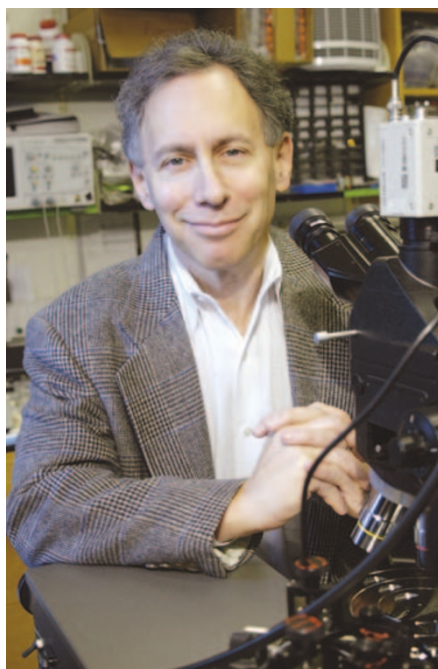


## CAREER PATH

## Robert Langer



Robert Langer was recently named Institute Professor at the Massachusetts Institute of Technology (MIT), the highest accolade awarded by the MIT faculty, and has been cited by MIT colleagues and others as “an extraordinary scientist” and “one of history’s most prolific inventors in medicine.” Despite having worked in academia for all of his career, Langer evidently has his foot in the industry camp too: his collaborative and innovative approach to inventing and developing medical devices has led to more than 500 issued and pending patents, many of which have been licensed to pharmaceutical and biotechnology companies worldwide. As a chemical engineer working in biology, his success is a great example of how taking an unconventional career path can be both fruitful and rewarding.

Langer’s career has seen him honoured with many awards. He is a recipient of the Draper Award, the engineering equivalent of a Nobel prize, and very recently has been awarded the largest US medical prize, the Albany Medical Center Prize, and is to share the 2005 Dan David Prize for Materials Science. But the Institute Professorship has particular resonance after what he admits was a “rocky start” at MIT. Indeed, his career

could have been a very different story if he’d taken the advice of some MIT colleagues early on when initially trying to apply engineering principles to solve biological problems.

“Some professors felt I didn’t fit in, and some of my fellow researchers thought my work was unimportant and even suggested that I should leave.” It’s an experience that has left Langer keen to encourage his own students to believe in themselves and stretch themselves scientifically, whether it be taking on a new, challenging discipline or turning their back on the obvious career path.

Langer graduated in 1974, but unlike many of his peers who took the obvious route into the oil industry, the prospect of such a career did little to entice him. Instead, he wanted his work to benefit human health, and so for his postdoctoral studies he joined the laboratory of Judah Folkman, renowned cancer researcher and pioneer of the drug delivery implant, Norplant, at Boston’s Children’s Hospital. It was a wonderful opportunity for Langer: “It was my first exposure to biology and Judah was very visionary, so it was a great experience for me.”

Langer began to use his engineering skills to develop polymer delivery systems for the controlled release of large-molecule cancer drugs, and published a landmark paper in *Nature* proving that you could deliver molecules of any size or charge using polymers, an approach that had previously been thought impossible. He regards this work, and his collaboration with Jay Vacanti on using polymer scaffolds to create new tissue, among the biggest highlights of his career so far. But making this happen involved some tough decisions. “It was

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“There may be many times when you try to do something in science or engineering that people tell you is impossible. But I like to think if you believe in yourself, if you really stick to things, there is very little that is really impossible.”

ROBERT LANGER, 1998, WHEN AWARDED THE LEMELSON–MIT AWARD

difficult to turn away from an obvious career and then to stick it out at MIT when it looked like I might not get tenure or be promoted. Many years later it’s easy to look back on it and see it as a good decision, but at the time it was very depressing.”

Langer modestly believes there was a certain amount of serendipity involved in his career progression and says that he was lucky to be in the right place at the right time. “Certain decisions I made were fortuitous. For example, how could I ever have known that biotechnology would emerge to be so important? But I think it’s always worthwhile taking chances and that’s the advice I would always give to my students.”

Langer’s students are success stories themselves, with more than 100 taking on professorships at universities worldwide and almost 200 in top positions in industry. Having the opportunity to encourage and mentor students and postdoctoral researchers to help them develop their careers is something that Langer finds rewarding, and he is very proud of their achievements. It is also part of the reason why he has never been tempted to swap academia for industry, particularly because balancing this supervisory role and his research is less of a challenge in the academic environment. “There are managerial responsibilities, but as an academic you are really your own boss. If I decide I want to follow a particular project, I can just do it. I have a great deal of interaction with industry and I enjoy that, but I also like the fact that my role enables me to work with students.”

When asked what career advice he gives to his students, Langer replies: “I always encourage them to go for the top jobs. People can be insecure - I was, too, as a young scientist - and so mostly I just try to get people to believe in themselves. But also, do what makes you happy rather than rich. My parents put a high premium on being happy with what you’re doing and I think it was good advice.”

As for future plans, Langer is happy to continue doing what he does now. “I love coming up with new ideas and I love working with the students. I also want to get more and more of our discoveries into the clinic where they can help people.”