A CALL TO ACTION
Rising to the Challenge: The Campaign for Johns Hopkins will raise unprecedented levels of support to attract, sustain, and further empower the people of Johns Hopkins — our students, faculty, and researchers — who through their work improve the lives of millions around the world. Together with our philanthropic partners we will: ADVANCE DISCOVERY AND CREATIVITY through support of our exceptional faculty and researchers. Their innovative work drives the development of new knowledge, new forms of expression, and new ways to save lives and improve health, and furthers progress across our core disciplines in science and technology, the humanities and arts, and public health and medicine.
ENRICH THE STUDENT EXPERIENCE by investing in scholarships and fellowships, inspirational spaces for collaborative learning and social opportunities, and new programs that will enhance student-faculty interactions, ensure diversity on campus, link learning in the classroom to life after graduation, and strengthen our efforts to catalyze economic development.
SOLVE GLOBAL PROBLEMS AS ONE UNIVERSITY by creating new cross-disciplinary solutions in crucial areas such as revitalizing cities around the world, advancing individualized health, understanding how we learn and teach, and attacking the root causes of global health problems.

JOHNS HOPKINS TECHNOLOGY VENTURES

A Rich Resource for Entrepreneurs — and Investors
Christy Wyskiel thinks Hopkins faculty members are by nature entrepreneurial. “If you run a lab here, you’ve built a product and attracted funding, just like a start-up,” says the serial entrepreneur, investor, and senior advisor to Johns Hopkins University President Ronald J. Daniels. “My job is to foster and promote that entrepreneurial spirit and provide resources that will help faculty and students approach investors and industry partners in a planned, sophisticated manner.”

Providing those resources — space, funding, and support programs — depends significantly on philanthropy. “Bringing products or services out of the lab requires early-stage support, before many investors are willing,” Wyskiel says. “Philanthropy takes you across that gap.” “Once investors look,” she adds, “they will find incredible potential. With more than 500 invention disclosures a year, the task is not to find innovators but to help them move forward. Investors will find an incredibly deep well of products to draw from at Johns Hopkins.”

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BIOGRAPHICAL CLARKE

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The Measure of Momentum
In FY 2015, Johns Hopkins:
- Received 516 invention disclosures — the majority in life sciences — and $17.9 million in licensing revenue, both record numbers
- Signed 171 new agreements, including options
- Saw an increase of seven percent in patents issued to faculty members (112) and active issued patents reach 2,478
- Completed 3,900 material transfer agreements
- Assisted in creating a record 16 start-ups that licensed Hopkins technologies
- Surpassed 160 spin-off companies created from Hopkins intellectual property since 2000, which have raised nearly $1.6 billion in funding.

A POWERFUL ENGINE OF INNOVATION

Across decades and disciplines, Johns Hopkins has served as a powerful engine of innovation, a rich source of ideas to improve life around the world. Yet to date, the university has only partly realized the commercial potential of its discoveries and indeed has amassed a backlog of inventions and ideas to bring forward.

That’s why Johns Hopkins Technology Ventures is building an “innovation ecosystem” that will unify and strengthen existing commercialization programs, develop new ones, and provide extensive resources to help faculty members and students create new products and companies.

Guided by the recommendations of the Committee on the Innovation Ecosystem (co-chaired by Drew Pardoll, the Martin D. Abelloff Professor and director of Cancer Immunology at the Sidney Kimmel Comprehensive Cancer Center, and Jennifer Elisseeff of the Department of Biomedical Engineering and the Jules Stein Professor of Ophthalmology at the Wilmer Eye Institute), we have launched efforts in three key areas — space, funding, and support programs — and are already making progress.

FastForward: High-Quality, Cost-Effective Spaces for Start-Ups
FastForward provides affordable, turnkey office and lab spaces for university and external start-ups that seek proximity to our faculty and students. FastForward resident companies enjoy services and resources such as access to subject matter experts, business analysis support, educational programming, networking events, and introductions to funding sources. Two facilities have been launched already:

**FASTFORWARD HOMEWOOD** is located in the Stieff Silver Building near the Hopkins Homewood campus. It offers 13,000 square feet of space (including several wet labs) and is now at capacity. One area for improvement is remodeling of the space to encourage collaboration among start-ups.

**FASTFORWARD EAST** is currently located in the Rangos Building on the north edge of the Hopkins Medical Campus, and students create new products and companies.

“The potential for commercialization is enormous.”
Drew Pardoll, A&S ’76, Med ’82 (MD/PhD), the Abelloff Professor in the Kimmel Cancer Center and co-chair of the university’s innovation committee, was convinced 30 years ago that the immune system was the most powerful anticancer weapon available to physicians. His research since then has made him one of the world’s leading experts in immuno-oncology, and he has succeeded in translating his work into FDA-approved therapies through entrepreneurship.

