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Microscopy Under the Microscope: Practical Strategies for Precision and Reproducibility

Microscopy not only produces awe-inspiring images of the unseen world, but each pixel encodes rich quantitative data that reveals cellular and molecular dynamics at ever-higher resolution. Achieving rigor and reproducibility in this work requires careful attention to both the biological and technical aspects of an experiment. From how samples are prepared and data are acquired to how images are analyzed, managed, and how methods are reported, each step plays a critical role in ensuring reproducibility. This talk will highlight practical strategies for maintaining microscope quality, standardizing workflows, and documenting procedures to strengthen the reliability of imaging-based discoveries, leaving attendees with concrete approaches to improve the reproducibility of their user's microscopy research.

Speaker Bio

Travis I. Moore, Ph.D. is an Assistant Professor at McGovern Medical School at UTHealth Houston and Director of the Center for Advanced Microscopy, a Nikon Center of Excellence. His research examines the biophysics of cell adhesion and migration, with a particular focus on how mechanical forces regulate immune cell function. By combining advanced microscopy with molecular techniques, Dr. Moore studies integrin dynamics and mechanotransduction pathways, advancing understanding of immune-mediated diseases such as idiopathic pulmonary fibrosis, peripheral artery disease, and autoimmune disease.

Dr. Moore's research journey included postdoctoral training at Harvard Medical School in the laboratory of Dr. Timothy Springer and at Seoul National University, where he developed expertise in cell adhesion, migration, tissue engineering, and microfluidics. He also trained at the HHMI Janelia Research Campus and the Marine Biological Laboratory in Woods Hole, specializing in super-resolution microscopy. His interdisciplinary approach—spanning molecular biology, protein engineering, biophysics, and immunology—drives innovations that connect basic science with therapeutic development. In addition to research, Dr. Moore is also deeply committed to education and mentorship, actively teaching and fostering diversity of thought within the biomedical research community.

