



# *Robert Maddin Lecture*

## in Materials Science

# LRSM | **Active & Adaptive Matter Driving Cell Dynamics**

The Laboratory  
for Research on  
the Structure  
of Matter



**Monday, September 25, 2023**

**4:00PM**

**Glandt Forum**

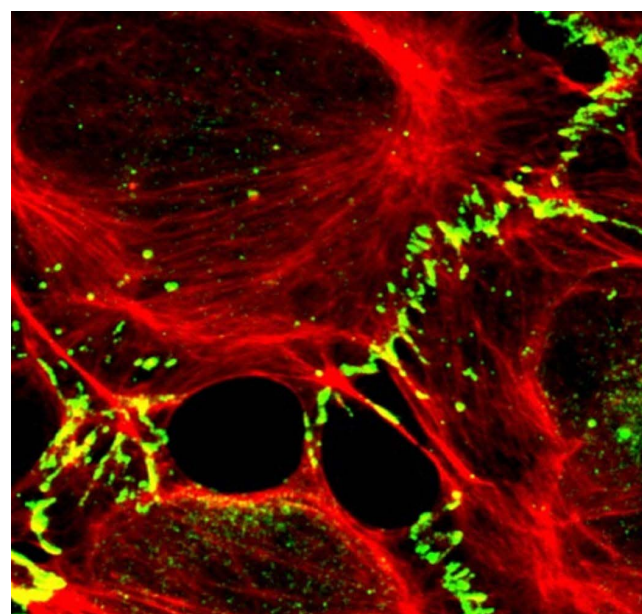
Singh Center for Nanotechnology



**Margaret Gardel**

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Control of shape and movement is essential for cell physiology, from cell migration to control of tissue shape. The mechanical behaviors of living cells are controlled by materials constructed by protein-based assemblies within the cell interior. These soft materials both regulate how forces generated by individual mechanoenzymes are transmitted to cell and tissue scales as well as how mechanical properties evolve, or adapt, over time to allow for smooth transitions. I will describe my lab's recent efforts to understand the design principles of the active, soft materials that drive multi-cellular dynamics. In particular, I will describe our progress to reveal design principles by which the actin cytoskeleton senses, generates, and adapts to mechanical force. Hopefully, I will convince you that the materials within cells provide a rich playground to understand design principles of active and adaptive soft materials.



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Margaret Gardel is the Horace B. Horton Professor of Physics and Molecular Engineering at University of Chicago. She is a member of the Institute for Biophysics Dynamics and currently serves as Director of the James Franck Institute. She joined the University of Chicago in 2007 after earning her Ph.D. from Harvard University with David Weitz and completing postdoctoral research as a Pappalardo Fellow at MIT and at Scripps Research Institute with Clare Waterman. She is a Fellow of the American Physical Society. Her awards include a Packard Fellowship, Sloan Fellowship, NIH Director's Pioneer Award and Raymond and Beverly Sackler International Prize in Biophysics.

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