

MELISSA A. MULLEN DAVIS

PROFESSIONAL POSITIONS

- 2018-present* **Assistant Professor, Chemistry Department**
Millersville University of Pennsylvania, Millersville, PA
- 2014-2017* **Visiting Assistant Professor, Biochemistry and Molecular Biology Program**
The College of Wooster, Wooster, OH
- 2011-2014* **Postdoctoral Research Fellow, Department of Molecular Genetics**
Lerner Research Institute, Cleveland Clinic Foundation, Cleveland, OH
Postdoctoral Advisor: Dr. Donal Luse

EDUCATION

- 2005- 2011* **Ph.D. in Chemistry**
The Pennsylvania State University, University Park, PA
Doctoral Advisors: Dr. Philip Bevilacqua and Dr. Sarah Assmann
- 2001-2005* **B.A. in Chemistry and Spanish, *Magna cum laude***
Colby College, Waterville, ME
Independent Research Advisor: Dr. Steve Dunham

COURSES INSTRUCTED

Millersville University of Pennsylvania (2018-present)

- Chemistry! Better things for Better Living: CHEM 101 (1 semester)
- Biochemistry I: CHEM 326 (2 semesters)
- Biochemistry I Laboratory: CHEM 326 Lab (3 semesters)
- Analytical Biochemistry Laboratory: CHEM 328 (1 semester)
- Independent Study: CHEM 498 (3 semesters)
- Independent Study: BIOL 498 (2 semesters)

The College of Wooster (2014-2017)

- Principles of Chemistry (1 semester)
- Principles of Biochemistry (3 semesters)
- Biochemistry of Metabolism (3 semesters)
- Techniques in Biochemistry and Molecular Biology Lab (3 semesters)
- Introduction to Junior Independent Study (2 semesters)
- Gateway to Molecular and Cellular Biology (2 semesters)
- Gateway to Molecular and Cellular Biology Lab (5 semesters)

The Pennsylvania State University as a Teaching Assistant (2005-2007)

- Chemical Principles I (2 semesters)
- Chemical Principles II (2 semesters)
- Experimental Chemistry I (2 semesters)
- Experimental Chemistry II (1 semester)
- Experimental Chemistry II: Environmental Studies (1 semester)

RESEARCH SKILLS

- Native and Denaturing gel electrophoresis including nucleic acid structure mapping
- Molecular Cloning
- In vitro* transcription assays
- Circular dichroism
- Isothermal titration calorimetry (ITC)
- Fluorescence Spectroscopy

PUBLICATIONS (* undergraduate mentee)

Coyne, K.*; **Mullen Davis, M.A.**; Mizoguchi, T.; Hayama, R. Temporal restriction of salt inducibility in expression of salinity-stress related gene by the circadian clock in *Solanum lycopersicum*. Accepted for publication in *Plant Biotechnology* **2019**.

Mullen Davis, M.A.; Guo, J.; Price, D.H.; Luse, D.S. Functional interactions of the RNA polymerase II-interacting proteins Gdown1 and TFIIF. *J. Biol. Chem.* **2014**, 289: 11143-11152.

Mullen, M.A.; Assmann, S.M.; Bevilacqua, P.C. Towards a digital gene response: RNA G-quadruplexes with fewer quartets fold with higher cooperativity. *J. Amer. Chem. Soc.* **2012**, 134 (2): 812-815.

Mullen, M.A.; Olson, K.J.*; Dallaire, P.; Major, F.; Assmann, S.M.; Bevilacqua, P.C. RNA G-quadruplexes in the model plant species *Arabidopsis thaliana*: Prevalence and possible functional roles. *Nucleic Acids Res.* **2010** 38 (22): 8149-8163.

Bove, J.; Hord, C.L.H.; **Mullen, M.A.** The blossoming of RNA Biology: Novel Insights from Plant Systems *RNA* **2006** 12 (12): 2035-2046.

PRESENTATIONS

Mullen Davis, M.A. Surviving stress: How gene expression responds to changing environmental conditions. **Invited talk** at Millersville University Seminar Series. Millersville, PA. *November 2018*.

Mullen Davis, M.A. Teaching and research in small universities/community colleges. **Invited talk** at Career Development Seminar Series, Cleveland Clinic Lerner Research Institute. Cleveland, OH. *December 2017*.

Mullen Davis, M.A. Surviving a salty diet: long non-coding RNAs and the plant stress response. **Invited talk** at Davidson College Biology Department. Davidson, NC. *November 2016*.

