Langer Lab

MIT Department of Chemical Engineering

Tethered nanoparticles make tumor cells more vulnerable - New strategy could improve performance of some immune-based drugs. [Full Story]

Research Overview

Our work is at the interface of biotechnology and materials science. A major focus is the study and development of polymers to deliver drugs, particularly genetically engineered proteins, DNA and RNAi, continuously at controlled rates for prolonged periods of time. Work is in progress in the following areas.

- Investigating the mechanism of release from polymeric delivery systems with concomitant microstructural analysis and mathematical modeling
- Studying applications of these systems including the development of effective long-term delivery systems for insulin, anti-cancer drugs, growth factors, gene therapy agents and vaccines
- Developing controlled release systems that can be magnetically, ultrasonically, or enzymatically triggered to increase release rates

More on Lab Research >>

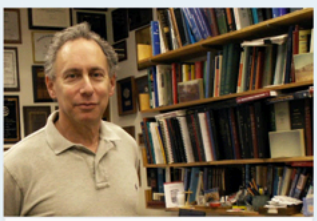
NEWS & EVENTS

Bob Langer receives the 2020 Maurice Marie-Janot Award

The 15th US-Japan Symposium on Drug Delivery Systems Conference was held in Hawaii in December 2019

Robert Langer wins the 2019 Dreyfus Prize in Chemical Sciences

[**More News**]



Robert S. Langer
David H. Koch (1962) Institute

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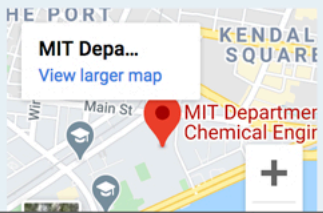
Accessibility

MAP & DIRECTION TO OUR LAB



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Research

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- Developing controlled release systems that can be magnetically, ultrasonically, or enzymatically triggered to increase release rates
- Synthesizing new biodegradable polymeric delivery systems which will ultimately be absorbed by the body
- Creating new approaches for delivering drugs such as proteins and genes across complex barriers in the body such as the blood-brain barrier, the intestine, the lung and the skin
- Researching new ways to create tissue and organs including creating new polymer systems for tissue engineering
- Stem cell research including controlling growth and differentiation
- Creating new biomaterials with shape memory or surface switching properties
- Angiogenesis inhibition

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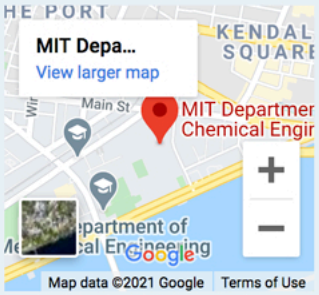

Center for Extreme Bionics

‹ Research

In this Group:

Overview

Updates

People

Projects

Publications

Half of the world's population currently suffers from some form of physical or neurological disability. At some point in our lives, it is all too likely that a family member or friend will be struck by a limiting or incapacitating condition, from dementia, to the loss of a limb, to a debilitating disease such as Parkinson's. Today we acknowledge—and even "accept"—serious physical and mental impairments as inherent to the human condition. But must these conditions be accepted as "normal"? What if, instead, through the invention and deployment of novel technologies, we could control biological processes within the body in order to repair or even eradicate them? What if there were no such thing as human disability?

These questions drive the work of faculty members Hugh Herr, Ed Boyden, Canan Dagdeviren, Joe Jacobson, Deblina Sarkar, and Institute Professor Robert Langer, and has led them and the MIT Media Lab to establish the Center for Extreme Bionics. This dynamic new interdisciplinary organization draws on the existing strengths of research in synthetic neurobiology, biomechatronics, and biomaterials, combined with enhanced capabilities for design development and prototyping.