



American Chemical Society Susquehanna Valley Section

NOVEMBER 2017 NEWSLETTER

The four hundred and forty first meeting of the American Chemical Society will be held on Wednesday, November 8th, 2016 in Room G11 of the Heim Building on the campus of Lycoming College. The meeting will begin at 7:30 PM and will be preceded by a dinner at 5:00 PM. The speaker will be Dr. Rebecca Switzer of Bucknell University.

“Biochemical Consequences of Disease-Causing Mutations in the RFTS Domain of DNA Methyltransferase 1”

Dr. Rebecca Switzer
Assistant Professor of Chemistry
Bucknell University, Department of Chemistry
Lewisburg, PA

In eukaryotes, the most common epigenetic DNA modification is methylation of the 5-carbon of cytosines, predominantly in CpG dinucleotides. Methylation patterns are established and maintained by a family of enzymes known as DNA Methyltransferases (DNMTs). DNA methylation is an important epigenetic mark associated with gene repression and disruption of the normal DNA methylation pattern is known to play a role in several disease states. Methylation patterns are primarily maintained by DNMT1, which is the most abundant DNMT in humans. DNMT1 is a multidomain protein with a C-terminal catalytic methyltransferase domain and a large N-terminal regulatory region comprised of several globular conserved domains. One of these domains, the Replication Foci Targeting Sequence (RFTS) domain, has been shown to act as an endogenous inhibitor of DNMT1 activity. Recently, several mutations in the RFTS domain were shown to be casual for two different neurodegenerative diseases - hereditary sensory autonomic neuropathy with dementia and hearing loss (HSAN1E) and cerebellar ataxia, deafness, and narcolepsy (ADCA-DN) – but little is currently known about the biochemical consequences of these mutations. We have successfully expressed and purified several of these mutant DNMT1 proteins. Interestingly, the mutations result in dramatic decreases in protein stability. At the same time, electrophoretic mobility shift assays reveal that the mutant proteins can bind DNA better than the wild-type enzyme. Preliminary data indicates that the mutations increase DNA methylation activity in vitro. Taken together, this data suggests these disease-causing mutations decrease overall protein stability and, at least partially, relieve RFTS-mediated autoinhibition of DNMT1. Our hope is that a better understanding of the biochemical consequences of these mutations will ultimately lead to a better understanding of the molecular mechanisms of disease formation.

BIOGRAPHY OF DR. SWITZER:

Rebecca Switzer obtained a B.S. degree in chemistry from Indiana State University. She then went to the University of Michigan to pursue graduate studies in biological chemistry. Her thesis work in the laboratory of Dr. Bruce Palfey centered on understanding the mechanisms of several flavin-dependent enzymes. After obtaining her Ph.D. in 2009, she moved to the University of Iowa for her postdoctoral studies. She worked as an American Cancer Society Postdoctoral Fellow in the laboratory of Dr. Charles Brenner developing high throughput screening procedures to discover novel DNA methyltransferase inhibitors. She was appointed as an Assistant Professor of Chemistry at Bucknell University in 2014. Her current research is focused on understanding the activity and regulation of DNA methyltransferases, enzymes involved in epigenetic gene regulation.

DINNER: The lecture will be preceded by dinner at 5:00 pm at the [Bullfrog Brewery](#) (231 West 4th Street, Williamsport, PA 17701). Please call or email reservations to Debbie Smith (570-321-4180 or smithdeb@lycoming.edu) by Tuesday, November 7

DIRECTIONS TO THE BULLFROG BREWERY RESTAURANT:

The brewery is at 229 West Fourth Street, Williamsport PA 17701. From I-80, take U. S. Route 15 north. Travel approximately 15 miles to Williamsport. Continue over the Market Street Bridge (stay in left lane) and follow the signs for the Business District. At the third traffic signal, turn left onto 4th Street. Follow 4th Street west to the third traffic signal, which is Hepburn Street (there will be a movie theater on the right at the corner). Parking is available along Hepburn Street (on the street and in a public parking lot). The Bullfrog Brewery is directly next to City Hall on 4th Street, one block east of Hepburn Street.

From I-180/US-220, exit onto Market Street (Exit 27A). Turn left from the exit ramp at the traffic signal and follow Market Street north into the city. At the second traffic signal, turn left onto 4th Street. Follow 4th Street west to the third traffic signal, which is Hepburn Street (there will be a movie theater on the right at the corner). Parking is available along Hepburn Street (on the street and in a public parking lot). The Bullfrog Brewery is directly next to City Hall on 4th Street, one block east of Hepburn Street.

DIRECTIONS FROM THE BULLFROG BREWERY RESTAURANT TO THE COLLEGE:

The college is at 500 Mulberry Street Williamsport, PA 17701. Follow Hepburn Street north to the traffic signal at Little League Boulevard (0.2 mi). Turn right onto Little League Boulevard and follow it until it ends at Mulberry Street (0.3 mi). Turn left at the stop sign onto Mulberry Street. At the next traffic signal, turn right onto Washington Boulevard. The entrance to the Heim Building/Lynn Science Center parking lot will be the first right. Proceed through the main doors into the Heim Building. Take the elevator down to the ground floor, where you will exit within sight of the doorway to room G09.

