

Deshpande Center for Technological Innovation

The Deshpande Center for Technological Innovation serves as a catalyst for innovation and entrepreneurship by supporting the research of MIT faculty and students and facilitating collaboration with entrepreneurs, venture capitalists, and innovative businesses. It carries out its mission through several activities, including the Grant Program, the Catalyst Program, 10.807J/15.371J Innovation Teams (“i-Teams”) subject, and sponsored events. The center’s goal is to be able to accelerate the movement of technology from the laboratories at MIT into the commercial marketplace where the technology can have an impact.

The Deshpande Center was founded in 2002 through a generous gift of \$20 million from Jaishree and Gururaj “Desh” Deshpande, cofounder and chairman of Sycamore Networks, Inc. The center depends on the generous support of industry, the entrepreneurial community, and the MIT alumni communities to sustain its programs.

Executive director Leon Sandler spearheads the Deshpande Center’s efforts, along with Charles L. Cooney, faculty director and Robert T. Haslam professor of chemical engineering. Guidance is provided by a steering committee that includes Edward Anderson of North Bridge Venture Partners; Desh Deshpande; Robert Langer, Institute Professor; Thomas Magnanti, Institute Professor and former dean of the School of Engineering; Rafael Reif, provost; and Subra Suresh, director of the National Science Foundation and former dean of the School of Engineering.

Highlights

In the academic year 2010, the center continued to see more of its projects move towards commercialization. Since inception, the Deshpande Center has funded more than 80 projects with more than \$10 million in grants. Twenty-one projects have spun out of the center into commercial ventures, 20 as startups and one as a license to an existing company. The 20 startups have collectively raised more than \$180 million in outside financing. Thirteen venture capital firms have invested in these startups that now employ more than 200 people (see <http://web.mit.edu/deshpandecenter/spinouts.html>).

Spin-offs in Academic Year 2010

Several Deshpande Center projects spun out from MIT and commercialized their technologies:

Firefly Bioworks: A molecular diagnostics company founded by professor Patrick Doyle of the Department of Chemical Engineering and Dr. Daniel Pregibon, PhD ’09.

Entra Pharmaceuticals: A drug delivery company cofounded by professors Yet-Ming Chiang and Michael Cima.

i2Chem: A continuous flow chemistry company that does “chemical production on a chip,” cofounded by professors Klavs Jensen and Martin Schmidt.

Goby: A search engine which allows users to quickly and easily find fun activities in their locale or fill their next vacation itinerary. Goby was founded by professor Michael Stonebraker of the Computer Science and Artificial Intelligence Laboratory.

Awards and Recognition for Grantees and Spin-offs

Deshpande Center grant recipients and spin-offs received notable media attention for their work.

A recent *New York Times* article titled “The Idea Incubator Goes to Campus” discusses how visionaries, researchers, engineers, and entrepreneurs are all working together to move technology “from the lab to the marketplace” at the MIT Deshpande Center for Technological Innovation. See http://www.nytimes.com/2010/06/27/business/27incubate.html?_r=1&hpw.

In the Department of Chemical Engineering, professor Michael Strano and postdoctoral researcher Paul Barone are experimenting with carbon nanotubes that could be injected under the skin to reveal blood glucose levels—a “tattoo” that could help diabetics track their blood sugar. This research is being funded by the Deshpande Center. The full article appears on the MIT News Office site: <http://web.mit.edu/newsoffice/2010/glucose-tattoo-0528.html>

Professor J. Christopher Love of the Department of Chemical Engineering believes that there is a better way to diagnose food allergies. One of his projects, funded in part by the Deshpande Center, involves a new technology that can analyze individual immune cells taken from patients, allowing for precise measurement of the cells’ response to allergens such as milk and peanuts. To learn more about this project, see <http://web.mit.edu/newsoffice/2010/food-allergies-0521.html>.

Funded by the Deshpande Center, professor Douglas Hart of the Department of Mechanical Engineering and his research team are developing 3D imaging technology that could lead to hearing aids that fit, and thus function, better than current models. To learn about this project, see <http://web.mit.edu/newsoffice/2010/hearing-aid-0520.html>.

