



# ATTENTION ALL STUDENTS

The Office for Biomedical Research & Training

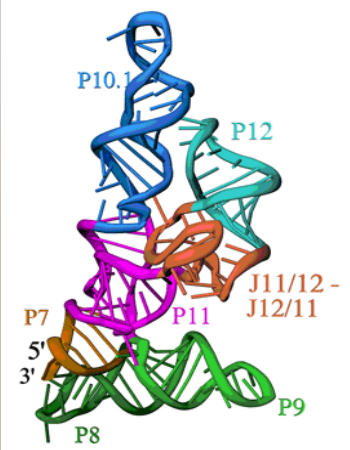
MBRS-SCORE\*, MARC -U- STAR\*\*, & RISE\*\*\*

Presents:

## “Uncovering parallels in the functioning of an ancient enzyme present in all three different domains of life”

Venkat Gopalan, PhD., Department of Biochemistry, The Ohio State University

Ribonuclease P (RNase P) is a  $Mg^{2+}$ -dependent endoribonuclease responsible for the 5'- maturation of transfer RNAs (tRNAs) from their precursor transcripts (ptRNAs). It is a ribonucleoprotein (RNP) complex containing an essential RNA (RNase P RNA; RPR) and a varying number of protein subunits (RNase P Protein; RPP) depending on the source: at least one, four, and nine in Bacteria, Archaea, and Eukarya, respectively. RNase P has been considered an appealing candidate for the hypothetical evolutionary path from a simple RNA- to a complex RNP-based catalyst. Bacterial RPRs are catalytic (ribozymes) under certain



*in vitro* conditions. However, only a few archaeal and eukaryal RPRs are weakly active under various conditions tested *in vitro* despite striking secondary structural similarity and conservation of nucleotide identity in the putative catalytic core of all RPRs. Our objectives are to address (i) why many archaeal and eukaryal RPRs are inactive *in vitro* in the absence of their cognate RPPs, and (ii) why archaeal and eukaryal RNase P require multiple RPPs for function while a single RPP suffices for bacterial RNase P? Biochemical studies on different archaeal RNase P holoenzymes are helping us to uncover parallels in RNase P catalysis not readily expected from variations in its subunit make-up in the three domains of life.

Thursday, **February 7, 2008**  
Commons 206  
4:00-5:30

*Refreshments will be provided*