

STANFORD BYERS CENTER FOR BIODESIGN



A Message From Paul Yock

Sixteen years ago, we founded Stanford Biodesign based on the belief that innovation is a process that can be learned, practiced, and perfected. Our vision was to create an ecosystem of training and support for students, fellows, and faculty with the talent and ambition to become health technology innovators. We also wanted to provide the freedom, mentoring, and network required to deliver biomedical innovation, and drive results that open up new worlds of possibility for human health.

That first year, we trained a single class of four fellows. Today, we work with multiple teams of fellows at Stanford and abroad, as well as with faculty fellows and students in graduate and undergraduate courses. These bright, highly-motivated people have invented technologies that have helped more than half a million patients — and that's just from projects they began during their training with us at Stanford. Many have launched additional companies, trained other innovators, or incorporated our process as clinicians or innovators in large companies. As you will see on page seven of this report, our net impact and our multiplier effect are clear.

As our reach has grown, so too has our program itself. This year, thanks to the generosity of our donors, the support of our friends in Silicon Valley, and the vision of our university leaders,

we officially transitioned from a Program to a Center within the university. This redefinition means that Biodesign is now considered a permanent part of Stanford's academic landscape as the Stanford Byers Center for Biodesign.

And this is why Stanford Biodesign has made an unprecedented commitment to ensure our fellows have the ability to innovate at their full potential, year after year. To this end, we hope to collaborate with you, our philanthropic partners, to raise \$15 million for endowed innovation fellowships. These endowed funds provide a permanent, dependable source of income, empowering Biodesign's finest to pursue high-value health solutions—cost-effective technologies that have the potential to help millions of patients.

We thank you—our donors, advisors, mentors, and friends—for helping us unleash the power of innovation. Your continued support allows us to teach and disseminate the biodesign process, improving healthcare for people everywhere.

Paul Yock, MD
Director, Stanford Byers Center for Biodesign

2016 HIGHLIGHTS

January

Biodesign's sixth class of Singapore-Stanford Biodesign (SSB) fellows arrived at Stanford to begin their initial training in the biodesign innovation process. Their clinical focus area was physical medicine and rehabilitation.

We also welcomed a new participant in our Global Faculty Training program, Nishiuchi Daisuke. In addition to learning our process, Daisuke received guidance on how to lead an innovation program within a university setting, which he is now applying as part of the leadership team of the Japan Biodesign initiative.



The 2016 Singapore-Stanford Biodesign Fellows

February

The inaugural class of 10 fellows from Japan Biodesign, who hail from Tohoku University, Osaka University, and the University of Tokyo, spent two weeks at Stanford Biodesign. The purpose of the visit was to introduce the Japan fellows to the Stanford Biodesign team and expose them to resources in the Silicon Valley health technology ecosystem. Their busy schedule included coaching from Biodesign faculty on their innovation projects;



Japan Biodesign Fellows visit Element Science, a start-up company founded by Uday Kumar

visits to start-ups founded by Biodesign alumni and mentors; a field trip to medtech incubator The Foundry, where they met with managing partner Hanson Gifford; and a tour of global design firm IDEO with Farzad Azimpour, the firm's director of health and a Biodesign Innovation Fellowship alum. They also spent an entire day in a hands-on "Introduction to Design Thinking" workshop taught by the Stanford-based Biodesign Innovation Fellows.

March

Biodesign's annual Executive Education program, which teaches corporate leaders how to more effectively drive innovation within their organizations, took place with 70 participants from Abbott, Bard, NEC Corporation, Johnson & Johnson, Stryker Neurovascular, Texas Children's Hospital, and Verily. The program included participatory instruction on the biodesign innovation process, including the opportunity to apply it to a company-specific project during the course with the help of Biodesign faculty.

According to the attendees, high-value takeaways included the hands-on nature of

the program, networking within and across companies, and a fresh perspective on innovation. As one executive commented, "Need-driven innovation is a novel approach that runs counter to the usual corporate approach of technology extension — doing the same thing, only better. My entire team found the program inspiring."



Jay Watkins mentors at Biodesign Executive Education

April

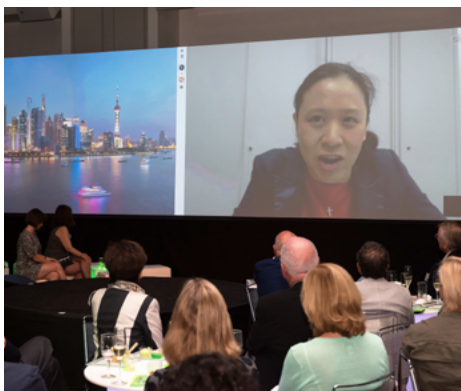
Stanford Biodesign was honored at an event orchestrated by the Stanford School of Medicine to celebrate our new status as a Center. The event, which was distinguished

by its glowing green décor, featured an impressive roster of speakers including Dean Persis Drell from the Stanford School of Engineering, Dean Lloyd Minor from the Stanford School of Medicine, Brook Byers of Kleiner Perkins Caulfield and Byers, and fellowship alumni Michael Ackermann and Dorothea Koh.

