Space, services and funding are essential to startup success, and many ventures are taking advantage of the growing opportunities within Johns Hopkins. Emocha, one of the first tenants of FastForward East and a participant in the DreamIt Baltimore accelerator program, has used Johns Hopkins resources as a springboard that has helped its company move forward, deploying its technology to stop the spread of Ebola and more.

Fusiform, an undergraduate-led venture in the field of orthopaedics, appears on a trajectory similar to emocha’s. The young company has already seen clinics adopt the technology it developed to modernize the orthopaedic device workflow and has moved forward with the development of its custom orthotics. The new Student Entrepreneurship Award, a $10,000 grant provided by an anonymous donor, enabled the Fusiform team to work through the summer.

While startups certainly need funding, they also need to understand the challenges and opportunities they face on the road to commercialization. A July visit from three members of the FDA’s Center for Devices and Radiologic Health highlighted the importance of communication, collaboration and understanding between the FDA and early-stage medical device innovators.

Read more about these and other exciting things going on in this month’s issue of Johns Hopkins Technology Ventures’ newsletter.

The Future of Health Care Relies On Your Smartphone

After selling the chain of 25 coffee shops he built over a decade in Germany, Sebastian Seiguer returned to his hometown of Baltimore in 2011 and now serves a completely different product, one that is saving lives around the world.

Emocha—a mobile health platform based on technology that Seiguer licensed from Johns Hopkins Medicine, enhanced and brought to market—connects patients to health care providers and helps solve problems such as medication adherence, linkage to care and patient engagement.

For example, proper treatment of tuberculosis requires directly observed therapy (DOT), meaning a clinician must monitor patients in-person as they take

Continued on page 6
Param Shah will never forget the two ill-fitting children’s orthotics he saw as a high school student abroad in a rural Indian village: one cast aside never used or replaced, and another worn but producing pressure sores.

These images are products of outdated orthopaedic practices used around the world that rely on hand-made devices, hand-written order forms and a monthslong waiting process, according to Shah. They also inspired Fusiform, the company the rising junior at The Johns Hopkins University co-founded with fellow Johns Hopkins student Alex Mathews in March 2015. The company intends to maximize clinic efficiency by controlling the entire orthopaedic device workflow from fitting to manufacturing.

In less than two years since its inception, Fusiform has made inroads in developing technologies to digitize order forms that maximize clinics’ efficiency, replacing the hourlong hand-casting process with a 10-minute 3-D scan and automating the manufacturing of custom orthotics. Shah attributes much of this rapid ascent to a deep talent pool at the university and Johns Hopkins Technology Ventures’ Social Innovation Lab, an early-stage incubator for nonprofits and mission-driven businesses.

“We’ve received a lot of mentorship and taken advantage of the speakers the Social Innovation Lab brings in,” says Shah, a computer science major and Fusiform’s CEO. “We have gone nearly every week to sessions related to pitching or to work with people who specialize in legal matters.”

The most meaningful mentorship Fusiform has received has come from former collegiate entrepreneur Kasim Ahmad, the venture coordinator for student projects at Tech Ventures. Ahmad co-founded a restaurant delivery and marketing service and developed the sports betting app Waygr at the University of Cincinnati before graduating in 2014.

Shah called Ahmad a “mirror to reflect with,” explaining that they turn to him for advice when faced with challenges related to being a student entrepreneur. Ahmad sees promise in Fusiform, which he has watched grow since he joined Tech Ventures in August 2015.

“The team members have taken advantage of all the programs we offer. They’re coachable and open to any resource that can help them,” Ahmad says. “They’re doing all they can to maximize their chances of success.”

**Fusiform Growing and Expanding**

Fusiform has also looked outside of the Johns Hopkins ecosystem to get the funding it needs to get to market and make an impact. In May, Fusiform was one of six startups to complete Accelerate Baltimore, a four-month boot camp through Baltimore incubator ETC that awarded the company $25,000.

Around the same time, Fusiform signed a six-month lease to grow its business in the Impact Hub, an accelerator only a few minutes south of The Johns Hopkins University campus in Baltimore’s Station North neighborhood. Fusiform has added 10 other Johns Hopkins students to its team as it begins moving its products to market, and it could easily be more.

