

# MARYKAY ORGILL

## Curriculum Vitae

### Professional Address:

Department of Chemistry  
University of Nevada, Las Vegas  
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### Communication:

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### Educational Background

- Ph.D. Chemistry (Chemistry Education) August 2003  
Purdue University, West Lafayette, IN  
Ph.D. Research Thesis: "Playing with a double-edged sword: Analogies in biochemistry"
- M.S. Chemistry (Biochemistry) December 1999  
Purdue University, West Lafayette, IN  
M.S. Research Thesis: "Structural and kinetic studies on *Escherichia coli* acid phosphatase/phytase"
- B.S. Chemistry April 1995  
Brigham Young University, Provo, UT  
B.S. Research Thesis: "Molecular conformations of methacrylic acid: An infrared spectroscopic study"  
Graduated *summa cum laude* with University Honors and Honors in Chemistry

### Professional Experience

#### Research Experience

- Assistant Professor of Chemistry (Chemistry Education)* 2004 - present  
Department of Chemistry. University of Nevada, Las Vegas, Las Vegas, NV.
- Assistant Professor of Science Education and Biochemistry* 2003 - 2004  
Department of Learning, Teaching, and Curriculum and Department of Biochemistry. University of Missouri-Columbia, Columbia, MO.
- Graduate Student in Chemistry Education* 1999 - 2002  
Performed textbook analysis, observed classroom practices, and interviewed students and instructors in order to determine the roles that analogies play in biochemistry learning. Department of Chemistry. Purdue University, West Lafayette, IN.

- Graduate Student in Biochemistry* 1997 - 1999  
 Mutated, expressed, and purified *E. coli* acid phosphatase/phytase; performed kinetic, limited proteolysis, fluorescence, and labeling studies on the protein in order to determine its structure and the location of its disulfide bonds. Department of Chemistry. Purdue University, West Lafayette, IN.
- Laboratory Intern and Phlebotomist* January to August 1997  
 Performed venipunctures in the hospital and in the hospital clinic, reported test results to physicians' offices, organized hospital test records in a computer data-bank, translated instructions for Spanish-speaking patients. St. Mary's Regional Medical Center, Reno, NV.
- Research Assistant* 1993 - 1995  
 Performed neat, dilute solution, solid, and matrix isolation infrared spectroscopy to study molecular conformations. Brigham Young University, Provo, UT.
- Laboratory Technician* Summers 1992 and 1993  
 Performed literature searches, tested MALDI-TOF MS instrument to determine optimum performance parameters, performed spectral analyses (MALDI-TOF MS), developed calibration standards, ordered supplies, and maintained inventory. Research and Development Department. Biomolecular Separations, Inc., Reno, NV.

## **Teaching Experience**

- Assistant Professor of Chemistry* 2004 - present  
 Taught general chemistry I; preparatory chemistry; general, organic, and biochemistry for nursing majors; and professional development courses for in-service secondary science teachers. Department of Chemistry. University of Nevada, Las Vegas, Las Vegas, NV.
- Assistant Professor of Science Education and Biochemistry* 2003 - 2004  
 Taught "College Science Teaching" and assisted in secondary methods courses. Department of Learning, Teaching, and Curriculum and Department of Biochemistry. University of Missouri-Columbia, Columbia, MO.
- Chemistry Teacher* 2003 - 2004  
 Rock Bridge High School, Columbia, MO.
- Teaching Assistant* Spring 2003  
 Attended lectures, took lecture notes, held weekly office hours, and graded quizzes and exams in an introductory general chemistry class for non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.
- Teaching Assistant* Fall 2002  
 Attended lectures, taught help sessions and laboratory classes in an honors general chemistry class. Department of Chemistry. Purdue University, West Lafayette, IN.
- Teaching Assistant* Summer 2002  
 Attended lectures, took lecture notes, held weekly office hours, and graded quizzes and exams in an introductory organic chemistry class for non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.

- Instructor* Spring 2002  
Co-taught “Molecular Biotechnology” course for upper-class undergraduate chemistry majors and chemistry department graduate students. Department of Chemistry. Purdue University, West Lafayette, IN.
- Instructor* Fall 2001  
Taught “Introductory General Chemistry” course for non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.
- Teaching Assistant* Spring 2001  
Attended lectures, held weekly office hours to address student questions, and graded exams in an introductory biochemistry class for non-majors. Taught recitation and laboratory classes in a general chemistry class for non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.
- Substitute Lecturer* Fall 2000  
Taught “Introductory Biochemistry” to third-year non-majors while the instructor was out of town (8 lectures). Department of Chemistry. Purdue University, West Lafayette, IN.
- Teaching Assistant* Summer 2000  
Supervised students in an organic chemistry lab, and graded lab reports and quizzes. Department of Chemistry. Purdue University, West Lafayette, IN.
- Instructor* Summer 2000  
Taught biochemistry in an intensive two-week course to gifted and talented junior high school students. Gifted Education Resource Institute summer programs. Purdue University, West Lafayette, IN.
- Instructor* Spring 2000  
Taught “Introductory Biochemistry” for third-year non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.
- Instructor* Summer 1999  
Taught food chemistry and biochemistry in intensive two-week courses to gifted and talented junior high school and high school students. Gifted Education Resource Institute summer programs. Purdue University, West Lafayette, IN.
- Teaching Assistant* Spring 1999  
Attended lectures, held twice-weekly office hours to address student questions, and graded exams in an introductory biochemistry class for non-majors. Department of Chemistry. Purdue University, West Lafayette, IN.
- Course Supervisor* Fall semesters 1998 - 2000, 2002  
Supervised four to five teaching assistants for an honors general chemistry course for non-majors, conducted staff meetings, prepared answer keys for quizzes and exams, maintained student records, and taught lecture when the professor was out of town (3 - 5 lectures a semester). Department of Chemistry. Purdue University, West Lafayette, IN.
- Private Tutor* 1998 - 2000  
Tutored general chemistry, high school chemistry, and biochemistry. Department of Chemistry. Purdue University, West Lafayette, IN.

