



**Harvard-MIT Division of  
Health Sciences and Technology**

**Spring Term 2009**

## **HST-521 - Biomaterials and Tissue Engineering in Medical Devices and Artificial Organs**

Wednesdays and Fridays, 1:00 – 3:00 pm at Harvard Medical School (260 Longwood)

Course Director: Frederick J. Schoen, MD, PhD ([fschoen@partners.org](mailto:fschoen@partners.org))  
Associate Course Director: Ali Khademhosseini, PhD ([alik@mit.edu](mailto:alik@mit.edu))

Prereqs: Biology, Chemistry, and HST-030 or 035 Human Pathology recommended;  
or permission of instructor

HST-521 will:

- Focus on the structure, properties, and applications of biomaterials (synthetic or modified natural materials used to evaluate, replace tissues, organs or biological functions) and biological principles (e.g., development, stem cells, mechanotransduction) that support tissue engineering (use of biomaterials with incorporated cells and biological signals to stimulate tissue regeneration).
- Provide an integrated biological/engineering academic/corporate approach to biomaterials and their use in medical devices.
- Probe mechanisms and methods of evaluation for tissue/biomaterials and patient/device interactions.
- Assess current challenges and cutting-edge technological solutions to medical problems and their translation to the clinical environment.

Additional topics will include: key pathophysiological concepts of biomaterials-tissue and environment-tissue interactions; stem cells and regenerative medicine; biofunctional materials; nano-biomaterials; issues in design, development, fabrication and clinical evaluation; regulatory concerns; and novel research directions and applications of materials to medicine.

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