“People at Johns Hopkins are very driven and talented,” says Mathews, a biomedical engineering major graduating in December and Fusiform’s CTO. “We struggle not to hire people.”

Fusiform recently received 15 applications within 24 hours of posting a position and hired the perfect candidate shortly after. Shah and Mathews agree that these applicants are a microcosm of a rich, eager talent pool and growing entrepreneurial spirit at Johns Hopkins.

They attribute this growth to structured support, available mentorship and funding opportunities, such as the JHU Undergraduate Entrepreneurship Award.

Fusiform claimed the inaugural JHU Undergraduate Entrepreneurship Award, receiving $10,000 to develop the business through the summer. Before the close of June, Fusiform also received commitments from Dankmeyer and from Maryland Orthotics and Prosthetics to implement its enterprise software as beta users. This small-scale deployment is a big step toward getting clinics hooked on digital order forms that reduce mistakes, maximize efficiency and lead to better patient experiences.

Before classes resume in the fall, Fusiform will have used its $10,000 award to develop several more designs of its revolutionary orthotic that uses a “backbone” with customizable pieces that clip in instead of a single block of plastic. Though it will have taken a year and a half to build the prototype, Shah and Mathews envision that soon their technology will scan patients and produce custom orthotics in a matter of hours with an on-site 3-D printer.

Even with a burgeoning startup, the memory of the ill-fitting orthotics Shah saw while in India remain top of mind. He plans to use Fusiform’s technology and organizations, like the Lotus Life Foundation, a nonprofit Shah founded to reduce the stigma of disability in rural India, to make a global impact.

“Creating a digital ecosystem for manufacturing medical devices in the United States is important; in developing countries, it will soon become a necessity,” Shah says. “I’ve seen the consequences of an inefficient device delivery system, and finding an effective way to deploy digital systems like ours there would improve global standards of health care delivery.”
New Award Keeps Student Entrepreneurs Busy Through the Summer

Summer jobs provide tremendous experiences for college students, but for aspiring entrepreneurs, the work may distract from the more ambitious goal of starting their own company. Thanks to the rollout of the JHU Undergraduate Entrepreneurship Award, promising student-led startups at The Johns Hopkins University won’t lose momentum between the spring and fall semesters.

The $10,000 award was initiated by an anonymous donor and serial entrepreneur who wanted to provide undergraduate entrepreneurs and inventors with opportunities and resources to work on their startups over the summer, something that wasn’t available while the donor was in school. In addition to the cash, the students can access startup office space in the FastForward facility, the full range of resources offered through FastForward and one-on-one mentorship from the donor.

“This grant provides an opportunity for those working on a startup and who wanted to spend the summer working on it to do that here,” says Darius Graham, director of the Social Innovation Lab and Student Ventures at Johns Hopkins Technology Ventures.

“We have a lot of student teams doing great work and starting great things,” Graham adds. “We want to make sure they get the funding and support they need, and ultimately stay in Baltimore. This grant helps move that needle.”

Fusiform Claims First Award

The recipient of this year’s award, Fusiform, beat out 12 other highly qualified applicants from different schools within the university who pitched ideas across a number of disciplines, including mobile security, digital pathologies and innovative photography bag designs.

The applicants were rated on three criteria: traction and accomplishment, team members’ skills and abilities, and what they could achieve with the award.

“It was not an easy process,” says Kasim Ahmad, venture coordinator for student products, of the selection process, which included input from colleagues within Tech Ventures. “We thought Fusiform was a great fit, and the donor did as well.”

Fusiform is spending the summer working from the Baltimore Impact Hub at 10 E. North Ave., honing technology that will allow clinics to use 3-D scans to get an exact rendering of their patients’ orthotics needs. This technology promises to maximize clinics’ efficiency in terms of patients seen while reducing costly errors.

“Winning the JHU Undergraduate Entrepreneurship Award was definitely validation,” says Fusiform CEO Param Shah, a rising junior majoring in computer science.

As part of the summer program, Fusiform has developed short- and long-term goals and milestones, held weekly check-ins with JHTV mentors, and provided monthly updates to the donor about its progress. They will conclude the program by submitting a program review summarizing what they learned and showing how the award has advanced their business.

