

STANFORD BIODESIGN

Annual Report 2014



LETTER FROM THE DIRECTOR

Paul Yock

We are pleased to provide you the 2014-15 Stanford Biodesign Annual Report. I want to express my sincere gratitude to all our donor/partners, advisers, faculty, staff and most importantly the fellows and students! It has been a fantastic year—built upon this wonderful ecosystem of relationships that involve so many of you for so long. A sincere thanks from all of us in the Biodesign Program.

The Medtech industry has flourished over the last 60 years; the community of inventors, innovators, investors, marketers, regulators and business executives has delivered innovative technologies that have revolutionized health care globally. But over the past several years the medical economy has changed profoundly, not only in the U.S. but also internationally. With these historic changes comes a responsibility to re-imagine the way we train the next

generation of medical technology innovators. We have been working hard to begin this transformation. In February of this year we released the 2nd edition of the Biodesign textbook. What began two years ago as an updating project evolved into a major revision of the book, with an emphasis on innovating for value and incorporating global needs and markets into the value equation. In parallel with the textbook we launched a new Biodesign Video Library series, an open-source collection of

nearly 300 training videos that can be accessed at ebiodesign.org. We are using these new training materials to refresh our teaching approach in our own classes, so that the students can be primed before coming to class to create much more dynamic and interactive class sessions. We are also experimenting this year with a new Biodesign Faculty Fellows Program, providing talented young faculty with a "crash course" in the Biodesign process.

continued

EDUCATION



Our emphasis continues to be on 'training by doing', and we are happy to see that technologies invented by the first-time innovators in our program continue to move forward toward patient care. We are careful to remind our trainees that our purpose is not to create companies -- but to give them the knowledge and skills (when the time is right) they will be successful in innovating new technologies that reach patients. To this end, we do keep approximate track of the number of patients who have been treated by technologies invented within the program -- and that number is now over 350,000.

Our fellows and students seem to be adjusting almost naturally to the new environment for affordable health care innovation. They are thinking about new approaches that combine technologies, informatics and system solutions. One example is Vynca, founded by Ryan Van Wert and Rush Bartlett. Vynca's product is a cloud-based Physician Order system for Life-Sustaining Treatment (POLST). Ryan and Rush identified the fact that there are large, inappropriate expenditures on end-of-life care for patients who have made a legal decision not to have heroic measures-- but for multiple reasons this decision was not registered in the hospital system. With a cloud-based solution, physicians and other caregivers are able to determine the patient's desires at the right time and place.

It is our hope that you will continue to partner with us as we move into the next phase of our mission of "training the next generation of biomedical technology innovators." Your support has been key to building the Biodesign Program into a sustainable initiative. We look forward to working with you as we explore the opportunities that the new health care environment is revealing.

In June 2014 we congratulated our graduating fellows: Varun Boriah, Tiffany Chao, Nicholas Damiano, Ryan Krone, Shreya Mehta, Kathryn Olson, Holly Rockweiler, Jonathan Steinberger, and John Woock. Our fellows have since gone on to form two companies, return to further training or have taken positions in large medtech companies. As in prior years, we already see the fruits of the biodesign innovation process training.

INNOVATOR'S WORKBENCH

We were fortunate to have the great "Stans" at our Innovator's Workbench this past year. Stanton Rowe and Stan Rabinovich, founders of PVT

(Percutaneous Valve Technologies) and now with Edwards, spoke about their careers and the path to innovation. They are pictured on the cover of our report.

FACULTY/STAFF ADDITIONS

In 2014 we added the skills and dedication of Drs. Dan Azagury and James Wall to our faculty. Both Dan and James were Biodesign fellows (2011-12 and 2006-07 respectively) and are now on faculty in the Department of Surgery and work with Biodesign to help mentor the fellows teams and support our Global programs.

141 FELLOWS
900+ STUDENTS
100 EXECUTIVES

Congratulations to Ross Venook, 2006-07 Biodesign fellow, who was appointed lecturer to Bioengineering to help with the Undergraduate Capstone course, the Biodesign collab and other Bioengineering design facilities. He's a welcome addition to the Biodesign team.

NEW PROGRAMS

In 2014 we developed a program to train Stanford faculty in the biodesign innovation process. The recipients of the training are the first Biodesign Faculty Fellows. The 2015 cohort selected include Robson Capasso, Markus Covert, Cindy Kin, Peter Li, Mintu Turakhia, and Shreyas Vasanawala who were welcomed into the program in January, 2015.

