

# 2018 ANNUAL REPORT

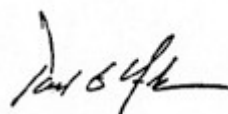
## A Message from Paul Yock

When we ask our trainees what motivates them to become health technology innovators, they most often reply that it's their desire to help patients in a significant and scalable way. In 2018, we reached a milestone that illustrates that promise; technologies initiated by our trainees during their time with Stanford Biodesign have been used to help more than 1.5 million patients. We are exceptionally proud of this impact and excited to watch as this number continues to grow. I encourage you to read the stories of some of the innovators who contributed to this accomplishment, and the patients who inspired them, on this special section of our [website](#).

The Innovation Fellows who graduated in 2018 are on their way to add to this number by taking forward projects that address important needs in stroke detection, early-stage lung cancer detection, and vascular access for hemodialysis. Other 2018 endeavors included expanding our teaching portfolio with the relaunch of our course in Global Biodesign. We also kicked off this year's Biodesign for Digital Health course under the direction of Oliver Aalami, a vascular/endovascular surgeon, Biodesign Faculty Fellowship alum, and an accomplished digital health innovator. We expanded our efforts to support early-stage innovators with a new role administering seed grants for the Stanford Neuroscience Institute. And, after eight years of collaboration, we celebrated with Singapore-Stanford Biodesign as the program achieved independent status.

With these milestones came transitions. Marta Gaia Zanchi, founding director of our digital health program, relocated to Barcelona where she is launching a new fund to advance the innovation ecosystem there. Additionally, Todd Brinton, director of the Innovation Fellowship, accepted a new position at Edwards Lifesciences that reflects, in part, the desire by Edwards to implement the Biodesign process more fully within their organization. Todd will complete the 2018-19 fellowship year here, then continue to contribute to our programs in an advisory role.

Like all changes, these transitions represent an opportunity for us to evolve, expand, and strengthen our leadership team, so please stay tuned for updates. Looking ahead, we continue to be inspired by our trainees as they work globally to understand and address unmet needs in healthcare, train others in our process, and drive innovation projects within start-ups and larger companies. And we are grateful for the vision and generosity of our donors, advisors, and mentors, whose support and commitment underpin all of our efforts.



Paul Yock, MD  
Founder and Director, Stanford Byers Center for Biodesign



# 2018 Highlights

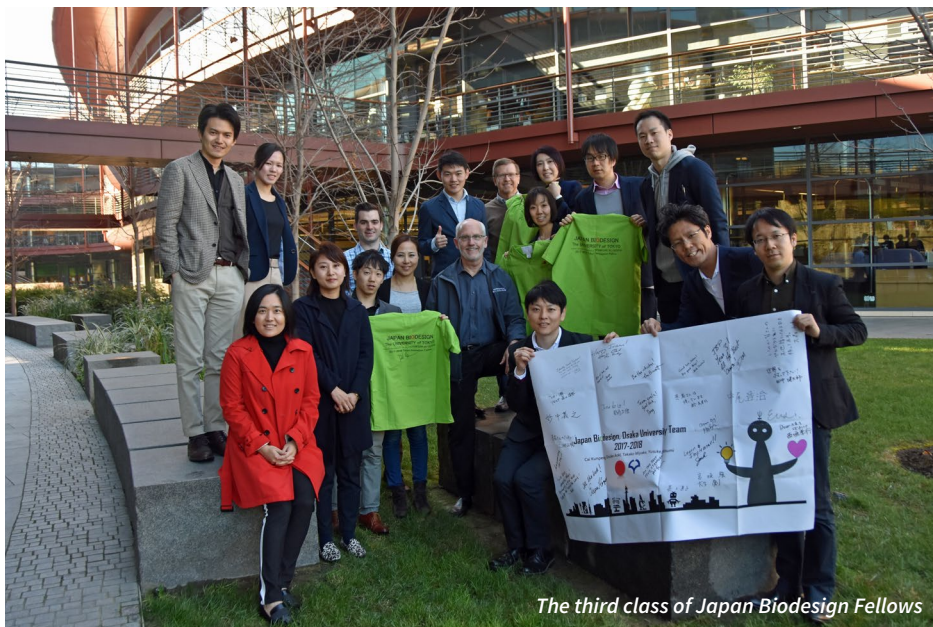
## January

The eighth class of Singapore-Stanford Biodesign Fellows arrived for six months of training in the biodesign innovation process. Their clinical focus was diabetes, a problem of epidemic proportion in Asia. After leaving Stanford, the fellows conducted immersive research in China, Indonesia, and Singapore before working on innovative ideas to tackle challenges for patients in the region.

Also in January we welcomed two new participants in our Global Faculty Training program (Jozef Bartunek from Belgium and Matt Oldakowski from Australia) and kicked off the 2018 Biodesign Faculty Fellowship with 12 Stanford Faculty members from medicine and engineering.

