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1. Micro RNA and Cancer

Research in my laboratory revolves around the biology of short interfering (siRNA) and micro RNAs (miRNAs). These small non-coding RNAs control diverse cellular and developmental processes by targeting complementary mRNAs for rapid decay (siRNA/miRNA) or translation impairment (miRNA). There are several indications that miRNA might also have a role in tumorigenesis. For example miRNAs are frequently located at cancer-associated genomic regions and many of them have altered expression in a variety of cancers. With more than ~1000 predicted miRNAs and plethora of putative targets in the human genome, they are poised to play a vital role in almost all biological processes including cancer.

The current research interest of my laboratory is to study the role of miRNAs in cancer growth and progression. We plan to use in vivo RNA interference (RNAi) approach, a tool that we recently developed (Rao et al., 2006) to characterize the function of miRNAs and identify their targets in different types of pediatric cancer. We believe that miRNA profiling and establishment of their role in oncogenic signaling pathway will provide a new dimension to diagnosing and treating cancer.

2. Applications of RNAi

RNA interference (RNAi) is one of the most exciting discoveries of the past decade. The potential uses for this technique in the fields of reverse genetics and drug discovery are far reaching. We are interested in developing high throughput genome-wide RNAi screen using *Drosophila* and/or human genome RNAi libraries to identify novel components of different pathways involved in cancer growth and metastasis. Our goal is to explore the therapeutic potential of these components for cancer.

