

STANFORD BYERS CENTER FOR BIODESIGN

Stanford Biodesign in India

Phase 1 — 2007 to 2016 — Training Local Innovators and Catalyzing the Indian Medtech Ecosystem

Stanford-India Biodesign (SIB) was launched in 2007 as a first-of-its-kind collaboration between Stanford University, the All India Institute of Medical Sciences (AIIMS), and the Indian Institute of Technology (IIT) Delhi. The goals of this partnership were to identify and train a first generation of local innovation leaders in medical technology who, in turn, would help stimulate India's nascent medtech industry.

From the outset, Stanford Biodesign identified a critical success factor for the program: it had to focus on training India-based innovators to develop new technologies specifically for the Indian healthcare environment rather than furthering the country's reliance on western technologies (according to some estimates, more than 80% of all medical devices are imported into the country).

To accomplish this ambitious objective, the SIB program was designed with two distinct parts. First, each class of four SIB fellows, all Indian nationals, would travel to Stanford for six months of world-class training in the Biodesign innovation process. This process is a proven approach to medical

technology innovation that involves:

- Identifying important unmet medical needs through in-depth clinical immersion and research.
- Inventing novel technologies and supporting business models.
- Implementing those solutions into patient care through product development and commercialization planning.

During those six months, the SIB fellows would work in multidisciplinary teams to learn and apply this process to real-world healthcare projects identified in

Stanford's hospitals and clinics. For the second part of the SIB program, the fellows would then return to Delhi to repeat the process, this time to address the unique unmet healthcare needs of Indian patients, physicians, and healthcare facilities, and to take their innovative solutions forward into patient care.

Over the program's nine-year duration, Stanford-India Biodesign trained 32 innovators who developed 14 technologies and started 13 companies. (Read more about some of these technologies in the section that follows.)



The first group of SIB applicants arrive for interviews at Stanford Biodesign.

More importantly, the SIB program helped ignite an innovation mindset within the broader Indian medtech ecosystem and helped coalesce a fragmented group of stakeholders, including the Indian Government, device manufacturers, and funders.

The Indian innovation ecosystem is now a vibrant community that includes more than a dozen innovation training programs that are directly or indirectly modeled after SIB in academia and private sector organizations.

Thanks to SIB's successful track record, our Indian partners transitioned to independent status. The program is known today as the School of International Biodesign based at AIIMS. Our former SIB fellows are now leading and advising this initiative.

According to Professor Rajiv Doshi, Director, India Program, Stanford Biodesign, "We are proud of everything the Stanford-India Biodesign program has accomplished and are delighted that our curriculum continues to be a guiding light for India's aspiring medtech innovators."



SIB fellow Mridusmita Choudhury speaks with villagers at a rural clinic outside Delhi.

Innovative Biodesign Technologies in India

Consure Medical

Consure Medical develops and commercializes innovative critical care technologies. Consure's flagship product, Quora, helps bedridden patients and their caregivers manage fecal incontinence, a distressing condition that affects more than 100 million patients worldwide. Consure was founded by SIB fellows Nish Chasmawala and Amit Sharma. The Consure team has received FDA 510(k) clearance for their low-cost catheter device and simultaneously launched the product in India and the US.

HiCARE LIMO

HiCARE LIMO is a unique cardboard splint that allows caregivers to temporarily and cost-effectively immobilize and protect injured limbs in trauma patients before the patient is able to receive definitive care. The technology was licensed by an Indian healthcare products manufacturing company and, to date, has been used to treat nearly 3,000 patients. HiCARE LIMO was developed by SIB fellows Darshan Nayak and Pulin Raje, and it won the prestigious Good Design Award.



(L to R) Professor Rajiv Doshi with HiCARE LIMO inventors Darshan Nayak, Pulin Raje, and Asokan Thondiyath.

Sohum Innovation Lab

Sohum provides an accurate and affordable newborn hearing screening device for use in resource-poor settings. Every year, roughly 100,000 children are born with hearing defects in India. If detected early, speech loss may be prevented. However, most hospitals do not offer diagnostic tests because of their high cost. Now available in India, the Sohum device has no expensive disposable parts, is easy to sterilize/reuse, and reduces the need for infant sedation. Sohum Innovation Lab was founded by SIB fellow Nitin Sisodia.

Windmill Health Technologies

Windmill Health's first product, NeoBreathe, helps caregivers save the lives of newborns who fail to breathe at birth. The world's first foot-operated resuscitation system, NeoBreathe makes it possible for a single caregiver to perform basic resuscitation by freeing the hands for important tasks such as mask holding and cardiac massage. The product, which is currently being used in 15 Indian states, was developed by SIB fellows Avijit Bansal and Ayesha Chaudhary.



SIB fellow Avijit Bansal demonstrates NeoBreathe. Photo by Vishal Koul for Outlook Business Magazine, India.



