**Department of Chemistry**
**COLLEGE OF ARTS AND SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES**
**FOR UNDERGRADUATE WOMEN**

**APPLICATION DEADLINE: March 1, 2013**

*The Department of* Chemistry *is pleased to offer the following research project for the summer of 2013. 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.*

## PROJECT TITLE: Development of Novel Nanocarrier Delivered Cancer Chemotherapeutic Agents

**Professor Vladislav A. Litosh**
**Department of Chemistry**
**Crosley Tower, Room 805**
**Cincinnati, OH 45221-0172**
**Tel: (513) 556-9273**
**Fax: (513) 556-9239**
**Email: litoshvv@uc.edu**

### Project Description

The ultimate goal of this project is to develop highly efficient anti-tumor agents capable of successfully combating cancer. This can be achieved by the discovery of novel, more efficient cancer chemotherapeutic agents and the development of a nanoscaled drug delivery system that will carry the drugs selectively to the tumor.

The studies will include designing novel nucleoside analogs with high anti-cancer activity and a drug delivery system suitable for their transportation specifically to the tumor site. These nucleoside-based chemotherapeutic agents (both new and known) will be conjugated *via* an acid-labile linker to a water-soluble polymer capable of self-assembly into nanoparticles, functionalized with targeting ligands. The resulting conjugates will be screened *in vitro* against the specific cancer cell lines to examine the effect of the conjugation and targeting ligand attachment on activity and cellular membrane permeability. Elucidation of the mechanism of action of the most promising drug candidates will be achieved by their labeling with compact, uncharged fluorescent dyes followed by examination of their cellular uptake and distribution using fluorescent confocal microscopy. The participants will receive appropriate training in synthetic organic chemistry and running bioassays by the group members currently involved in the project.