The impact has been remarkable, and points to exciting possibilities for the full range of Hopkins research: Pardoll’s first company, Amplimmune, was started with support from Hopkins and acquired by MedImmune (part of AstraZeneca) for $500 million, including milestones.

“Experiences like mine demonstrate the immense value represented by Hopkins research,” says Pardoll. “Across the university, in hundreds of labs, the potential for commercialization is enormous.”
**Building the Innovation Ecosystem**

**Seed Funding: Overcoming the Gap in Early-Stage Funding**

For many start-ups, seed funding is the key factor in moving their research out of the lab and into commercialization. Seed funding enables start-ups to build and test prototypes, develop data to show potential commercial value, and attract external interest, whether from angel investors, venture capital, or corporations, that will enable them to move forward with product development.

Thanks to the generosity of a few key donors, we have secured nearly $6 million of our $10 million seed-fund goal and are already beginning to make awards to faculty and student start-ups on a competitive basis. The Louis B. Thalheimer fund supports faculty members and is “evergreen,” meaning it will be recouped by the output of its endowment and by returns from successful launches (see profile, page 1). The Ralph S. O’Connor fund supports start-up development by undergraduates and provides access to business plan writing support, marketing, legal and accounting information, and other benefits (see profile, page 8).

We also provide seed funding to social entrepreneurs through a program called the Social Innovation Lab. Supporting some 12 student-led non-profits and mission-driven companies each year, the Social Innovation Lab provides teams seed funding of $1,000 upon selection, access to additional funding up to $10,000, mentoring by a distinguished group of Innovators-in-Residence, and office space (see second profile, page 5).

Another resource has been the DreamIt Health accelerator, which in exchange for equity has provided up to $50,000 in seed funding for participating health-oriented start-ups (with the potential for $250,000 in follow-on funding). It also has provided access to mentors, investors, and medical professionals, pro bono legal services, and the chance to pitch to potential customers, investors, and partners. Hopkins has been one of several Baltimore-area partners supporting the program.

Gifts are still needed to meet our seed-funding goals and match the creativity and ambition of our faculty and student innovators.

**Education and Service Programs: Guidance and Support for Fledgling Entrepreneurs**

We are building effective support programs to connect entrepreneurs with mentors, provide student employment and hands-on training, and promote social entrepreneurship. All of these programs need your support to grow and improve.

**Entrepreneurship Bootcamp**

Two levels of mentoring programs

There is no substitute for face-to-face guidance from successful entrepreneurs who know exactly what start-ups are facing. Our Mentors-in-Residence program brings to campus savvy leaders with deep domain expertise. Through regular interactions with start-ups, mentors offer invaluable insights on business and market strategy, funding needs and connections, and many other critical topics (see profile, page 7).

The Science and Technology Advisory Team is a larger group of Johns Hopkins-affiliated subject matter experts (including alumni) who are mobilized as needed to help start-up companies confidently tackle a variety of challenges.

Both programs welcome your interest in assisting our faculty and student entrepreneurs in providing financial support.

**Proven educational programs that are ready to grow**

Offered by the Carey Business School, together with the Whiting School of Engineering and the School of Medicine, the Entrepreneurship Bootcamp provides faculty members and students — more than 70 per year — the basic knowledge and skills to turn raw ideas into validated business proposals. Participants build knowledge and skills through case studies, didactics, and hands-on experiences that help them move from proof-of-concept to product launch.

A second educational program, the Commercialization Academy, provides a skilled assessment of market value proposition, IP position, competition, and development risk — the first steps toward commercialization — for each of the more than 500 invention disclosures we receive each year from Hopkins faculty members. This invaluable service is performed by highly trained graduate and undergraduate students, who in the process obtain hands-on commercialization experience, form working relationships with innovative faculty members, and make high-impact contributions to exciting new products.

**Our Students Take on the World**

Of the seven teams remaining in the global $10 million Qualcomm Tricorder XPRIZE contest — which started more than two years ago with a field of 300 teams — only one is a group of undergraduates working while going to class, backed not by corporate resources but by philanthropy. Hopkins’ Team Aezon, led by Tatiana Rypinski, Engr ’16, and supported by the O’Connor Undergraduate Entrepreneurship Fund (see page 8) and other sources, has built a handheld wireless device that can diagnose 15 medical conditions. Contest winners will be announced in 2016.