Long-Term Results on the Horizon

The 2016 award marks the kickoff of a program that will run through at least summer 2020. Graham says he hoped to continue working with the current donor to continue the project indefinitely and potentially expand it so more than one team can take advantage of the opportunity.

After all, these students are working on startups that could radically change their lives and positively impact both local and global communities. For those eager startups that missed out on this year’s award, there’s always next year.

“The next application process will open in November, and hopefully, we’ll select a winner in February,” Graham says.

But students don’t have to wait to get support for their entrepreneurial endeavors. “At any point of the year, a student can reach out and get one-on-one support,” Graham says.
Good News: Bristol-Myers Squibb’s acquisition of Cardioxyl Pharmaceuticals, Sonavex won the 2016 Incubator Company of the Year awards, TEDCO’s recent investment, and More

Bristol-Myers Squibb’s acquisition of Cardioxyl Pharmaceuticals and its prodrug used to treat heart failure earned top honors in the Mergers and Acquisitions category from Thomson Reuters’ Allicense event on June 8.

Johns Hopkins Technology Ventures and a visiting researcher from the National Institutes of Health helped put the Johns Hopkins University scientists who compose the startup in touch, which led to the creation of Cardioxyl Pharmaceuticals.

Sonavex won the 2016 Incubator Company of the Year award for Best Med Tech/Life Science Company. This marks the third time in the last four years that a member of the FastForward accelerator has claimed this award. Gemstone Biotherapeutics won last year and Clear Guide Medical took the award in 2013.

Sonavex has received a number of awards for its blood clot detection system, including grants from the Maryland Technology Development Corporation and an award at the BioHealth Innovation competition. To learn more about Sonavex’s achievements, visit here: http://ventures.jhu.edu/sonavex-snags-multiple-awards-for-blood-clot-detection-system/

The Maryland Technology Development Corporation (TEDCO) recently invested $200,000 in four Maryland companies, including three with connections to Johns Hopkins: AsclepiX Therapeutics, Sonavex and Vasoptic Medical.

The award, which comes through TEDCO’s Life Science Investment Fund, is designed for companies who have progressed beyond the technology validation stage and have begun discussing their product with the FDA.

The Johns Hopkins University ranked eighth among universities worldwide in number of granted U.S. patents in 2015, according to the latest National Academy of Inventors (NIA) and the Intellectual Property Owners Association (IPO). This marks the second consecutive year Johns Hopkins has ranked eighth.

The NIA and IPO formulated the rankings by determining the number of U.S. Patent and Trademark Office utility patent grants that list a university as the first assignee on the printed patent.

ImmunArray, a Richmond, Virginia-based molecular diagnostics company, received $10 million in funding from Exigent to develop its blood-testing technology
for chronic diseases, such as lupus, and traumatic head injuries.

ImmunArray previously received a grant from the National Football League and a corporate partner to develop a test that uses blood biomarkers to determine the severity of a concussion or other forms of traumatic brain injury. The company’s traumatic brain injury program is based in part on a series of biomarkers in-licensed from Johns Hopkins University.

In early July, Proscia announced it completed a $1 million seed financing round. The two-year-old data solutions provider for digital pathology will use the proceeds to accelerate growth with the aim of making discoveries that will provide a better understanding of and treatments for cancer.

Emerald Development Managers led the financing with participation from Robin Hood Ventures, TCP Venture Capital and A-Level Capital.

Two Johns Hopkins University alums and a current Ph.D. candidate make up part of the Proscia team:

- CEO David West, Jr. (Class of 2016, B.S., biomedical engineering)
- Co-founder Nathan Buchbinder (Class of 2015, B.S., biomedical engineering)
- VP of Research Hunter Jackson (Ph.D. candidate, philosophy of mathematics)

Ready Robotics, a robotics software company based in Baltimore’s City Garage, announced on June 28 its $1.5 million series seed financing led by RRE Ventures and Eniac Ventures with participation from Emerald Development Managers and Sagamore Ventures.

Kelleher Guerin, a founder of Ready Robotics, developed the core technology the company uses as a Ph.D. student at The Johns Hopkins University.

Ben Gibbs left his position as associate director of the commercialization strategy group at Johns Hopkin Technology to become CEO of Ready Robotics.

