



American Chemical Society Susquehanna Valley Section

SEPTEMBER 2013 NEWSLETTER

The four hundred and fourth meeting of the American Chemical Society Susquehanna Valley Section will be held on Wednesday, September 11, 2013 in room 108 of Academic West on the Bucknell University campus. The meeting will begin at 7:30 PM and will be preceded by a reception at 5:00 PM in room 325 of the Rooke Chemistry Building Center and dinner at 6:00 PM in the Elaine Langone Center (room 241). The speaker will be Dr. Scott A. Showalter from Penn State University.

"A Physical Chemist's Perspective on Intrinsically Disordered Proteins"

Scott A. Showalter
Assistant Professor of Chemistry
The Pennsylvania State University

Intrinsically Disordered Proteins (IDPs) partially or completely lack a co-operatively folded structure under native conditions, preventing their equilibrium state from being adequately described by a single structural model. Our view is that IDPs do possess native structure that is responsible for imparting their specific functions; describing these structures simply requires a broadening of the traditionally narrow structure-function paradigm, beyond the current models developed for cooperatively folding systems. We have shown that ^{13}C direct-detection NMR methods are well suited to generating quantitative and comprehensive structural constraints for IDP ensembles. Generally effective strategies for applying ^{13}C -detected NMR to highly flexible biomolecules will be presented. In addition, coupled folding and binding interactions have arisen as a prevalent mechanism for molecular recognition when IDPs interact with other proteins, or nucleic acids. This has lead many investigators to propose a significant loss of chain entropy must oppose the binding process, thus explaining the generally weak (micromolar) binding affinities experimentally measured for IDP-mediated interactions. We apply thermodynamically rigorous tests of this narrow folding-upon-binding model using titration calorimetry. Our calorimetric data indicate a large and negative heat capacity change is typically associated with the binding event, as are other thermodynamic characteristics consistent with the disaffinity of non-polar surface for water. In other words, our results quantitatively demonstrate the same signatures of the hydrophobic effect that are observed in the folding of globular proteins make folding-upon-binding highly favorable near room or body temperature. Synergy between our NMR structural characterizations and equilibrium binding measurements will be discussed.

Scott A. Showalter. B.Sc., 1999, Cornell University, Ph.D., 2004, Washington University in St. Louis, 2005-2008 postdoctoral fellow, National High Magnetic Field Laboratory, 2008-present, Assistant Professor of Chemistry, The Pennsylvania State University. The Showalter Laboratory applies biophysical chemistry techniques to understand the function of partially disordered proteins and to define the features of protein-RNA interactions. Our research addresses the hypothesis that a conserved functional role for disordered biomolecules exhibiting heterogeneous conformational ensembles renders them uniquely capable of mediating cellular signaling, transcription, and translation. We are primarily Nuclear Magnetic Resonance (NMR) spectroscopists, but emphasize any physical-chemical technique capable of addressing our goals.

