CENTER FOR BIOENGINEERING INNOVATION & DESIGN NEWS

JOHNS HOPKINS DEPARTMENT OF BIOMEDICAL ENGINEERING | Vol. 1, Issue 1 • 2011

CBID Launches Global Health Innovation Program

High Impact Medical Innovation for Low-Resource Markets

CBID's mission is about two core deliverables: training leaders in medtech innovation and developing high impact health care solutions. "But to be leaders, CBID graduates need to know how to innovate for the whole world, not just resource-rich highly developed market segments" says CBID executive director, Dr. Youseph Yazdi. That's why CBID moved quickly in its second year, 2010-2011, to launch a new Global Health Innovation program within CBID's award winning MSE degree. CBID also increased attention to global health innovation projects in the CBID undergraduate Design Teams program.

The new CBID Global Health Innovation program is a partnership with Jhpiego, a Johns Hopkins affiliate with decades of on the ground experience in the delivery of health care in 130 countries. "Jhpiego is a perfect fit for this new program at all stages" says Dr. Soumya Acharya, graduate program director at CBID. In the 'identify' stage, where needs are assessed and projects identified, Jhpiego provides a clear understanding of what is needed in the field. Next, Jhpiego staff work with CBID design teams to make sure innovations stay relevant and work well in tough conditions. "Such input is critical to success of the new device or solution. We can spend a lot of time developing a device that performs its task well but is ill suited for field use in resource and training poor environments. Jhpiego is also critical in the delivery stage as well, because it can ensure that CBID global health innovations make it rapidly into field use and provide feedback for improvements," says Dr. Acharya.

The new module includes courses, field immersion, innovation, and development. All CBID MSE students begin with an immersive three week rotation in hospitals and community health centers in Asia and Africa. This August, students traveled to India, Tanzania, and Nepal to Jhpiego-affiliated sites. "It's been a life changing event. I felt I was seeing medicine practiced in its purest form, without much of the commercial encumbrances of Western care" said Haim Gottfried, a CBID MSE student from Israel. Students also received an overview of all segments of the India health care market at Johnson & Johnson's R&D HQ in Mumbai, India. More student testimonials and pictures about this trip are on page two.

Support for this exciting new program has been strong. "We bootstrapped this early in August using existing funds, as a trial, in the hope that others will see value and help make it sustainable. The response has been wonderful," says Dr. Yazdi. So far, the program has received support from the Whiting School of Engineering, the Johns Hopkins Center for Global Health, and the National Collegiate Inventors and Innovators Alliance (NCIIA). "The combination of this initial support and the glowing feedback from students means this trial was a success and we will continue work on making it a sustainable part of the CBID program long term," says Dr. Yazdi.

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IN THIS ISSUE:

CBID'S MSE TEAMS KICK OFF ANOTHER AWARD WINNING YEAR

L-R Byron Tang, Hyo Jun Kim, David Huberdeau, Valeriya Aranovich, Joshua Budman, Jessica Chen. The team members not present are: Joe Chao, Jessica Hu, Mikel McDonald, Yoshiaki Sono.

Last year, CBID MSE and undergrads carried away many of the top medtech innovation and business plan competitions around the nation, including first place wins at University of California at San Francisco, University of Maryland, and Wharton School of Business at the University of Pennsylvania. They also brought home the BME IDEA first place trophy. "We are very proud of our undergraduate design team having worked on brain cooling technology that can save lives, and we are privileged to have won the BMEidea competition. Its trophy is on display this year at Johns Hopkins in the Biomedical Engineering Department. It's a real honor for the students, their clinical mentor, and the program," says Robert H. Allen, PhD, PE, undergraduate program director at CBID.

Theracord System

Not to be outdone, this year's MSE students have started early with a couple of initial wins:

CBID MSE TEAM TIED 1ST PLACE AT THE 2011 GEORGIA BOWL

The Georgia Bowl is the one of the country's oldest intercollegiate competitions for entrepreneurs. In February CBID MSE design team TheraCord participated in the Georgia Bowl, presenting their business plan for commercialization of a system to improve the process of umbilical cord blood collection. TheraCord has the potential to save lives by making umbilical cord derived stem cell therapy more widely available.