Too Impatient to Wait 17 Years

It takes 17 years to apply new research in evidence-based practice.* For Carrie Nieman, MD, MPH, Hopkins Otolaryngology-Head and Neck Surgery resident, that’s too long. Nieman is developing data to show that, with in-home training and counseling of patients, personal sound amplification products — relatively cheap volume-boosting technologies — could significantly improve quality of life for older adults who cannot afford or will not use hearing aids. Nieman’s non-profit, Access HEARS, funded and advised by the Johns Hopkins Social Innovation Lab, will put her work to use in the community in as little as one year.

* Crossing the Quality Chasm, The Institute of Medicine, 2001.
DAVID NARROW AND DEVIN O’BRIEN COON DISCUSS THE ECHOSURE BIODEGRADABLE MARKER, WHICH IS PLACED BENEATH its effect on surgical failures. 15 percent of cases. Half of hard-to-detect blood clots begin annually in the U.S. alone — some 550,000 operations of veins are surgically connected procedures in which arteries or veins are surgically connected — some 550,000 operations annually in the U.S. alone — hard-to-detect blood clots begin to form after surgery in up to 15 percent of cases. Half of these result in surgical failures.

Sonavex Moves Toward FDA Clearance for Human Use
In soft-tissue reconstructions, organ transplants, bypass surgeries, and other medical procedures in which arteries or veins are surgically connected — some 550,000 operations annually in the U.S. alone — hard-to-detect blood clots begin to form after surgery in up to 15 percent of cases. Half of these result in surgical failures.

To improve success rates, Devin O’Brien Coon, MD, Engr ‘13 (MS), and David Narrow, Engr ‘13 (MS), alumni of the Hopkins Center for Bioengineering Innovation and Design and now president and chief executive officer respectively of their start-up company Sonavex, are developing EchoSure, a patent-pending, ultrasound-based system to pinpoint postsurgical blood clots while they form and enable rapid clot removal.

To date, Sonavex has completed a private seed round of funding and won two SBIR grants, two TEDCO Maryland Innovation Initiative awards, a BioMaryland LIFE award, and top prize in the 2015 Association of University Technology Managers New Venture Forum. With preliminary large-animals studies showing efficacy, O’Brien Coon anticipates FDA clearance for human use in mid-2016.

How You Can Help Us Complete The Ecosystem
With your generous support, we can go far beyond our recent successes and create the complete range of resources that our faculty and student entrepreneurs need. In doing so we will place Johns Hopkins among the nation’s top academic sites for entrepreneurship and create the life-changing impact we hope to achieve, here at the university, in Baltimore, and around the world.

Build Out FastForward East at 1812 Ashland
The demand for start-up facilities in East Baltimore far outstrips the space available in the existing FastForward East facility. With your support, we will expand FastForward East into 1812 Ashland, a state-of-the-art hub that will serve as a focal point for start-ups in Baltimore. Encompassing 25,000 square feet (two floors) of the new 165,000 square-foot 1812 Ashland Avenue Building, FastForward East at 1812 Ashland will provide four times the space of the existing facility, answering current and future demand in East Baltimore. The new space will offer all the advantages of the FastForward concept — affordable office and co-working space along with shared and dedicated wet lab space, meeting and event areas, and professional management — where collaboration is fostered and mentorship, education, and support programs create a rich start-up culture that will help entrepreneurs grow and succeed.

The philanthropic component of the build-out is $6 million, with a variety of giving options, including naming opportunities for the FastForward East space and for the 1812 Ashland Avenue Building.

Partnering with Corporations and Foundations
Johns Hopkins welcomes partnerships with corporations and foundations seeking to collaborate in discovery. Examples include organizations that provide advanced technologies to enable “big data” approaches in medical applications; that engage in joint research in a variety of disease areas; and that establish translational partnerships which provide funding and mentorship to move medical innovations towards commercialization. We actively pursue such partnerships and investments.

JOHNS HOPKINS TECHNOLOGY VENTURES

There’s real innovation and momentum here and I get to be part of it.”
Whiting School alumnus Daniel J. Roche is a serial entrepreneur with a highly successful track record in technology and health care. Throughout his career he has benefited from the guidance of many mentors and come to value one-on-one coaching in particular. He emulates that approach today in his role as a Mentor-in-Residence at Johns Hopkins Technology Ventures.

“Hopkins entrepreneurs are smart people at the forefront of innovation in health care, with unique ways of looking at problems,” Roche says about the faculty members he advises. “I help them think through questions they don’t normally consider: Is there a market that justifies the effort? Can the idea be monetized? What are the key business processes, structures, and personnel required?”
Roche sees his work as “giving back,” but notes that it’s so enjoyable, “you can’t really call it work. There’s real innovation and momentum here, and I get to be part of it.”
HELP US BRING LIFE-CHANGING HOPKINS INNOVATIONS TO THE WORLD

Expand Our Seed Funds

We are deeply thankful to Louis Thalheimer and Ralph O’Connor for their wonderful gifts to establish seed funds, which help faculty and undergraduate entrepreneurs develop their technologies to a point where securing venture funding is possible. Through their generosity we are more than halfway to our $10 million goal.

