Greenspring Associates and Johns Hopkins Technology Ventures

Healthcare Technology Day

Johns Hopkins Medical Campus
Baltimore, Maryland
December 10, 2014
AGENDA

2:00 p.m. - 2:15 p.m.  Registration  
The Koch Cancer Research Building, Owens Auditorium

2:15 p.m. - 2:20 p.m.  Welcome to Hopkins/Introduction of Keynote Speaker  
Christy Wyskiel – Senior Advisor to the President of Johns Hopkins University

2:20 p.m. - 2:30 p.m.  Greenspring and VC Introductions  
John Avirett – Greenspring Associates, Partner

2:30 p.m. - 3:00 p.m.  Keynote Address  
Drew Pardoll, MD, PhD – Scientific Founder of Amplimmune; Seraph Professor of Oncology, Medicine, Pathology and Molecular Biology

3:00 p.m. - 4:45 p.m.  Overview of 23 Hopkins start-ups (4 minutes each)

5:00 p.m. - 6:15 p.m.  Cocktail reception/ 1:1 Meetings  
The Robert H. and Clarice Smith Building, Atrium

6:15 p.m. - 6:45 p.m.  Tour of the new hospital  
Sally W. MacConnell – Vice President, Facilities
Greenspring Associates

Greenspring Associates is a leading global venture capital firm exclusively focused on providing venture capital investment solutions through its co-mingled fund-of-funds strategies, direct investment strategies, secondary investment strategies and customized separate accounts to its clients in Europe, North America, Australia and Asia. Greenspring Associates has over $3.1 billion under management and has consistently delivered upper-quartile returns to its investors. Greenspring Associates has over 30 employees with offices in Owings Mills, Maryland and Palo Alto, California.

Greenspring Associates’ core fund-of-funds strategy invests in top-tier venture managers focusing from seed to later stage investments in the information technology, communications and healthcare/life sciences sectors. Geographically, Greenspring Associates’ funds invest predominantly in North America, with up to 20% in China, India, Israel and Western Europe. Greenspring Associates’ strategy of investing in venture capital funds is complemented by its direct strategy. Up to 30% of investable capital is reserved for investments directly in later-stage, private companies with experienced management, innovative technologies, profitable and sustainable business models and clearly defined exit strategies.

Greenspring Associates has a proven track record of not only gaining access to top-tier venture funds, but also of gaining meaningful allocations within these funds. This access and allocation has been a direct result of the value Greenspring Associates has been able to deliver to our existing and prospective venture fund managers.

Greenspring Associates has put in place a formalized value-add program where we work closely with our existing and prospective managers in an effort to add value through strategic connections for these organizations. These strategic connections include: introduction to corporate partners who could be customers, partners or acquirers, qualified deal introductions and introductions to our limited partners. Our Firm does this on a one-on-one basis but also in larger forums as well through specific events such as our “Technology Days” where we are able to add value to a multitude of managers and companies at one event.

Greenspring Associates works with a number of corporate partners and strategic limited partners in a dedicated manor delivering on business critical initiatives and providing a window into the most promising venture-backed companies through our relationships with the top-tier venture capital managers. These partners have been integral in affecting positive outcomes for our fund managers and our direct portfolio companies. Many of these relationships have been formalized through our Strategic Advisory Board filled with C-level executives at leading Fortune 1000 companies as well as through strategic limited partnership investments into our funds.

Greenspring Associates’ meaningful direct investment program serves as an important differentiator for our organization through our ability to provide meaningful growth capital to our managers’ most promising companies. Greenspring Associates invests between $5 million to $30 million into later-stage and growth equity opportunities either as a lead or follow-on investor.

