Georgia Institute of Technology

School of Materials Science and Engineering

materials science and engineering

MSE Seminar Wednesday, November 10, 2010

"Bio-inspired Materials for Regenerative Medicine and Sensing"

Presented by

Professor Molly M. Stevens

Wednesday, November 10, 2010
Van Leer Auditorium
4:00 p.m.

ABSTRACT

This talk will provide an overview of our recent developments in bio-inspired nanomaterials for tissue regeneration and sensing. Bio-responsive nanomaterials are of growing importance with potential applications including drug delivery, diagnostics and tissue engineering. Our recent simple conceptually novel approaches to real-time monitoring of protease, lipase and kinase enzyme action using modular peptide functionalized NPs will be presented.[1-3]

The highly interdisciplinary field of Tissue Engineering (TE) can also benefit from advances in the design of bio-responsive nanomaterials. TE involves the development of artificial scaffold structures on which new cells are encouraged to grow. The ability to control topography and chemistry at the nanoscale offers exciting possibilities for stimulating growth of new tissue through the development of novel nanostructured scaffolds that mimic the nanostructure of the tissues in the body.[4-7] Recent developments in this context will be discussed.

References

[1] A. Laromaine, L. Koh, M. Murugesan, R.V. Ulijn, M. M. Stevens. Journal of the American Chemical Society. 2007, 129, 4156-4157.
[2] J. Ghadiali, M. M. Stevens. Advanced Materials. 2008, 20, 4359-4363.
[3] D. Aili, M. Mager, D. Roche, M. M. Stevens. Nano Lett. 2010. DOI: 10.1021/nl1024062
[4] M. M. Stevens, J. George. Science. 2005, 310, 1135 – 1138.
[5] M. M. Stevens et. al. Proc. Natl. Acad. Sci. USA. 2005, 102, 11450 – 11455.
[6] E. Place, N. D. Evans, M. M. Stevens, Nature Materials, 2009, 8, 457-470.
[7] E. Gentleman, et al. Nature Materials. 2009. 8,9;763-770

BRIEF CV

Professor Molly Stevens is Research Director for Biomedical Material Sciences in the Institute of Biomedical Engineering at Imperial College London. She joined Imperial in 2004 from Postdoctoral training with Professor Robert Langer at MIT. She graduated from Bath University with a first class honours degree in Pharmaceutical Sciences and was awarded a PhD in biophysical investigations from the University of Nottingham (2000). Amongst many awards, in 2009 she was awarded the Jean Leray Award from the European Society for Biomaterials. She has been recognised by Technology Review's TR100, a compilation of the top innovators worldwide. She has a large, extremely multidisciplinary research group of students and postdocs/fellows developing novel biomaterials for regenerative medicine and biosensing. She is the main founder of RepRegen which was awarded the ACES Amgen European Life Sciences company of the year 2009 and is setting-up a clinical trial for bone regeneration in humans.

RECEPTION AT 3:30 P.M. IN LOBBY OUTSIDE AUDITORIUM