**Paula Jean Schlax**

Bates College Work: 207 786 6290

Department of Chemistry FAX: 207 786 8336

5 Andrews Road pschlax@bates.edu

Lewiston ME 04240

**Education and Professional Training:**

B.S. Chemical Engineering Clarkson University May 1989

Ph.D. Physical Chemistry University of Wisconsin-Madison December 1994

Thesis: Mechanisms of Gene Expression

Advisor: M. Thomas Record Jr.

Postdoctoral Research Fellow Johns Hopkins University 1995-1998

Advisor: David Draper

**Research Interests:**

Gene regulation in diverse bacteria; kinetics and thermodynamics of mRNA structure formation, mRNA deay, RNA localization using high resolution nanoscopy, sRNA-mRNA interactions and protein-nucleic acid interactions; mRNA structure and function in prokaryotic mRNA degradation and translational initiation.

**Experience:**

**Department of Chemistry and Biochemistry - Bates College Lewiston, ME**

2015-present Professor of Chemistry and Biochemistry

2004- 2015 Associate Professor of Chemistry

September 1998- 2004 Assistant Professor of Chemistry

**Department of Chemistry-Johns Hopkins University Baltimore, MD**

September 1995-August 1998 Postdoctoral Research Fellow

**Institute of Chemical Education (Project Seraphim) Madison, WI**

May 1995-August 1995 Postdoctoral Project Assistant

**Department of Chemistry- University of Wisconsin-Madison Madison, WI**

January 1995-May 1995 Lecturer

September 1989-December 1994 Research Assistant and Teaching Assistant

**Molecular Genetics Division –Eli Lilly Research Laboratories Indianapolis, IN**

May 1990-August 1990 Research Intern

**Peer-Reviewed Research Publications (\* denotes Bates College undergraduate student):**

†S. Snow\*, E. Bacon\*, J. Bergeron, D. Katzman\*, A. Wilhelm\*. O. Lewis\*, D. Syangtan\*. A. Calkins, L. Archambault, M.L. Anacker, and P.J. Schlax, 2020, :Transcript decay mediated by RNase III in Borrelia burgdorferi” Biochem Biophys Res Commun. 529:386-391.

J. Matsunaga, P.J. Schlax, D. Haake, 2013,  **“**A role for *cis*-acting RNA sequences in the temperature-dependent expression of the multiadhesive Lig proteins in *Leptospira interrogans”* J. Bacteriol.  195:22 5092-5101.

L. Archambault, J. S. Borchert\*, J. Bergeron\*, S. Snow\*, P.J. Schlax, 2013, “Measurements of mRNA Degradation in *Borrelia burgdorferi*” J. Bacteriol.  195:21 4879-4887.

L. Archambault, J. Linscott\*, N. Swerdlow\*, K. Boyland\*, E. Riley\* and P.J. Schlax, 2013, “Translational Efficiency of *rpoS* mRNA from *Borrelia burgdorferi*: Effects of the Length and Sequence of the mRNA Leader Region” Biochem Biophys Res Commun. 433(1):73-8.

R. I. Koleva, C. A. Austin\*, J. M. Kowaleski\*, D.S. Neems\*, L.Wang\*, C.P.H. Vary and P.J. Schlax, 2006, “Interactions of Ribosomal Protein S1 with DsrA and *rpoS* mRNA” Biochem Biophys Res Commun. 348:662-668.

P.J. Schlax and D. J. Worhunsky\* “Translational Repression Mechanisms in Prokaryotes”, 2003, Mol. Microb, 48: 1157-1169.

D. J. Worhunsky\*, K. Godek\*, S. Litsch\*, & P.J. Schlax“Interactions of the Non-Coding RNA DsrA and *rpoS* mRNA with the 30S Ribosomal Subunit”, 2003, J. Biol. Chem., 278:15815-15824.

P.J. Schlax, K. A. Xavier, T.C. Gluick & D.E. Draper “Translational Repression of the *E. coli*  Operon mRNA: Importance of an mRNA Conformational Switch and a Ternary Entrapment Complex”, 2001, J. Biol. Chem. 276:38494-501.

D. E. Draper , T. C. Gluick & P. J. Schlax "Pseudoknots, RNA Folding and Translational Regulation" for RNA Structure and Function ed. R.W. Simon & M. Grunberg-Manago, CSHL Press, 1998, pp. 415-436.