Greenspring Associates has invested in many leading private healthcare and healthcare IT companies including: BARRX Medical (acquired by Covidien), Bravo Health (acquired by HealthSpring), Cameron Health (acquired by Boston Scientific), Colorescience, Concentric Medical (acquired by Stryker), Entellus Medical, Esprit Pharmaceuticals (acquired by Allergan), GenVault, Intarcia Therapeutics, Intrinsic Therapeutics, Kareo, Myogen (acquired by Gilead Sciences), NeoTract, Ocera Therapeutics (NASDAQ: OCRX), Orexigen Therapeutics (NASDAQ: OREX), Pharmon (acquired by Celgene), Proxima Therapeutics (acquired by Cytrc), Senseonics, SkinMedica (acquired by Allergan), Teladoc, Tethys Bioscience, TriVascular Technologies (NASDAQ: TRIV), Xcel Pharmaceuticals (acquired by Valeant Pharmaceuticals) and ZONARE Medical Systems (acquired by Mindray Medical).

Additionally, Greenspring Associates’ notable information technology exits include: ExactTarget (acquired by Salesforce), Zulily (NASDAQ: ZU), GrubHub (NYSE: GRUB), Cvent (NASDAQ: CVT), BlueArc (acquired by Hitachi Data), ChannelAdvisor (NYSE: ECOM), ScanSafe (acquired by Cisco) and Proofpoint (NASDAQ: PFPT).
A Message from Christy Wyskiel

It is both an honor and a pleasure to welcome you to this event co-hosted by Johns Hopkins Technology Ventures (JHTV), the “front door” for industry and investors at Johns Hopkins University. Johns Hopkins Technology Ventures, our newly branded name, encompasses our licensing, business development and accelerator efforts.

Our goal is to nurture an innovation ecosystem. This ecosystem helps ensure that the discoveries made by Hopkins faculty have the best possible chance of reaching their full potential. Ultimately, these inventions can improve and save the lives of people across the globe and increase productivity for providers and consumers. As such we feel a moral imperative to act as quickly, efficiently and effectively as possible while recognizing the complexity facing all of our stakeholders.

Notable facts about JHTV in FY2014:

- 454 Invention Disclosures were received from the faculty
- 159 New Agreements were signed, including options
- 2,324 Active Issued Patents are in our portfolio, a 12% increase over the FY 2013 patents
- $16.5 Million in Licensing Revenue, which includes both new agreements and options
- 3,898 Material Transfer Agreements were completed
- 13 newly created start-up companies with technology licensed from JHU

Helping to nurture start-up companies based on Hopkins technology is one of our priorities, and we hope that your interest will be piqued by those who are presenting today. This past year we have made a number of changes to improve the way we deal with start-up companies:

Here are some highlights:

- Created an express license agreement that dramatically speeds up the process for a faculty member’s invention to be licensed into a startup company.
- Invested in an accelerator program, Dreamit Health Baltimore, which nurtured nine new companies last year in the Health IT space.
- Increased our involvement with the Social Innovation Lab, which supports innovations that have a social impact.
- Established a Mentor-in-Residence program that connects experienced industry talent with our entrepreneurial faculty.
- Benefitted from an Entrepreneurship Bootcamp for over 70 faculty and students in East Baltimore, run by the Carey Business School.

Every day we are fortunate to work with faculty who are world leaders in their field. We also work with investors like you. And we recognize that the two groups do not always understand each other’s mindset or organizational demands. As such we strive to cultivate connections, and today’s event is an example of that effort. We welcome your feedback about the event and look forward to getting to know you.

Signature

Senior Advisor to the President
Johns Hopkins Technology Ventures
Participating Investors
AsclepiX Therapeutics represents the next generation of drug development technology. The Company uses bioinformatics and systems biology methods to design classes of short biomimetic anti-angiogenic (anti-neovascular) and anti-lymphangiogenic peptides that work through novel mechanisms capable of blocking both VEGF-mediated and non-VEGF-mediated vessel growth. In addition, the Company uses the latest developments in biomaterials and drug delivery to design long-lasting biodegradable nano and microparticles to deliver these biomimetic therapeutic peptides to different locations in the body. The Company's animal studies show promising results including superiority vs. Eylea head to head, regression of neovascuclature and long-lasting efficacy for at least four months in vivo following ocular injection.

