

# 16th Annual Undergraduate Research Symposium for Chemical and Biological Sciences

## Plenary Talk

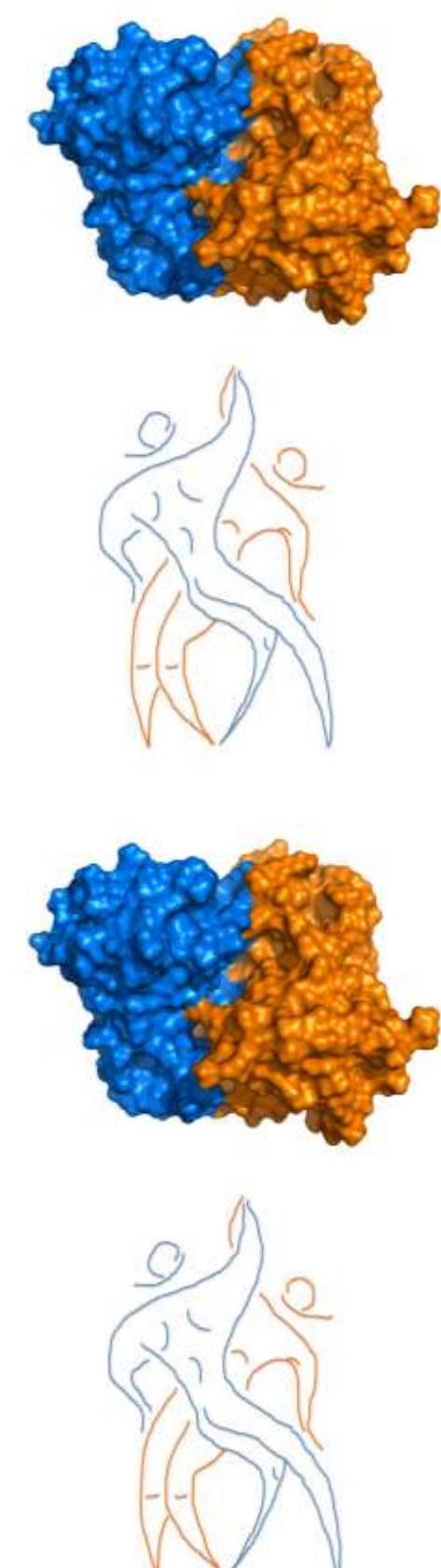
### A Tango Lesson: Open-Close Transitions and Protein Embraces

1:00 PM—1:50 PM | *Engineering Building, Room 027*



**Dr. Elsa Garcin,**  
Assistant Professor of  
Chemistry & Biochemistry  
at UMBC

The small gaseous molecule Nitric Oxide (NO) regulates a plethora of biological processes, including vasodilation, neurotransmission, and fighting of infectious diseases. Dysregulation of NO signaling leads to heart disease, hypertension, atherosclerosis, erectile dysfunction, neurodegeneration, susceptibility to infection, and cancer. Soluble guanylate cyclase (sGC) is the primary receptor for NO and produces the second messenger cGMP from GTP. NO binding to sGC activates the enzyme and leads to an amplification of the primary NO signal. Because sGC is the central player in the NO/sGC/cGMP pathway, this enzyme is a validated target for therapeutic intervention. Small molecules activating sGC show great potential for treating cardiovascular diseases. However, the exact mechanism by which sGC transitions from a basal state to an activated state remains unknown. Our latest structural results provide new avenues for structure-based drug design of novel sGC activators targeted at the catalytic domain.



### Morning Workshop

#### Are We Alone In The Universe? 4 Clues From Interdisciplinary Science

10:30 AM - 11:30 AM,  
*CASTLE, First Floor of the University Center, UC 115D*



**Dr. Steve Freeland,**  
Director of  
Interdisciplinary Studies and  
Associate Professor at UMBC

Image Credit: UMBC Interdisciplinary Studies  
<http://inds.umbc.edu/>

The origin of life on Earth remains one of the greatest mysteries in science - yet the clues that have been uncovered in recent years suggest much about the likelihood of life elsewhere in our galaxy. This interactive workshop will present findings from various corners of science to help you reach your own conclusions about our place within the cosmos. Along



the way, you will meet the emerging science of astrobiology and understand how the best research often ends up changing the question you thought you were asking!

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### Afternoon Workshop

#### NSF and Graduate Education in STEM: Agency Mission and Funding Opportunities for Potential and Incoming Graduate Students

2:30 PM - 3:30 PM,  
*CASTLE, First Floor of the University Center, UC 115D*



**DR. ZEEV ROSENZWEIG**  
Program Director  
Division of Chemistry  
National Science Foundation

Learn about the NSF Graduate Research Fellowship Program. The program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited United States institutions. This presentation highlights the philosophy and mechanics of the program including eligibility rules, time line and application content. Tips for increasing the probability of success will be described. Following the presentation there will be time for questions.