- Teaching Assistant* 1997 - 1998  
Proctored general chemistry labs and exams; taught recitation sessions (for chemical engineers and non-majors). Department of Chemistry. Purdue University, West Lafayette, IN.
- Volunteer Missionary* 1995 - 1996  
Taught short lessons relating religious teachings to Spanish speaking people in New York City; taught English classes.
- University Writing Fellow* Winter 1995  
Developed writing skills of chemistry majors in a "Technical Writing and Chemical Literature" class. Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.
- Teaching Assistant* 1993 - 1995  
Acted as a student assistant in a general chemistry lecture class, a department tutorial lab and organic chemistry labs; answered student questions, maintained safety standards, graded student lab reports, and taught review sessions. Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.

## **Grant/Funding Activities**

### **Funded Activities**

- NV Dept. of Education Mathematics and Science Partnership Grant* 2008 - 2011  
"Project MIST (Mathematics Integrated with Science using Technology)" submitted by MaryKay Orgill (PI), Kent J. Crippen (PI, UNLV Department of Curriculum and Instruction), David Miller (PI, Clark County School District, Las Vegas, NV), and Lynn Trell (PI, Clark County School District, Las Vegas, NV). Funded for \$860,000.
- ACS Grant to Support Undergraduate Programming at Regional Meeting* 2007  
Chemical Interactions, the UNLV ACS student affiliate was awarded a grant by the American Chemical Society to host the undergraduate program "Representing the New Faces of Chemistry" at the 2008 Western Regional Meeting in Las Vegas, NV. I am the club advisor. Funded for \$2,000.
- University Faculty Travel Grant* 2007  
Received \$1,000 from UNLV to fund travel to an American Chemical Society Meeting.
- EPSCoR Undergraduate Research Opportunities Program* 2007  
Received summer research support for undergraduate student Aynsley Sutherland (\$4,500 stipend + tuition waiver for 3 credits) and \$900 supplies budget.
- Math and Science Partnership Grant Work* 2004 - 2008  
Consultant to the Clark County Public School District in planning and carrying out the professional development program, Project PASS (Proficiency and Success in Science). Was instructor of record for the teachers' summer classes.

<i>Nevada Collaborative Teaching Improvement Program Grant</i>	2004 - 2006
“Transforming Middle School Science Achievement using Instructional Technology.” Co-Principal Investigator with Dr. Kent Crippen of the UNLV College of Education. Funded for \$113,724.	
<i>Tuition Funding for Gordon Research Conference</i>	2005
Received tuition and housing funding for the 2005 Gordon Research Conference on Chemistry Education: Research and Practice from the conference chair. New London, CT.	
<i>Purdue Research Foundation Summer Grant</i>	2003
Purdue University, West Lafayette, IN.	
<i>Purdue University Graduate Student Association Travel Grant</i>	2002
Purdue University, West Lafayette, IN.	
<i>Purdue Research Foundation Summer Grant</i>	1999
Purdue University, West Lafayette, IN.	

### **Unfunded Activities**

<i>NSF-DUE Course, Curriculum, and Laboratory Improvement Program Grant</i>	2008
“Collaborative Research: Advancing Chemistry by Enhancing Learning in the Laboratory (ACELL)” submitted by MaryKay Orgill (PI), Nathan Barrows (PI, Grand Valley State University), George Bodner (PI, Purdue University), Jennifer Lewis (University of South Florida), Melanie Cooper (co-PI, Clemson University), Scott Kable (co-PI, University of Sydney), Mark Buntine (co-PI, University of Adelaide), Robert Bucat (co-PI, University of Western Australia), and Justin Read (co-PI, University of Sydney). Total funds requested: \$484,448. UNLV funds requested: \$294,564. Not funded.	
<i>Institutional Development Grant</i>	2007
“Chemistry Learning Center Pilot Program,” submitted by MaryKay Orgill (PI) and Lawrence J. Tirri (UNLV Department of Chemistry) to UNLV for internal funding. Funds requested: \$39,053. Not funded.	
<i>HHMI Undergraduate Science Education Grant</i>	2005
Grant proposal submitted 10/2005 to the Howard Hughes Medical Institute to establish and fund the UNLV HHMI Life Science Scholars Program. A collaboration of faculty members from Biological Sciences, Physics, Libraries, and Academic Assessment. Not funded.	

<b><i>Awards and Fellowships</i></b>
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<i>UNLV College of Sciences Distinguished Teacher Award</i>	2008
University of Nevada, Las Vegas, Las Vegas, NV.	
<i>CSUN Faculty Excellence Award</i>	2008
Consolidated Students of the University of Nevada, University of Nevada, Las Vegas, Las Vegas, NV.	
<i>Marquis Who's Who in America</i>	2008
University of Nevada, Las Vegas, Las Vegas, NV.	