Avhana Health is a cloud-based decision support platform that integrates actionable patient-specific clinical content directly into the physician’s workflow. By working closely with leading EMR vendors, the Company's HIPAA-compliant cloud-based platform interfaces in real time with EMR systems. This allows the Company to add value by providing relevant recommendations on patient care at the right time and place to make a clinical difference. Avhana Health has successfully partnered and tested its integration with three leading EMR vendors – Allscripts, Greenway and Epic. With these strategic partners, the Company's platform can work with 38% of physicians and 60% of patient data in the U.S. By partnering with content providers, Avhana Health can focus on refining its technology to ensure every patient receives the best care.
**Presenter:** Harry Goldberg, CEO
Improving patient safety through better handoffs

The patient “handoff” is a term used to describe the transfer of patient information from one member of a medical team to another. The handoff represents a critical moment in patient care because it addresses the discrepancy in knowledge between the “passing” and “receiving” care providers. An effective handoff should seamlessly transfer information and enable collaboration between all members of a health care team. Baton improves handoffs by encouraging communication and the use of handoff best practices. It does so by using mobile-enabled software that is intuitive to use and permits care providers to determine which information is important to pass to other members of the care team.

**Presenter:** Kelvin Liu, CEO
High content made easy

Navigating the complex world of cancer biomarkers is a daunting task for patients, clinicians and scientists alike. Even now, the value of cancer screening and early detection is subject to intense debate between the clinical benefits of detecting cancer at an early, treatable stage versus the financial and societal burdens resulting from large numbers of false positive diagnoses. Newly discovered molecules called microRNA have the potential to revolutionize cancer management. Circulomics spun-out of a cancer nanotechnology center at JHU and has leveraged NIH SBIR funding to create an integrated technology platform that streamlines the entire microRNA analysis workflow from front end sample preparation to measurement assays and detection instruments.

**Presenter:** Dorothee Heisenberg, CEO
Revolutionizing image-guidance with advanced technology

Using ultrasound to find targets inside the body is difficult and requires significant skill acquisition. Clear Guide Medical’s device guides users to align the needle outside the body and hit the target the first time—all at a fraction of the cost of existing systems. By speeding up the procedure, not requiring calibration, and being more accurate, significant cost savings are obtained. Clear Guide uses two cameras affixed to the ultrasound probe combined with computer software to immediately see and track the needle when it is in the field of view of the cameras. Using the ultrasound image overlaid with the software, the user has only to indicate the desired designation by touching the screen. Immediately, two target circles are aligned, and the user is guided to line up the needle with the correct trajectory to reach that desired target.
**Presenter:** Andres Mellik, CEO
Completing minds

Cognuse Neuroscience is a mobile rehabilitation platform helping hospitals and clinics better assess and rehabilitate patients with neurological conditions such as Stroke, Traumatic Brain Injury, ADHD, Autism, Alzheimer’s, MCI and Multiple Sclerosis. Focused on developing a serious game-based approach to stimulate higher-level (executive) function in the brain, the platform presents a serious of virtual exercises that are correlated to real life cognitive function tasks. The platform provides remote rehabilitation and offers therapists and physicians the ability to monitor real-time patient progress in order to adjust training plans to ensure improved health-care outcomes.

**Presenter:** Brian Lipford, CEO
Critical cooling for emergency care

Every year, several million people will have a cardiac arrest, heart attack or stroke, resulting in severe brain injury or death. Time is crucial in these events. Blood and oxygen to the brain and heart has stopped. Mild cooling of the patient (called therapeutic hypothermia) has been proven to improve survival rates up to 40%, if done early. The relative hazard of death increases 29% for every hour delay in cooling. Cooling is endorsed by the American Heart Association. CoolTech’s product is called the CoolStat, designed to start cooling early, pre-hospital. The Company’s product is unique in that it induces cooling using only ambient, dry air, tricking the body to cool itself. This is a large, recognized unmet need. A number of companies have tried to develop ways to induce early cooling. None of them have succeeded, until now.