Mullen Davis, M.A.; Guo, J.; Price, D.H.; Luse, D.S. The pausing factor Gdown1 can load into functional RNA polymerase II complexes and accompany pol II through initiation and transcript elongation. **Poster** at RustBelt RNA Meeting RRM. Cleveland, OH. *October 2013*.

Mullen Davis, M.A.; Guo, J.; Price, D.H.; Luse, D.S. The RNA polymerase II associated protein Gdown1 can enter the preinitiation complex and accompany pol II through initiation and transcript elongation. **Poster** at Mechanisms of Eukaryotic Transcription Meeting. Cold Spring Harbor, NY. *August 2013*.

Mullen, M.A.; Olson, K.J.; Dallaire, P.; Major, F.; Assmann, S.M.; Bevilacqua, P.C. G-quadruplexes in *Arabidopsis thaliana*: Folding cooperativity and implications for drought stress regulation. **Talk** at RustBelt RNA Meeting RRM. Cleveland, OH. *October 2010*.

Mullen, M.A.; Olson, K.J.; Dallaire, P.; Major, F.; Assmann, S.M.; Bevilacqua, P.C. Prevalence and biological significance of G-quadruplexes in *Arabidopsis thaliana*. **Poster** at Nucleic Acids Conference. Puerto Morelos, Mexico. *November 2010*.

Mullen, M.A.; Olson, K.J.; Dallaire, P.; Major, F.; Assmann, S.M.; Bevilacqua, P.C. Prevalence and Biological Significance of G-quadruplexes in *Arabidopsis thaliana*. **Poster** at Bridges Science, Technology, Engineering, and Mathematics Symposium, Penn State University, University Park, PA. *June 2010*.

Mullen, M.A.; Olson, K.J.; Assmann, S.M.; Bevilacqua, P.C. G-quadruplexes in *Arabidopsis thaliana*: Prevalence and possible roles in RNA during stress. **Poster** at Symposium on RNA Biology VIII: RNA Tool and Target. Research Triangle Park, NC. *October 2009*.

CONTRIBUTING PRESENTATIONS

Luse, D.S.; Delaney, E.; Price, D.H.; **Mullen Davis, M.A.** The pausing factor Gdown1 competes with the initiation/elongation factor TFIIF for binding to RNA polymerase II in early elongation complexes. **Poster** at Mechanisms of Eukaryotic Transcription Meeting. Cold Spring Harbor, NY. *August 2015.*

GRANTS AND PROPOSALS

PASSHE Faculty Professional Development Council Grant (Millersville University) "Regulation of the Glyoxylate Pathway by IclR Multimerization," \$9,190, Funded Spring 2019.

National Science Foundation Graduate Fellowship (Penn State University) Honorable Mention, Fall 2006.

MENTORED STUDENT GRANTS AND PROPOSALS

Millersville University Neimeyer-Hodgson Award with Robert Fisher: "The binding characteristics of IclR transcription factor" \$716, Funded Spring 2019.

Millersville University Student Grant for Research and Creative Activity with Thomas Przywara: "Environmental effects on the function of IclR transcription" \$500, Funded Fall 2018.

College of Wooster Henry J. Copeland Grant for Independent Study with Peter Arts: "Real time PCR analysis of a salt stress responsive lncRNA in Arabidopsis under salt stress conditions" \$798, Funded Fall 2016.

College of Wooster Henry J. Copeland Grant for Independent Study with Michael Andes: "Differential expression of a novel lncRNA aids in Arabidopsis thaliana survival under high salinity stress. \$789, Funded Fall 2015.

College of Wooster Henry J. Copeland Grant for Independent Study with Ellyn Evans: "Characterization of long non-coding RNA expression during low temperature stress in Arabidopsis thaliana" \$300, Funded Fall 2015.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Graduate Women in Science (GWIS), *2009-present*

Board of Directors, *2016-present*; Chair *2019-2020*

Finance Committee Chair, *2015-2019*

National President, *2014-2015*

National Executive Committee Member *2012-2016*

American Society for Biochemistry and Molecular Biology (ASBMB)

American Chemical Society (ACS)

RNA Society

Ad Hoc Reviewer for Bioinformatics, G3

ACADEMIC SERVICE AND OUTREACH

Millersville University of Pennsylvania

Guest Speaker, UNIV 101 Seminar	<i>Oct 23, 2018</i>
Chemistry Department Recording Secretary	<i>2018-2019</i>
Academic Advisor, Chemistry major	<i>2018-present</i>