<i>America's Registry of Outstanding Professionals</i>	2007
University of Nevada, Las Vegas, Las Vegas, NV.	
<i>AcademicKeys Who's Who in Sciences Higher Education</i>	2006
University of Nevada, Las Vegas, Las Vegas, NV.	
<i>Favorite Chemistry Professor, Spring 2006</i>	2006
Recipient of student-nominated award sponsored by the UNLV chemistry club, Chemical Interactions. Department of Chemistry. University of Nevada, Las Vegas, Las Vegas, NV.	
<i>Purdue University Graduate Student Award for Outstanding Teaching</i>	2004
Purdue University, West Lafayette, IN.	
<i>Epple Teaching Award</i>	2004
Department of Chemistry. Purdue University, West Lafayette, IN.	
<i>Viol Endowed Fellowship</i>	2003
Purdue University, West Lafayette, IN.	
<i>Brown-Wetherill Graduate Fellowship</i>	1997 - 1999
Department of Chemistry. Purdue University, West Lafayette, IN.	
<i>Karl G. Maeser Graduate Fellowship</i>	1995
Award given to one graduating senior who will be pursuing a graduate degree. Brigham Young University, Provo, UT.	
<i>Outstanding Graduating Senior in Chemistry (Keith P. Anderson Award)</i>	1995
Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.	
<i>BYU Honored Student Award</i>	1994
Award given to one student from each college each year. I was chosen from the College of Physical and Mathematical Sciences. Brigham Young University, Provo, UT.	
<i>Best Presenter at Micro-ACS Conference</i>	1994, 1995
Sponsored by the Central Utah section of the American Chemical Society. Brigham Young University, Provo, UT.	
<i>Undergraduate Summer Research Scholarship</i>	1994
Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.	
<i>ACS Undergraduate Award in Analytical Chemistry</i>	1994
Co-sponsored by the Analytical Division of the American Chemical Society and the Department of Chemistry and Biochemistry of Brigham Young University. Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.	
<i>Catalyst Club Award</i>	1994
Award given to the outstanding junior female chemistry major. Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.	
<i>Freshman Chemistry Student of the Year</i>	1992
Department of Chemistry and Biochemistry. Brigham Young University, Provo, UT.	
<i>National Science Scholars Program Scholarship</i>	1991 - 1995
Brigham Young University, Provo, UT.	
<i>Ezra Taft Benson Scholarship</i>	1991 - 1995
Presidential scholarship. Brigham Young University, Provo, UT.	

## **Other Activities and Honors**

- Graduation Speaker* 1995  
Speaker at the Honors Graduation ceremony and at the graduation ceremony for the College of Physical and Mathematical Sciences. Brigham Young University, Provo, UT.
- Golden Key Honor Society Scholarship* 1992  
Brigham Young University, Provo, UT.

## **Professional Societies**

### *American Chemical Society*

- Member of the Division of Chemical Education
- Vice-President of the ACS Student Affiliate at Brigham Young University 1993 - 1994, in which year we were named an “Excellent” ACS student affiliate
- President of the ACS Student Affiliate at Brigham Young University 1994 - 1995, in which year we were named an “Outstanding” ACS student affiliate and received a grant to host an undergraduate section of the Rocky Mountain Regional ACS conference in Park City, Utah, in June 1995.
- Member-at-large, Southern Nevada section 2005 – 2007.
- Member, Program Committee of the ACS Division of Chemical Education 2007 – present.

### *Golden Key National Honor Society*

### *International Center for First-year Undergraduate Chemistry Education*

### *Iota Sigma Pi—National Honor Society for Women in Chemistry*

- Treasurer of the Plutonium chapter 1999 - 2000

### *National Association for Research in Science Teaching*

### *Phi Kappa Phi National Honor Society*

### *Phi Lambda Upsilon—National Honorary Chemical Society*

## **Publications**

### **Peer-Reviewed Articles**

13. Orgill, M., & Crippen, K. J. (2008). *What’s so big about being small?: The interdisciplinary opportunity of nanoscience*. Manuscript submitted for publication.
12. Asay, L. D., & Orgill, M. (2008). *Analysis of essential features of inquiry found in articles published in The Science Teacher, 1998-2007*. Manuscript submitted for publication.
11. Biesinger, K. D., Crippen, K. J., Muis, K., & Orgill, M. (2008). *Scaffolding Motivation Through the Use of Worked Examples*. Manuscript submitted for publication.
10. Kang, N.-H., Orgill, M., & Crippen, K. J. (2008). Understanding teachers’ conceptions of classroom inquiry with a teaching scenario instrument. *Journal of Science Teacher Education, 19*, 337-354.