**Presenter:** Graham Allaway, CEO
Activating cellular anti-oxidant pathways to treat disease

Cureveda was founded by scientists at Johns Hopkins University to discover and develop activators of Nrf2, the master regulator of cellular antioxidant pathways, for the treatment of inflammatory, autoimmune and fibrotic diseases. The Company is developing a novel small molecule Nrf2 activator called VEDA-1209. This compound has the potential to slow or reverse disease in various conditions including Chronic Obstructive Pulmonary Disease (COPD) and lung fibrosis. Currently in preclinical development, VEDA-1209 has already shown promising results in safety and efficacy studies. Recently, Cureveda was awarded two Phase I STTR grants from the NIH, which will support additional studies on VEDA-1209 as a potential treatment for COPD and systemic sclerosis.
Gemstone Biotherapeutics is a Baltimore-based research and development company dedicated to pioneering the field of tissue engineering and regenerative medicine by developing improved methods for advanced wound healing and tissue vascularization. The Company’s approach focuses on understanding the cellular microenvironment and harnessing that knowledge to develop engineered solutions that enhance angiogenesis and tissue regeneration. Gemstone’s primary biomaterial platform technology is a novel dextran-based hydrogel that was produced from original protocols and promotes the scar-free healing of full-thickness wounds. Early pre-clinical animal studies have demonstrated that the Company’s dextran hydrogel enhances angiogenesis and supports complete skin regeneration.

GrayBug is an ophthalmic pharmaceutical company pioneering breakthrough intraocular therapeutics through a continuum of innovative polymer-based drug delivery platforms. The Company’s objective is to develop injectable, extended release therapeutics for both small and large molecules including proteins that provide significant benefits over current treatments for major ocular diseases such as wet AMD and glaucoma. GrayBug has developed a technology to solve the problem of high frequency intraocular injections by providing the potential of injections every 4 to 6 months, dramatically improving compliance and reducing risks associated with injections. The Company has obtained an executive worldwide license to patent families from Johns Hopkins University School of Medicine.

HeartMetrics is a medical imaging analysis software company that assists cardiologists with important decisions regarding appropriate therapies for patients with coronary artery disease (“CAD”). CAD affects 17.6 million Americans and results in nearly half a million deaths per year. The Company has developed an automated non-invasive diagnostic algorithm to rapidly quantify coronary blood flow from a standard computed tomography (CT) image of the heart. This test allows cardiologists to make critical decisions regarding whether or not their patients should be sent to the catheterization laboratory or operating room for invasive therapy such as a stent or bypass surgery or be managed by medications only.

**Presenter:** George Davis, CEO  
Regeneration re-engineered

**Presenter:** Michael O’Rourke, President & CEO  
Extended release therapeutics through micro particle drug delivery

**Presenter:** Al Lardo, CEO  
Quantifying heart health
Presenter: Bill Hearl, CEO  
Pioneering vaccines that will transform lives

Immunomic Therapeutics ("ITI") is commercializing LAMP-vax, a breakthrough vaccine development platform through multi billion dollar product candidates in various stages of clinical testing. With a lean team of biotechnology professionals and scientists, ITI has executed on a strategy to efficiently build value and maximize investor returns by development products capable of revolutionizing the treatment of allergic diseases. ITI is a clinical stage company with a Phase II-ready lead product that addresses the major cause of allergies in Japan and a potentially best-in-class preclinical program for peanut allergy. The Company is on the cusp of its third commercial out-license, targeted to the Japanese allergy market.