M. T. Record Jr., W. S. Reznikoff, M. L. Craig, K. L. McQuade & P. J. Schlax, "*Escherichia coli* RNA Polymerase (E70), Promoters, and the Kinetics of the Steps of Transcription Initiation" *Escherichia coli* and *Salmonella typhimurium*: Cellular and Molecular Biology 2nd Edition Ed. F.C.Neidhhardt, 1996, pp.792-821.

P. J. Schlax, M. W. Capp and M. T. Record Jr. "Inhibition of Transcription Initiation by Lac repressor", 1995, J. Mol. Biol. 245:331-350.

L. Rao, W. Ross, J. A. Appleman, T. Gaal, S. Leirmo, P. J. Schlax, M. T. Record Jr. and R. L. Gourse, "Factor Independent Activation of *rrnB* P1-An 'Extended' Promoter with an Upstream Element that Dramatically Increases Promoter Strength", 1994, J. Mol. Biol., 235:1421-1435.

S. Law, G. Bellomy, P. J. Schlax, M. T. Record Jr., "*In Vivo* Thermodynamic Analysis of Repression with and without Looping in Lac constructs: Estimates of Free and Local lac Repressor Concentrations and of Physical Properties of the Interoperator Region of Supercoiled Plasmid DNA", 1993, J. Mol. Biol., 230:161-230.

A. Lucia, X. Guo, P. J. Richey , R. Derebail, "Simple Chemical Process Equations, Fixed Point Methods and Chaos" 1990, AIChE Journal, 36:641-654.

**Other Publications:**

L. Archambault, S. Snow\*, J. Bergeron\*, and P.J. Schlax, “Relationship between RpoS-mRNA leader sequence and structure and rate of mRNA decay”  **Data Paper.**

Contributor to web-based tool for teaching chemical techniques to introductory chemistry students. Described in Joe L. March, John W. Moore, and Jerrold J. Jacobsen (2000) “ChemPages Laboratory: Abstract of Special Issue 24 on CD-ROM”, Journal of Chemical Education, 77(3):423.

**Recent Presentations (\* denotes Bates College undergraduate student):**

Panelist: “The Road to Inclusive Excellence on Your Campus: How Do You Know You Are There?” January 9. 2019, 2019 Massachusetts PKAL Network Winter Meeting, Faculty development fo Inclusive Excellence in STEM

E. Bacon\*, A. Calkins, T. Gould, O. Lewis\*, M. Reinhold, D. Syangtan\*, X. Wang\*, A. Wilhelm\* and P.J. Schlax, (2018) “RNA Fate in *Borrelia burgdorferi*” Gordon Conference: Biology of Spirochetes, Ventura, CA (Poster).

Schlax, P.J. (2017) “mRNA Sequence and Structure Influences Translational Regulation and mRNA Decay” Bowdoin College, Brunswick, ME (Presentation).

E. Bacon\*, D. Syangtan\*, L. Archambault, A. Calkins, O. Lewis\*, A. Wilhelm\* and P.J. Schlax, (2018) “RNA Decay in *Borrelia burgdorferi*” Molecular Genetics of Bacteria and Phages, Madison, WI (Poster).

Schlax, P.J. (2016) “mRNA Sequence and Structure Influences Translational Regulation and mRNA Decay” Rocky Mountain National Laboratory, Hamilton, Montana (Presentation).

Schlax, P.J. (2016) “This talk is not called ‘Exposing students to Lyme disease” Bates College (Presentation).

Schlax, P.J. (2016) “mRNA Sequence and Structure Influences Translational Regulation and mRNA Decay” Gordon Conference: Biology of Spirochetes, Ventura, CA (Presentation).

L. Archambault, J. Bergeron\*, S Snow\*, P. Schlax (2015) “Investigating mRNA Degradation and Translational Regulation in *Borrelia burgdorferi”* Molecular Genetics of Bacteria and Phages, Madison, WI (Poster)

L. Archambault, J. Bergeron\*, S Snow\*, P. Schlax (2015) “Gene Regulation in *Borrelia burgdorferi”* Dartmouth Microbial Pathogenesis Retreat, Lake Morey, Vermont (Poster).

