

## FYRE First Year Research Experience 2011-12

Dr. Susan Marine is looking for First Year students to become part of her research projects through the new FYRE program.

To apply, e-mail Martha Weber at [weberme@muohio.edu](mailto:weberme@muohio.edu).



[mariness@muohio.edu](mailto:mariness@muohio.edu)

513-727-3372 Levey Hall Rooms 215,216

**FYRE-STEM:**  
**Analytical Chemistry- Middletown**

SUSAN MARINE  
ASSOCIATE PROFESSOR  
CHEMISTRY

### Caffeine and Theobromine in Chocolate

Chocolate is concocted from cocoa powder, cocoa butter, sugar, and milk powder with great variations possible in the products. An excess of chocolate can stimulate the central nervous system as much as coffee does due to two chemical components of interest: caffeine and theobromine. An HPLC analysis was developed to determine the concentrations of each in chocolate containing 20-72% cocoa powder. This project will extract and quantitate theobromine and caffeine from a variety of chocolates and try to correlate the concentrations to each other, to the cocoa content, and possibly to the source of the cacao beans.

Student involvement: You will use a series of solvent extractions to isolate the chemicals of interest from the chocolate, sublimation to purify standards, and HPLC to analyze the sample extracts. You will present your results at professional meetings and publish your work when it is complete.

Visit Dr. Marine's webpage:

<http://chemistry.muohio.edu/index.php/faculty/11-faculty/4-susan-s-marine>

**How do students get more Information?** Visit the FYRE program webpage at [www.muohio.edu/undergradresearch](http://www.muohio.edu/undergradresearch) and click on the FYRE link.

#### **What is the FYRE Program Student Application Process?**

To apply, simply e-mail Martha Weber Undergraduate Research Coordinator in the Office for the