Presenter: Mary Ann Shallcross, CEO  
Saving lives through early detection for appropriate treatment

MycoMed is focused on the development and commercialization of products for the early detection and treatment of fungal infections to improve patient outcomes. The Company’s lead product, AspUTest, is a urine-based lateral flow antigen test for the detection of Aspergillus infection. Kieren Marr, MD at Johns Hopkins University, discovered that during the course of Aspergillus infection a component of the fungal cell wall, galactofuranose, is excreted to urine of infected patients. JHU collaborated with Marta Feldmesser, MD at Albert Einstein University, to develop novel antibodies to detect galactofuranose. A monoclonal antibody, m476, was found, which laid the foundation for the development of a diagnostic test for the detection of Aspergillus antigen in urine. AspUTest, an advanced prototype, has been developed.

Presenter: Ken Carter, CEO  
Advancing the promise of cancer immunotherapy

NexImmune holds an exclusive worldwide license to the Artificial Immune ("AIM") technology from Johns Hopkins University. This nanotechnology platform is the foundation for an innovative approach to immunotherapy in which the body’s own immune system is guided by a synthetic particle that has been engineered to activate and orchestrate a targeted T cell response. The Company’s first therapeutic, AIM101, is a novel product for the treatment of cancer and should be ready for testing in humans by 2015. Successful administration of AIM101 as an injectable off-the-shelf therapy would represent a major leap for immunotherapy in terms of cost, ease of administration and, most likely, efficacy and would establish a pharmaceutical solution to cellular therapy.
**Presenter:** Howie Kaufman, CEO  
Detecting early-stage cancers from genetic evidence

The vision of the PapGene founders is to commercialize proprietary technology developed in their lab at Johns Hopkins University to detect early-stage cancers from genetic evidence found in exfoliated cells. The Company’s lead product will be a test for the early detection of ovarian and endometrial cancer using Next Generation Sequencing instrumentation. The test will be conducted on routinely-collected liquid based-cytology Pap samples by using an optimized 12-gene panel to detect somatic mutations indicative of cancer. PapGene plans to expand its first test into a portfolio of tests. Additional tests will detect other cancers including recurring bladder cancer (by testing urine samples) and pancreatic cancer (by testing pancreatic cyst fluid collected endoscopically).

**Presenter:** Jeff Geschwind, CEO  
Developing anti-cancer agents by disrupting tumor metabolism

PreScience Labs is a bio-pharmaceutical company focused on the development of new drugs targeting the metabolism of tumors, specifically glycolysis. The Company was formed to develop and market a unique formulation of 3-bromopyruvate (“3-BrPA”) to treat cancer. The use of 3-BrPA as an anti-cancer agent was discovered at Johns Hopkins University School of Medicine and patented through the Johns Hopkins University Office of Technology Transfer, for which PreScience has an exclusive license from JHU. The Company is ready to launch a robust clinical trial program targeting large and unmet cancer needs. 3-BrPA has been tested in numerous animal models and has shown very high efficacy and tolerability.

**Presenter:** Robert Lord, Co-Founder  
Helping hospitals protect patient data

While the advent of electronic medical records has come none too soon, this innovation brings with it the new risk that every patient’s medical record is now freely accessible to several thousand people in their hospital’s network. As we move towards more centralized data sharing models across the U.S., this problem will get only worse. Protenus helps hospitals protect patient privacy in the EMR using leading-edge technologies to detect, analyze and resolve breaches in real-time. The Company reports potential inappropriate access events and PHI disclosures to key security and compliance personnel, without interfering with the clinical workflow, allowing compliance teams to reduce breach detection and response times from months or weeks to mere minutes, and automate common compliance tasks.
**Presenter:** Michael Batista, CEO  
Better health starts at home

Quantified Care (“QC”) develops care coordination software to close gaps in care between caregivers and patients. Each of QC’s solutions is designed with direct clinical input and tailored to effectively manage critical disease states where action at home by the patient is key for treatment. The Company’s solution includes connected medical devices, a patient mobile app and a caregiver web management portal. Using personal mobile devices, patients become educated, active and engaged participants in their own health management. With access to real-time data aggregated in a management portal, caregivers quickly identify and directly manage or deploy resources to address high-risk patients. The result is improved caregiver efficiency, reduced operational costs and improved health in the managed population.

