10-1-2013

Acquisition of a Polarimeter for Teaching and Research in the Forensic Science and Chemistry Laboratories

Zhaohua Dai
Dyson College of Arts and Sciences, Pace University

Provost's Grants for the *Thinkfinity* Initiative: Innovative Teaching, Technology and Research

Title of Project: Acquisition of a Polarimeter for Teaching and Research in the Forensic Science and Chemistry Laboratories

Cornerstone III: Interdisciplinary Programs, including Informatics

Zhaohua Dai, Ph.D. (Dyson College of Arts and Sciences, Department of Chemistry and Physical Sciences, Forensic Science Program)

September 16th, 2013

Mid-Project Report:

A. Outline of original goals.

The main goal for the project is the purchase of a polarimeter that will be used in the research and teaching laboratories as a means to improve chemistry undergraduate students' and Forensic Science Master's level graduate students' learning in stereochemistry.

B. Progress made towards original goals

The purchase of the ATAGO 5223 POLAX-2L Semi-Automatic Polarimeter from Novatech was completed and the instrument was delivered in the summer. Accessories were also purchased from Novatech. One experiment has been developed to be included in FOR620 Analytical Analysis to analyze chiral drug enantiomeric excess in the Spring semester. Similar but simpler experiments will be developed for CHE331 Instrumental Analysis. The P.I. and his research students has developed protocols to employ this instrument in our research in chiral drug analysis and asymmetric catalysis.

Theoretical concept on polarimetry and chirality discussed in class will now be reinforced with the use of the instrument.

C. Impact of project on students

Use of the instrument will be incorporated in laboratory classes of some Chemistry (CHE331 Instrumental Analysis in the Spring semester, about 20 students) and Forensic Science (FOR620 Analytical Spectroscopy in the Spring, about 20 students) courses.

Three out of 4 of the P.I.'s current research students are using the instrument in chiral drug analysis and asymmetric catalysis studies.

D. Impact on other faculty

Prof. Jaimelee Rizzo is interested in incorporating the instrument in the Organic Chemistry teaching lab to help student understand chirality, which is covered in Organic Chemistry lecture

E. Next Steps.

The instrument has been acquired. It is low maintenance hence no financial investment is needed in the future. We will develop more teaching lab modules using this instrument. We will actively use it analyze chiral compounds in our research in chiroptical sensor, chiral drug analysis and asymmetric analysis for years to come. I will train other faculty member who are interested in using it in their teaching and research.