9. Orgill, M., & Sutherland, A. (2008). Undergraduate chemistry students' perceptions of and misconceptions about buffers and buffer problems. *Chemistry Education Research and Practice*, 9, 131-143.
8. Orgill, M., & Bodner, G. M. (2007). Locks and keys: An analysis of biochemistry students' use of analogies. *Biochemistry and Molecular Biology Education*, 35, 244-254.
7. Orgill, M., & Thomas, M. (2007). Analogies and the 5E model. *The Science Teacher*, 74, 40-45.
6. Orgill, M., & Bodner, G. M. (2006). An analysis of the effectiveness of analogy use in college-level biochemistry textbooks. *Journal of Research in Science Teaching*, 43, 1040-1060.
5. Orgill, M., & Bodner, G. M. (2006). What research tells us about using analogies to teach chemistry. In J. Gilbert (Ed.), *Science Education: Major Themes in Education* (pp. 195-217). New York, NY: Routledge. (Reprinted from *Chemistry Education: Research and Practice*, 5(1), pp. 15-32, 2004)
4. Friedrichsen, P., Munford, D., & Orgill, M. (2006). Brokering at the boundary: A prospective science teacher engages students in inquiry. *Science Education*, 90, 522-543.
3. Orgill, M., & Bodner, G. M. (2004). What research tells us about using analogies to teach chemistry. *Chemical Education: Research and Practice*, 5, 15-32.
2. Orgill, M., Baker, B. L., & Owen, N. L. (1999). FTIR studies of conformational isomerism in acrylates and acrylic acids. *Spectrochimica Acta Part A*, 55, 1021-1024.
1. Baker, B. L., Orgill, M., Owen, N. L., Stephenson, E. H., Williams, G. A., Macdonald, J. N., & Boggs, J. E. (1995). The molecular conformation of methyl methacrylate — An infrared and ab initio study. *Journal of Molecular Structure*, 356, 95-104.

### **Book Chapters**

4. Orgill, M., & Bodner, G. M. (2007). Prologue. In G. M. Bodner & M. Orgill (Eds.), *Theoretical frameworks for research in chemistry/science education* (pp. vii-ix). Upper Saddle River, NJ: Pearson Education Publishing. [The prologue of this book gives a brief description of what a theoretical framework is and why it is useful. It also argues for the need for a book that describes theoretical frameworks for qualitative research.]
3. Orgill, M. (2007). Situated Cognition. In G. M. Bodner & M. Orgill (Eds.), *Theoretical frameworks for research in chemistry/science education* (pp. 187-203). Upper Saddle River, NJ: Pearson Education Publishing.
2. Orgill, M. (2007). Phenomenography. In G. M. Bodner & M. Orgill (Eds.), *Theoretical frameworks for research in chemistry/science education* (pp. 132-151). Upper Saddle River, NJ: Pearson Education Publishing.
1. Orgill, M., & Bodner, G. M. (2005). The role of analogies in chemistry teaching. In T. Greenbowe, N. Pienta, & M. Cooper (Eds.), *Chemists' Guide to Effective Teaching* (pp. 90-95). Upper Saddle River, NJ: Pearson Education Publishing.

## **Co-Edited Book**

1. Bodner, G. M., & Orgill, M. (Eds.) (2007). *Theoretical frameworks for research in chemistry/science education*. Upper Saddle River, NJ: Pearson Education Publishing.

## **Peer-Reviewed Conference Proceedings**

5. Orgill, M., Bodner, G. M., Ferguson, R., Hunter, W. J. F., & Mayo, P. M. (2007). Theoretical frameworks for research in science education. In *Proceedings of the 2007 Annual Meeting of the National Association for Research in Science Teaching*, New Orleans, LA.
4. Crippen, K. J., Biesinger, K. D., & Orgill, M. (2007). Achievement goal orientation as a predictor for learning in an online environment for undergraduate chemistry. In *Proceedings of the 2007 Annual Meeting of the National Association for Research in Science Teaching*, New Orleans, LA.
3. Kang, N.-H., Orgill, M., & Crippen, K. (2006). A tool for identifying teachers' conceptions of inquiry teaching: Responding to teaching scenarios. In *Proceedings of the 2006 Annual Meeting of the National Association for Research in Science Teaching*, San Francisco, CA.
2. Orgill, M., & Gilmer, P. J. (2006). Using concept inventories to assess students' understanding in general chemistry classes. In *Proceedings of the 2006 Annual Meeting of the National Association for Research in Science Teaching*, San Francisco, CA.
1. Orgill, M., & Bodner, G. M. (2004). Locks and keys: How analogies are used and perceived in biochemistry classes. In *Proceedings of the 2004 Annual Meeting of the National Association for Research in Science Teaching*, Vancouver, BC.

## **Papers Adopted for Use by Instructors of Courses**

1. Orgill, M. *Phenomenography*. (2002). Unpublished manuscript adopted for use in "Qualitative Research Methods in Education" class (Educational Curriculum and Instruction 615). Purdue University, West Lafayette, IN.

## **Conferences Attended**

16. 20<sup>th</sup> Biennial Conference on Chemical Education. Bloomington, IN, July 2008.
15. Southern Nevada T3 Mathematics and Science Conference. Las Vegas, Nevada, February 2008.
14. 2007 Annual Meeting of the National Association for Research in Science Teaching. New Orleans, LA, April 2007.
13. 232<sup>nd</sup> American Chemical Society Meeting. San Francisco, CA, September 2006.
12. 19<sup>th</sup> Biennial Conference on Chemical Education. West Lafayette, IN, July 2006.
11. 2006 Annual Meeting of the National Association for Research in Science Teaching. San Francisco, CA, April 2006.
10. 2006 UNLV Academic Assessment Faire. Las Vegas, NV, March 2006.