**resp(EQ)**  
**Presenter:** Erin Hawks, Research Program Manager  
Digital health for managing chronic conditions

respEQ provides a patient-monitoring solution for CPAP and Oxygen concentrators for hospitals, durable medical equipment (DMEs), patients, providers and payers to reduce the cost of managing chronic respiratory disease in Sleep Apnea or COPD. The Company has developed a clinically-validated, low-resistance flow sensor that accurately assesses breath-by-breath airflow to measure treatment efficacy. The smartphone acts as a receiver/gateway device, processing the data and tracking therapy adherence in the cloud. Additionally, respEQ has a device in development that can be bundled with inhaled drugs for asthma and COPD, which uses the same sensor and electronics.

**Presenter:** David Narrow, COO  
Clot visualization and surgical salvage at the bedside

Many surgical procedures such as kidney transplantation involve a surgical connection of blood vessels that is necessary to provide blood flow to downstream tissue. Such procedures can be lifesaving, but in up to 15% of cases a non-preventable clot will form in the post-operative period. If it is not recognized in time, all of the newly transplanted tissue will die. Beyond tremendous patient morbidity, hospitals are not reimbursed for expensive follow-on procedures and long LOS. SONAVEX has developed the EchoSure system to detect post-operative vessel clots earlier and more reliably than existing modalities. The two-part solution consists of an absorbable marker placed underneath the vessels at the surgical site (EchoMark) and ultrasound software (EchoFind) to guide users to the right position and extract blood flow data.
**Presenter: Mark Rampy, CEO**  
Enabling new and longer active therapies

Theraly is a pharmaceutical company with the goal to efficiently generate medically important, stable and long-acting therapies. The Company has a proprietary platform technology (4G-PEG) that can empower short-acting peptides and proteins by increasing their half-lives while maintaining potency, in turn allowing reduced dosing frequency, lower doses and potentially reduced adverse effects. Olaedin is a long-acting form of exenatide that utilizes 4G-PEG and is the Company’s lead asset in diabetes. Olaedin can be injected without using expensive recombinant technology or cumbersome depot systems. The Company’s lead asset for fibrosis is the recombinant human protein TLY012 that has been shown to have striking therapeutic efficacy in clinically unmet fibrotic diseases, inflammatory diseases and oncology.

**Presenter: Kevin Keenan, CEO**  
Simplifying wound care

Tissue Analytics is transforming the smartphone into a sophisticated platform for imaging and remotely evaluating chronic wounds. 8.5 million Americans living with chronic wounds, such as bedsores and diabetic ulcers, cost the U.S. healthcare system $30 billion each year. The high cost of care is due primarily to: (1) insufficient access to highly specialized physicians and clinics and (2) crude wound assessment and tracking technologies. Tissue Analytics addresses both of these problems using image analysis technology that standardizes wound documentation. Using the Company’s mobile application, nurses can capture digital photographs of wounds. Then, Tissue Analytics processes these images and sends them to a secure website where doctors can log on and remotely evaluate their patients with decimal level accuracy.

**Presenter: Alfredo Celedon, CEO**  
Making DNA analysis accessible to everyone

Twistnostics is developing a rapid, highly sensitive, low cost, Point of Care (“POC”) diagnostic test for tuberculosis (“TB”). TB is a curable disease; however, 1.3 million people die every year, in part due to the low sensitivity of the main method used for diagnosis, which was developed more than 100 years ago. The Twistnostics TB test will save lives and reduce the burden of TB by allowing dramatically better TB detection. The Company’s technology is broadly applicable for rapid POC diagnosis of infectious disease. Twistnostics is developing a universal reader than will be capable of running cartridge tests for several highly relevant infectious diseases. In addition to TB, the test pipeline includes Chlamydia, Malaria, Pneumonia and enteric diseases.
Notes