite, a Montreal-based startup, closed a \$6 million seed fundraising round to make AI more accessible. Deeplite’s automated software engine enables AI computing on any device.

➤ Read: [Full story](#)

“Brown’s technology commercialization function is a key component of the University’s initiatives to translate academic discoveries into commercial applications and help drive economic development. I am pleased at the excellent progress made by the group this year, particularly its service to our faculty and engagement with companies.”

– *Jill Pipher, Vice President of Research, Brown University*

@BrownUResearch



Story in Alzheimer’s News Today highlights the new Center for Alzheimer’s Disease Research at @BrownUniversity@CarneyInstitute @BrownMedicine, saying it will “focus on early diagnosis, treatment.”

Exclusive Insights

Entrepreneur Initiative: Connecting Brown Inventors with Industry Know-How

Reflecting university technology transfer trends and harnessing the vibrant early-stage investment market, startups have become a preferred vehicle for bringing academic discoveries into commercial applications. To start this process, Tech Innovations launched its Entrepreneur Initiative in fall 2020. The initiative pairs seasoned entrepreneurs with faculty inventors to create fundable startups.

➤ Read: [Full story](#)

Insights from the 2021 J.P. Morgan Health Care Conference

One year into the “[Decade of Neuroscience](#),” the J.P. Morgan Health Care Conference was a chance to learn about which neuro-technologies and strategies life science companies are pursuing. This report shares insights about where companies are looking for innovation.

➤ Read: [Full report](#)

Derek Stein and Techstyles Materials

Techstyle Materials has developed a multipurpose technology that transforms ordinary wood and sheetrock into smart materials. The team led by Brown University professor **Derek Stein** created a millimeter-thin coating of a proprietary material that can be applied to common building products like drywall, sheathing and roofing. These smart materials can be used in a coating that absorbs heat when the temperature rises and releases heat when the temperature falls, saving energy. Techstyle Materials has started building an intellectual property portfolio — including an exclusive license to the coating IP — that will eventually cover novel functions, specific material formulations, special manufacturing methods, product configurations and design copyrights.

➤ Interactive: [Watch video](#)

➤ Read: [Tech Innovations Exclusive Insights on TechStyle Materials](#)

Engagement Model for Industry-Academic Alliances

What makes Brown Technology Innovations uniquely positioned to make successful connections with industry partners? It is our alliance management model. The goal is to launch research that advances a vision shared by both company collaborators and Brown inventors. The alliance management process draws from two creative strategy tools: (1) design thinking, a critical tool that uses design sprints to discover innovation in research and product development, and (2) appreciative inquiry, a high-engagement, strengths-based approach to collaborative strategy development.

@BrownURsearch



Researchers from @BrownUniversity @BrownCSDept and @MIT developed a new data science framework that allows users to process data with the programming language Python — without paying the “performance tax” normally associated with a user-friendly language.

Faculty Focus

One Year Later: Brown's Contributions to COVID-19 Solutions

Looking back over the past year and a half, we see how Brown inventors pivoted to find ways to address the COVID-19 pandemic.

First up: making schools and public spaces safer from COVID-19 and influenza A virus H1N1 in under one minute. **Amanda Jamieson**, a respiratory virologist (molecular microbiology and immunology), performed independent testing of a trademarked nanomaterial, GC Ink. According to her report released at the end of February, GC Ink neutralized 100% of the virus present.

➤ Read: [Story and press release](#)

In spring 2020, researchers in **Dan Harris's** lab began developing a rapidly deployable ventilator, addressing critical shortages worldwide. The design uses 3D-printed mechanical components, off-the-shelf parts and open-source electronics that allow for easy use in resource-limited settings. Calling the design BrunO2, the team — which now includes collaborators from other universities — is working to submit a specific variant of the BrunO2 ventilator prototype to the U.S. for review under Emergency Use Authorization. Brown recently signed a collaboration agreement with Stanford and the University of Utah for continued work on the project.

➤ Visit: [BrunO2](#)

Leaders in Regenerative Medicine: Kareen Coulombe and Diane Hoffman-Kim

The emerging field of regenerative medicine allows for a broad range of testing for toxicity and other health threats without the use of animal testing. Two Brown researchers, **Kareen Coulombe** and **Diane Hoffman-Kim**, have been part of the Bioengineering Research Partnerships project, funded in 2016 by the National Heart, Lung, and Blood Institute (NHLBI).

In the final stages of the five-year award, the NHLBI Advisory Board selected two of the five teams to be the focal point of the remaining funds; Coulombe, who studies heart tissue, and Hoffman-Kim, who studies nerve fibers, were selected. Brown Technology Innovations has received interest from bioengineering companies for technologies that could emerge from their work.

BROWN *Invents* ➤



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