9. 2005 Gordon Research Conference on Chemistry Education: Research and Practice. New London, CT, June 2005.
8. 49<sup>th</sup> Annual Conference of the Arizona-Nevada Academy of Science. Las Vegas, NV, April 2005.
7. 229<sup>th</sup> American Chemical Society Meeting. San Diego, CA, March 2005.
6. 18<sup>th</sup> Biennial Conference on Chemical Education. Ames, IA, July 2004.
5. 2004 Annual Meeting of the National Association for Research in Science Teaching. Vancouver, BC, April 2004.
4. 38<sup>th</sup> Midwest Regional American Chemical Society Meeting. Columbia, MO, November 2003.
3. 17<sup>th</sup> Biennial Conference on Chemical Education. Bellingham, WA, July 2002.
2. 209<sup>th</sup> American Chemical Society Meeting. Anaheim, CA, March 1995.
1. 207<sup>th</sup> American Chemical Society Meeting. San Diego, CA, March 1994.

## Presentations

### National/International

27. Bussey, T., & Orgill, M. (2008, July). *Identification of pervasive student conceptions of the central dogma and the implications for the development of a concept inventory*. Poster presented at the 20<sup>th</sup> Biennial Conference on Chemical Education, Bloomington, IN.
26. Orgill, M. (2008, July). *Undergraduate chemistry students' perceptions of and misconceptions about buffers and buffer problems*. Presented at the 20<sup>th</sup> Biennial Conference on Chemical Education, Bloomington, IN. Invited.
25. Orgill, M. (2008, July). *Phenomenographic research in chemical education*. Presented at the 20<sup>th</sup> Biennial Conference on Chemical Education, Bloomington, IN.
24. Ebert, E. K., Kern, C., Mayes, G., Marconi, E., Pollins Bard, H., Doughty, L., Asay, L. D., Crippen, K. J., Bailey, J., Thomas, M., Orgill, M., Waldman, C. A., Messina, F., Reichenbach, R., & Holt, S. (2008, March). *Using action research data to inform instruction: A tale of data sense making*. Presented at the 2008 National Conference of the National Science Teachers Association, Boston, MA.
23. Ebert, E. K., Crippen, K. J., Bailey, J., Thomas, M., Orgill, M., Asay, L. D., Holt, S., Reichenbach, R., Kern, C., Pollins Bard, H., Doughty, L., Mayes, G., Waldman, C. A., Messina, F., & Wagner, C. (2008, March). *Project PASS: Inquiry, conceptual change, and self-regulated learning*. Presented at the 2008 National Conference of the National Science Teachers Association, Boston, MA.
22. Holt, S., Ebert, E. K., Crippen, K. J., Bailey, J., Orgill, M., Thomas, M., Asay, L. D., Kern, C., Waldman, C. A., Messina, F., Pollins Bard, H., & Reichenbach, R. (2008, March). *Project PASS – Researching the role of scientific argumentation in the classroom*. Presented at the 2008 National Conference of the National Science Teachers Association, Boston, MA.
21. Sutherland, A., & Orgill, M. (2007, August). *Upper-level chemistry students' conceptions of buffers and acid-base equilibrium problems*. Poster presented at 234<sup>th</sup> American Chemical Society Meeting, Boston, MA.

20. Orgill, M. (2007, April). *Phenomenography*. Presented at the 2007 National Association for Research in Science Teaching Annual Meeting, New Orleans, LA.
19. Crippen, K. J., Biesinger, K. D., & Orgill, M. (2007, April). *Achievement goal orientation as a predictor for learning in an online environment for undergraduate chemistry*. Presented at the 2007 National Association for Research in Science Teaching Annual Meeting, New Orleans, LA.
18. Asay, L. D., Crippen, K. J., Ebert, E. K., Orgill, M., Thomas, M., Bailey, J., & Wagner, C. (2007, March). *Project PASS action research poster session*. Presented at the 2007 National Conference of the National Science Teachers Association, St. Louis, MO.
17. Kaczmarek, K., & Orgill, M. (2006, September). *General chemistry students' perceptions of buffers and buffer problems*. Poster presented at 232<sup>nd</sup> American Chemical Society Meeting, San Francisco, CA.
16. Orgill, M. (2006, September). *Phenomenographic research in chemical education*. Presented at 232<sup>nd</sup> American Chemical Society Meeting, San Francisco, CA.
15. Kaczmarek, K., & Orgill, M. (2006, July). *General chemistry students' perceptions of buffers and buffer problems*. Poster presented at the 19<sup>th</sup> Biennial Conference on Chemical Education, West Lafayette, IN.
14. Orgill, M. (2006, July). *Phenomenographic research in chemical education*. Presented at the 19<sup>th</sup> Biennial Conference on Chemical Education, West Lafayette, IN.
13. Orgill, M., & Gilmer, P. J. (2006, July). *Using concept inventories to assess students' understanding in general chemistry classes*. Presented at the 19<sup>th</sup> Biennial Conference on Chemical Education, West Lafayette, IN.
12. Kang, N.-H., Orgill, M., & Crippen, K. (2006, April). *A tool for identifying teachers' conceptions of inquiry teaching: Responding to teaching scenarios*. Presented at the 2006 National Association for Research in Science Teaching Annual Meeting, San Francisco, CA.
11. Orgill, M., & Gilmer, P. J. (2006, April). *Using concept inventories to assess students' understanding in general chemistry classes*. Presented at the 2006 National Association for Research in Science Teaching Annual Meeting, San Francisco, CA.
10. Mayo, P. M., Orgill, M., & Bodner, G. M. (2005, June). *Blind students' use of text, figures, and analogies to visualize abstract chemistry concepts*. Presented at Gordon Research Conference on Chemistry Education: Research and Practice, New London, CT.
9. Orgill, M., & Emerich, D. W. (2005, June). *Biochemistry students' perceptions of buffer and bioenergetics problems*. Poster presented at Gordon Research Conference on Chemistry Education: Research and Practice, New London, CT.
8. Orgill, M., & Emerich, D. (2005, March). *Biochemistry students' perceptions of buffer problems*. Presented at 229<sup>th</sup> American Chemical Society Meeting, San Diego, CA.
7. Mayo, P. M., Orgill, M., & Bodner, G. M. (2005, March). *Blind students' use of text, figures, and analogies to visualize abstract chemistry concepts*. Presented at 229<sup>th</sup> American Chemical Society Meeting, San Diego, CA.