L. Archambault, J. Bergeron\*, S Snow\*, P. Schlax (2014) “Investigating mRNA Degradation and Translational Regulation in *Borrelia burgdorferi”* Northeast Regional INBRE Meeting, Washington DC (Poster).

L. Archambault, J. Bergeron\*, S Snow\*, P. Schlax (2014) “Investigating mRNA Degradation and Translational Regulation in *Borrelia burgdorferi”*, Gordon Conference: Biology of Spirochetes, Ventura, CA (Poster).

L. Archambault, J. Bergeron\*, S Snow\*, S. Borchert\* (2013) “mRNA Decay in *Borrelia burgdorferi*”,

13th Conference on Lyme Borreliosis and other tick-borne diseases, Boston, MA (Poster).

J. Bergeron\*, S. Snow\*, L. Archambault and P. Schlax (2013) “mRNA Decay in *Borrelia burgdorferi*”, Northeast Regional INBRE Meeting, Delaware (Poster).

P.J. Schlax, L. Archambault, E. Riley\*, S. Borchert\*, K. Boyland\*, J. Linscott\* and N. Swerdlow\* (2012) “Gene Expression and Regulation in *Borrelia burgdorferi*”, NISBRE, Washington DC (Poster).

P.J. Schlax, K. Boyland\*, E. Riley\*, N. Swerdlow\*, J. Linscott\*, and L. Archambault (2012) “Translational Regulation in *Borrelia burgdorferi*”, Gordon Conference: Biology of Spirochetes, Ventura CA (Poster).

P.J. Schlax, K. Boyland\*, E. Riley\*, N. Swerdlow\*, J. Linscott\*, and L. Archambault (2011)“Translational Regulation of the RpoS gene”, Northeast Regional INBRE Meeting, Newport RI, (Poster).

P.J. Schlax, N. Swerdlow\*, J. Linscott\* (2010) “Translational Regulation of Ribosomal Protein and RNA Polymerase Subunit Synthesis in Diverse Bacterial Species” NISBRE, Bethesda MD (Poster).

P.J. Schlax (2010) “Translational Regulation of Ribosomal Protein and RNA Polymerase Subunit Synthesis in Diverse Bacterial Species” Southern Maine Community College INBRE Investigators and External Advisory Board Meeting.

P.J. Schlax (2009) “Translational Regulation of Ribosomal Protein and RNA Polymerase Subunit Synthesis in Diverse Bacterial Species” Southern Maine Community College INBRE Investigators and External Advisory Board Meeting.

P.J. Schlax, N. Swerdlow\*, J. Linscott\* (2009) “*In vitro* Studies Examinin*g Borrelia burgdorferi rpoS* Translational Initiation and Regulation” at Molecular Genetics of Bacteria and Phages (Poster)

J. Linscott\*, N. Swerdlow\*, P.J.Schlax, (2009)  **“**The role of transcript length in the translational regulation of RpoS, a key virulence regulator in the Lyme disease spirochete *Borrelia burgdorferi*” CUR Posters on the Hill, Washington D.C. (Poster).

**External Funding:**

**Current:**

†2020-2024 NIH R01: SpoVG and PlzA Regulation of Lyme Disease Spirochete Infection Processes co-PI with B. Stevenson U Kentucky ($99,470 to Bates)

2019-2021 NIH R21 “Using Fluorescence Nanoscopy to Study RNA Localization in Borrelia burgdorferi, the Spirochete that Causes Lyme Disease” (**$372,639**) co\_PI with Travis Gould, Bates College

**Former:**

2018-2023 HHMI: Inclusive Excellence Proposal for Bates (Project Director 2018-2020)

2018 NIH R21 Award “Post-transcriptional regulation in *Borrelia burgdorferi* by the BpuR RNA-binding protein***”*** ($41,490 to Bates), co-PI with B. Stevenson, U Kentucky

2015 NIH R15 Award **($345,000)** “mRNA Degradation in *Borrelia burgdorferi****”***

2014 INBRE Core Facility Grant ($**1,000**) “Measurements of ribonuclease levels in *Borrelia burgdorferi*, the causative agent of Lyme disease, using proteomic approaches*”*

2009-2014 ($**638,163)** NIH INBRE Award: Translational Regulation of Ribosomal Protein and RNA Polymerase Subunit Synthesis in Diverse Bacterial Species (Sub-contract of the Maine INBRE award)

2004-2008 NSF RUI- **($271,840)** Translational Regulation of RpoS mRNA (Finished in 2008)

2004-2006: Cottrell College Science Award Renewal **($24,000 awarded)** Characterization of the Role of RpoS mRNA Interactions with Regulatory Factors During Osmotic Induction of the *rpoS* Gene

2003: NSF MRI-**($76,100)** Acquisition of a Multifunctional Imaging System for Research and teaching in an Undergraduate Environment. Co- Principal Investigator.

