

JOHNS HOPKINS TECHNOLOGY VENTURES

FISCAL YEAR 2022
ANNUAL REPORT



BRINGING THE BENEFITS OF ACADEMIC DISCOVERY TO THE WORLD



JOHNS HOPKINS
TECHNOLOGY VENTURES

Our annual reports recently have celebrated the accomplishments of Johns Hopkins Technology Ventures (JHTV) team members who primarily worked from home during the pandemic. This year, as we returned to the office and The Johns Hopkins University came back to life, we wanted to celebrate the vibrancy of our campus innovation environment and our connection to the broader Baltimore startup ecosystem.

Place making is an important aspect of our work, and the university is committed to championing and investing in Baltimore. Entrepreneurship is making its mark on the city, much like the colorful murals and streetscapes you will see on the following pages help define their neighborhoods.

As we see new technologies, new companies and new alumni launch from our Homewood and East Baltimore campuses, so, too, do we see the city continue to become a growing hub for innovation. Ask any Johns Hopkins faculty or student entrepreneur and they’ll relish the opportunity to tell you about the can-do spirit of this place. Read on to hear directly from some of them about their projects.



A handwritten signature in black ink.

Christy Wyskiel

Senior Advisor to the President of Johns Hopkins University
for Innovation and Entrepreneurship
Executive Director, Johns Hopkins Technology Ventures

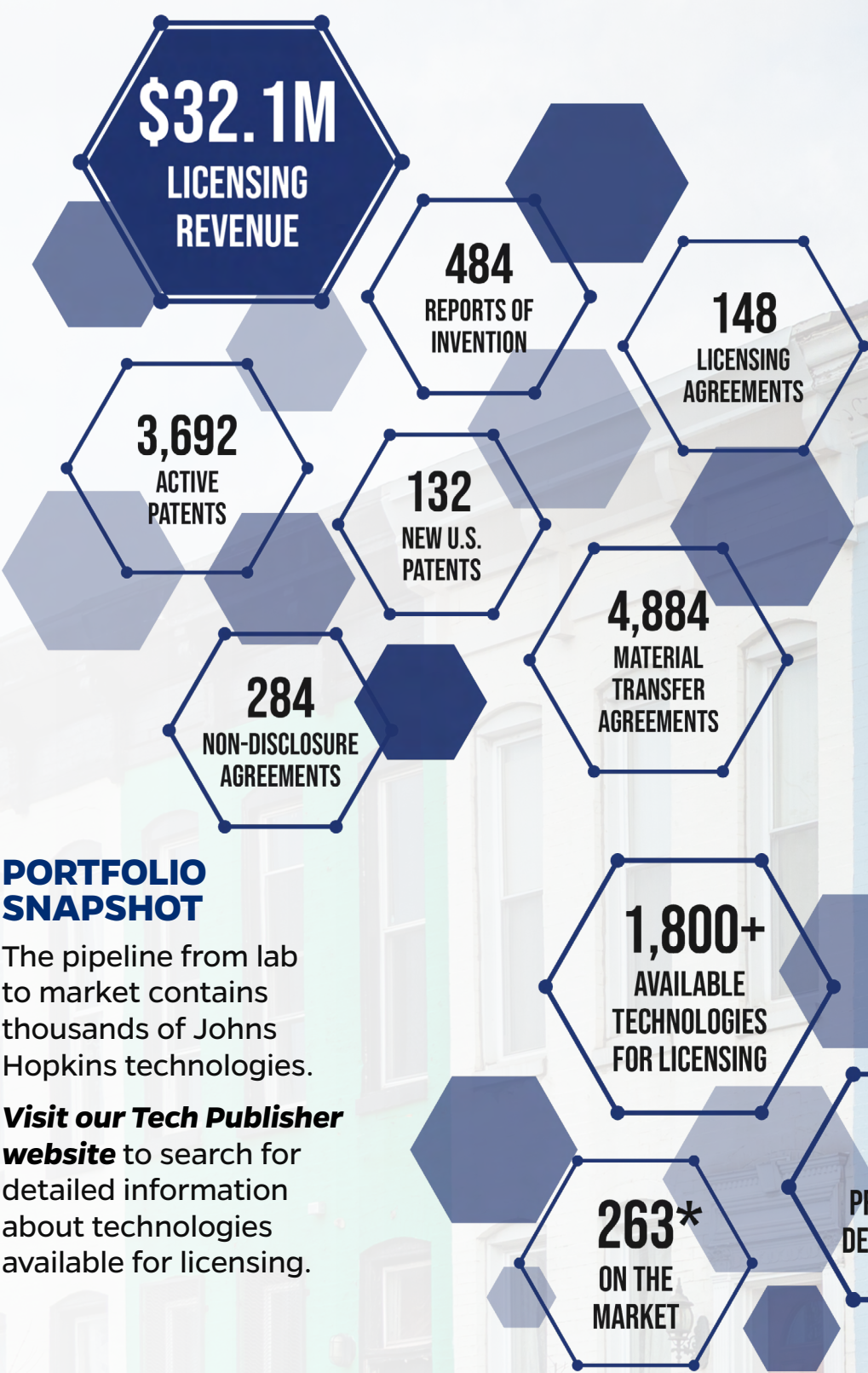
Technology Transfer	1
Enhanced JHTV Team	3
Translational Funding	4
Corporate Partnerships	5
Startups	7
Student Ventures	9
Programs	11
Community Impact	12
Elsewhere in the Ecosystem	13
Events	15
Acknowledgments	16

