

Curriculum Vitae
Anita Schuchardt
Assistant Professor

Education

Ph.D. University of Pittsburgh, Learning Sciences and Policy 2016

Ph.D. Columbia University, Genetics and Development 1994

BA Cornell University, Biological Sciences 1989

Ph.D. Advisors: Frank Costantini, Christian D. Schunn

Licenses, certifications, certificates

Teaching Certificate, Biology and General Science

Positions/Employment

University of Minnesota, Twin Cities 2016 – present year

Assistant Professor 2016 – present year

Postdoctoral appointments 1994-1996

Graduate appointments 2011-2016, 1989-1994

Science Teacher 2003-2004, 2004-2011

Current Membership in Professional Organizations

National Association of Research in Science Teaching

National Science Teacher Association

American Modeling Teachers Association

National Association of Biology Teachers

Society for the Advancement of Biology Education Research

American Association for the Advancement of Science

**HONORS AND AWARDS FOR RESEARCH/CREATIVE WORK, TEACHING, PUBLIC ENGAGEMENT,
AND SERVICE**

EXTERNAL SOURCES

Outstanding Alumni PhD Dissertation Award, School of Education, University of Pittsburgh, 2017

Outstanding Doctoral Research Award, National Association of Research in Science Teaching, 2017

Carnegie Science Award for Excellence, High School Educator, 2009

RESEARCH, SCHOLARLY, AND CREATIVE WORK

RESEARCH PUBLICATIONS

Refereed Research Publications

1. Kirkpatrick, C., **Schuchardt, A.**, Baltz, D., & Cotner, S. (In Press). Computer-based and bench-based undergraduate research experiences produce equivalent attitudinal outcomes, CBE-LSE.
2. Zhao, F. & **Schuchardt, A.** (Revise and Resubmit, January 2019). Exploring students' descriptions of mutations from a cognitive perspective suggests how to modify instructional approaches, CBE-LSE.
3. Ghalilchi, N., **Schuchardt, A.**, Roerhig, G. (Submitted, December 2018). Development of analytical framework based on shifts in students' representations of connections between system objects. *Science Education*.
4. Malone, K., Schnun, C.D., **Schuchardt, A.M.** (2018). Improving conceptual understanding and representation skills through Excel-based modeling. *Journal of Science Education and Technology*, 27 (1) 30-44.
5. **Schuchardt, A.**, Tikkamaru-Kisai, M., Schunn, C.D., Stein, M.K., & Reynolds, B. (2017). How much professional development is needed with educative curriculum materials? It depends upon the intended student learning outcomes. *Science Education* 101 (6) 1015-1033.
6. **Schuchardt, A.**, & Schunn, C. D. (2016). Modeling scientific processes with mathematics equations enhances student qualitative conceptual understanding and quantitative problem solving. *Science Education*, 100, 290-320.
7. Cox, C. Reynolds, B., Schunn, C.D., & **Schuchardt, A.** (2016). Using mathematics and engineering to solve problems in secondary level biology. *Journal of STEM Education: Innovations and Research* 17 (1), 22.
8. **Schuchardt, A.**, D'Agati, V., Costantini, F., & Pachnis, V. (1994). Defects in the kidney and enteric nervous system of mice lacking the tyrosine kinase receptor ret. *Nature*, 367, 380.
6. Dodd, J., & Schuchardt, A. (1995). Axon guidance: A compelling case for repelling growth cones. *Cell*, 81, 1.
9. **Schuchardt, A.**, Srinivas, S., Pachnis, V., & Costantini, F. (1995). Isolation and characterization of a chicken homolog of the c-ret proto-oncogene. *Oncogene*, 10, 641-649.
10. Schuchardt, A., D'Agati, V., Larsson-Blomberg, L., Costantini, F., & Pachnis, V. (1995). Ret-deficient mice: An animal model for hirschprung's disease and renal agenesis. *Journal of Internal Medicine*, 238, 327-332.
11. **Schuchardt, A.**, D'Agati, V., Pachnis, V., & Costantini, F. (1996). Renal agenesis and hypodysplasia in ret-k- mice result from defects in ureteric bud development. *Development*, 122, 1919.
12. Durbec, P. L., Larsson-Blomberg, L. B., **Schuchardt, A.**, Costantini, F., & Pachnis, V. (1996). Common origin and developmental dependence on c-ret of subsets of enteric and sympathetic neuroblasts. *Development*, 122, 349-358.
13. Rothman, T. P., Chen, J., Howard, M. J., Costantini, F., **Schuchardt, A.**, Pachnis, V., & Gershon, M. D. (1996). Increased expression of laminin-1 and collagen (iv) subunits in the anganglionic bowes of ls/l_s, but not c-ret -/- mice. *Developmental Biology*, 178, 498-513.
14. Burton, M. D., Kawashima, A., Brayer, J. A., Kazemi, H., Shannon, D. C., **Schuchardt, A.**, . . . Kinane, T. B. (1997). Ret proto-oncogene is important for the development of respiratory co2 sensitivity. *Journal of the Autonomic Nervous System*, 63, 137-143.