## February

Our third class of Japan Biodesign fellows arrived from Osaka University, Tokyo



*The third class of Japan Biodesign Fellows*

University, and Tohoku University to begin a busy two weeks of innovation training. Their curriculum included coaching from Stanford Biodesign's global faculty, a full-day design thinking workshop, and visits to the Fogarty Institute for Innovation, The Foundry, and the offices of several Biodesign-originated companies.

## March

We had a full house for our sixth annual Executive Education program, with nearly 90 corporate leaders from Abbott, Baxter, BD, Edwards, Johnson & Johnson, and Stryker on deck for an intensive, hands-on training program to enhance



*Michael Ackermann leads a team exercise at Executive Education*



innovation within their organizations. According to one attendee, “The content was enlightening and pertinent to our organization.” Another noted that, “The process has a solid chance of making a difference in my business,” which we certainly hope is the case!

## April

Stanford Biodesign’s “From the Innovator’s Workbench” speaker series featured a robust and accomplished lineup of innovators and medtech executives this year. Our first guest was Biodesign Innovation Fellowship co-founder Josh Makower and a panel from his medical and health technology incubator, ExploraMed. At the second event, we heard from Joe Almeida, CEO of Baxter International, before wrapping up the series with Yoh Chie Lu, founder of Biosensors, Inc. Yoh Chie described how he leveraged healthcare needs in China to take his company from a manufacturer of

medical device consumables to one of the largest suppliers of cardiovascular stents globally.

Also in April, we launched a series of online case studies to help innovators and instructors explore challenges and opportunities in identifying, inventing, and implementing new health technologies. The first set of cases, all focused on the broad area of digital health, are available in the [learning](#) section of our website.

## May

In a moving ceremony attended by associates, mentors, and friends from the National Academy of Engineering, the Stanford School of Engineering, Stanford Medicine, and the health technology industry, Paul Yock was formally presented with the 2018 Bernard M. Gordon Prize for Innovation in Engineering and Technology Education. Paul was honored for “the development and global

dissemination of Biodesign, a biomedical technology training program that creates leaders and innovations that benefit patients.” The prize is the Academy’s top award for teaching.

That same month, Stanford Biodesign went to Brazil! Global advisor and Biodesign Faculty Fellowship alum Robson Capasso, along with our director of academic programs, Lyn Denend, traveled to São Paulo to lead a week-long innovation training program in partnership with Hospital Israelita Albert Einstein. Rounding out the core team were alumni fellows Ravi Pamnani, Vijay Rajasekhar, Michael Ackermann, and Ken Wu, along with Robert Chang, another Biodesign Faculty Fellowship alum.



Paul Yock receives the Gordon Prize



## June

The future of healthcare was on display at the second annual Health Technology Showcase, where Biodesign student teams demonstrated projects addressing a wide range of health care needs, from improving asthma medication compliance to delivering a better prosthetic fit for amputees. Guest speaker Yogen Dalal, founder of Glooko, gave a provocative [opening speech](#), and a panel of judges selected the top three projects for awards.

At graduation, we enjoyed catching up with the hundreds of Stanford Biodesign mentors, friends, alums, (and babies!) who gathered to send off the 2017-18 Innovation Fellows. Speaking on behalf of the graduates, Derek Thong gave an inspiring speech about innovations that “deserve to exist” because they address real problems and help patients, even if they’re not destined to become billion dollar companies, save millions of lives, or dramatically reduce healthcare costs. (To catch up with this class of fellows, see the sidebar “Where Are They Now.”) We also recognized our global faculty trainees

who won the [LUNAR Robert Howard Next Step Award](#) for Earbuddy, a non-invasive solution for children with a common ear disease known as “glue ear.” The team was awarded 200 hours of complimentary design and engineering consulting to advance Earbuddy to patients.

## July

Now in its second year, the Undergraduate Summer Needs Finding program gave a group of dedicated undergraduate students the opportunity to directly observe and validate unmet needs in healthcare. The needs identified ranged from issues with arterial line placement in surgical patients to diabetes management in teenagers transitioning to adulthood.

We also welcomed the summer interns from the Fogarty Institute for Innovation for a one-day workshop on the Biodesign innovation process. Special thanks to our dedicated teaching team: Lyn Denend, Richard Fan, Justin Huelman, Ross Venook, James Wall, Shiqin Xu, and Marta Zanchi.

## Scenes from graduation



*The next generation of Stanford Biodesigners*



## August

Last year, Biodesign launched the Founder's Forum program in India to help Indian innovators get their technologies "the last mile" into hands of the doctors and patients who need them. In 2018, the fourth convening of the Forum in Raipur tackled the challenges of innovating for India's public health system. On day one, company founders met with industry advisors from the US Agency for International Development, the Bill & Melinda Gates Foundation, PATH, Phoenix Medical Systems, Boston Scientific, Stryker, Medtronic Labs, and others to identify obstacles to piloting and scaling innovative health technologies in the state-wide public health systems. On the second day, health officials from multiple states and the Chief Minister of Chhattisgarh joined for a collaborative discussion on how to more efficiently support the adoption of new technologies in those states.

