RESEARCH OPPORTUNITY PROGRAM
299Y/399Y PROJECT DESCRIPTIONS 2019-2020
FALL/WINTER

Name and Title: Ronald Kluger, Professor
Department: Chemistry

TITLE OF RESEARCH PROJECT: Fragmentation of Thiamin

Number of 299Y Spots: 1 Number of 399Y Spots: 1

OBJECTIVES AND METHODOLOGY:
The destruction of thiamin (vitamin B1) in the presence of benzaldehyde was discovered by Oka in 1970. The reaction gives two products that cannot be put back together. There have been several ideas presented as to how this process occurs. The project involves making new compounds that provide tests and information that will enable us to understand how the vitamin is destroyed. The problem is significant because the enzymes that process derivatives of thiamin avoid the destruction and it appears to be a fundamental chemical difference between solution and enzymes. The student will learn to make the compounds for study and then examine the rates and products of the reactions to provide a full picture of what drives the reaction. The results will be presented as a full report and could lead to a publication.

DESCRIPTION OF STUDENT PARTICIPATION:
The student will work in an active laboratory. They will learn safe operation within the lab, how to produce new compounds with care and with modern analysis. With that completed, they will learn to measure rates of reactions and how to interpret results. A successful effort will give an overview of the research process. A student who works on this must be well-versed in introductory organic chemistry concepts and lab techniques. The student will be required to attend weekly group meetings and to present progress talks in those meetings periodically.

MARKING SCHEME (assignments with weight and due date):
Five monthly progress reports, typically 2-4 pages each, will be due in the first week of the next month, following the template to be provided– 5 marks each – 25 marks total
Group meeting presentations and participation - 20 marks (attendance weekly, presentation once each term)
Final progress report – 20 marks total (end of winter term prior to exams)
Lab work including notebook, time committed, technique – 25 marks (duration of participation)
Understanding of background and results as demonstrated in ongoing informal discussions with course instructor during weekly meetings -10 marks. The discussions increase in depth as the course progresses.