6. Orgill, M., & Bodner, G. M. (2005, March). *Teaching biochemistry through analogies: How students interpret common biochemistry analogies*. Presented at 229<sup>th</sup> American Chemical Society Meeting, San Diego, CA.
5. Orgill, M., & Bodner, G. M. (2004, July). *The role of analogies in chemistry teaching*. Presented at 18<sup>th</sup> Biennial Conference on Chemical Education, Ames, IA.
4. Orgill, M., & Bodner, G. M. (2004, July). *What did you mean when you said an enzyme is like a glove?: How students use and interpret analogies in their biochemistry courses*. Presented at 18<sup>th</sup> Biennial Conference on Chemical Education, Ames, IA.
3. Orgill, M., & Bodner, G. M. (2004, April). *Locks and keys: How analogies are used and perceived in biochemistry classes*. Presented at the 2004 National Association for Research in Science Teaching Annual Meeting, Vancouver, BC.
2. Orgill, M., & Bodner, G. M. (2002, July). *Biochemistry is like a circle: Analogies in biochemistry*. Presented at the 17<sup>th</sup> Biennial Conference on Chemical Education, Bellingham, WA.
1. Weinberger, S. R., Egan, R., Orgill, M., & Hoonhout, C. (1993, July). *Analysis of peptide digests by matrix-assisted laser desorption/ionization time-of-flight mass monitoring*. Presented at the Seventh Symposium of the Protein Society, San Diego, CA.

### **Regional**

3. Sutherland, A., & Orgill, M. (2007, October). *Upper-level chemistry students' conceptions of buffers and acid-base equilibrium problems*. Poster presented at 41<sup>st</sup> Annual Western Regional Meeting of the American Chemical Society Meeting, San Diego, CA.
2. Chan, F., Orgill, M., & Emerich, D. (2005, April). *Biochemistry students' perceptions of buffer problems*. Poster presented at 49<sup>th</sup> Annual Meeting of the Arizona-Nevada Academy of Science, Las Vegas, NV.
1. Orgill, M., & Bodner, G. M. (2003, November). *Locks & keys and hands & gloves*. Presented at 38<sup>th</sup> Midwest Regional American Chemical Society Meeting, University of Missouri-Columbia, Columbia, MO.

### **State/Local**

12. Litster, M., & Orgill, M. (2008, February). *Using analogies to supplement the 5E instructional model*. Presented at the Southern Nevada T3 Mathematics and Science Conference. Las Vegas, Nevada.
11. Orgill, M. (2007, October). *Examining biochemistry learning from two perspectives: Biochemistry students' use and interpretation of analogies and biochemistry students' perceptions of buffers and buffer problems*. Presented at Biochemistry Seminar Series, Department of Chemistry and Biochemistry, University of Delaware, Newark, DE. Invited.
10. Sutherland, A., & Orgill, M. (2007, August). *Upper-level chemistry students' conceptions of buffers and acid-base equilibrium problems*. Poster presented at UNLV Undergraduate Summer Research Poster Session, Las Vegas, NV.

9. Orgill, M. (2006, October). *Locks & keys and hands & gloves: How biochemistry students use and perceive analogies*. Presented at Department of Chemistry and Biochemistry Seminar, California State University, Fullerton, Fullerton, CA. Invited.
8. Orgill, M. (2006, March). *Using concept inventories as a measure of student learning*. Presented at the UNLV Academic Assessment Faire, Las Vegas, NV. Invited.
7. Orgill, M. (2004, April). *Using analogies to teach science*. Presented at Conversations in College Science Teaching, University of Missouri-Columbia, Columbia, MO. Invited
6. Orgill, M. (2004, February). *Biochemistry students' perceptions of buffer and bioenergetics problems*. Presented at Mathematics Education and Science Education Research Colloquium Series, University of Missouri-Columbia, Columbia, MO. Invited.
5. Orgill, M. (2003, June). *Biochemistry is like a circle: Analogies in biochemistry*. Presented at Departmental Seminar, Purdue University, West Lafayette, IN.
4. Orgill, M. (2002, November). *Locks and keys: How analogies are used and perceived in biochemistry classrooms*. Presented at Departmental Seminar, Purdue University, West Lafayette, IN.
3. Orgill, M. (1999, November). *Structural and kinetic studies on Escherichia coli acid phosphatase/phytase*. Presented at Departmental Seminar, Purdue University, West Lafayette, IN.
2. Orgill, M. (1995, March). *Molecular conformations of methacrylic acid: An infrared spectroscopic study*. Presented at Micro-ACS Conference sponsored by the Central Utah section of the ACS at Brigham Young University, Provo, Utah.
1. Orgill, M. (1994, March). *Molecular conformations of methacrylic acid: An infrared spectroscopic study*. Presented at Micro-ACS Conference sponsored by the Central Utah section of the ACS at Brigham Young University, Provo, Utah.