Also in August we welcomed the 2018-19 Biodesign Innovation Fellows! Our newest

class of innovators included five physician and seven engineers. For the first time, the women outnumbered the men, seven to five. We selected ophthalmology as the clinical focus for 2018, with our Specialty Fellows working in cardiology and ENT.

## September

The BME-IDEA consortium, which exists in the US, Europe, and Asia, was formed to share experiences across the community of university programs teaching innovation, design, and entrepreneurship in biomedical engineering; discuss challenges and opportunities for the enhancement of these programs; and explore the potential for creating mutually beneficial tools and resources. The 2018 US meeting, organized under the leadership of Stanford Biodesign, broke attendance records with 115+ participants representing 50+ universities. Highlights included interactive sessions on global partnerships, diversity in BME, industry-academic partnerships, healthcare economics, team dynamics, and technology translation.

## Where are they now?

An update on the 2017-18 Innovation Fellows

Ayo Roberts, Patrick Thompson, Orestis Vardoulis, and Urs Naber have founded Zeit Medical, a project focused on early stroke detection for high-risk individuals. The team beat 55 other entrants in the Silicon Valley Boomer Venture Summit & Business Plan Competition to win funding to advance their efforts.

Bryan Hartley, Ben Berkowitz, and Faculty Fellowship alum Harmeet Bedi are working on the Pulmera Airway Visualization System, a technology that improves early stage lung cancer detection by helping doctors visualize and access airways more effectively. The team won \$250,000 in funding from the Bonnie J. Addario Lung Cancer Foundation.

Dimitri Augustin and Racquel Redwood are working on a non-invasive wearable device that assesses the health of a dialysis fistula (graft). They are currently performing clinical studies with hemodialysis patients.

Topher Kinsella is consulting, investing with Life Science Angels, and working as a trauma and acute care surgeon in the Bay Area. Derek Thong returned to McMaster University to complete his residency in physical medicine and rehabilitation. Nassir Mokarram returned as a research faculty at Duke University and is a consultant for The Foundry. Zach Wolf is exploring opportunities at mid- and early-stage start-ups in North Carolina's Research Triangle.



*The 2018-19 Innovation Fellows*

## October

In an [article](#) published in *Fast Company*, Paul Yock explained why the lean start-up approach favored by many high-tech innovators, in which they push quickly to get a minimum viable product to market and then iterate to improve it based on what most resonates with consumers, is ill-suited for healthcare, a much more complex, highly-regulated industry. He asserted that a better approach is need-driven innovation, where the innovator starts by deeply understanding an important problem in healthcare and then designs a technology that is uniquely suited to solve it. The article was well-received, with luminaries such as Eric Topol of Scripps Research weighing in with support for the approach.

## November

The twentieth annual Fogarty Lecture featured Dr. John Adler, founder of the Cyberknife® frameless stereotactic radiosurgery system, a break-through therapy for patients with brain tumors and other lesions deep in the body. Speaking before a crowd of 300+ people, Adler explained why bringing medical technologies from ideas into patient care is the hardest thing he's ever done. "Don't do it to make money," he cautioned. "Do it because you're passionate."

## December

At the Asia-Pacific meeting of BME-IDEA, Lyn Denend, Paul Yock, and Biodesign global faculty including Ritu Kamal, Anurag Mairal, Uday Kumar, Chris Shen,

and alumni including Partha Ray, Jagdish Chaturvedi, and Prusothman Sina Raja, shared their expertise on topics such as creating a medtech ecosystem in India, lessons from industry, reimbursement, and technology translation. The 50+ participants also explored cross-program collaboration opportunities and shared strategies for overcoming common challenges.





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## Our Impact

Stanford Biodesign is proud to have helped educate and empower...

**161** Innovation Fellows since 2001

**1,900** Stanford students since 2002

**463** corporate executives since 2013

**125** global fellows and faculty since 2015

**50** Stanford faculty since 2015

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## Promotions & Awards

Lyn Denend, our director of academic programs, was appointed as a lecturer with Stanford Medicine.

Director and founder Paul Yock was one of five innovators honored with the National Academy of Engineering's Russ Prize for advancing the minimally-invasive treatment of advanced coronary artery disease. The prize honors two of Yock's inventions; the Rapid Exchange™ stenting and balloon angioplasty system, which is now the primary system in use worldwide, and intravascular ultrasound (IVUS), a medical imaging technology. The Russ Prize recognizes outstanding bioengineering achievements that improve the human condition through their widespread adoption.



*Lyn Denend and Paul Yock*

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## Get Involved!

For more information on how you can support Stanford Biodesign, please contact Allie Gregorian at (650) 724-9910 or Ariel Korn at (650) 850-1859.

For other information about Stanford Biodesign, email Stacey McCutcheon at [staceypm@stanford.edu](mailto:staceypm@stanford.edu) or visit us [online](#).



Stanford Biodesign faculty and alums at graduation