Ready Robotics plans to deploy prototype systems for use in small-batch manufacturing to several manufacturers in the coming months.
their daily medications over a period of months. This burden interrupts patients’ work and education, drives up health care costs and puts healthy people at risk.

Emocha’s miDOT application, which in November received a $200,000 NIH grant, removes the need for tuberculosis patients to see clinicians daily. MiDOT allows patients to securely record themselves taking medication at their convenience and to submit the video to the health department. There, a health care worker views the video and confirms the patient’s adherence. But that’s not all emocha provides.

“The TB application is the most advanced because it has been over two years that we’ve been developing it in collaboration with Hopkins and early customers,” Seiguer says. “But we have other applications that are technologically very similar in areas such as HIV and HCV (hepatitis C) management, and now opioid addiction.”

A pilot program run by University of Colorado pharmacologist Dr. Jennifer Kiser uses emocha technology to ensure her Denver clinic’s hepatitis C patients take their medications and to monitor their progress. Complete adherence to hepatitis C treatments are essential as each 12-week course costs in excess of $80,000 and missed doses can prevent the medication from curing the disease.

The Maryland Department of Health and Mental Hygiene used emocha to monitor travelers coming from West Africa for symptoms of Ebola during the outbreak in 2015. At the time, based on Centers for Disease Control and Prevention guidelines, the department set up a call center to contact travelers twice a day for 21 days. This required significant time and resources. With emocha, travelers and health care workers used their smartphones to report their temperature, the presence of symptoms and travel plans twice daily for three weeks. The emocha interface enabled the department to monitor patient submissions and stratify the population by risk. This proactively helped keep Maryland prepared to rapidly respond to an Ebola outbreak.

“A provider or health system like Johns Hopkins is not likely to contract for one app in TB, one for diabetes and other apps on a disease-by-disease basis,” Seiguer says. “Long-term sustainability requires, in the tech space, that we take a multi-condition approach that still has workflow specificity for the disease or condition.”

Though emocha’s technology has already produced promising results across 10 countries, the process of getting to this point and for becoming an even greater commercial and medical success offers challenges that building a chain of cafés doesn’t.

“That’s where John Hopkins Technology Ventures (JHTV) came in. Emocha was one of the first tenants of FastForward East at John Hopkins and also participated in the very first DreamIt Baltimore 16-week accelerator program supported by JHTV.

“The Tech Ventures team offers tremendous support, but they aren’t going to do your work for you, and that is as it should be,” Seiguer says. “We have what we need to succeed and to ramp up our business with the FastForward community as our base. This has included great introductions to our seed investors on the West Coast, New York and Boston.”

Seiguer notes that FastForward provides the nine-person emocha team with affordable rent for state-of-the-art facilities, basic legal and accounting services, mentorship from experienced startup and health care industry veterans, and access to the university’s and hospital’s business and medical experts.

“New JHTV Inventor Portal

Got an invention?

Submitting your invention disclosure is now easier than ever. Johns Hopkins Technology Ventures’ new user-friendly, simplified electronic portal includes fewer questions and forms, making invention disclosures less complex and time-consuming. Anyone with a JHED identification account can access the portal.

For questions or support, contact Tina Preston at 410-516-4561.
The FDA Visits FastForward East

In an effort to accelerate medical device innovation, representatives from the FDA’s Center for Devices and Radiologic Health visited Johns Hopkins from July 12 to July 14. The program focused on improving communication, collaboration and understanding between the FDA and early-stage medical device innovators.

On July 13, dozens of people filled FastForward East to hear the three FDA fellows present and answer questions about how regulations and the approval process are intended to work. Informal discussions continued at the mixer immediately following. [http://ventures.jhu.edu/fda-visits-fast-forward/](http://ventures.jhu.edu/fda-visits-fast-forward/)

Help us bring life-changing innovation to the world

Innovation is essential to our culture at Johns Hopkins. Across our campuses, faculty members and students are eager to develop their ideas and discoveries and put them to use in benefit to society – here in Baltimore and around the world.

We welcome gifts of any size. We would be happy to discuss our range of giving opportunities and other giving options.

For more info, please visit [http://ventures.jhu.edu/support-our-mission/](http://ventures.jhu.edu/support-our-mission/)