Structure and dynamics regulating miRNA biogenesis

Sarah Keane
Assistant Professor, Department of Biophysics, Department of Chemistry
University of Michigan, Ann Arbor

MicroRNAs are small non-coding RNAs that post-transcriptionally regulate gene expression. To maintain proper microRNA expression levels, the enzymatic processing of primary and precursor microRNA elements must be strictly controlled. However, the molecular determinants underlying this strict regulation of microRNA biogenesis are not fully understood. We are investigating the differential processing of oncomiR-1, a polycistronic primary microRNA that is enriched in many cancers. NPSL2 is an auxiliary hairpin within the oncomiR-1 transcript predicted to adopt multiple structures to regulate the processing of a downstream microRNA element. We determined the solution structure of NPSL2 and are expanding our structural studies to build a comprehensive view of the oncomiR-1 structure. We also examine the role of protein binding partners in remodeling and regulating the processing of the mocomiR-1 RNA.