

# **Self-Assembly and Alternative Solvents as Key Contributors to the Origins of Life**

Nicholas V. Hud  
Georgia Institute of Technology  
hud@gatech.edu

The RNA World hypothesis posits that RNA existed before the advent of DNA and proteins. However, despite substantial effort and steady progress, robust and plausible prebiotic methods for RNA polymer synthesis and replication remain elusive. We are investigating the hypothesis that RNA evolved from an ancestral polymer (or proto-RNA) with molecular building blocks that had a strong propensity for self-assembly. We are also exploring the possibility that alternative solvents and oscillating environments facilitated proto-RNA replication, before the emergence of polymerase enzymes. Experimental results that provide support for these hypotheses will be discussed – as well as insights into what is required for efficient self-assembly in water and how non-aqueous solvents can be used to control the assembly of complex nucleic acid structures.