

Producing Tomorrow's Inventors

By ANDRZEJ ZWANIECKI

Medical technology innovations from Stanford students

Cardiologist Uday Kumar was completing a fellowship in biomedical technology products design when he decided it was a good time in his life to start a company.

Kumar had an idea for a medical device. It was a raw concept, not even a prototype at that stage. But he started iRhythm Technologies to develop and market a cardiac-rhythm monitoring device.

California-based iRhythm Technologies is one of several medical-device firms started by graduates of the Stanford University Biodesign Innovation Program, which teaches how to invent, use and market new medical technologies. Innovative products hatched under the program include a visualization catheter used in coronary procedures, a minimally invasive device for extracting bone marrow and a special heart coating that prevents dilation during heart operations.

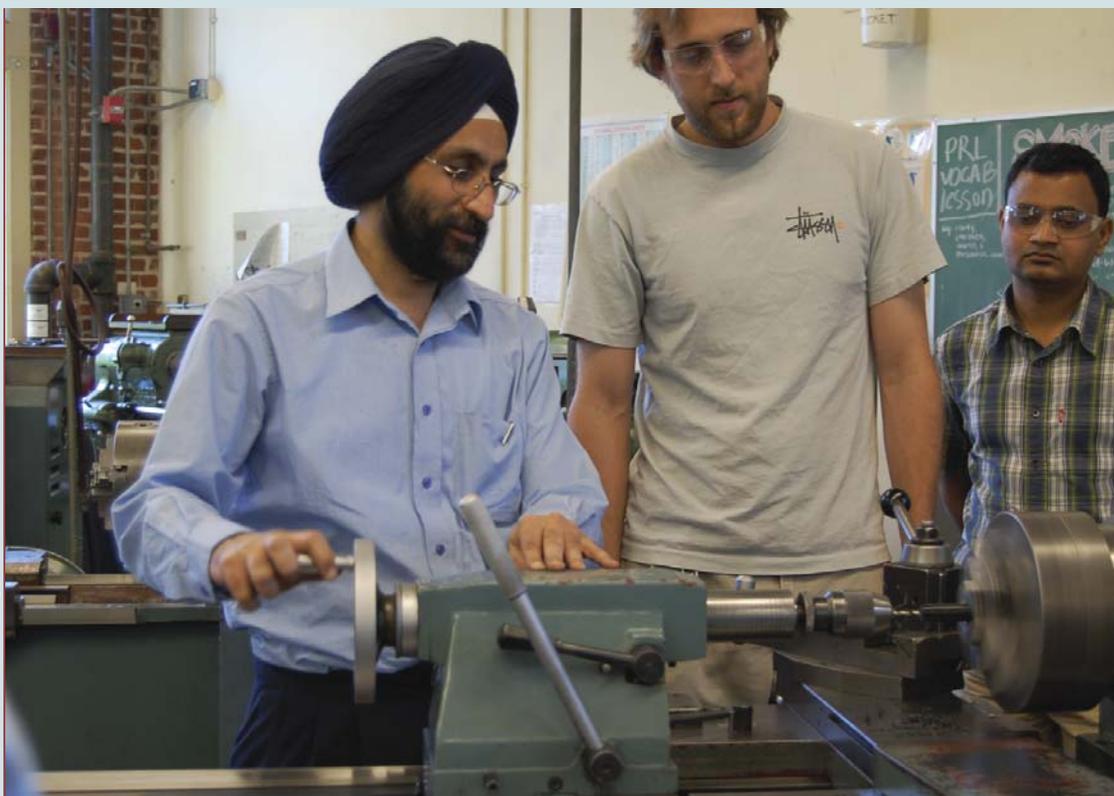
But the seven-year-old program aims at producing inventors—developing people like Kumar—rather than inventions, says one of the managers, Christine Kurihara. The focus is on

Cardiologist Uday Kumar started iRhythm Technologies.

Courtesy Uday Kumar



EDUCATION



Sandeep Singh, Peter Frykmann and Jayant Karve at Stanford University's Product Realization Laboratory.

North Carolina established their own programs based on the Stanford model.

Stanford University has also launched a small-scale program for students from a technical university in Monterrey, Mexico, and formed a partnership with India's government to stimulate innovative and cost-effective technological solutions to medical problems.

Stanford-India Bidesign's goal is to train the next generation of medical technology innovators in India. Funded by the Department of Biotechnology, Ministry of Science and Technology, Government of

India, Stanford University, and other supporters, the program is based in New Delhi. Approximately half of the fellows' time is spent in India, and the other half at Stanford. Fellows work as part of a team for a year and those with well-developed projects have a chance of continuing their fellowships for another year.

"The purpose is to eventually help meet the medical needs of the people at the bottom of the economic pyramid in India," says Balram Bhargava, the executive director of Stanford-India Bidesign and a professor of cardiology at the All India Institute of Medical Sciences (AIIMS).

Launched in 2007, it is administered as a collaboration between Stanford University, the Indian Institute of Technology, Delhi, and AIIMS in partnership with the Indo-U.S. Science & Technology Forum. There are plans to take the fellowship and associated teaching to other centers in India.

"By sharing our teaching methods with our Indian partners, we expect similar biodesign training programs to spring up around India..." says Paul Yock, director of Stanford's biodesign program. "We hope this will parallel the extraordinary growth of the medical technology industry in the Silicon Valley over the past 25 years."

<http://biodesign.stanford.edu/bdn/india/>



Andrzej Zwaniacki is a staff writer with America.gov

training students, fellows and faculty in a systematic approach to solving medical problems and developing technologies that apply the solutions in medical practice.

Kurihara says she looks for people who have demonstrated "an innovative streak" but do not have specific ideas for medical devices.

"We want them to have a clean slate," she says, because the program's main concept is to teach the entire process—from identifying the need for a new device to designing, patenting and marketing it—rather than how to bring pre-conceived ideas to fruition.

"When they move through their careers, they will be able to repeat this process over and over again."

Eight of roughly 90 applicants are selected each year for the rigorous 10-month program, and 60 graduate students for a month-long version. People from different backgrounds are sought after to set up multidisciplinary, four-member teams. Most have doctoral or master's degrees from medical, engineering or business schools.

For Kumar, working with diverse teammates was eye-opening.

"I was able to take what I knew and build upon it in a different mode than what I might have used if I had been on my own," said Kumar, who moved to the United States from Bangalore when he was 3.

Students spend the first few months in clinics trying to identify medical needs and then winnow about 300 ideas down to a few. They use ideas discarded by the more experienced fellows and push them through the development process.

Participants are expected to try to patent the ideas they develop, according to Kurihara. But because they can graduate without a patent, in some years three or four designs are patented, in others, only one or two.

Those who want to tap the commercial potential of their patents have access to the venture capital industry concentrated around the university in California's Silicon Valley. They have numerous opportunities to meet with representatives of more than 30 such funds, all of which are associated with the program.

Kumar says he learned how to talk to venture capitalists and found out what expertise he would need to develop an idea into a business.

When Kumar's teammates decided to pursue different careers after graduating, he says he started a company alone, but recruited a seasoned chief executive and soon thereafter got venture capital funding.

Launches of several companies by graduates have drawn the attention of other U.S. universities. The University of Minnesota and Duke University in