TECHNOLOGY TRANSFER

Protects, promotes and licenses Johns Hopkins University technologies.

COMMERCIAL SUCCESS FOR PROSTATE CANCER IMAGING AGENT

FY22 STATS



PORTFOLIO SNAPSHOT

The pipeline from lab to market contains thousands of Johns Hopkins technologies.

Visit our Tech Publisher website to search for detailed information about technologies available for licensing.

*Technologies with multiple uses generate product variations. From 263 technologies, 2,225 products are on the market



MARTIN POMPER, M.D., PH.D.

Professor, Johns Hopkins Medicine
Department of Radiology and
Radiological Science

The U.S. Food and Drug Administration’s approval of the first commercially available positron emission tomography imaging agent targeting the prostate-specific membrane antigen (PSMA) was **the culmination of 25 years of work for Pomper.**

“The bottom line is that it’s going to improve vastly the management for prostate cancer,” he says. Prostate cancer is the second leading cause of cancer-related death in men, and one in eight men will receive a prostate cancer diagnosis. PyL, the imaging agent that Pomper and his team discovered, attaches to cells with elevated PSMA levels, allowing doctors to pinpoint the exact location or locations of the cancer without a biopsy or other procedures.

JHTV obtained patent protection for PyL. Jeanine Pennington, JHTV’s director of licensing, joined Pomper to convince a company holding background intellectual property rights on the technology to co-develop the imaging agent, which is now marketed as Pylarify.

“The moral of the story is perseverance,” Pomper says.

“In addition to our team, I owe it to Johns Hopkins, which has provided me with the kind of freedom, collaborators and physical environment to do things like this.”

ENHANCED JHTV TEAM

The technology development team has been expanded to speed up commercialization for early stage, high impact technologies.

These industry experts help create the highest-value path to market for technologies through industry collaboration, corporate licensing or venture creation. The team also provides guidance to faculty on commercialization strategies, funding sources and team building. Click below to learn more about their roles.

CHRISTINA DEMUR

PATRICK HO

MARK KOMISKY



TRANSLATIONAL FUNDING

The newest recipients of the Louis B. Thalheimer Fund for Translational Research join nine faculty members who received grants through philanthropy-enabled funding.

Read about the Bisciotti Foundation Translational Fund, Cohen Translational Engineering Fund and Thalheimer grant programs.



NICHOLAS DURR, PH.D.
Assistant Professor, Department of Biomedical Engineering

Catheter-associated urinary tract infections (CA-UTIs) are the most common hospital-based infections. A significant risk factor is prolonged use of a catheter, and nearly 80% of the 500,000 annual cases are thought to be preventable with timely intervention.

