**Paula Jean Schlax**

Bates College Work: 207 786 6290

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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, sRNA-mRNA interactions and protein-nucleic acid interactions; mRNA structure and function in prokaryotic mRNA degradation and translational initiation.

**Experience:**

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

2004-2010; 2013-Present Chair of Biological Chemistry

2004- present Associate Professor of Chemistry

2010- 2012 Chair 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

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

**†**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.

**Manuscripts in Preparation and Data Papers**

**†**L. Archambault, M. Hargreaves, S. Snow\*, J. Bergeron\* and P.J. Schlax**, “**Transcript decay in *Borrelia burgdorferi* requires RNase III” Manuscript in Preparation.

**†**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.

**Teaching Publication:**

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.

**Presentations (Last 5 years, \* denotes Bates College undergraduate student):**

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:**

†2014 NIH R15 Proposal “mRNA Degradation in *Borrelia burgdorferi****” (re-submitted)***

2012 NIH R15 Proposal “mRNA Degradation in *Borrelia burgdorferi****” (Submitted)***

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 5 years) :**

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

2012-present 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:**

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

**Professional Service:**

Ad-hoc reviewer:Molecular Microbiology, Biophysical Journal, EMBO, JMB, Journal of Bacteriology, BBA- Gene Regulatory mechanisms, Research Corporation, NSF MCB Program

**Bates College Service (Last 5 years):**

2013-present Purposeful Work Working Group

2013-present Institutional Biosafety Committee

2011-present Educational Policy Committee

2010 External Reviewer Biochemistry and Molecular Biology Program, Gustavus Adolphus

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

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

2007-2009 Ad-Hoc Committee for Enrollments

**Speaker and Panelist at Career Days:**

1999: University of Utah Biological Chemistry and Molecular Biology Programs.

2001: Kieve Science Camp for Girls.

2003: University of Wisconsin Madison Life Sciences Career Day

**Courses Taught:**

63 undergraduate students have done research with me since I arrived at Bates.

For Chemistry or Biological Chemistry Majors:

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

For Non-Science Majors:
Epidemics (First Year Seminar)

Biotechnology for Citizens

Structure and Function of DNA, RNA, and Proteins