

**Curriculum Vitae**  
**Jane M. Liu**

Drew University  
Chemistry Department  
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**EDUCATION**

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Tufts University School of Medicine, Boston, MA: 2006-2009  
*TEACRS (IRACDA/NIGMS) Postdoctoral Fellow*

Harvard University, Cambridge, MA: 2001-2006  
*Ph.D., Chemistry*

Swarthmore College, Swarthmore, PA: 1996-2000  
*B.A., Biochemistry, High Honors*

**POSITIONS HELD**

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**Assistant Professor of Chemistry, Pomona College: 2012-present**

*Teaching: Biochemistry, Chemical Biology, and Research in Chemistry and Molecular Biology*

**Assistant Professor of Chemistry, Drew University: 2009-2012**

*Teaching: General Chemistry, Organic Chemistry, Biochemistry, Chemical Biology, and Research in Chemistry and Molecular Biology*

**Teaching Fellow for Undergraduate Organic Chemistry, Harvard University: 2001-2005 (5 semesters)**

*Teaching: Organic Chemistry for majors and non-majors, and Organic Chemistry of Life*  
*Head Teaching Fellow for undergraduate organic and biological chemistry course; handled administrative aspects of course with enrollment of 280 students (Spring 2005 semester)*  
*Received: 4 Distinction in Teaching awards, based on student evaluations, one for each semester as a teaching fellow*

**RESEARCH EXPERIENCE**

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**Principle Investigator, Pomona College, Department of Chemistry: 2012-present**

*Regulatory small RNAs in Vibrio cholerae; engineering riboswitch-based biosensors*

**Principle Investigator, Drew University, Department of Chemistry: 2009-2012**

*Molecular mechanisms by which non-canonical RNAs regulate gene expression in Escherichia coli and Vibrio cholerae*

**Postdoctoral Fellow, HHMI and Tufts University School of Medicine: 2006-2009**

*Department of Molecular Biology and Microbiology (Laboratory of A. Camilli). Experimental discovery of new sRNAs in the enteric pathogen Vibrio cholerae through the use of direct cloning, 5S/tRNA-depletion and parallel sequencing*

**NSF Predoctoral Fellow/Graduate Research Assistant, HHMI and Harvard University: 2001-2006**

*Department of Chemistry and Chemical Biology (Laboratory of D.R. Liu). Functional dissection of natural RNAs in Escherichia coli and Saccharomyces cerevisiae by nonhomologous random recombination and in vivo selections*

**Undergraduate Research Assistant, Swarthmore College: 1999-2000**

*Department of Chemistry (Laboratory of R.S. Paley). Honors thesis exploring intramolecular pinacol coupling and ring-closing metathesis of enantiopure sulfinyl iron(0) dienes*

### Summer Research Assistant, Rutgers University - New Brunswick: 1998

Department of Chemistry (Laboratory of R.A. Jones). *Synthesized <sup>15</sup>N-labeled guanosine for investigations on metal-binding by RNA*

### FELLOWSHIPS, GRANTS AND AWARDS/RECOGNITION

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#### Research grants

CLA Faculty Award for Student-Faculty Research in Environmental Studies and Sustainability: 2011 (\$11,400)

Drew University Research Grant: 2011 (\$900)

National Institutes of Health Academic Research Enhancement Award (AREA) Research Grant: 2010-2013 (\$325,455)

Drew University Research Grant: 2010 (\$400)

Training in Education and Critical Research Skills (TEACRS) Postdoctoral Fellowship, National Institute of General Medical Science (NIGMS): 2006-2009

National Science Foundation (NSF) Graduate Research Fellowship: 2002-2005

Howard Hughes Medical Institute Summer Research Scholar: 1999

#### Professional awards and recognition

Distinction in Teaching for leading two discussion sections in Chemistry 27 (undergraduate organic and biological chemistry) at Harvard University: 2004. *This distinction is granted by the Committee for Undergraduate Education based on teaching evaluations from students*

Distinction in Teaching for Chem 30, Organic Chemistry II, Harvard University: 2002

Distinction in Teaching for Chem 27, Organic Chemistry of Life, Harvard University: 2002

