CAREER: A Single Molecule Study of Alternative Folding of a Retroviral Untranslated RNA

The goals of this CAREER project are to explore alternative folding of a model retroviral 5’-untranslated leader RNA, and to understand how control of RNA folding regulates the viral life cycle. Alternative folding is an intrinsic property of RNA and plays a critical role in gene regulation. In the post-genomic world, new models for RNA folding that extend beyond the most stable structure will be useful to predict versatile biological functions of untranslated RNAs from the ever-growing sequence database. The proposed single-molecule study will provide direct observations necessary to calibrate the leading folding theories, and will foster close collaborations between biologists and physicists, experimentalists and theoreticians. The project will be conducted at the newly founded RNA Institute at SUNY Albany, providing long-term research opportunities in RNA field for undergraduate and graduate students of diverse backgrounds.