Participants at the inaugural Founders Forum in Mumbai, India.

Phase 2 — 2017 forward — Helping Indian Innovators Bring New Technologies to Patients

While the in-country Indian medtech ecosystem has become significantly more robust over the last 10 years, getting new technologies into the hands of patients and doctors where they can truly make a difference remains a formidable challenge. SIB fellowship alumni are seeking ongoing coaching and mentorship—beyond the scope of the original SIB training program—to help overcome the many hurdles that exist as they develop and drive the adoption of their new technologies.

To meet this emerging need, Stanford Biodesign recently launched a Phase 2 program to support aspiring Indian medtech innovators and increase their chances of scaling the impact of their innovations.

A core offering of our Phase 2 initiative is a twice-yearly executive education program for India's top start-up innovators, called the "Founders Forum." During each Founders Forum, participants share knowledge and receive mentorship from carefully selected experts in R&D, manufacturing, commercialization, and funding to help them mitigate risks related to getting new technologies into patient care. Sample topics include how

to best work with state and central government purchasers, and how to facilitate distribution to the poor in remote rural villages.

The Founders Forum has led to ongoing engagement between founders and advisors, which has already proven catalytic to these start-up companies. Over time, Stanford Biodesign will further assess the effectiveness of the program by evaluating the progress of participating companies and the total number of patients helped by their technologies.

To date, we have organized four Founders Forum events, with each attracting approximately 30 attendees including company founders, mentors, and executives from USAID, Gates Foundation, Stryker, Medtronic, Boston Scientific, Glaxo, Villgro, PATH, and TEAMFund.

"The most important takeaway is that the company founders find these sessions to be enormously valuable and that it appears to improve their companies' trajectories," said Anurag Mairal, Director, Global Outreach Programs, Stanford Biodesign. Professors Mairal and Raj Doshi together spearhead Stanford Biodesign's ongoing work in India.

Feedback from the Founders Forum

From the Innovators

"The Founders Forum is a much-needed initiative for the medtech innovation ecosystem in India. Founders get valuable input from industry leaders in an open, no holds barred format!"

—Siraj Dhanani, CEO, InnAccel

"This is the only forum in India that provides a platform for founders to interact and get specific guidance on their real-world problems."

—Nitin Sisodia, SIB alumnus, Founder & CEO of Sohum Innovation Lab

"Stanford-India Biodesign changed—and continues to change—the trajectory of medtech innovation in India."

—Krista Donaldson, CEO, D-Rev

From the Mentors

"This multifaceted group brings together great learning from challenges, failures, and successes. Very candid. Very informative."

—Neeraj Jain, India Country Director at PATH

"The coming together of medtech innovators, entrepreneurs, and industry advisors will ultimately have a positive impact on thousands of patients in India."

—Ravi Kaushik, Country Business Director, Diabetes, Medtronic India

"Stanford Biodesign has led by example with its deep-dive focus on India, which was the early epicenter for frugal medtech innovation and now is the undisputed model for other geographies."

—Tim Ring, CEO CR Bard and co-founder of TEAMFund

Project Spotlight: Rheumatic Heart Disease Awareness Video

2015 Stanford-India Biodesign fellows Shashi Ranjan, Debayan Saha and Harsh Sheth did extensive needs finding around rheumatic heart disease (RHD) in India as part of their fellowship training.

After months of on-the-ground research in resource-constrained settings, the team determined that the solution needed most was a way to increase awareness of RHD in children in order to improve early diagnosis and treatment.

With funding from the Edwards Lifesciences “Every Heartbeat Matters” initiative, the SIB fellows

have been working to create a culturally sensitive, appropriate, and provocative video that depicts early symptoms of RHD and the serious consequences that result if medical treatment is not sought.

Their public service video “A Sore Throat Can Hurt Your Child’s Heart,” began screening in India in late 2017.

Significantly, Anurag Mairal has facilitated a Memorandum of Understanding between the Government of Chhattisgarh, one of the areas most affected by RHD, and Stanford University to ensure

broad access to the video across that state.

It is anticipated that the video will ultimately reach several hundred-thousand people across India with its life-saving message.



An image from the RHD video.

Sponsors Make It All Possible

We are grateful to the early supporters who have helped catalyze the second phase of Stanford Biodesign in India:

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We look forward to expanding our network of supporters. To get involved, please contact Allie Gregorian allie.gregorian@stanford.edu, or visit biodesign.stanford.edu/giving.html.

To learn more about Stanford Biodesign in India, please contact professors Rajiv Doshi rdoshi@stanford.edu or Anurag Mairal mairal@stanford.edu.

Thank you!



SIB fellow Ayesha Chaudhary identifies clinical needs in a government hospital in India.



(Clockwise from bottom L): SIB fellows Siraj Bagwan, Jonathan Pillai, Jagdish Chaturvedi, and Siddhartha Joshi.



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