The current approach to managing CA-UTIs is mostly reactive — monitoring for symptoms following by confirming the diagnostics. **Durr and his collaborators have invented a lens-free imaging device** that can provide continuous, noninvasive analysis of urine with the potential to detect early signs of CA-UTI.



MANDEEP SINGH, M.D., PH.D., M.B.B.S.
Assistant Professor of Ophthalmology and Genetic Medicine, Wilmer Eye Institute

Inherited retinal diseases (IRDs) cause vision loss in approximately one in 4,000 people and are caused by a mutation in any one of about 300 genes expressed in photoreceptor cells of the retina. Gene therapies are being developed to treat more than 25 individual IRD gene mutations.

Singh has developed cytoplasmic transfer cell therapy, a new treatment modality that has the potential to treat most IRDs with one off-the-shelf product.

\$796K
TRANSLATIONAL
FUNDING AWARDED

CORPORATE PARTNERSHIPS

Facilitates industry research collaborations.

JOHNS HOPKINS, AMAZON COLLABORATE TO EXPLORE TRANSFORMATIVE POWER OF AI

32
CURRENT
PARTNERS

\$175M
SPONSORED
RESEARCH
SINCE 2014

CANON MEDICAL
SYSTEMS

Our collaboration includes 10 faculty members across six departments. Two biomedical engineering projects started in FY22, and Johns Hopkins will lead a multisite international clinical study on precision CT scanners during FY23. All of the projects aim to explore and improve imaging tools.

ABBVIE

We extended our partnership in oncology research for five years. A joint effort to find new projects is underway, with the goal of identifying new targets, technologies, biomarkers and therapeutics for treatment of hematological malignancies and solid tumors.

CUSTOMER VALUE
PARTNERS (CVP)

We collaborated on a \$650 million bid for the U.S. Department of Veterans’ Affairs’ Accelerating VA Innovation and Learning contract, positioning seven PIs as subject-matter experts for the Veterans Health Administration, the nation’s largest integrated health system.



SANJEEV KHUDANPUR, PH.D.

Associate Professor,
Department of Electrical and
Computer Engineering

The new JHU + Amazon Initiative for Interactive AI at the Johns Hopkins Whiting School of Engineering will harness the power of artificial intelligence (AI) to transform the way humans interact online and with the world.

The program will use the university’s world class expertise in interactive AI to advance groundbreaking technologies in machine learning, democratize access to AI innovations, and broaden participation in research from diverse, interdisciplinary scholars. “Johns Hopkins is renowned for its pioneering work in these areas of AI, and

working with Amazon researchers will accelerate the timetable for the next big strides,”