Deshpande Grant Program Awards

The Grant Program provides research funds that permit MIT faculty and students to create and investigate new technologies and support the transfer of new knowledge and technologies from the Institute to young companies. The Grant Program consists of two types of awards: Ignition Grants of up to \$50,000 and Innovation Grants of up to \$250,000. Multiple experts in academia and industry review each application in two stages: pre-proposal and full proposal. The center announces awards twice annually.

The Deshpande Center awarded nine grants in fiscal year 2010 totaling just under \$650,000. The awards support a wide range of emerging technologies.

Ignition Grants

Ignition Grants target projects focusing on novel, enabling, and potentially useful ideas in all areas of technology. Though it might enable only exploratory experiments to establish proof of concept, an Ignition Grant can position projects to receive further funding.

Innovation Grants

An Innovation Grant benefits projects that have already established a proof of concept and identified a research and development path and intellectual property strategy. Each grant helps a project advance its technology and reduce technical and market risks. The goal is to reach a stage of development where investors are willing to invest in a start-up to commercialize the technology, or where an existing company wants to license the technology and develop it.

Academic Year 2010 Grant Recipients

Vladimir Bulovic: MEMS for Large Area and Flexible Applications. A flexible paper thin micro-electromechanical system array that can be used for sensing and actuation over large surfaces. See http://web.mit.edu/deshpandecenter/proj_bulovic4.html.

Michael Cima: Device for Treatment of Cerebral Edema. A drug device to treat edema with reduced systemic side-effects typical of conventional treatments. See http://web.mit.edu/deshpandecenter/proj_cima2.htm.

Joel Dawson: A New Architecture for Highly Efficient Broadband RF Transceivers. Very energy efficient, high-data-rate transmitters for broadband wireless communications, which will increase battery life in handsets and reduce heat generation in base stations (renewal from spring 2008). See http://web.mit.edu/deshpandecenter/proj_dawson.html.

Karen Gleason: Stable Inorganic-Organic Hybrid Light Emitting Diodes. Long-lived LEDs on flexible substrates providing energy efficient portable displays (renewal from fall 2008). See http://web.mit.edu/deshpandecenter/proj_gleason2.html.

Rohit Karnik and Jeffrey Karp: A Novel Device For Label-Free Cell Rolling Separation. A device for separating cells that can be used for monitoring and diagnosis of a wide variety of diseases (renewal from fall 2008). See http://web.mit.edu/deshpandecenter/proj_karnik.html.

Michael Strano: A Wearable Sensor for Continuous Glucose Monitoring for Diabetics. A carbon nanotube-based, minimally invasive, tissue-implantable, glucose sensor. The sensor will allow continuous glucose monitoring for diabetes patients, resulting in improved glucose regulation and better health. See http://web.mit.edu/deshpandecenter/proj_strano.html.

Timothy Swager: Chemical Production of Functionalized Graphene for Enhanced Composite Materials. The development of a chemical process to produce graphene at a

very reasonable cost, leading to the industrial use of new composite materials. See http://web.mit.edu/deshpandecenter/proj_swager.html.

Kripa Varanasi: Nano-engineered Surfaces for Ultra High Power Density Thermal Management. Heat needs to be removed rapidly from high-power electronics or the semiconductors will fail. This project will develop a system to very rapidly dissipate large amount of heat from such devices. See http://web.mit.edu/deshpandecenter/proj_varanasi.htm.

Graham Walker: New Antibiotic Target. A project to attempt to isolate lead compounds to develop a new antibiotic (renewal from fall 2008). See http://web.mit.edu/deshpandecenter/proj_walker.html.

Catalyst Program

Volunteers from the business community are integral to the Deshpande Center's mission of helping MIT innovators achieve market impact.

Catalysts are a highly vetted group of individuals with experience relevant to innovation, technology commercialization, and entrepreneurship. Catalysts provide individual contributions to the center and do not represent any company interests in their role as catalysts.