BOSS Harvester

CBID TEAM WINS TRACK AWARD AT MIT $100K COMPETITION

On February 10, the CBID MSE team BOSS Medical won the Executive Summary Life Sciences Track Award at the MIT $100K Entrepreneurship Competition. This competition is a year-long educational experience designed to encourage student and researchers to act on their talent, ideas, and energy to produce tomorrow's leading firms. The team presented its BOSS Harvester device, which is a minimally invasive tool for extracting bone graft that enables the surgeons to obtain bone graft easily and safely.

ABOUT CBID

CBID is the focus for the biodesign at Johns Hopkins University. Located within the Department of Biomedical Engineering, CBID has footing in both the Whiting School of Engineering and the School of Medicine. This allows CBID students to access the wealth of clinical and scientific depth across both Johns Hopkins campuses. CBID students engage closely with clinicians, engineers, and experienced industry advisors to design, build, and test devices that solve significant health care needs.

Our Mission:

The Center for Bioengineering Innovation & Design at Johns Hopkins University educates and develops the next generation of leaders in health care technology innovation and creates and develops health care solutions for major challenges to human health around the world.

Our key measure of success is the positive impact of our students and our innovations on the quality and and accessibility of health care accessibility of health care.

Student Testimonials from the Global Health Trip

Continued from page 1.

"I was one of the five students who traveled to India in August to learn about health care in India from the directors of Johnson and Johnson in Mumbai and firsthand at the Mahatma Gandhi Institute of Medical Science in Sevagram. This trip was an amazing opportunity to see health care being provided in rural India and provide insight that no extent of research through literature could ever bring. As we are working now on our global engineering projects to develop an electronic partogram and an antenatal screening kit, I often refer back to our experience abroad. The understanding that I have gained from this trip will not only help me to develop the antenatal screening kit, but will also stay with me as I go into the industry of biomedical engineering to design medical devices." *–Mary O'Grady, CBID MSE '11 and Hopkins BME '10*

"Our projects have the power to significantly transform these people's lives and I am thankful for being given such an opportunity."

–James Waring, MSE Class of '11

"I was one of five students who traveled to Kathmandu, Nepal to explore health care delivery and understand the complex challenges they face each and every day. Over the course of two and a half weeks we were immersed in an environment like nothing I have ever seen. Having spent the majority of my life living in the United States, I realized it is easy to get caught up in your own "bubble" and forget that a vast portion of our planet's population lives in completely different environments. We had a chance to observe surgeries, speak with patients, meet with NGOs, and discuss health care with government officials. I quickly realized the tremendous opportunity we had been given and that this was a once in a lifetime opportunity to see health care delivered at the most basic level around the globe. Now that we are back in the United States working on our global health projects, I do so with a new sense of purpose, having seen directly the people we can help. Our projects have the power to significantly transform these people's lives and I am thankful for being given such an opportunity. This experience is certainly one I will carry with me for the rest of my life."
–James Waring, CBID MSE class of '11

"I was part of the student team that spent two weeks in Dar es Salaam, Tanzania as part of the developing world clinical immersion. During this trip I was able to interact with doctor mid-wives, and patients in different rural and urban hospitals around the city. This allowed me to gain a novel perspective of health care which starkly differed from the surgery wards, emergency rooms, and clinics of Johns Hopkins Medical Center. After returning from our visit, my classmates and I began a project to design an extremely low-cost labor monitoring system to help midwives deliver babies. We believe that the use of this device will drastically decrease maternal and child mortality rates in these countries. While creating design criteria for our project we were able to draw on our experiences from our developing world economic factors that we could have easily overlooked had we not witnessed them ourselves."
–Neil Shah, MSE class of '11

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HIGHLIGHTS OF STUDENT SUCCESSES, CLASS OF 2010

Cortical Concepts, LLC, won first place, and $20k in the distinguished Wharton Business Plan Competition for their spinal surgery device that increases the strength of fixation in osteoporotic bone. The students were honored for their success by being invited to NASDAQ to ring the closing bell on August 23, 2010. www.corticalconcepts.com

CervoCheck, LLC, won first place at the University of San Francisco Business Plan Competition for their vaginal ring device to accurately detect early indications of preterm labor. They received a cash prize of $10k. CervoCheck has recently launched a start-up for their device and they are currently testing their device at the Emerging Technologies Center incubator in Baltimore, MD. www.cervocheck.com

Inspiro won the University of Maryland $75k Business Plan Competition in the biotechnology category. They received $15k to further the development of their product, Inspiro, an incentive spirometer designed to improve lung function post surgery.

Rapid Hyperthermia Induction Device won first prize of $10k at the NCIIA annual BMEidea Awards for their brain-cooling invention. The device aims to improve the survival rate of cardiac arrest patients.