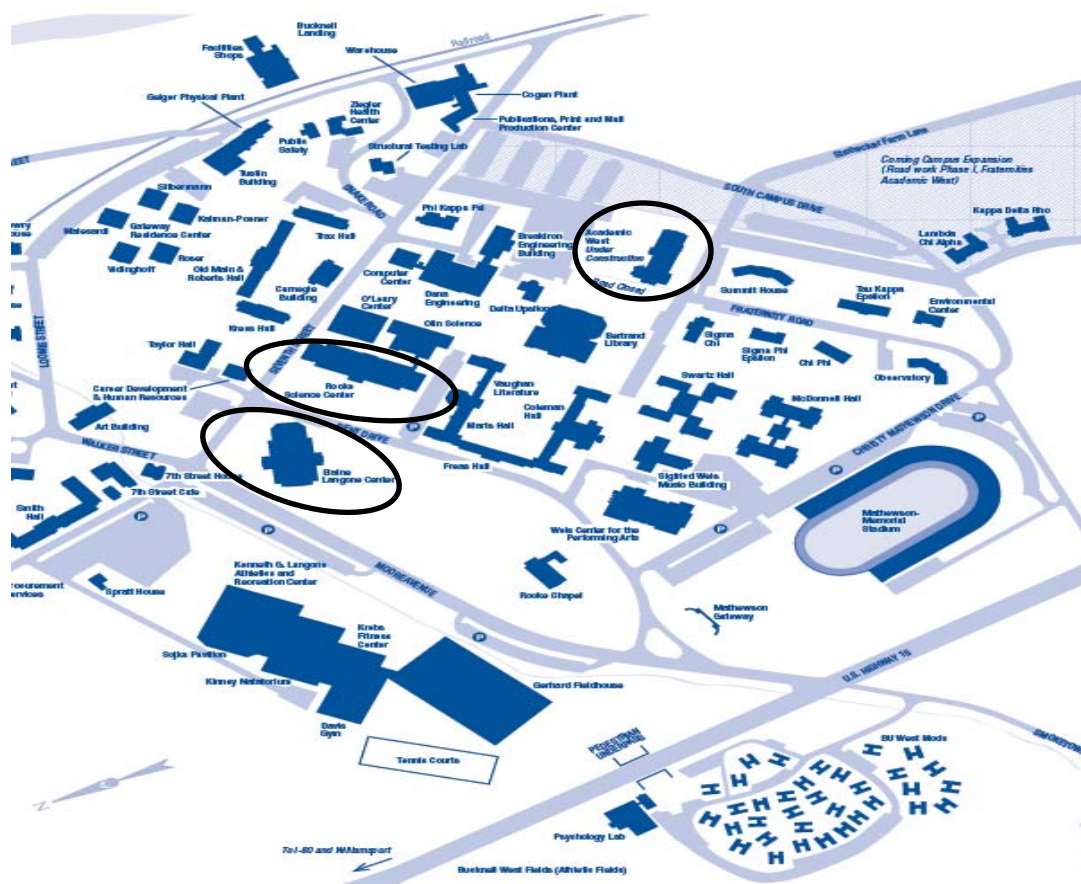
DINNER:

Dinner entrees will be a buffet dinner including a vegetarian option and dessert. The cost will be \$15.00 per person. ACS guests wishing to reserve dinner can contact Suellen Beck by email sb047@bucknell.edu or phone (570) 577-3258 by Tuesday, September 10.

DIRECTIONS TO BUCKNELL UNIVERSITY:

East of Lewisburg: 1. Interstate 80 West to Exit 210A 2. Route 15 South 3. At 11th traffic light, turn left. (Look for the Bucknell Athletic Stadium on the left.)	West of Lewisburg: 1. Interstate 80 East to Exit 210A 2. Route 15 South 3. At 11th traffic light, turn left. (Look for the Bucknell Athletic Stadium on the left.)
South of Lewisburg: 1. Take Routes 11&15 North 2. When Routes 11 & 15 split, stay on Route 15 (Tedd's Landing is on your right; KMart on your left)	North of Lewisburg: 1. Take Route 15 south 2. Once past Interstate 80, turn left at the 11th traffic light. (Look for the Bucknell Athletic Stadium on the left.)
3. Approx. 7 miles after Selingsgrove / Shamokin Dam, you'll come to a stop light. Bucknell is on your right. (Look for the Bucknell Athletic Stadium on right.)	

Once on campus: Follow the campus map to the visitor parking designated with a “Ⓟ”.



2013 - 2014 Local Section Meeting Schedule:

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| 11-Sept-2013: Bucknell University | 12-Feb-2014: Marywood University |
| Oct-2013: Wilkes University | 12-March-2014: Susquehanna University |
| 13-Nov-2013: Lycoming College | 12-April-2014: Joseph Priestly House |
| 15-Jan 2014: Executive Board Meeting | 7-May-2014: Bloomsburg University (Awards Banquet) |

Section Web Page: <http://departments.kings.edu/SusquehannaValleyACS>