Koh, who participated via Skype, described how she is applying her Biodesign training to drive innovation in China: “You can’t take solutions that were created for developed markets and bring them into an emerging one like China and expect them to work the same way. Bringing healthcare to millions and millions of people requires you to change your paradigm. Every day, I use the



The unique décor at the Biodesign Center event



Dorothea Koh Skypes in from Asia



Paul Yock with Biodesign alumni fellows and faculty at the Center event

Biodesign process to create and commercialize disruptive business models tailored to the Chinese market.”

May

Biodesign marked its 15th anniversary with an afternoon panel discussion focused on the past, present, and future of Stanford Biodesign. The talk was moderated by David Cassak, managing partner of Innovation at Medtech, LLC, and featured founder and director Paul Yock; co-founder Josh Makower; innovation fellowship director Todd Brinton; director of academic programs Lyn Denend; co-director Tom Krummel; and director of strategy Uday Kumar.

Summarized Kumar during the event, “Over 15 years we’ve learned a lot, we’ve been able to teach a lot, but most importantly, we hope this network of people we’ve trained can help improve lives everywhere.” Afterwards, more than 200 members of the extended Biodesign community celebrated with us at a reception.

June

The 2015-16 class of Biodesign Innovation Fellows graduated in an inspirational outdoor ceremony that was attended by over 300 family, friends, mentors, and fellowship alumni. Josh Makower gave the keynote address, and the whole Biodesign team was there to help launch these newly minted innovators on the next steps in their careers (see sidebar on page 4: “Where Are They Now?” for updates on select fellows).

July

While cutting edge at the time of its initial release, Biodesign’s website had become outdated over the years. Recognizing the need for an overhaul, academic programs director Lyn Denend embarked on a mission to develop and deploy a new site that reflects the high quality of Biodesign’s programs and its leadership role in health technology innovation training.

The new site provides up-to-date information about all aspects of Stanford Biodesign, and is robust enough to meet the needs of a full range of online visitors. It is one of the most visible aspects of the Biodesign corporate rebranding that was completed this year, along with a new logo and mission statement. Looking for information about Biodesign's programs, impact, leaders, news, or events? Visit biodesign.stanford.edu.

August

Our 2016-17 Biodesign Innovation fellows arrived, a group that included five engineers and six medical doctors (two of whom also hold advanced degrees in bioengineering). The announcement of this year's clinical focus in aging and longevity was met with enthusiasm. This is an area ripe with opportunity as countries around the world confront a massive increase in their senior citizens and grapple with

2015-16 INNOVATION FELLOWS: WHERE ARE THEY NOW?

In clinical practice:

Alesandro Larrazabal is a pediatric interventional cardiology fellow at Texas Children's Hospital, Jonathan Schwartz is an interventional cardiology fellow at Stanford, and Craig Stauffer is a urologic surgery resident at Stanford.

In industry:

Rich Timm is a principal design engineer at Ethicon, Inc. and Rachel Gerver is working as an independent consultant to help companies commercialize microfluidic technologies.

Pursuing start-ups:

Véronique Peiffer and Justin Huelman are working on a treatment for palmar hyperhidrosis (excessively sweaty hands) and Elise DeVries is continuing her work on a solution for women with underactive bladder.



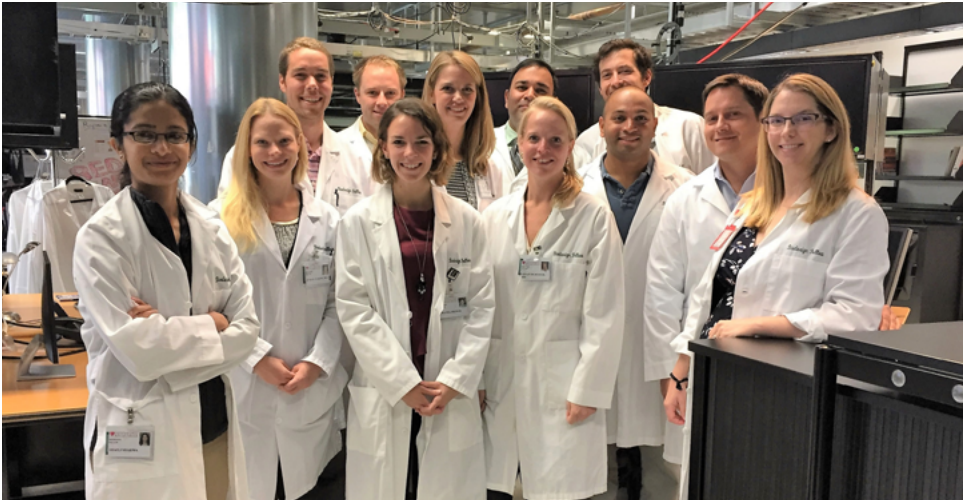
Josh Makower addresses the 2015-16 Innovation Fellows



Graduation, June 2016



Rich Timm and Elise DeVries at work in the lab



2016-17 Biodesign Innovation Fellows

the accompanying growth in demand for age-related healthcare and services.

