University of Minnesota
Driven to Discover℠

Department of Chemistry

Seminar

9:45 a.m. Thursday, February 2 • 331 Smith Hall

Associate Professor

Matthew Disney

Department of Chemistry
Scripps Research Institute

Progress Toward the Rational Design of Small Molecules Targeting RNA from Genomic Sequence

Research interests: developing rational methods to target RNA with small molecules.

Website: http://www.scripps.edu/research/faculty/disney

Abstract

Numerous studies have identified RNAs that play central roles in disease, however, exploiting these targets via bioactive small molecules is very difficult. In our opinion, this is generally due to a fundamental lack of understanding of the types of small molecules that bind RNA specifically and the types of RNA motifs that can be specifically targeted by small molecules. In an effort to establish a database of such information, our group has developed an agnostic library versus library approach called two-dimensional combinatorial screening to quickly identify RNA motif-small molecule partners. In addition, we have also developed theoretical models to quickly and accurately annotate the affinity and selectivity of these interactions. By merging this information with genomic RNA sequence and structure, we have designed bioactive small molecules targeting a series of RNAs that cause incurable neurological disorders. Designed compounds are orders of magnitude more potent than compounds identified by high throughput screening of chemical libraries, suggesting that rational approaches may be useful. It is our hope that we can make substantive progress in developing these synergistic approaches into general and rational strategies to exploit RNA targets in genomic sequence.

Host: Professor Mark Distefano
Refreshments will be served prior to the seminar.