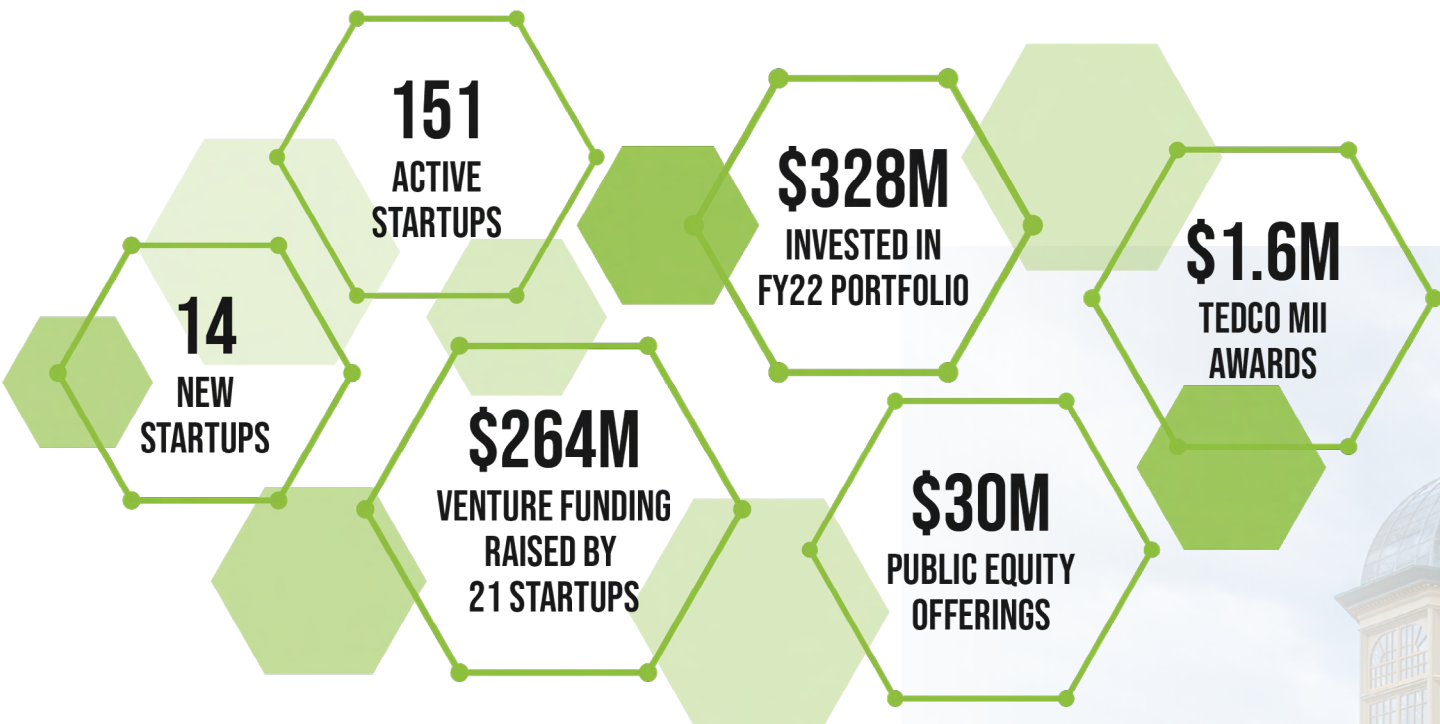
says Khudanpur, the initiative’s founding director.

Amazon’s investment will span five years and includes doctoral fellowships and sponsored research funding. “This initiative brings together top talent in a joint mission to drive groundbreaking advances in interactive and multimodal AI,” says Prem Natarajan, Alexa AI vice president of natural understanding at Amazon. “These advances will power the next generation of interactive AI experiences across a variety of domains.”

STARTUPS

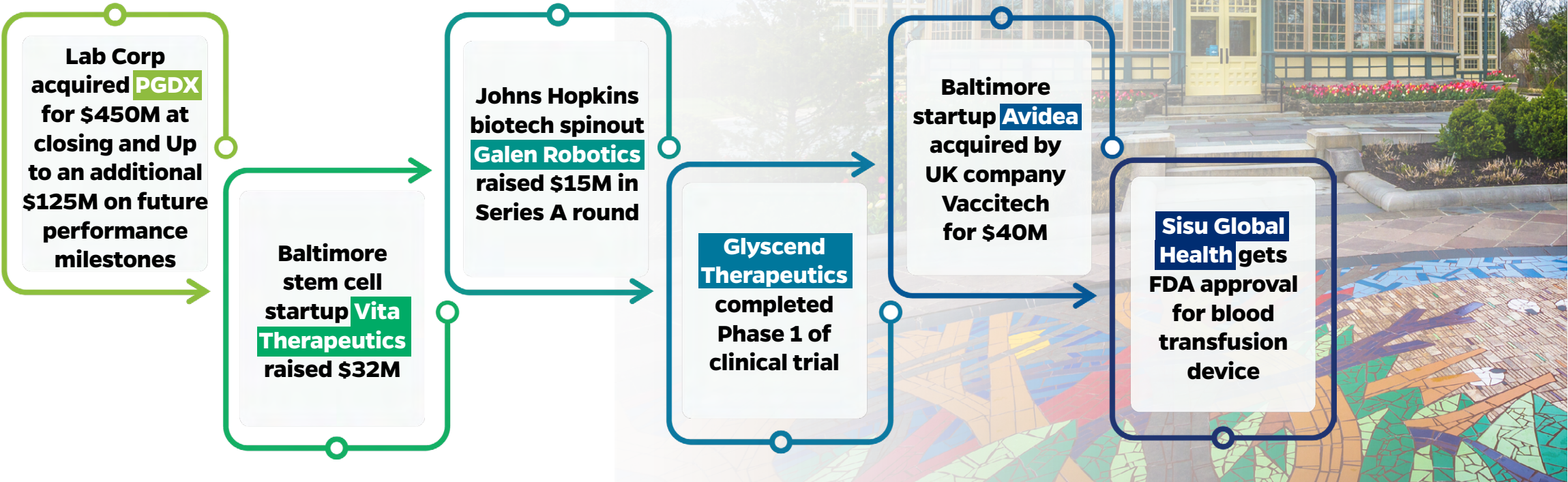
FastForward provides space, funding and mentorship to build high impact companies out of Johns Hopkins University discoveries.