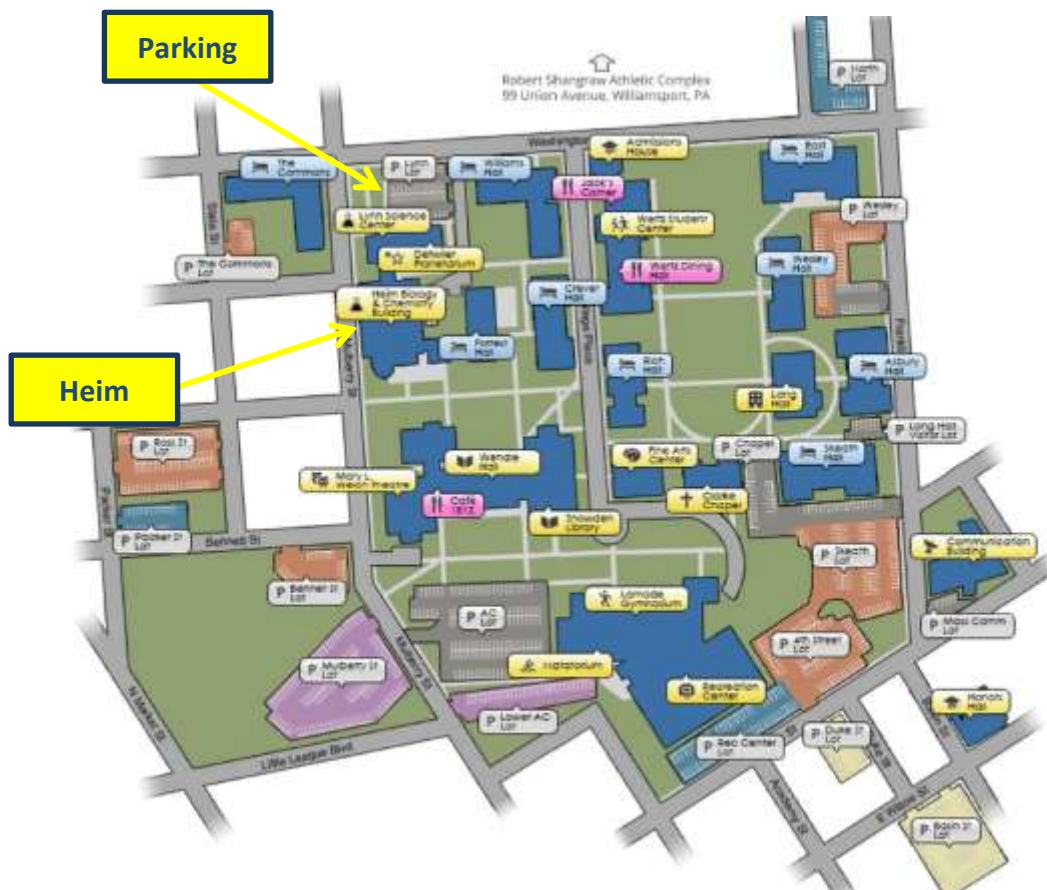
DIRECTIONS TO THE COLLEGE

The college is at 500 Mulberry Street Williamsport, PA 17701. From I-80, take U. S. Route 15 north. Travel approximately 15 miles to Williamsport. Continue over the Market Street Bridge (stay in left lane) and follow the signs for the Business District. Go to the fourth traffic signal and turn right onto

Little League Boulevard. Go one block east and turn left at the stop sign onto Mulberry Street. At the next traffic signal, turn right onto Washington Boulevard. The entrance to the Heim Building parking lot will be the first right as shown in map below. Take the elevator down to the ground floor, where you will exit within sight of the doorway to room G11.

From I-180/US-220, exit onto Market Street (Exit 27A). Turn left from the exit ramp at the traffic signal and follow Market Street north into the city. Go to the third traffic signal and turn right onto Little League Boulevard. Go one block east and turn left at the stop sign onto Mulberry Street. At the next traffic signal, turn right onto Washington Boulevard. The entrance to the Heim Building parking lot will be the first right. Take the elevator down to the ground floor, where you will exit within sight of the doorway to room G11.

You can also see <http://www.lycoming.edu/admissions/ourCampus/directionsToCampus.aspx>



SECTION NEWS:

2018 LOCAL SECTION ELECTIONS:

We are still in need of nominations, including self-nominations, for the position of Chair-elect. Voting will take place once we have a nomination. If interested, please contact Dr. Ron Supkowski at ronaldsupkowski@kings.edu or 570-208-5900x5733.

CHEMISTRY TEACHER OF THE YEAR:

Dr. William Dougherty, Chair of the Susquehanna Valley ACS section, presented the 2017 Outstanding Chemistry Teacher award to Ms. Maria Masankay at Western Wayne High School on October 26.

NATIONAL ACS NEWS:

ACT4CHEMISTRY:

Legislation that may impact the chemical enterprise comes before Congress on a regular basis, and the ACS is committed to keeping its members informed and encouraging them to weigh in on high-priority issues. One of the main ways the ACS does this is through Act4Chemistry. To learn more please visit their [website](#) or email advocacy@acs.org.

NATIONAL MEETINGS:

The 2018 spring national meeting will be held in New Orleans, Louisiana from March 18 – 22. See the [website](#) for details.

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

Please send any comments about the monthly newsletter to Ron Supkowski, Section Secretary
King's College 131 N River St Wilkes-Barre PA 18711 ronaldsupkowski@kings.edu