Distinction in Teaching for Chem 17, Organic Chemistry, Harvard University: 2001

Elected to Phi Beta Kappa: 2000

Elected to Sigma Xi: 2000

### PUBLICATIONS (underlined: students mentored by J. Liu)

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1. Mustachio LM, Aksit S, Mistry RH, Scheffler R, Yamada A, **Liu JM**. The *Vibrio cholerae* mannitol transporter is regulated post-transcriptionally by the MtlS small RNA. *Journal of Bacteriology*. **2012**, *194*, 598-606.
2. **Liu JM**, Camilli A. Discovery of sRNAs by high-throughput sequencing. In: Kwon YM, Ricke SC eds. *Methods in Molecular Biology*. Vol 733. New York, NY: Humana Press; **2011**.
3. **Liu JM**, Camilli A. A broadening world of bacterial small RNAs. *Current Opinions in Microbiology* **2010**, *13*, 18-23.
4. Wang W, Zha, J, Han Q, Wang G., Yang G., Shallop AJ, **Liu JM**, Gaffney BL, Jones, RA. Modulation of RNA metal binding by flanking bases: <sup>15</sup>N NMR evaluation of GC, tandem GU, and tandem GA sites. *Nucleosides, Nucleotides & Nucleic Acids* **2009**, *28*, 424-434.
5. Paley RS, Berry KE, **Liu JM**, Sanan TT. Diastereoselective intramolecular pinacol couplings of sulfinyl iron(0) diene complexes. *Journal of Organic Chemistry* **2009**, *74*, 1611-1620.
6. **Liu JM**, Livny J, Lawrence MS, Kimball MD, Waldor MK, Camilli A. Experimental discovery of sRNAs in *Vibrio cholerae* by direct cloning, 5S/tRNA-depletion and parallel sequencing. *Nucleic Acids Research* **2009**, *37*, e46.

7. **Liu JM**, Liu, DR. Discovery of a mRNA mitochondrial localization element in *Saccharomyces cerevisiae* by nonhomologous random recombination and *in vivo* selection. *Nucleic Acids Research* **2007**, *35*, 6750-6761.
8. **Liu JM**, Bittker JA, Lonshteyn M, Liu DR. Functional dissection of sRNA translational regulators using nonhomologous random recombination and *in vivo* selection. *Chemistry & Biology* **2005**, *12*, 757-767.
9. Bittker JA, Le BV, **Liu JM**, Liu DR. Directed evolution of protein enzymes using nonhomologous random recombination. *Proceedings of the National Academy of Sciences USA* **2004**, *101*, 7011-7016.
10. Paley RS, **Liu JM**, Lichtenstein BR, Knoedler VL, Sanan TT, Adams DJ, Fernandez J, Rablen PR. Simultaneous and stereoselective formation of planar and axial chiralities in enantiopure sulfinyl iron diene complexes. *Organic Letters* **2003**, *5*, 309-312.

#### **RESEARCH PRESENTATIONS** (underlined: students mentored by J. Liu)

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1. **Liu, JM**, Mustachio L, Aksit A, Mistry R. **2011**. The *Vibrio cholerae* MtlS small RNA regulates gene expression in response to changes in carbon source. ASM Conference on Regulating RNA in Bacteria: San Juan, Puerto Rico. (Poster Presentation)
2. **Liu JM**, Kimball MD, Camilli A. **2009**. An sRNA regulator of mannitol uptake in *Vibrio cholerae*. Symposium on Bacterial Cell Biology and Pathogenesis: Umea, Sweden. (Oral Presentation)
3. **Liu JM**, Livny J, Lawrence MS, Waldor MK, Camilli A. **2008**. Experimental discovery of sRNAs in *V. cholerae*. 108<sup>th</sup> General Meeting of the American Society for Microbiology: Boston, MA. (Poster Presentation)
4. **Liu JM**, Liu DR. **2006**. Characterization of an mRNA localization element in *S. cerevisiae* by nonhomologous random recombination and *in vivo* selection. 11<sup>th</sup> Annual Meeting of the RNA Society: Seattle, WA. (Poster Presentation)

#### **RESEARCH EXPERIENCE WITH STUDENTS**

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##### **Supervised Research Students at Drew University**