## Service

### **National/to Profession**

#### ***Article Reviews***

16. Reviewer for *Instructional Science* (1 review). 2008.
15. Reviewer for *Journal of Research in Science Teaching* (2 reviews). 2008.
14. Reviewer for *Interdisciplinary Journal of Problem Based Learning* (1 review). 2008.
13. Reviewer for the *Journal of Science Education and Technology* (1 review). 2008.
12. Member, Editorial Review Board, *Biochemistry and Molecular Biology Education*. 2008-2010.
11. Reviewer for *Chemistry Education: Research and Practice* (1 review). 2007.
10. Member, Editorial Review Board, *Electronic Journal of Science Education* (~6 reviews/year). 2007-present.
9. Reviewer for *Journal of Research in Science Teaching* (1 review). 2007.
8. Reviewer for *Interdisciplinary Journal of Problem Based Learning* (1 review). 2007.

7. Reviewer for the *Journal of Science Education and Technology* (2 reviews). 2007.
6. Reviewer for *Journal of Research in Science Teaching* (2 reviews). 2006.
5. Reviewer for *Interdisciplinary Journal of Problem Based Learning* (1 review). 2006.
4. Reviewer for *Chemistry Education: Research and Practice* (1 review). 2005.
3. Reviewer for the *Journal of Science Education and Technology* (2 reviews). 2005.
2. Reviewer for the *Journal of Research in Science Teaching* (3 reviews). 2005.
1. Reviewer for the *Journal of Research in Science Teaching* (1 review). 2004.

### **Meeting Organization**

10. Organizer/coordinator of Division of Chemical Education poster sessions for 237<sup>th</sup> national meeting of the American Chemical Society. Salt Lake City, UT, March 2009.
9. Program co-chair, Division of Chemical Education, 241<sup>st</sup> national meeting of the American Chemical Society. Anaheim, CA, March 2011.
8. Co-organizer of action research poster session and 2 sessions for Teacher Researcher Day, 2008 Annual Meeting of National Science Teachers Association. Boston, MA, March 2008.
7. Co-organizer of three symposia for 20<sup>th</sup> Biennial Conference on Chemical Education. Bloomington, IN, July 2008.
6. Member, American Chemical Society Division of Chemical Education Program Committee. 2007 – present.
5. Co-organizer of action research poster session for 2007 Annual Meeting of National Science Teachers Association. St. Louis, MO, March 2007.
4. Organizer of paper set for 2007 Annual Meeting of the National Association for Research in Science Teaching. New Orleans, LA, April 2007.
3. Co-organizer of symposium for 232<sup>nd</sup> American Chemical Society Conference. San Francisco, CA, September 2006.
2. Co-organizer of symposium for 19<sup>th</sup> Biennial Conference on Chemical Education. West Lafayette, IN, July 2006.
1. Co-organizer of symposium for 18<sup>th</sup> Biennial Conference on Chemical Education. Ames, IA, July 2004.

### **Textbook Reviews**

20. Reviewer of Tro's *Essentials of General Chemistry*, 1e (Prentice Hall). 2008.
19. Reviewer of proposed general chemistry text *Chemistry and the logic of life* (Brooks/Cole). 2008
18. Reviewer of Silberberg's *Chemistry: The molecular nature of matter and change*, 5e (McGraw-Hill). 2007.
17. Accuracy reviewer of Gilbert, Kirss, and Davies's *Chemistry: The science in context*, 2e (WW Norton). 2007.
16. Reviewer/Technical Advisor for Timberlake's *Chemistry: An introduction to general, organic, and biological chemistry*, 9e (Prentice Hall). 2007.
15. Reviewer of Burdge's *Chemistry*, 1e (McGraw-Hill). 2007.
14. Participant, McGraw-Hill textbook symposium, Tucson, AZ. February 2007.

13. Reviewer/focus group participant for W. H. Freeman GOB textbook proposal. 2006.
12. Reviewer of Gilbert, Kirss, and Davies's *Chemistry: The science in context*, 2e (WW Norton). 2006.
11. Reviewer of Timberlake's *Basic chemistry*, 2e (Benjamin Cummings). 2006.
10. Member, Board of Advisors for Silberberg's *Chemistry: The molecular nature of matter and change* (McGraw-Hill). 2006.
9. Reviewer of preparatory/introductory chemistry textbook proposal (Wiley). 2005.
8. Reviewer of Silberberg's *Chemistry: The molecular nature of matter and change* (McGraw-Hill). 2005.
7. Comparative reviewer of Brady and Senese's *Chemistry: Matter and its changes* and Brown, LeMay and Bursten's *Chemistry: The central science*. 2004.
6. Reviewer of non-major version of Berg, Stryer, and Tymoczko's *Biochemistry* (pre-publication version). 2004.
5. Reviewer of Gilbert, Kirss, and Davies's *Chemistry: The science in context*. 2004.
4. Reviewer/focus group participant for *Chemistry: A forensic science approach*. 2004.
3. Reviewer of non-major version of Berg, Stryer, and Tymoczko's *Biochemistry* (under development). 2004.
2. Reviewer of Pratt's *Essential biochemistry*, 1e. 2004.
1. Reviewer of Berg, Stryer, and Tymoczko's *Biochemistry*, 5e. 2003.

