CENTER FOR RNA BIOMEDICINE

RNA Faculty Candidate Seminar
Wednesday, March 20th at 4:00pm
Willard H Dow Chemistry & Laboratory
Room 1400
930 UNIVERSITY AVE

Stephanie Moon, Ph.D.
Howard Hughes Medical Institute Post-doctoral Fellow
University of Colorado, Boulder

"Spatiotemporal regulation of mRNA function in health and neurological disease"

Abstract: Genes are expressed via the generation of messenger RNA intermediates that must be translated to produce functional proteins. Translation is the most energetically costly step in the process of gene expression and translation is rapidly repressed when the cell encounters stress (e.g. oxidative stress or infection). At the same time, large RNA-protein granules called stress granules form. Stress granules contain mRNAs and RNA binding proteins, and are thought to enhance cell survival. However, their exact function, and the determinants and consequences of mRNA localization to stress granules were not well understood. Understanding the precise mechanisms of mRNA regulation during stress is important because many neurodevelopmental and neurodegenerative disorders are caused by defects in factors that regulate the protein biosynthesis machinery and stress granules. In this talk, I will discuss my research on how defects in the protein biosynthesis machinery contribute to Vanishing White Matter disease, a rare fatal genetic disorder that affects children and adults, and how drugs that activate translation during stress rescue disease phenotypes. Second, I will discuss how single molecule fluorescence microscopy of living cells at high spatiotemporal resolution allowed us to define the fundamental properties of mRNA interactions with stress granules. These studies lend insight into the properties and functions of mRNP granules and demonstrate that targeting the protein biosynthesis machinery has therapeutic potential in neurological disease.

BIOSCIENCES
umichrna.org