Drug, Device, or Diagnostics?
Engineering in a New World of Medicine

By Prof. Michael Cima
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ABSTRACT
Medical technologies are evolving at a rapid pace. Portable communication devices and other handheld electronics are influencing our expectations of future medical tools. Advanced medical technologies of our future will not necessarily be large and expensive, but are just as likely to be small and disposable. In addition, the lines between drugs, devices, diagnostics, and procedures are being blurred. This talk will review how microsystems and microdevices are already impacting healthcare as commercial products or products in clinical developmental stages. Examples of systems for point-of-care diagnostics (POCT), patient monitoring, systemic drug delivery, local drug delivery, and imaging tools will be described. These technologies are moving care from hospitals to outpatient settings including physicians’ offices, community health centers, nursing homes, and patients’ homes.

BIOGRAPHY
Dr. Michael J. Cima is a Professor of Materials Science and Engineering at the Massachusetts Institute of Technology and has an appointment at the David H. Koch Institute for Integrative Cancer Research. He earned a B.S. in chemistry in 1982 (Phi Beta Kappa) and a Ph.D. in chemical engineering in 1986, both from the University of California at Berkeley. He was elected a Fellow of the American Ceramics Society in 1997. Prof. Cima was elected to the National Academy of Engineering in 2011. He now holds the David H. Koch Chair of Engineering at MIT. Prof. Cima is author or co-author of over 250 peer reviewed scientific publications, 50 US patents, and is a recognized expert in the field of medical devices and materials processing. Prof. Cima is actively involved in materials and engineered systems for improvement in human health such as treatments for cancer, metabolic diseases, trauma, and urological disorders. He is a co-inventor of MIT’s three dimensional printing process. Machines and products by many licensees using this process are used throughout the world. Prof. Cima also has extensive entrepreneurial experience. He is co-founder and director of MicroChips Biotech., a developer of microelectronic-based drug delivery and diagnostic systems. Prof. Cima took two sabbaticals to act as senior consultant and management team member at Transform Pharmaceuticals Inc. a company that he helped start and that was ultimately acquired by Johnson and Johnson Corporation. He is a co-founder and director at T2 Biosystems, a medical diagnostics company. Prof. Cima is also a co-founder and director of Taris Biomedical, a company specializing in pharmaceutical products for urology.

EVENT DETAILS
DATE: Wednesday, April 20, 2016
TIME: 12:00 PM
LOCATION: Babbio 122
Stevens Institute of Technology
ATTENDANCE: Public
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