



Sangeeta
BHATIA





The Ludwig MIT investigator on the importance of childlike curiosity to a scientific career, her long-standing advocacy for women as scientists and entrepreneurs and making science fit her life—not the other way around.

By the time Sangeeta Bhatia was in high school, she and her father—immigrant, engineer, entrepreneur—had worked out a plan for her life.

“The idea was that I would get a bachelor’s degree, and a master’s, and then I would go be a captain of industry,” says Bhatia, who is today a member of the Ludwig Center at MIT. That plan, she confesses, “evolved a lot along the way.”

Yet its contours remain distinctly visible in her biography. Bhatia indeed obtained a BS in engineering from Brown University and an MS in mechanical engineering from MIT. But she also went on to earn a PhD in biomedical engineering from a joint program of Harvard University and MIT and added to that an MD from the former. As for being a captain of industry, she chose instead to become a scientist and inventor—who has so far launched six biotechnology startups, received the 2014 Lemelson-MIT Prize (a.k.a. the “Oscar for inventors”) and is a member of the National Academy of Inventors. Her accomplishments in fields ranging from oncology, hepatology and infectious disease to nanotechnology and tissue engineering have earned her the extremely rare distinction of election to all three of the U.S. National Academies (Medicine, Science and Engineering), as well as the American Academy of Arts and Sciences.

Scientific achievement isn’t the only thing that distinguishes Bhatia. She has also emerged as a leading advocate for gender equity in fields related to science, technology, engineering and mathematics (STEM).

FINDING A NICHE

As an undergraduate at Brown in the mid-1980s, Bhatia worked as an intern in the laboratory of the tissue engineer Patrick

Aebischer, trying to apply piezoelectric materials to support nerve regeneration. Bhatia grew fascinated with the possibility of devising materials that communicate with living tissue for therapy. After a gap year at a drug company, she enrolled in the Harvard-MIT Health Sciences and Technology (HST) program. “I was one of two women in a class of about 40 students,” she recalls.

The HST program required students to take a year of classes at Harvard Medical School, and it was there that Bhatia “fell in love with the human body” and decided she’d become a doctor as well. For her graduate research, meanwhile, Bhatia developed microfabrication technology to grow liver tissue on a chip in Mehmet Toner’s lab at Massachusetts General Hospital. Toner would prove to be an influential mentor to Bhatia. “He saw more in me than I saw in myself,” says Bhatia. “He was the one who said I should at least consider interviewing for faculty positions. He saw that I had leadership potential and gave me that nudge of encouragement.”

Taking his advice, Bhatia accepted a tenure-track position at the University of California, San Diego, where she set up her first lab as she completed her medical training, and her husband—systems biologist Jagesh Shah—took up a postdoctoral fellowship. “I actually was not sure I wanted to be a professor,” she says. “My husband said to me, ‘Let’s just go try it out.’” As it turned out, Bhatia loved training young scientists and found herself surrounded by supportive colleagues.

“I didn’t feel that pressure to succeed as a junior faculty member where my whole life was on the line,” she says. “That allowed me to take more



Sangeeta Bhatia speaks at *TED Talks Live—Science and Wonder* in 2015.

Photo by Ryan Lash/TED

risks scientifically and follow my curiosity into new spaces.” One of those spaces was nanotechnology, a brand new field at the time. Bhatia began collaborating with Erkki Ruoslahti, president of the Burnham Institute in San Diego, to devise targeted nanoproboscopes for medical imaging. A paper out of that collaboration, she notes, remains among the most highly cited of her publications.

Bhatia drew an important lesson from that experience. “The reason to be in this profession is to do things that other people aren’t also doing,” says Bhatia. “Science can be scary. We train a really long time, and it feels like the stakes are high. And so, people can become overly strategic. They think, ‘What is my one reagent? Which experiment am I going to take to my lab and build my lab around.’ I ask them, ‘What are you curious

about, like when you were a kid?’ That spirit, in my opinion, is the most important thing to hold on to.” Though obtaining funding can feel like a consuming challenge these days, Bhatia notes, things aren’t quite hopeless. “We all think about going to the NIH, which is a wonderful mainstay, but there are also a lot of philanthropic and foundation sources,” she says. “There’s sponsored research from companies which, if done carefully, can also provide insights into knowledge gaps that are not obvious in the public domain. We have to teach our trainees to think a little bit broader about funding so that they can get going with their great ideas earlier in their career.”

HOMING INSTINCTS

As her career took off in San Diego, Bhatia became pregnant with her first child. There

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Photo by Bill Gallery

was uncertainty about departmental policies in addressing pregnancy and childcare, since the issue had never come up. “So, I said, ‘Okay, I’m going to learn about best practices and recommend them to the department,’” she recalls. “And that’s what we did.” She was also greatly helped by a Packard Fellowship, which allowed her to use \$10,000 of her stipend every year for childcare. “That may sound small in the scheme of a grant, but it was just life changing for me as a young investigator,” she says, adding that she still pushes the institutions she interacts with to adopt similarly supportive childcare policies.

