

MAE Baetjer Colloquium

Bio-responsive hybrid materials for regenerative medicine and biosensing



Molly M. Stevens
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12:30 PM 222 Bowen Hall

Bio-responsive hybrid materials are of growing importance with potential applications including drug delivery, diagnostics and tissue engineering. A side effect of longer life-spans is the failure of one part of the body. The search for replacement body parts has fuelled the highly interdisciplinary field of tissue engineering and regenerative medicine. This talk will describe our research on the design of new hybrid (nano)materials and nanomaterials to direct stem cell differentiation for regenerative medicine. We have also designed and developed porous silicon “nanoneedles” capable of efficiently, rapidly and safely delivering sensitive biocargoes to cells and tissues *in vivo* as well as interfacing with cells to inform intracellular pH and high resolution demarcation of tumorous region boundaries. This talk will also provide an overview of our recent developments in the design of materials for ultrasensitive biosensing, applying these nanomaterial-based approaches to high throughput drug screening and to diagnose diseases.

Molly M. Stevens is currently Professor of Biomedical Materials and Regenerative Medicine, Research Director for Biomedical Material Sciences in the Department of Materials, Department of Bioengineering and the Institute of Biomedical Engineering at Imperial College London, and Director of the UK Regenerative Medicine Programme Hub for Smart Materials. She received her PhD from The University of Nottingham in 2000, then conducted her postdoctoral research at MIT in the labs of Prof Robert Langer, where she co-developed innovative techniques for the regenerative of bone and other tissues. She joined Imperial College in 2004 and was promoted to Full Professor in 2008. Research in the Stevens Programme focusses on designing and developing innovative bio-inspired materials for applications in regenerative medicine, tissue engineering and biosensing. Her research has been recognised by over 20 major awards. More information on the Stevens Group can be found at <http://www.stevensgroup.org>.

