

**Modulating extracellular matrix function by cell traction:
*implications for tissue engineering***

Speaker: Prof Viola Vogel, Department of Materials, ETH Zürich, Switzerland
Venue: Blk EA, #06-03, c/o Faculty of Engineering, NUS.
Date: 13th November 2006 (Monday)
Time: 3.30pm – 4.30pm

Abstract:

Cells can sense and transduce a broad range of mechanical forces into distinct sets of biochemical signals that ultimately regulate cellular processes, including adhesion, proliferation, differentiation, and apoptosis. But how is force translated at the molecular level into biochemical signal changes that have the potential to alter cellular behavior? New nanotechnology tools allow for the first time to probe how the structure/function relation of proteins can be switched if they are mechanically stretched and partially unfolded. Deciphering at the nanoscale the design principles of native extracellular matrix molecules and how they respond to force is essential to the design of the next generation of biomaterials and tissue engineering scaffolds.

Biography:

Viola Vogel is Professor in the Department of Materials at the ETH Zurich heading the Laboratory for Biologically Oriented Materials. After completing her graduate research at the Max-Planck Institute for Biophysical Chemistry, she received her Ph.D. in Physics at Frankfurt University, followed by two years as postdoctoral fellow in the Department of Physics (UC Berkeley). She became Assistant Professor in the Department of Bioengineering (University of Washington, Seattle) in 1991, and was the Founding Director of their Center of Nanotechnology ('97-'03) prior to her move to Switzerland in 2004. She served on the selection committee for the British Marshall Fund Fellowships, and as US Representative on the Council of Scientists of the Human Frontier Science Program. She was broadly involved in program and technology assessments for NIH and the US National Research Council, served on a special PCAST panel that prepared the Clinton's "Presidential National Nanotechnology Initiative (NNI)", and chaired the US National Nanotech Initiative (NNI) Workshop on "Nanobiotechnology". She is a Fellow of the American Institute for Medical and Biological Engineering (AIMBE), a member of the Council and Selection and Scheduling Committee for the Gordon Research Conferences (GRC), and serves on the Editorial Boards of several international journals. Awards include the Otto-Hahn Medal from the Max-Planck Society ('88), the FIRST Award from NIH ('93), the Research Award from the Philip Morris Foundation ('05) and the Julius Springer Prize for Applied Physics ('06).

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