## **State/Local**

### ***Meeting Organization***

4. Education Co-chair for 2008 Western Regional Meeting of the American Chemical Society. Las Vegas, Nevada, September 2008.
3. Event Supervisor, *Qualitative Analysis*, Missouri Science Olympiad, April 2004.
2. Facilitator, Missouri Science Olympiad Coaches Clinic, Fall 2003.
1. Organized the undergraduate program of the Rocky Mountain Regional Meeting of the American Chemical Society. Park City, Utah, June 1995.

### ***Committee Work***

1. Member-at-large, Southern Nevada section of the American Chemical Society, 2005 - 2007.

### ***Other***

2. Worked with representatives from across Nevada to examine prevalent misconceptions demonstrated in the State Science Proficiency Exam, 2006.
1. Volunteer, National Chemistry Week, Southern Nevada section of the American Chemical Society, 2004.

## **University**

### ***Student Committees***

7. Advisor, Doctoral Committee (Nicole Millick, Department of Chemistry). University of Nevada, Las Vegas, 2008-present.

6. Co-Advisor, Doctoral Committee (Thomas Bussey, Department of Curriculum and Instruction). University of Nevada, Las Vegas, 2007-present.
5. Member, Doctoral Committee (Becky Cox-Hess, Department of Chemistry). University of Nevada, Las Vegas, 2007-present.
4. Member, Doctoral Committee (Janice Klaasen, Department of Educational Psychology). University of Nevada, Las Vegas, 2006-present.
3. Member, Master's Committee (Susan Garcia, Department of English). University of Nevada, Las Vegas, 2006-2008.
2. Member, Master's Committee (Jessica Farrel, Department of Biological Sciences). University of Nevada, Las Vegas, 2007.
1. Member, Honors Thesis Committee (Kyle George, Department of Chemistry). University of Nevada, Las Vegas, 2005.

### ***Committee Work***

14. Planning Committee, Instructional Laboratory Building, Department of Chemistry. University of Nevada, Las Vegas, 2007.
13. College of Sciences Search Committee (for 2 positions), Department of Chemistry. University of Nevada, Las Vegas, 2006 - 2007.
12. College of Education Search Committee (for 1 Science Education position), Department of Curriculum and Instruction. University of Nevada, Las Vegas, 2006 - 2007.
11. MAS Advisory Committee, College of Sciences. University of Nevada, Las Vegas, 2006.
10. College of Education Search Committee (for 2 Science Education positions), Department of Curriculum and Instruction. University of Nevada, Las Vegas, 2005 - 2006.
9. Assessment Committee, Department of Chemistry. University of Nevada, Las Vegas, 2005 - present.
8. Textbook Adoption Committee, Department of Chemistry. University of Nevada, Las Vegas, 2005.
7. Planning Committee, Arthur C. Clarke Center for Imagination and Opportunity. University of Nevada, Las Vegas, 2005 - 2006.
6. Gender Diversity Committee, College of Sciences. University of Nevada, Las Vegas, 2005 - present.
5. Math and Science Education Award Committee, College of Sciences. University of Nevada, Las Vegas, 2005.
4. Member, UNLV Center for Mathematics and Science Education, 2004 - present.
3. Co-Advisor of ACS affiliate chemistry club at UNLV, 2004 - present.
2. Undergraduate Education Committee, Department of Biochemistry. University of Missouri-Columbia, 2003 - 2004.
1. Awards and Scholarships Committee, Department of Learning, Teaching and Curriculum. University of Missouri-Columbia, 2003 - 2004.

### ***Other***

12. Judge, Undergraduate Research Awards, University of Nevada, Las Vegas, 2008.
11. Student letters of recommendation (7 letters), Department of Chemistry. University of Nevada, Las Vegas, 2008.
10. Judge, Undergraduate Research Awards, University of Nevada, Las Vegas, 2008.

9. Faculty marshal, December graduation ceremonies, University of Nevada, Las Vegas, 2007.
8. Student letters of recommendation (14 letters), Department of Chemistry. University of Nevada, Las Vegas, 2007.
7. Student letters of recommendation (9 letters), Department of Chemistry. University of Nevada, Las Vegas, 2006.
6. Student letters of recommendation (11 letters), Department of Chemistry. University of Nevada, Las Vegas, 2005.
5. Student letter of recommendation (1 letter), Department of Chemistry. University of Nevada, Las Vegas, 2004.
4. Student letter of recommendation (1 letter), College of Education. University of Missouri-Columbia, 2004.
3. Reviewer of Student Teaching Portfolio (1 student), College of Education. University of Missouri-Columbia, Winter 2004.
2. Graduate student recruitment, Department of Biochemistry. University of Missouri-Columbia, 2003 - 2004.
1. Reviewer of Student Teaching Portfolio (1 student), College of Education. University of Missouri-Columbia, Fall 2003.