COLLABORATION



The mission of global Biodesign programs is to train the next generation of global medical technology innovators. To do so we:

- find and develop in-country innovators in select geographies
- train our partner institutions in the teaching of biodesign methodology
- promote exposure to our US-based fellows and students to foreign medical technology opportunities
- develop devices that are cost-effective and globally relevant

In December we congratulated our graduating fellows from Singapore-Stanford Biodesign: Rena Dharmawan, Prusothman Raja, Benjamin Tee and Cecilia Wang; and Stanford-India Biodesign: Anirudh Chaturvedi, Prashant Jha, Abhinav Ramani and Balaji Teegala.

In May, the Jaipur Knee, a project funded through Biodesign to provide a low-cost prosthetic knee for India, was reported to have been deployed in more than 6000 patients.

Manu Prakash, Professor of Bioengineering, and recipient of C-IDEA and Coulter grants from Biodesign, was featured on TED talks describing his \$.50 microscope made from paper. In November, Dr Prakash managed to impress the White House and the NIH with his \$5 chemistry set, presented at the White House Maker Faire. He has been named one of 35 Innovators Under 35 in MIT Technology Review and Popular Science's Brilliant 10.

Dan Azagury, Clinical Faculty in Biodesign, spoke at the 1st Annual European Biomedical Investor's Day event in Barcelona, Spain. Paul Yock, Director of Biodesign, gave a video welcome and team Torix Medical took the prize for best pitch.

Our 2014 Singapore-Stanford Biodesign Fellows placed first in a start-up competition with a medical device to help those who suffer from hemorrhoids. The team of Dr Rena Dharmawan, Prusothman Sina Raja, Dr Benjamin Tee, and Dr Cecilia Wang have

created the disposable device called Privi. The award was \$100,000 in cash. The team beat more than 200 teams at NTUC Income's Future Starter Competition.

IN THE PRESS

An OZY.com article featured Stanford-India Biodesign in "The Flip Side of Medtech Innovation."

Biodesign's alumni are featured in an article about "The Heart's Gadgeteers" in the School of Medicine's Quarterly Magazine.

Your Story featured Consure Medical, a company out of the first year of the Stanford-India Biodesign program.

Our India partners worked with the British Medical Journal (BMJ) to launch a new *Innovations Journal*. Dr. Prashant Jha, SIB fellow from 2013, is the Managing Editor; Dr. Balram Bhargava, Executive Director of Stanford India Biodesign, is the Editor-In-Chief and Dr. Paul Yock provided editorial content for the first issue.

5 GLOBAL PROGRAMS
39 GLOBAL FELLOWS
6 GLOBAL FACULTY

EVENTS & AWARDS

Healthcare Start-Up CareMessage, initially supported through Biodesign's C-IDEA grant program, raised over \$3.7 Million in its first round of funding. Vineet Singhal, co-founder and CEO, had launched the company through Y Combinator after finishing his training at Stanford.

Biodesign was invited to demonstrate devices that have come out of the program at TED MED in San Francisco.

Sponsor Day was held on November 11 and featured our current fellows as well as alumni fellows from 5 and 10 years ago. Sponsors also attended the Fogarty Lecture featuring Mark McClellan, senior fellow and director of the Health Care Innovation and Value Initiative at the Brookings Institution and a former administrator of the CMS and former commissioner of the U.S. FDA.

INNOVATION



AWARDS and HONORS

Dr. Thomas Fogarty, a named Biodesign Fellowship Sponsor and long-time educator in the program, was awarded the *National Medal of Technology and Innovation* by President Obama.

Todd Brinton, fellowship director; Bev Huss, mentor to student teams and Amir Belson, 2001-02 Biodesign Fellow have received the 1st TCT Innovation Competition award for Qool Therapeutics.

Congratulations to two of our 2014-15 fellows: Elizabeth Wynne and William Kethman, for their acceptance into the BEST training program at IRCAD in Strasbourg, France. They spent 4 weeks there just prior to joining Biodesign in August.

Augmedix, a medtech company based on Google Glass technology, announced their series A funding and gave credit to Biodesign in their press release.

37 COMPANIES
275,000 PATIENTS
\$325M RAISED

The Brun team (SIB 2013) received a grant from Govt. of India, the Lunar design award and won a business plan competition in Africa for their device that monitors fetal activity.

Team Madorra (2013-14 fellows) took a prize for their Elevator Pitch (worth \$10,000) at the Founders.org competition in Paris, France. They also placed 2nd in the BASES E-Challenge, with an award of \$10,000.

The Sohum device and one of its co-founders, Neeti Kailas, has received the Rolex Award. Kailas and her husband Nitin Sisodia (SIB Fellow, 2010) launched the Sohum Innovation Lab in India, where they've developed a prototype for a device to detect hearing loss in infants. Neeti is being honored by the Rolex Awards for Enterprise, which recognize five young laureates, all 30 or younger, for taking

on some of the world's biggest challenges. The prize is \$56,000.