\* Goldwater Scholar

§ Fulbright Scholar Finalist

\*\* ASM-Undergraduate Research Fellowship recipient

• Beta Beta Beta Research Foundation Research Grant recipient

# successfully wrote and defended honors research thesis

<b>Student (class year)</b>	<b>Term(s)</b>	<b>Current/last known position</b>
Stacey Ceron ('12)	Sept 2011 – May 2012	current Drew undergraduate
Aleksander Kubiak ('13)	Summer 2011	current Drew undergraduate
Taras Varshavsky ('13)	Summer 2011	current Drew undergraduate
Jarod Grossman ('12)	Jan 2011 – Aug 2011	current Drew undergraduate
Ross Shamby ('11)	Sept 2010 – Dec 2010	B.A. Biochem. Mol. Biol
Lalita Nekkanti ('11)	Sept 2010 – Dec 2010	Dental student, Tufts University
Robert Scheffler* ('14)	2010 summer – present	current Drew undergraduate
Ronak Mistry ('13)	2010 summer – present	current Drew undergraduate
Akikuni Yamada ('11)	2010 summer- Dec 2010	B.A. Biochem. Mol. Biol
Selime Aksit**•§# ('12)	Jan 2010 – present	current Drew undergraduate
Lisa Maria Mustachio•#('11)	Jan 2010 – May 2011	Ph.D. student, Dartmouth College

### High School Students Hosted

Madeline Ketley	2011 summer	Kent Place School
Joanna Mleczko	2010 summer	Kent Place School

### Supervised Research Student at Tufts University

∞post-baccalaureate student

Marc Kimball∞	Nov 2007- Nov 2008	Medical student, Tufts University
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### Supervised Research Student at Harvard University

Maria Lonshteyn	2003-2005	M.D. Boston, MA
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### STUDENT RESEARCH PRESENTATIONS (underlined: students mentored by J. Liu)

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1. Grossman J, Kubiak A, Varshavsky T, **Liu JM. 2011**. Development of a riboswitch-based biosensor for polychlorinated biphenyls. 14<sup>th</sup> Annual Undergraduate Research Symposium: University of Maryland – Baltimore County. (Poster Presentation)
2. Mistry R, Scheffler R, Aksit S, **Liu JM. 2011**. Small RNA-mediated expression of the mannitol operon in *Vibrio cholerae*. 14<sup>th</sup> Annual Undergraduate Research Symposium: University of Maryland – Baltimore County. (Poster Presentation)
3. Aksit S, Mustachio L, **Liu JM. 2011**. The MtlS small RNA regulates mannitol transport in *Vibrio cholerae*. 111<sup>th</sup> General Meeting of the American Society for Microbiology: New Orleans, LA. (Poster Presentation)
4. Mustachio L, Mistry R, Aksit S, **Liu JM. 2011**. The *Vibrio cholerae* mannitol transporter is regulated post-transcriptionally. 111<sup>th</sup> General Meeting of the American Society for Microbiology: New Orleans, LA. (Poster Presentation)
5. Mustachio L, Aksit S, Mistry R, **Liu JM. 2010**. Small RNA regulation of gene expression in *Vibrio cholerae* in response to changes in carbon source. 13<sup>th</sup> Annual Undergraduate Research Symposium: University of Maryland – Baltimore County. (Poster Presentation)

### CURRICULUM DEVELOPMENT

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#### **Designed and taught a course on Chemical Biology: 2011, 2012 (Drew University, Madison, NJ)**

*Developed and presented entirely new curriculum for an upper-level elective in the chemistry and biochemistry program, incorporating over 30 primary literature papers and active-learning techniques; designed and implemented a sequenced writing assignment where students prepared a grant proposal to the NIH addressing a human health problem from a chemical biology perspective.*

#### **Designed and taught a “Great Challenges” course on Molecular Biology and Human Disease: 2011 (Drew University, Madison, NJ)**

*Co-taught, with Prof. Stephen Dunaway (Biology), a research-based course for students interested in biochemistry and molecular biology. Students worked on authentic research projects stemming from the instructors’ research programs. For most of the students, this was their first exposure to science research; nine out of the 15 students applied and were accepted to participate in the Drew Summer Science Institute, allowing them to continue independent research beyond the one semester.*