15. Augsburger, A., **Schuchardt, A.**, Hoskins, S., Dodd, J., & Butler, S. (1999). Bmps as mediators of roof plate repulsion of commissural neurons. *Neuron*, 24, 127-141.

Non-refereed Research Publications (journal articles, essays, book chapters)

1. Malone, K., **Schuchardt, A.**, & Sabree, Z. (In Press). Models and Modeling in Evolution. In U. Harms & M.J. Reiss (Eds.), *Evolution Education Reconsidered: Understanding what works*: Springer.
2. Cox, C., Reynolds, B., **Schuchardt, A.**, & Schunn, C. D. (2014). How do secondary level biology teachers make sense of using mathematics in design-based lessons about a biological process? In L. Annetta & J. Minogue (Eds.), *Building bridges...Connecting science and engineering practices in meaningful ways*: Springer.
3. **Schuchardt, A.**, Durbec, P., Marcos-Gutierrez, C. V., Pachnis, V., & Costantini, F. (1999). The role of ret receptor tyrosine kinase and glial derived neurotrophic factor in development of the excretory and peripheral nervous systems. In W. Birchmeier & C. Birchmeier (Eds.), *Epithelial morphogenesis in development and disease*: Harwood Academic Publishers.

RESEARCH PRESENTATIONS

Invited Talks

1. **Schuchardt, A.** (2018, October). Bridging the Divide: Biology and Mathematics. Middle Tennessee State University, Murfreesboro, TN, USA.
2. **Schuchardt, A.**, & Malone, K.L. (2017, September). A critical review of Teaching Evolution along a Learning Progression: An Austrian Attempt with Focus on Selection. A presentation at the Evolution Education Re-considered – understanding what works: International Symposium, Leibniz Institute for Science and Mathematics Education, Kiel, Germany.
3. Malone, K.L., & **Schuchardt, A.** (2017, September). Models and Modeling in Evolution. A presentation at the Evolution Education Re-considered – understanding what works: An International Symposium, Leibniz Institute for Science and Mathematics Education, Kiel, Germany.

Contributed Research Papers Presented at Professional Meetings or Conferences

1. Zhao, F. & **Schuchardt, A.** (2018). Process versus object: How do students think about mutation? Paper presented at the Society for the Advancement of Biology Education Research, Minneapolis.
2. Ghalichi, N., **Schuchardt, A.**, & Roehrig, G. (2018). Exploration of students' systems thinking. Paper presented at the Society for the Advancement of Biology Education Research, Minneapolis.
3. Baltz, D., Stein, M., Parker, L., Wright, R., & **Schuchardt, A.** (2018). Developing a model of retention in the biological sciences: A precursor to creating effective interventions. Paper presented at the Society for the Advancement of Biology Education Research, Minneapolis.
4. **Schuchardt, A.**, Kramer, M., & Kirkpatrick, C. (2018). Integrating conceptual and quantitative understanding of variation to develop students' capacity to theorize about experimental data. Paper presented at the National Association of Research in Science Teaching, Atlanta.
5. Ghalichi, N., **Schuchardt, A.**, & Roehrig, G. (2018). The role of systems-oriented approach in promoting students' systems understanding of environmental issues. Paper presented at the National Association of Research in Science Teaching, Atlanta.
6. Baltz, D., Stein, M., Parker, L., Wright, R., & **Schuchardt, A.** (2018). Developing a model of retention in the biological sciences: A precursor to creating effective interventions. Paper presented at the Understanding Interventions that Broaden Participation in Science Careers Conference, Baltimore.

7. Malone, K.L., **Schuchardt, A.**, Irwin, C.R., Kajfez, R.L., & Irving, K. (2017). Engineering design in secondary biology. Paper presented at the American Society of Engineering Education Annual Conference and Exposition, Columbus.
8. **Schuchardt, A.**, Kirkpatrick, C., Baltz, D., Cotner, S., & Wright, R. (2017). Computational URE's versus wet bench URE's: Design features and comparison of student experiences. Paper presented at the Society for the Advancement of Biology Education Research, Minneapolis.
9. Stammen, A., Lan, D., **Schuchardt, A.**, Ding, L., Malone, K.L., Boone, W., Sabree, Z. (2017). Expert Panel Content Validation of the Secondary-Biology Concept Inventory (S-BCI). Paper presented at the National Association of Research in Science Teaching, San Antonio.
10. Malone, K.L., Stammen, A., Ding, L., **Schuchardt, A.**, Boone, W., & Sabree, Z. (2017). Development of a concept inventory to measure high school biology students concept knowledge. Paper presented at the National Association of Research in Science Teaching, San Antonio.
11. **Schuchardt, A.**, Schunn, C. D., & Godley, A. (2016). High school students' assessments of science concepts and explanations through peer review of writing. Paper presented at the National Association of Research in Science Teaching, Baltimore.
12. **Schuchardt, A.**, & Schunn, C. D. (2015). Leveraging mathematical models in an integrated biology and engineering curriculum enhances student learning. Paper presented at the National Association of Research in Science Teaching, Chicago.
13. Malone, K., **Schuchardt, A.**, & Schunn, C. D. (2015). Scalable approaches to modeling and engineering in high school biology. Paper presented at the National Association of Research in Science Teaching, Chicago.
14. **Schuchardt, A.**, Malone, K., Diehl, B., Harless, K., Parr, D., & McGinnis, R. (2008). The impact of a modeling based ninth grade physics curriculum on scientific reasoning and mathematics concepts. Paper presented at the National Association of Research in Science Teaching, Baltimore.
15. **Schuchardt, A.** (2007). Improved scores on classroom assessment and scientific reasoning following a switch to a physics first course sequence and a modeling-based instructional approach. Paper presented at the International Conference of Teacher Research.