Former fellows Sid Sinha and Ravi Pamnani and current SIB fellows Balaji Teegala, Prashant Jha and Anirudh Chaturvedi were awarded the Robert Howard Next Step award at the Biodesign graduation ceremony in June.

Team Madorra, Fellows from the 2013-14 White Team, have placed 2nd in the BASES E-Challenge, with an award of \$10,000.

Project ClearEar (from the Biodesign Innovation Course in 2012) won the speed pitch award at AARP's Health50 conference. Congrats to Lily Truong and Vandana Jain.

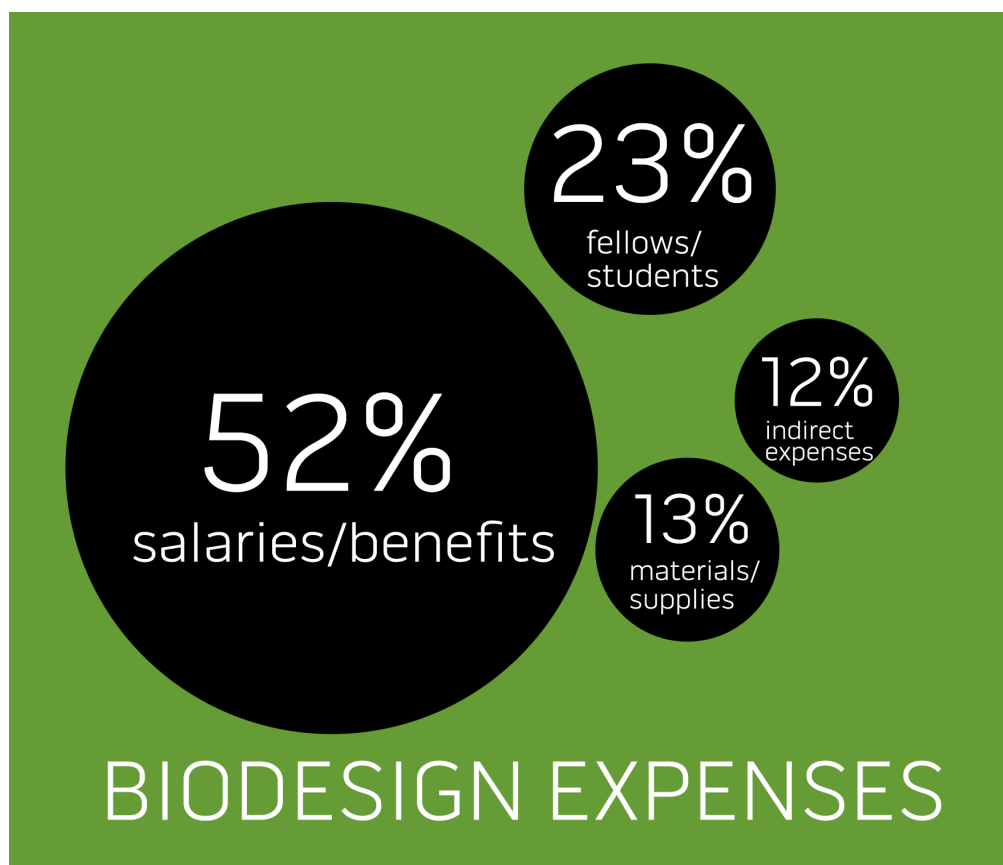
Caydian, a company coming from our Specialty team for 2013-14, has been making the competition circuit: they took 2nd place in the Dreamers competition at Chapman College for their night tremors prevention device. The award was \$6,000. The team, composed of Varun Boriah and Andy Rink, was admitted to StartX, a Stanford student-run incubator. They also took 2nd place in the Duke University competition and took "Most Innovative Idea" at the University of North Dakota Giants Entrepreneurship Challenge. Finally, they were awarded a \$5,000 E-Team grant from NCIIA.

The Awair team (from the 2012-13 fellows) took first place in the Life Sciences Track at the Lester Center for Entrepreneurship's Startup Competition. Congratulations to Rush Bartlett, Ryan Van Wert and Frank Wang.

Abhinav Ramani, Global Fellow for 2013, was one of a team who received a CTSA Spectrum grant for the project "A cost-effective solution for management of perioperative normothermia."

Biodesign received a substantial award from the Coulter Foundation to develop video material to accompany our new textbook, our course and to supplement the Coulter College materials. The new website <http://ebiodesign.org/> hosting the videos and textbook resources has been launched.

We are particularly grateful to acknowledge the following supporters who have helped advance the Biodesign mission.



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