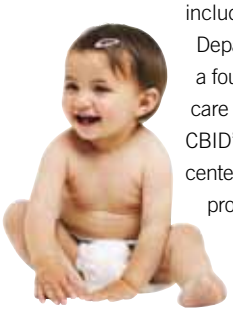
For more information: http://cbid.bme.jhu.edu/

CBID PLANS FOR EXPANSION

In addition to building sustainability in our Global Health Innovation Program, CBID is working with new partners in a number of areas, with the vision of making CBID the premier program of its kind worldwide.

Here are some of the initiatives in the works:

• Pediatric Innovation lags that of other areas of medicine for a number of reasons, with the smallest patients often deprived of innovative solutions designed to reduce suffering and improve medical outcomes. CBID has entered into discussions with several partners who treat children or provide philanthropic support for the treatment of children. These including Johns Hopkins' own Department of Pediatrics and a foundation focused on health care innovation for children. If CBID's proposal is funded, the center will launch next year a program with 2-3 dedicated design teams focused on pediatric innovation.



• Many medical students combine their MD degree with a second degree. The CBID MSE degree is ideally suited to that rare subset of clinicians who strive to impact health care through innovation and development of new devices and solutions. CBID is in discussions with the Johns Hopkins School of Medicine to launch a combined MD-MSE degree program. Medical students with technical backgrounds would join other students in the CBID MSE program and fulfill all other requirements of the MSE degree. This year CBID will recruit several Hopkins medical students to start with the new CBID MSE class in June. A key challenge in bringing in MD students into the program is developing fellowship support to cover their CBID year, since many students have borrowed extensively to fund their MD degree.

• Frugal Engineering is all about using engineering design talent to deliver equal or better performance at significantly lower costs. It is a critical talent needed by US engineers if they are to remain competitive in a global health innovation labor market. CBID has been invited by Austen BioInnovation Institute to help organize and run a summit event in Washington, DC to address this topic. Other partners in this summit are MIT, Stanford University, the Kaufmann Foundation, AdvaMed, Medtronic, the Mayo Clinic, and President Obama's chief technology officer, Aneesh Chopra.

• Incubation is needed for most CBID design team projects to enable them to attract follow-on resources. CBID is in discussions with several regional organizations with resources and expertise in incubation of early-stage technology companies. Our vision is to ensure each innovation gets the appropriate resources to realize its full potential to impact human health, and to do our part to build a strong innovation ecosystem in Maryland.

BME STUDENT DESIGN DAY 2011!

CBID's annual flagship event, Design Day, is scheduled for **Monday, May 9 2011**. This high profile event is held in the Armstrong Building at the Johns Hopkins University medical campus. (Address: 1600 McElderry Street, Baltimore, MD 21205). The day is filled with formal presentations by selected CBID undergraduate and MSE design teams, introductions by the director of Biomedical Engineering, the deans of the School of Medicine and Whiting School of Engineering, and a keynote address by Tore Laerdal. The event also provides ample opportunity for visiting entrepreneurs and licensees to speak to student teams about further development of their innovations. The day includes poster sessions, awards, and great food. Please join us! The audience includes a rich mix of students, clinicians, faculty, entrepreneurs, investors, and supporters of the program.

KEYNOTE SPEAKER ANNOUCED: TORE LAERDAL, CHAIRMAN LAERDAL MEDICAL

CBID is proud to announce this year's keynote speaker, Tore Laerdal, executive chairman of Laerdal Medical. This family owned company has been a leading supplier of training material and therapeutic equipment for acute medicine since modern lifesaving techniques were first developed at Johns Hopkins in 1960.

At the 50th anniversary of CPR, an estimated 400 milion people have been trained to be lifesavers and this has helped save over two million lives worldwide.

Mr. Laerdal has recently turned his full focus to global health challenges, and established Laerdal Global Health, a company with the sole purpose of providing highly affordable and culturally sensitive training and therapeutic solutions to help reduce maternal and newborn mortality in low resource settings. Laerdal Global Health has partnered with USAID, NICHD, Save the Children and the American Academy of Pediatrics in the Helping Babies Breathe Public-Private Global Development Alliance.

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We want to recognize your investment in CBID's widely noted academic curriculum, publically successful design projects with clinical and commercial value proposition, and overall expansion of the CBID organization as a Johns Hopkins leader in biodesign and medical technology innovation.

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