FY22 STATS



HEADLINES

Click below to read the full story.



HUSBAND-AND-WIFE RESEARCHERS DEVELOP DRUG TO TREAT INFLAMMATION IN PATIENTS WITH COVID-19



SUJATHA KANNAN, M.B.B.S.
Professor of Anesthesiology and Critical Care Medicine



KANNAN RANGARAMANUJAM, PH.D., M.S.
Co-Director, Center for Nanomedicine, Professor of Ophthalmology

For the founders of Ashvattha Therapeutics, **developing a drug to treat patients with COVID-19 is personal.** Both Rangaramanujam and Kannan lost relatives to the virus, including both of the latter’s parents.

Ashvattha recently published results of a small study showing that OP-101, their experimental treatment that decreases inflammation, substantially reduced the risk of death and need for a ventilator among adult hospitalized patients severely ill with COVID-19. “I feel the best way to keep my parents’ memories alive,” Sujatha says

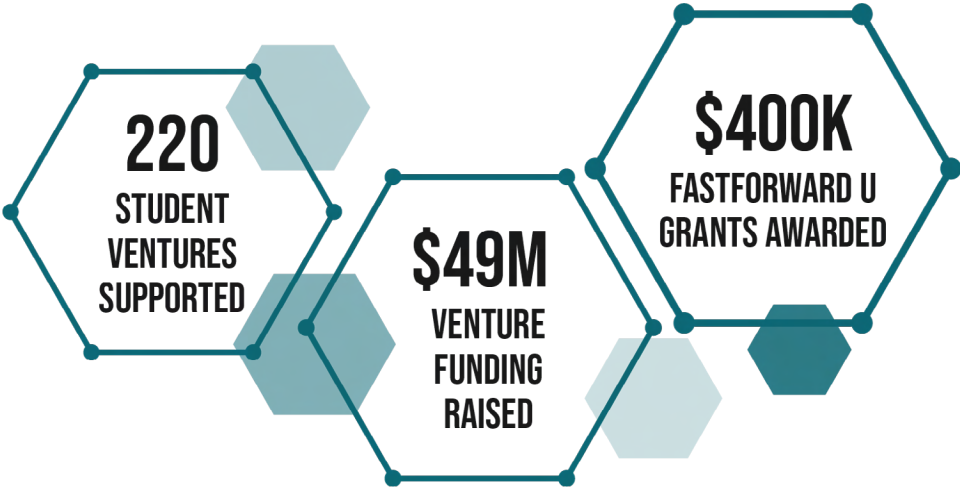
“is to help as many people as possible with this therapy so others don’t have to experience what we did.”

Ashvattha, which develops novel hydroxyl dendrimer therapeutics, announced in April a **\$69 million raise in Series B funding** and an up to \$45 million exclusive license agreement with Huadong Medicine Investment Holding Co., a Chinese pharmaceutical company. Ashvattha is also developing a one-dose treatment for age-related macular degeneration and diabetic macular edema in the eye.