The College of Wooster

Academic Advisor, Biochemistry and Molecular Biology major	<i>2015-2017</i>
Biology Department Curriculum Committee	<i>2015-2017</i>
Introductory STEM Faculty Learning Community (ISFLC)	<i>2015-2017</i>
Biochemistry and Molecular Biology Curriculum Committee	<i>2014-2017</i>
Pre-Dental Club Advisor	<i>2015-2016</i>
4 Paws for Ability Program House Advisor	<i>2015-2016</i>
B-WISER Summer Camp Instructor - Forensic Chemistry	<i>2016</i>
B-WISER Summer Camp Chemistry Night Volunteer	<i>2015</i>

Earlham College

Examiner, Biochemistry Comprehensive Exams 2017

Cleveland Clinic Foundation

Lerner Research Institute Postdoctoral Association Committee 2013-2014

The Pennsylvania State University

Penn State Spirit of Internationalization Award Selection Committee 2011

Penn State Graduate School Mentoring Matters Workshop Panelist 2010

Department of Chemistry Think Tank Committee 2008-2009

Station Organizer, Take your Sons and Daughters to Work Day 2006-2011

HONORS AND AWARDS

2014 Molecular Genetics Scientific Accomplishment Award
2010-2011 Apple Fellowship, Penn State Department of Chemistry
2010 Women in the Sciences and Engineering Travel Grant
2010 Penn State Department of Chemistry Graduate Student Travel Award
2009 RNA Society of North Carolina RNA Symposium Poster Award
2009 Penn State Department of Chemistry Graduate Student Travel Award
2009 Department of Chemistry Graduate Student Leadership and Service Award
2005-2006 PSU Chemistry Graduate Student Fellowship recipient
2000 Girl Scout Gold Award

PROFESSIONAL DEVELOPMENT

Voices Conference: Taking Action. State College, PA. *February 2019.*
Diverse Science: Graduate Women in Science National Conference. Iowa City, IA. *June 2018.*
OH-PKAL Evidence-Based STEM Education: Teaching and Student Success Conference, Findlay, OH, *May 2017.*
OH-PKAL Evidence-Based Practices in Undergraduate STEM Education Conference, Columbus, OH, *May 2016.*
New Approaches to Teaching Introductory Courses Teaching Seminar, Wooster, OH, *May 2016.*
Beyond the Bench STEM Symposium. University Park, PA. *June 2015.*
ASBMB Workshop: Designing Scientific Teaching Tools for Underlying Concepts and Skills in BMB Education, Wooster, OH. *March 2015.*
Keystone Symposia: "Long Noncoding RNAs: From Evolution to Function" Keystone, CO. *March 2015.*
Adversity and Success VOICES Conference, State College, PA. *February 2015.*
Teaching Matters: Distressed and Distressing Students, Wooster, OH. *October 2014.*
Building Bridges: Practicing Science in the Modern Era. Minneapolis, MN. *June 2014.*

RESEARCH MENTORSHIP

2018-2019 Research Assistants Thomas Przywara (MU '20, Chemistry) and Robert Fisher (MU '20, Biology)
Fall 2017 Senior IS Advisees: Derek Schwarz (COW '18, BCMB), Trang Trinh (COW '18, BCMB)
2016-2017 Senior IS Advisees: Peter Arts (COW'17, BCMB), Allyson Caselberry (COW'17, BCMB), Mara Kingscott (COW'17, BCMB), and Kelsey Coyne (COW'17, BIOL)
Spring 2016 Student Research Assistant in molecular biology: Justin Warner (COW'18)
2015-2016 Senior IS Advisees: Michael Andes (COW'16, BCMB), Ellyn Evans (COW'16, BCMB), and Oluwadamilola Onakomaiya (COW'16, BIOL)
2015-2016 Student Research Assistant in plant biology and molecular genetics: Tsun Ki Jerrick To (COW'17)
Spring 2015 Student Research Assistants in molecular genetics: Kaitlyn Rayl (COW '18) and Andrea Wade (COW '17)
Summer 2013 Undergraduate Research Assistant in transcription biochemistry: Eleanor Axson (JCU '16)
2008-2010 Undergraduate Research Assistant in biochemistry/biophysics: Kalee Olson (PSU '10)
2007-2008 Undergraduate Research Assistant in molecular biology/biochemistry: Kyle Miller (PSU '08)