Posters or Exhibitions

1. Hicks, J., Dewey, J., & **Schuchardt, A.** (2018). Development of BioVEDA: An assessment tool to measure student understanding of biological variation with respect to experimental design and analysis. ASCB/EMBO meeting, San Diego.
2. Chau, L., Zhao, F., **Schuchardt, A.** (2018). Students' confidence and sensemaking of commonly used mathematical expressions in biology. Conference at the interface of discipline-based education research in STEM and psychological science. St. Louis.
3. Chau, L., Zhao, F., **Schuchardt, A.** (2018). Students' confidence and sensemaking of commonly used mathematical expressions in biology. Society for the Advancement of Biology Education Research, Minneapolis.
4. Dewey, J. & **Schuchardt, A.** (2018). The impact of course-based undergraduate research experiences (CUREs) on student conceptions of the nature of science. Society for the Advancement of Biology Education Research, Minneapolis.
5. **Schuchardt, A.**, Grabowski, J.J., & Schunn, C.D. (2017). What attitudes matter for homework and exams across first and second year weeder chemistry courses? Poster presented at the National Association of Research in Science Teaching, San Antonio.

6. **Schuchardt, A.**, Malone, K.L., & Schun, C.D. (2016). Student selection of relevant elements during computational modeling increases conceptual understanding in an integrated STEM biology unit. Poster presented at the Modeling and Model-Based Reasoning in STEM Conference, Purdue University.

Other Key Activities

Consultant, Math Science Partnership Grant, Modeling Biology Instruction: Leadership in Science Education, PI Kathy Malone, Ohio State University, 2016-2017.

TEACHING

Instructor, Biology 1951, Foundations of Biology 1, Fall 2017, 2018

TEACHING PRESENTATIONS

Contributed Papers Related to Teaching Presented at Professional Meetings or Conferences

1. **Schuchardt, A.** (2010). The effects of a modeling approach on student learning in a grade 11 biology course. Paper presented at the National Science Teacher's Association National Conference, Philadelphia.
2. **Schuchardt, A.**, & Diehl, B. (2008). Modeling biology. Paper presented at the Pennsylvania Science Teacher's Association, Hershey, PA.
3. **Schuchardt, A.** (2008). Modeling instruction in biology. Paper presented at the Science, Technology, Engineering, and Mathematics (STEM) Governor's Institute, Hershey, PA.

Other Key Activities and Accomplishments

1. **Schuchardt, A.** (2017) Computational Thinking and Modeling Instruction, Webinar presented on May 16, American Modeling Teacher's Association.
2. **Schuchardt, A.** and Malone, K. (2017) Engineering in the Modeling Classroom, Webinar presented on March 2, American Modeling Teacher's Association.
3. Malone, K. and **Schuchardt, A.** (2016) Redevelopments in the Biology Modeling Instruction Curriculum presented on December 14, American Modeling Teacher's Association.

OTHER KEY TEACHING ACTIVITIES AND ACCOMPLISHMENTS

Professional Development Workshop Leader

1. Teacher Workshop: Modeling Instruction in Biology, Ohio State University, Columbus, OH, 2016
2. Teacher Workshop: Exposure to Modeling Instruction in Biology, Florida International University, Miami, FL, 2013
3. Teacher Workshop: Modeling Biology, MTSU TN High School Redesign, Clarksville, TN, 2010-2011
4. Teacher Workshop: Modeling Instruction in Biology, Pittsburgh, PA, 2008-2010

ADVISING AND MENTORING

Graduate Student Activities

FangFang Zhao
Narmin Ghalichi
Jessica Dewey

Postdoctoral Fellows

Linh Chau

Jenna Richter

SERVICE AND PUBLIC OUTREACH

SERVICE TO THE DISCIPLINE/PROFESSION/INTERDISCIPLINARY AREA(S)

Editorships/Journal Reviewer Experience

Reviewer experience, The Biology Teacher, 2017

Reviewer experience, CBE-Life Sciences Education, 2017

Committee memberships

Member at Large American Modeling Teachers Association Board

SABER Abstract Committee

SERVICE TO THE UNIVERSITY/COLLEGE/DEPARTMENT

University-wide service

STEM Education Collaboration, 2016-2017

Department service

Biology Teaching and Learning Executive Committee, 2018-2019

Biology Teaching and Learning Career Promotion Committee, 2018-2019

Department Head Search Committee, 2017-2018

Peer Observation Committee, 2017-present