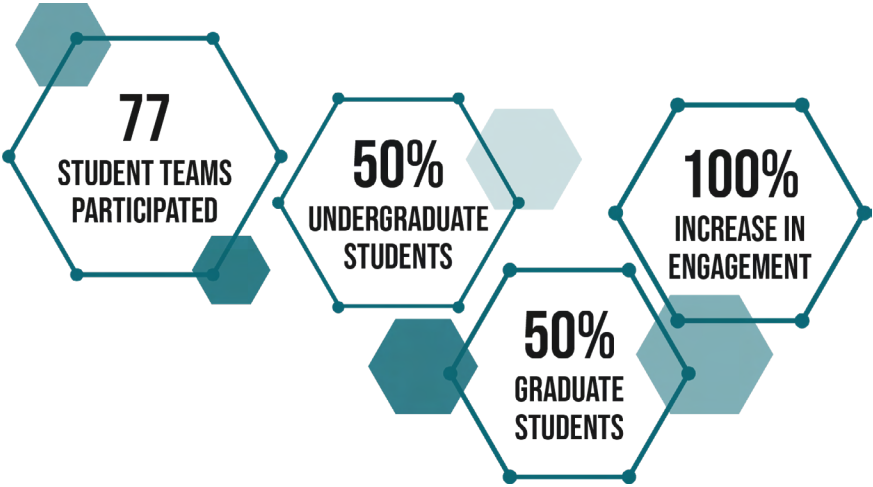
STUDENT VENTURES

FastForward U is the campus hub for student entrepreneurship.

FY22 STATS



ACCELERATOR PROGRAMS



STUDENT STARTUP THAT DETECTS WILDFIRES SWEEPS NATIONAL COMPETITIONS



NANDITA BALAJI
Junior, Johns Hopkins University
Krieger School of Arts and Sciences

Balaji was a freshman in high school when she felt the harmful effects of smoke from a fire in the Appalachian Mountains more than 100 miles away. The experience led her and classmates to start InfernoGuard, which uses a network of mounted sensory devices to continuously gather and analyze environmental data to detect an oncoming wildfire.

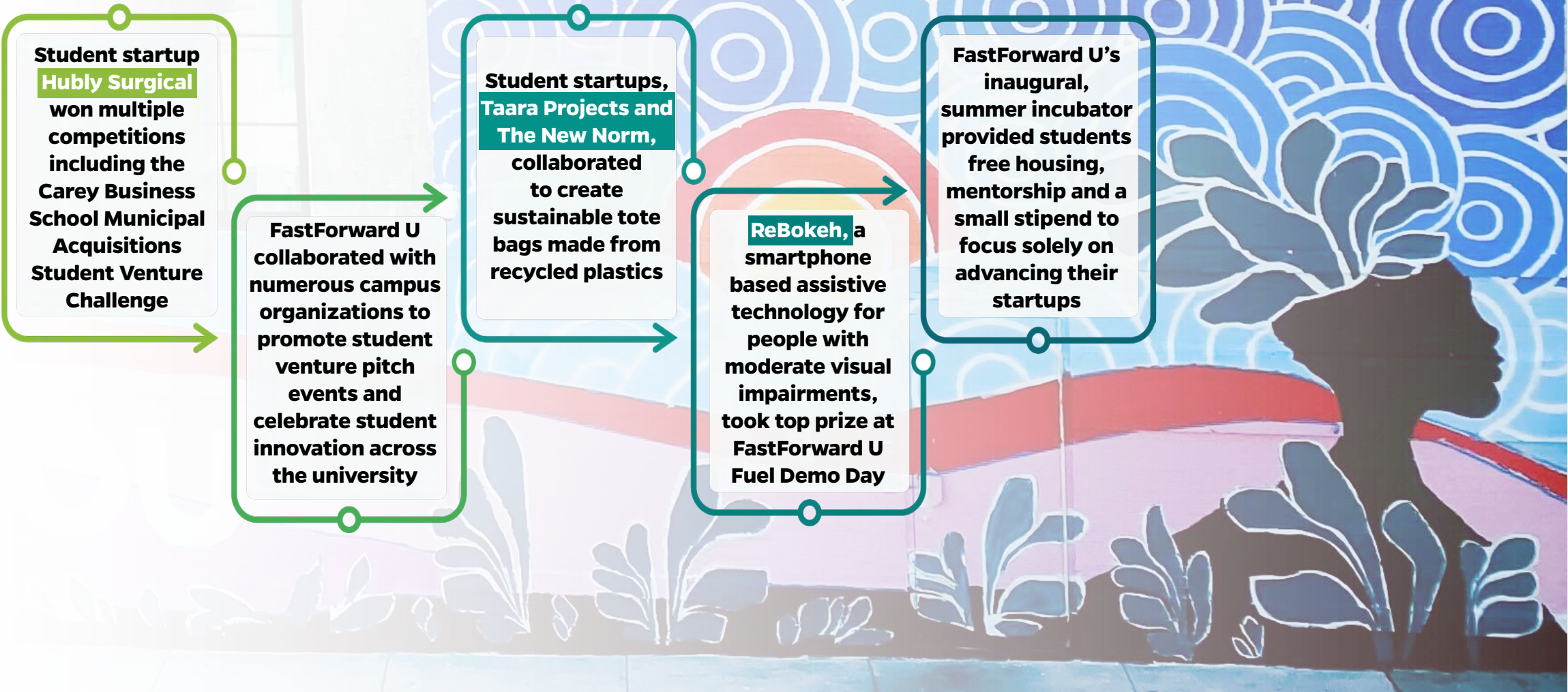
The founders are at different universities on the East Coast but remain focused on InfernoGuard, which has now raised \$420,000 and **continues to sweep student pitch competitions across the country.** In FY22 alone, the startup took first place in national competitions at Arizona State University, Northwestern University and Smith College. At Johns Hopkins, where Balaji is a rising junior, InfernoGuard won FastForward U’s Fuel fall accelerator Demo Day and received a Microsoft Innovation Acceleration Award.

