

**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: Protein-Nanoparticle Biosensors

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Project Description

Three dimensional nanoparticle arrays in solution will be constructed through self-assembly of fibril-forming proteins, such as Collagen. Plasmonic coupling between the nanoparticles, which determines the color of the nanoparticles, is very distance dependent. In the constructed protein-nanoparticle array, the distance is directly controlled by the conformation of the protein, and the protein conformation can be changed by the addition of acid, base and/or salts to solution. Methods for constructing these biosensing devices will be explored as well as their response to changing solution conditions. A biocompatible pH sensor is particularly useful for detecting various cancer cells which are known to lower the pH of solution.