Though she loved her work and colleagues at San Diego, Bhatia felt the urge to move back to Boston “After my husband and I had our first daughter, we felt this enormous pull to be near family again,” she explains. “We both come from big Indian families. A lot of what I’ve done since having kids has been around being the mother, wife, daughter and sister I want to be. Those things take time. I’ve made a lot of choices to have science fit in my life and not the other way around.”

In 2005, Bhatia accepted a position at MIT where she is today John J. and Dorothy Wilson Professor of Health Sciences and Technology and of Electrical Engineering

and Computer Science. Her lab had now expanded from the engineering of liver tissue and microfabrication to nanotechnology and then oncology, where she saw huge potential for the use of nanomaterials for diagnosis and therapy. She has sought to recreate in her lab the ethos of scientific freedom she enjoyed as a young professor in San Diego. She lets her trainees spend 20% of their time tinkering, for example. “They call it submarine time, where they can try something out that they are curious about,” she explains. “It doesn’t have to be anything to do with their project. Science is full of failure, so you have to have those fun moments.”

That culture has probably contributed something to the launch of five biotechs out of Bhatia’s lab, not to mention the many more established by her trainees. Most recently, Bhatia has co-founded a company—Glympse BIO—developing a sensor technology for the noninvasive detection of disease, including cancer. Another, Satellite Bio, which recently launched with \$110 million in funding, builds on her work engineering liver tissue to advance a new approach to regenerative medicine.

THE ADVOCATE

Between running her lab and launching

companies, Bhatia—a mother of two STEM-inclined girls, as she puts it—actively advocates for gender equity in science. Her efforts date back to 1993, when she and other women graduate students at MIT started a program, Keys to Empowering Youth, to inspire middle school girls to set their sights on STEM-related fields. “Young girls drop out of science disproportionately,” says Bhatia. “It starts at age 11 and is especially notable in subfields of engineering, math and physics.” Keys to Empowering Youth, is now run by an undergraduate Society of Women Engineers, for which Bhatia serves as an advisor. Bhatia also advocates for measures to promote gender equity further along the career path, such as deliberately ensuring parity in faculty and postdoctoral pay and recruitment, and in selecting speakers at conferences. “There’s a long list of best practices,” she says. “The NSF Advance Program has entire slide decks that you can download for your institution, and you can just adopt those policies.”

In a field as dominated by males as engineering, Bhatia recalls it took some time to feel at ease being herself. “I felt like an imposter in the room, and I was watching myself and picking my moment to speak,” she recalls, describing what is commonly referred to as “imposter syndrome.” She compensated by burying her femininity—avoiding makeup, wearing pantsuits. That, she says, changed after she read about the phenomenon and as she gained confidence in herself and came to appreciate her differences in ways she hopes other young women researchers do as well. “I realize that I manage differently, I do science differently, I start companies differently, I mentor differently, and that’s actually a strength,” she says. “The more comfortable you are being yourself, the more successful you’re going to be as a leader.”

Lately, Bhatia has aimed her advocacy at the highest rungs of the biotechnology ladder. With her friend and mentor Nancy Hopkins—a molecular biologist who famously led an influential [study](#) in the late 1990s

documenting gender discrimination across the School of Science at MIT—and Susan Hockfield, a former president of the university, Bhatia launched in 2018 the Boston Biotech Working Group (BBWG). Its aim is to bring gender parity to the notoriously male-dominated venture capital (VC) industry, which funneled just 2% of total funds to firms launched exclusively by women in the U.S. in 2021, according to the research firm PitchBook. A report put together by BBWG showed that less than 10% of the 263 start-ups spun out of seven departments at MIT had been founded or co-founded by women between 2000 and 2018, a period in which women comprised 22% of the faculty.

The BBWG hosted a series of dinners with VC and healthcare industry leaders to generate ideas about how to address these disparities. This exercise gave rise, among other things, to the Future Founders Initiative sponsored by Northpond Ventures, which recently underwrote a competition between aspiring women entrepreneurs for an incentive prize.

“We had nine women compete,” says Bhatia. “We created a cohort so they could support each other. We gave them world class mentors.” The winner received \$250,000 in discretionary funds, and the two runners up won \$100,000 each. But the others too benefited from the experience. “Eight of the nine are planning to start companies now,” Bhatia notes. BBWG’s aim is to cultivate an “ecosystem” that empowers women entrepreneurs, says Bhatia. “We have data gathering projects, mentoring projects, and initiatives to get more women on boards,” she says. “We have all kinds of experiments to accelerate the pace of change.”

If Bhatia’s track record is any indication, their results will be as useful as they are enlightening.