InfernoGuard now has 15 team members and is preparing to test its technology this fall in national parks and with partners in the timber industry, according to Balaji.

“We want to see this deployed in a forest monitoring for wildfires, out there protecting land and livelihood,” she says.

HEADLINES

Click below to read the full story.



PROGRAMS

Educating and equipping campus innovators in the lab-to-market process.

JHTV welcomed 13 new fellows into its **Commercialization Academy**, bringing the total to 29, and three summer students from Johns Hopkins’ Master of Science in Engineering Management program. Fellows develop the ability to critically evaluate business potential of Johns Hopkins’ technologies and help translate scientific discoveries into commercially viable enterprises.

Forty-one teams participated in **I-Corps** and 38 I-Corps site grants were awarded in FY22, totaling \$136,000. Developed by the National Science Foundation, I-Corps accelerates participants’ academic research toward entrepreneurship and commercialization.

FastForward’s **Mentors-in-Residence (MIR)** program had 625 engagements with startups totaling more than 830 hours during FY22. The mentors come from various industries and entrepreneurial backgrounds to help guide startups to success. Several of the MIRs have **monthly office hours** that are available to all Johns Hopkins University faculty member and JHTV startups.

COMMUNITY IMPACT

The Social Innovation Lab supports mission-driven leaders and ventures.

NONPROFIT OFFERS HOLISTIC, DANCE THERAPY FOR SURVIVORS OF TRAUMA



TYDE-COURTNEY EDWARDS
*Ballet After Dark
Founding Director*

Edwards was a lifelong dancer and lover of ballet until she was sexually assaulted in 2012. It took her three years to return to rehearsals but she now credits dance with helping her reset her life.

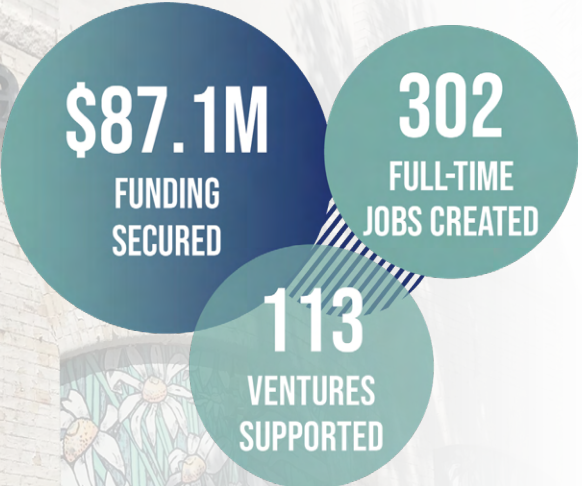
“There are elements of ballet that helped me reconnect with my femininity and my womanhood,” she says. “And those were elements of myself that I felt like I lost as a result of survival. Being reminded of

graceful lines, of elegance and posture and alignment really helped me start to repair those parts of me that I lost.”

