

**Department of Chemistry  
COLLEGE OF Arts and Sciences**

**SUMMER RESEARCH OPPORTUNITIES  
FOR UNDERGRADUATE WOMEN**

**APPLICATION DEADLINE: March 3, 2008**

*The Department of Chemistry is pleased to offer the following research project for the summer of 2008. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.*

**HUMAN LYSYL AMINOACYL TRNA SYNTHETASE: FUNCTION AND BINDING  
TO HIV-1 PROTEINS**

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**Project Description**

This research involves the study of peptides derived from the N-terminal domain of human lysyl tRNA synthetase. This synthetase extension does not exist in prokaryotic systems and its precise function is still unknown but is critical for proper enzyme functions during protein translation. This domain may be important for enabling the packaging of this synthetase with human lysyl tRNA into new HIV-1 virus particles. To study this, we will study this domain in a labeled or tagged form while spliced to the remaining domains of this enzyme. The spectroscopy of the N-terminal domain will be conducted to understand how it binds to tRNA and how it interacts with the adjacent domains. The spectroscopy to be used involved NMR, CD and fluorescence. This work will also involve molecular biology, protein expression and protein purification as well as some spectroscopic and electrophoresis techniques. These will be done in order to characterize where and how this domain interacts with important DNA and tRNA molecules.