#### **Participant in Great Challenges in Science Course Development Workshop: 2010 (Drew University, Madison, NJ)**

*Topics include: lab course design, teaching scientific literacy, and using problem based learning and case studies in teaching science*

**Developed and taught an activity-based lesson, “The Anatomy of a Primary Scientific Research Paper: How to read science papers and How to write about science”: 2010 (Drew University, Madison, NJ)**

*First-year students in a Science Honors Seminar learned how to approach reading a primary scientific paper and how to translate their gathered information to an original summary and evaluation of the paper.*

**Initiated the use of classroom response elements (“Clickers”) in science courses at Drew University: 2009-2012 (Madison, NJ)**

*Trained faculty to use clicker technology and organized the purchase and use of additional clickers to meet faculty and student needs.*

**Drew University Faculty Development Grant: 2009 (\$900)**

*Awarded funds allowed for the purchase of classroom response elements, “clickers”, for a pilot program in Fall 2009.*

**Developed and implemented a sequenced writing assignment for Organic Chemistry: 2009-present (Drew University, Madison, NJ)**

*Towards developing information literacy and effective communication skills, a sequenced writing assignment was developed in which students picked an ingredient from their favorite personal care product. The students then researched their chosen molecule and presented their found information to a general audience.*

**Developed and implemented course materials for student-centered, guided-inquiry learning in General Chemistry, Organic Chemistry and Biochemistry: 2009-2012 (Drew University, Madison, NJ)**

**Participant in 3-Day POGIL Workshop: 2009 (Salve Regina University, Newport, RI)**

*An in-depth exposure to the principles and practicalities of process-oriented guided-inquiry instruction.*

**Participant in ASM (American Society for Microbiology) Conference for Undergraduate Educators: 2008 (Endicott College, Beverley, MA)**

**Designed and taught a course on Cancer Biology: 2008 (Pine Manor College, Chestnut Hill, MA)**

*Co-taught, with TEACRS fellow Jennifer Kowalski, Senior Biology Major Capstone on cancer biology during spring 2008 semester. Developed and presented entirely new curriculum for capstone course, incorporating active-learning techniques; designed and implemented sequenced writing assignment. Organized the first PMC Cancer Health Fair poster session for capstone students to professionally present their gathered knowledge from the sequenced writing assignment to the entire PMC community.*

**Participant in Graduate Institute for Teaching (G.I.F.T.): 2007 (Tufts University, Medford, MA)**

*Experience-based formal instruction in the art of teaching undergraduates*

**TEACHING PRESENTATIONS**

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Kowalski JR\*, Liu JM.\* 2008. Teaching information literacy, critical thinking, and scientific communication skills to senior biology majors through a sequenced writing project on cancer biology. 2008 IRACDA Conference: Chapel Hill, NC. (Oral Presentation) [\*Co-presenters]

**PROFESSIONAL ACTIVITIES**

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**Participant in Workshop on Microscopy in Microbial Systems: 2009 (Umea Center for Microbial Research, Umea, Sweden)**

*Learned theory and techniques behind atomic force microscopy, optical tweezers, and electron microscopy.*

**Participant in Council on Undergraduate Research (CUR) Dialogues “The Art of Grantsmanship”: 2009 (Washington, D.C.)**

*Interacted with federal agency program officers and other grant agencies to learn about funding opportunities*

**PROFESSIONAL SERVICE**

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Reviewer for Oxford University Press

Reviewer for *ACS Synthetic Biology*

Judge for 13<sup>th</sup> and 14<sup>th</sup> Annual Undergraduate Research Symposium, University of Maryland – Baltimore County: October 2010, 2011

Panelist for “Negotiating the Job Offer”, National IRACDA Conference 2010: June 2010

Panelist for “Careers in Science” session, Bunker Hill Community College: October 2008

Organizer and facilitator for “Entering Mentoring” workshop, Tufts University: Spring 2007

**DREW UNIVERSITY SERVICE**

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***Invited presentation***

2009 Phillips Presentation: Drew University Science Day

***College-wide committees***

2011 – 2012 Faculty Advisory Committee on International and Off-campus Programs

2010 – 2012 Academic Standing Committee (*Chair*, 2011-2012)

**PROFESSIONAL MEMBERSHIPS**

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American Chemical Society since 2005

American Society for Microbiology since 2006

RNA Society since 2006