Edwards thought other survivors of sexual assault could similarly benefit from dance therapy, so she founded Ballet After Dark. More than 220 people, of which 70% are Black or brown residents of Baltimore, have taken part in a dance therapy cohort during the last four years. The nine-month course features workshops centered around dance as well as units on mental health, financial literacy and self-defense.

In April, Ballet After Dark was awarded **The Social Innovation Lab’s \$25,000 Cohort Prize** and earlier this summer, a troupe of dancers advanced past the audition round of “America’s Got Talent.” Edwards plans to launch B.A.D. Studios, a for-profit online platform featuring live and recorded classes.

PROGRAM HISTORY



2021-22 COHORT VENTURES

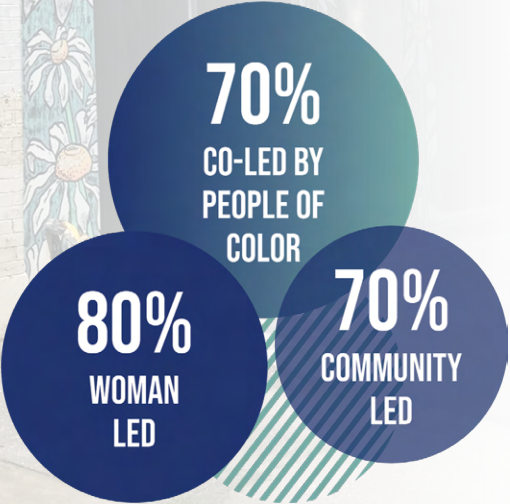


Image Credit: Kylis P. Winborne and Arena Players, 1999. Photograph by Eli Pousson

ELSEWHERE IN THE ECOSYSTEM

Beyond JHTV, the campus is bursting with innovation. Click on a number to learn about our partners in the pursuit of innovation and impact in Baltimore and beyond. *Be sure to close the text box by clicking on the X before selecting the next number.*



Virtual Institute for Scientific Software

Institute for Assured Autonomy

Ralph O’Connor Sustainable Energy
Institute (ROSEI)

UpSurge Baltimore

Municipal Acquisitions Student
Venture Showcase (MASVS)

Artificial Intelligence and Technology
Collaboratory for Healthy Aging

Hexcite/Technology Innovation
Center

Bloomberg American Health Initiative

Discovery and Innovation Fund

Wilmer Precision Ophthalmology
Center of Excellence

EVENTS

FY22 happenings and moments of celebration at JHTV.

JHTV kicked off its **“Emerging CEO Panel Series”** with four sessions throughout the year. These webinars included startup founders, CEOs, sponsors and Mentors-in-Residence talking about best practices for planning, launching and scaling a successful startup, among other topics.

Therese Canares, an assistant professor of pediatrics at the Johns Hopkins University School of Medicine, won \$10,000 in JHTV’s second annual **Pitch It On! competition**. Her startup, CurieDx, uses machine learning to enable point-of-care testing and exams through smartphones. The competition is part of JHTV’s AccelHERator program, which highlights and supports women innovators through research, translation and entrepreneurship.

As part of our **Women in Innovation** programming, Christy Wyskiel hosted a virtual breakfast chat featuring gene therapy pioneer Kathy High. High shared her story with more than 100 attendees, and discussed academic translation and the future of gene therapy.

ACKNOWLEDGMENTS

JHTV is grateful for the support of many generous stakeholders, including its donors, corporate sponsors, mentors and strategic advisers.

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1812 Ashland Avenue
Suite 110
Baltimore, MD 21205
ventures.jhu.edu



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