2000-2003**:** Cottrell College Science Award **($39,150)** Relationships between rpoS mRNA Structure and Stability and Osmotic Regulation of Translational Initiation

**Internal Funding (Last 10 years) :**

2019 Faculty Development Grant: *Replacement of Chromatography Cabinet*

2018 Faculty Development Grant: *Macromolecular Localization in the Bacteria that causes Lyme Disease*

2016, Roger J. Schmutz award: *Biosafety and the Bacteria that Causes Lyme Disease*

2016, 2017 Sherman Fairchild Faculty Student Grant

2015 Course Redesign Grant: Acquisition and Analysis of Data from Honeybee colonies to supplement Chemistry S11: The Natural Science of Honeybees

2015, 2016 INBRE Faculty Student Grant

2014 Faculty development Grant: Detection of ribonucleases in *Borrelia burgdorferi*, the bacteria that causes Lyme Disease

2013 Faculty Development Grant: Publication Costs for Archambault et al. (2013) J. Bact.

2012-2014 Faculty Development Grant: Microfluidics and *Borrelia burgdorferi*

2010 Faculty Development Grant: Renovations to Dana Chemistry to Facilitate Cell Culture work (Schlax and Lawson joint submission)

2009 Hughes: Identification of cis-acting elements involved in translational regulation of ribosomal proteins in diverse bacteria

**Honors and Awards:**

2016 Kroepsch Award for Excellence in Teaching

1996-1998 NIH Postdoctoral Fellowship

1994 Hoescht Celanese Award for Excellence in Chemical Research

1993-1994 Department of Education Fellowship

1990-1993 NIH Biotechnology Training Fellowship

1989 Union Carbide Award for Excellence in Chemical Engineering Design

1989 Tau Beta Pi National Engineering Honor Society

1988 Omega Chi Epsilon Chemical Engineering Honor Society

1985-1989 Weston and Clarkson Presidential Scholarships

1985, 1987 Meserve Memorial Scholarship for Environmental Studies

**Recent Bates College Service:**

2018 (Fall) Chair of Chemistry and Biochemistry

2017-2019 STEM Coordinator

2016-2017 Chair of Digital and Computer Studies

2004-2010; 2013-2016 Chair of Biological Chemistry

2019- HHMI Leadership Team

2015-2019 Personnel committee

2016-2017 STEM Facilities Committee

2016-2109 STEM Initiative Member

2015-2017 Digital and Computational Studies Program committee

2013-2014 Purposeful Work Working Group

2013-2017 Institutional Biosafety Committee (Chair 2015-2017)

2011-2015 Educational Policy Committee

2010 External Reviewer Biochemistry and Molecular Biology Program, Gustavus Adolphus

1999-2017: Biological Chemistry Program Committee (Chair 2004-2010, 2013-2017)

2000- 2002, 2007-2011: Committee on Curriculum and Calendar (Chair 2008-2010)

2007-2009 Ad-Hoc Committee for Enrollments

Continuous: Search committees for Tenure track and visiting positions in Chemistry

2017-2018 Search committee member Open STEM Faculty search

2016 Chaired DCS search for Chair

2004-2008, 2010-2014, 2018-present Radiation Safety Officer

**Courses Taught:**

Biophysical Chemistry

Cellular and Molecular Biology and Laboratory

Biological Chemistry and Laboratory

Topics in Macromolecular Chemistry

Thermodynamics and Kinetics Laboratory

Atomic and Molecular Structure and Laboratory

Chemical Reactivity and Laboratory

Advanced Chemical Measurement Laboratory

Epidemics (First Year Seminar)

Biotechnology for Citizens

Structure and Function of DNA, RNA, and Proteins

Natural Science of Honeybees