As always, the fellowship kicked off with a month-long bootcamp that included clinical lectures; talks on key topics such as business fundamentals, cost-effectiveness and value, regulatory pathways, reimbursement, and intellectual property; and a “mini-project” that serves as an accelerated introduction to the biodesign innovation process.

September

Stanford Biodesign had the unique opportunity to help convene a group of leaders from universities and governmental institutions across the Asia Pacific region who share an interest in training students to develop technologies to solve regional healthcare problems. The meeting was intended to help the participants, all of whom offer (or are aspiring to build) innovation training programs, explore potential synergies by fostering closer, more collaborative relationships.

Stanford Biodesign previously helped create such a consortium, known by the acronym

“BME-IDEA” (Biomedical Engineering – Innovation, Design, and Entrepreneurship Alliance), in the United States in 2003, and then in Europe in 2013. Now, as Asia Pacific becomes the next hotbed of innovation activity in healthcare, this new regional alliance can help train innovators and facilitate the development of region-appropriate solutions to expanding healthcare needs.

October

The 11th meeting of the US BME-IDEA consortium garnered record attendance with

more than 100 participants representing 66 universities with biomedical engineering programs focused on innovation, design, and entrepreneurship. Paul Yock facilitated the opening panel discussion on major trends in health technology industry, which featured representatives from Medtronic, St. Jude, DJO Global, Johnson & Johnson, and Boston Scientific. He also led a roundtable discussion on the topic of training approaches for value-based innovation. This session explored key changes taking place within the health technology industry and how biomedical engineering programs can better equip students to become effective contributors in the new environment.

Also at the event, Lyn Denend, Biodesign’s director for academic programs, facilitated a roundtable discussion on clinical immersion models, focusing on innovative ways to allow large groups of students to perform first-hand needs-finding such as the use of simulations, immersion in care environments other than the hospital,



Attendees at the first BME-IDEA Asia Pacific meeting

and bringing patients and physicians into the classroom.

November

Changes in tenancy at our shared office space at Stanford's Clark Center led to the opportunity to relocate our collaboratory (a creative maker space for the development of prototypes), into a new and larger room. The move triggered a partial office re-design that was planned and managed by Biodesign's director of operations, Carolyn Heller. Under her creative guidance, the former collab was transformed into a design studio that has already proved enormously popular for workshops, group activities, and other events. We also

added a small kitchen area, lightened up our brainstorming room with windows to enhance creativity, and freshened up two small conference rooms that are ideal for meetings and team collaboration sessions.

December

The *Annals of Biomedical Engineering* published a paper written by Stanford Biodesign on outcomes from the Biodesign Innovation Fellowship. Entitled "[The Impact of Postgraduate Health Technology Innovation Training: Outcomes of the Stanford Biodesign Fellowship](#)," the paper describes the career focus, leadership trajectory, and productivity of 114 Biodesign Innovation Fellowship alumni. The data

suggest a positive impact of the fellowship program on its trainees.

NEW BIODESIGN STAFF

During the first half of 2016, Stanford Biodesign welcomed five new staff members. Annette Ewanich joined as executive assistant to Paul Yock and Gordon Saul; Melanie Ester became our course manager; Carolyn Heller came on board as director of operations and finance; Stacey McCutcheon joined as manager of academic projects and communications; and Cece Torres took over as our program assistant.



The old brainstorming room



Remodeled brainstorming room



The old studio space (formerly the collab)



The new Biodesign studio

BIODESIGN BY THE NUMBERS*

41

companies have been founded by all Biodesign trainees based on technologies originated at Biodesign.



Those 41 companies hired

635

fulltime employees, raised more than

\$377 million

in funding, and helped

527,000+ patients.

35

additional companies founded by fellows after Biodesign.

Those companies have helped more than

1 million patients.



32

companies founded from Biodesign-supported translational research projects.



955

alumni fellow authorships on issued healthtech patents.



Percent of fellows who believe the program was extremely or very beneficial to their career: 91%

84% of alumni have trained others on aspects related to the blodesign process.



This equates to

10,000+ training experiences, or

~75 trainees per trainer.

*Data gathered in March 2016

SPONSORS MAKE THIS POSSIBLE

We are exceptionally grateful to the following sponsors who have helped advance the Biodesign mission. Thank you for your continued support!

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To learn more about how you can get involved with Stanford Biodesign, please contact:

[Melanie Erasmus](#) (650) 723-9948

[Allie Suzanne Gregorian](#) (650)

724-9910

For other information about Stanford Biodesign, please contact Stacey McCutcheon at staceypm@stanford.edu. We look forward to hearing from you!



Grateful 2015-16 Fellows