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PHYS 493 Dr. Lau
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Colloquium Date: 12 March 2018

Colloquium Speaker: Dr. M.E. Dokukin

Colloquium Title: Nanomechanics of Cells and Biomaterials With Atomic Force Microscopy

Speaker Affiliation: Department of Mechanical Engineering at Tufts University

Dr. Dokukin uses atomic force microscopy (AFM) to investigate structures and mechanics at the cellular level. The resolution of the AFM is fine enough to resolve individual atoms. The AFM apparatus requires a mechanical lever that moves along the surface of a structure that maps the topology of the structure. This is achieved by a light that is reflected off on the lever, and the light is measured to give the position of the pointer. The probe is very sensitive, but also can scratch the surface of the cell. Dr. Dokukin shared some results from a fractal analysis of malignant cells that showed that there was some link between fractal structures and malignant cells. However this did not show conclusive causality links. The probe can also be used to show the elasticity of the cell walls, and show what cells may be infected by malaria. Overall, Dr. Dokukin's talk was very interesting. He communicated well and answered questions well, while explaining his research. However, he did not talk much about the applications of this research other than mapping cell topology and mechanics. It would have been very interesting to hear about the future of his research and what the results mean for the medical industry.