Catalysts are chosen based on the following qualifications:

- Experience in commercializing early-stage technologies and/or mentoring researchers and entrepreneurs as well as industry expertise
- Willingness to proactively provide assistance to MIT research teams
- Willingness to abide by the time commitment, confidentiality, and conflict-of-interest-guidelines
- Commitment to the interests of MIT researchers and the Deshpande Center

All catalysts must sign a catalyst guidelines document and agree to abide by the Deshpande Center's volunteer guidelines for managing privileged information and conflicts of interest.

Innovation Teams

The Innovation Teams subject is a full-credit subject taught jointly by the School of Engineering and the Sloan School of Management. The subject is designed for entrepreneurial and highly qualified graduate students throughout the Institute who want to help bring innovations from Deshpande Center-funded research projects and other MIT technologies to the marketplace. Guidance is offered by the project's principal investigators, faculty from MIT's Entrepreneurship Center, and Deshpande Center catalysts, and each team is expected to create a go-to-market strategy for a technology developed by Deshpande Center-funded research.

The course is led by a faculty team of Charles Cooney and Luis Perez-Breva from the Department of Chemical Engineering and Edward Roberts and Fiona Murray from the Sloan School of Management. The subject has been offered 11 times, has focused on go-to-market strategies for over 60 projects, and has engaged more than 300 students.

Deshpande Center Events

Through its sponsored events, the Deshpande Center seeks to bring together the components needed for MIT technologies to reach commercialization. These events connect faculty and students with members of the emerging technology industry.

IdeaStream Symposium

On April 13, 2010, the Deshpande Center held its annual IdeaStream Symposium aimed at connecting MIT researchers with the entrepreneurial community. The symposium included presentations highlighting grantees at different stages—from new grantee to spin-off; an Innovation Showcase at which MIT researchers pitched their innovative technology ideas and received market feedback from venture capitalists and successful entrepreneurs attending the symposium; and a “fireside chat” moderated by professor Fiona Murray, iTeams faculty director, and keynote speaker Dave Vieau, chief executive officer of A123 Systems. A demonstration of a Deshpande Center spin-out technology, the Brontes Lava Chairside Oral Scanner, took place during the lunch session. More than 200 entrepreneurs, industry executives, venture capitalists, and MIT researchers attended this year’s conference, which had the generous support of nine corporate sponsors. See http://web.mit.edu/deshpandecenter/ideastream2010/is10_index_new.html.

Catalyst Events

Near the start of each semester the Deshpande Center arranges a small reception to celebrate the latest grant recipients. This event is held in advance of announcing the grant round to the general public. It is an opportunity for the grant recipient teams and catalysts to get to meet and mingle with each other and with staff and other volunteers. All new grant recipients are also asked to give a brief “elevator pitch” of their project.

Open House

The Deshpande Center hosted its premier fall event, the open house, in December 2009. The event served as a poster session for active grant projects and gathered nearly 200 members of the Deshpande Center community, including members of the MIT Corporation, for an evening of camaraderie and networking.

Other Collaborations

The Deshpande Center met with delegates from over 20 national and international universities and organizations to discuss the center’s and MIT’s approach to innovation and technology commercialization. Deshpande Center staff also spoke at numerous forums, conferences, and events. The center is seen as an internationally renowned model for stimulating technological innovation. Leon Sandler, the center’s executive director, participated in the President’s Council of Advisors on Science and Technology

workshop on the future of advanced manufacturing and also in a US Department of Commerce workshop on innovation and technology commercialization.

Within the MIT community, the Deshpande Center actively collaborates with other members of MIT's innovation ecosystem, including the Technology Licensing Office, the Entrepreneurship Center, the Venture Mentoring Service, the Industrial Liaison Program, and numerous student organizations.

During the Independent Activities Period in January, the center cohosted a panel discussion and networking event with the Lemelson-MIT Program. The discussion focused on MIT resources available to faculty, students, and collaborators who have great ideas and inventions along with a desire to bring them to the marketplace. The panel drew on the experiences and insights from past Lemelson-MIT Program student prize winners, current and former Deshpande Center faculty and student grant recipients, MIT staff, and volunteers active in the innovation/entrepreneur ecosystem.

Leon Sandler
Executive Director
Deshpande Center for Technological Innovation

More information on the Deshpande Center for Technological Innovation can be found at <http://web.mit.edu/deshpandecenter/>.