Support is also needed for the Social Innovation Lab, so that it may offer a greater number of awards, build on the Innovators-in-Residence program, and provide educational programs and travel expenses. We seek $1 million over five years for the Social Innovation Lab.

Enhance Our Education and Service Programs

Programs like the Commercialization Academy, Mentors-in-Residence, and the Entrepreneurship Bootcamp help not only to increase entrepreneurs’ chances for success but also to build a community that fosters collaboration, increases awareness of campus entrepreneurship and its benefits, and shares members’ successes and failures. We seek support totaling $4 million for opportunities such as:

- Increasing the number of students we can include in the Commercialization Academy
- Supporting coordinators for the Science and Technology Advisory Team
- Launching a Summer Start-up Fellows program to support students working at Johns Hopkins start-up companies over academic breaks
- Providing service programs and personnel at FastForward East and Homewood.

Innovations to the World

We are deeply thankful to Louis Thalheimer and Ralph O’Connor for their generosity. “Then I came to campus and met some of the students. They were bright and positive and filled with energy, and I wanted to help Hopkins find more of them.”

To that end he established the Ralph O’Connor Undergraduate Entrepreneurship Fund, which provides $5,000-to-$10,000 grants to student-led teams developing technologies with a clear commercial focus — like the Aezon students competing for the XPRIZE (see profile, page 5). Selected teams can also obtain information on intellectual property protection, business plans, marketing, accounting, and legal issues; connections with investors; and space in one of the FastForward hubs.

“Nowadays many top students look for schools where they can start a company and find programs to assist them,” O’Connor says. “I want to help Johns Hopkins compete for those students.”

Helping Hopkins Compete for Student Entrepreneurs

“When I heard President Daniels describe Johns Hopkins Technology Ventures and the opportunities he saw for undergraduate start-ups, it hit a nerve — I was immediately interested,” says Ralph S. O’Connor, A&S ’51, trustee emeritus, and Houston-based entrepreneur, civic leader, and philanthropist. “Then I came to campus and met some of the students. They were bright and positive and filled with energy, and I wanted to help Hopkins find more of them.”

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Make a Gift:

Johns Hopkins Technology Ventures can succeed only with the support of dedicated philanthropists determined to help bring Hopkins discoveries out of the lab and into the market. We stand ready to guide you in exploring gift opportunities and planning and structuring gifts in ways that support your goals and ours. To discuss gift opportunities, please contact: Robin Rezvani Development and Alumni Relations Johns Hopkins University and Medicine 3400 North Charles Street San Martin Center 233A Baltimore, Maryland 21218 Phone: 410-516-6458 Email: rrezvani@jhu.edu

A RANGE OF GIVING OPPORTUNITIES

Johns Hopkins Technology Ventures requires $20 million in philanthropic support. Your gifts will help us commercialize brilliant new discoveries and improve life for millions. Opportunities include:

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<thead>
<tr>
<th>Your Gift</th>
<th>Example Impact</th>
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<tbody>
<tr>
<td>$1,000</td>
<td>Partial support for a Commercialization Academy intern</td>
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<tr>
<td>$5,000</td>
<td>Partial support for a student start-up through the Social Innovation Lab</td>
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<tr>
<td>$10,000</td>
<td>Fund a Mentor-in-Residence</td>
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<tr>
<td>$50,000</td>
<td>Support a business analyst to assist start-ups</td>
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<tr>
<td>$100,000</td>
<td>Make a seed-fund award to a faculty member or fund a wet lab</td>
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<tr>
<td>$500,000</td>
<td>Remodel FastForward Homewood to create a better environment for collaboration</td>
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<tr>
<td>$1 million</td>
<td>Support build-out of FastForward East at 1812 Ashland</td>
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We would be happy to discuss these and other giving options, including naming opportunities for FastForward East and the 1812 Ashland Building.

LET US HELP YOU TAKE THE NEXT STEPS

LEARN AND SHARE: Visit FastForward Homewood and FastForward East to see our existing facilities and talk with entrepreneurs and staff; visit our website to learn more about Johns Hopkins Technology Ventures and to receive our newsletter; and share your thoughts and questions on our Facebook and Twitter pages.

ventures.jhu.edu
jhotechventures
@JHTechVentures

VOLUNTEER: Talk to us about working with the Science and Technology Advisory Team, Mentors-in-Residence, or Social Innovation Lab Innovators-in-Residence.

INVEST: Make an investment in one of our start-ups or discuss corporate partnerships.

JOHNS HOPKINS TECHNOLOGY VENTURES