

ALEXANDER PAULCHELL

UNIVERSITY OF ARIZONA · COLLEGE OF EDUCATION · TUCSON, ARIZONA · ATPL@ARIZONA.EDU

RESEARCH INTERESTS

Science education and teacher education, with an emphasis on the sociocultural nature of scientific knowledge production and communication. My dissertation work examines how secondary science teachers frame family and heredity, while my scholarship more broadly considers how diverse epistemologies challenge normative assumptions about whose knowledge counts as scientific to inform more justice-oriented science teaching.

EDUCATION

PhD Candidate – Teaching, Learning, & Sociocultural Studies

EXPECTED MAY 2028

UNIVERSITY OF ARIZONA, TUCSON, AZ — CHAIRS: KRISTIN GUNCKEL & PATRICIA MOREIRA

Dissertation: Selective Teaching Traditions and the Framing of Family in Secondary Genetics Education

A qualitative case study examining how secondary science teachers conceptualize and present family structures during genetics instruction and the values that inform that instruction, drawing on the selective teaching traditions framework (science-centric essentialist, morally progressivist, and socially critical reconstructivist traditions). Data from eight secondary teachers in public and private schools in the Southwestern United States are triangulated across the Belief in Genetic Determinism scale, semi-structured interviews, classroom observations, and lesson plan artifacts.

Master of Education

MAY 2015

JOHN CARROLL UNIVERSITY, UNIVERSITY HEIGHTS, OH — SUMMA CUM LAUDE, 4.0 GPA

Bachelor of Science, Molecular Genetics

JUNE 2012

THE OHIO STATE UNIVERSITY, COLUMBUS, OH — MAGNA CUM LAUDE, HONORS PROGRAM, 3.75 GPA

RESEARCH EXPERIENCE

Graduate Research Assistant

MAY 2026 – PRESENT

UNIVERSITY OF ARIZONA, PI: PATRICIA MOREIRA

- Project: Exploring the Role of Formative Assessment in STEM Higher Education
 - Explore preservice teachers' engagement and knowledge application in tasks such as explaining, building arguments, and designing solutions by analyzing assessment responses related to mechanistic reasoning
 - Recruit preservice teacher participants, organize and code data in MAXQDA, and draft conference proposals and manuscripts from initial findings

Graduate Research Assistant

AUG 2023 – AUG 2025

UC BERKELEY & UNIVERSITY OF ARIZONA, PI: MARK WILSON; CO-PIs: KRISTIN GUNCKEL & LINDA MORELL

- Project: Learning Progressions in Science: Analyzing & Deconstructing the Multiple Dimensions in Assessment
 - Continued investigation of how well learning progressions for scientific argumentation, patterns, and the three disciplinary core ideas (physical science, life science, and Earth science) can be measured, including teacher utility of learning progressions, assessments, and results
 - Created tasks to measure students' learning progressions on natural resources, human impacts, and patterns; conducted student think-aloud interviews; and analyzed student responses to revise task items

Undergraduate Research Assistant

SEP 2011 – MAY 2012

THE OHIO STATE UNIVERSITY, DEPARTMENT OF MOLECULAR GENETICS, PI: MARK SEEGER

- Project: Axon Guidance and Nervous System Development in *Drosophila*
 - Investigated the genetic mechanisms of axon pathfinding during embryonic nervous system development using *Drosophila melanogaster* as a model organism
 - Maintained fly stocks, performed selective genetic crosses, and processed embryos

TEACHING EXPERIENCE

Graduate Teaching Assistant – Instructor of Record

AUG 2023 – PRESENT

UNIVERSITY OF ARIZONA, COLLEGE OF EDUCATION, TUCSON, AZ

- TLS 308 – Environmental Science for Elementary Teachers
 - Students learn physical, life, Earth and space science, and engineering concepts and scientific practices included in the elementary and middle school science curriculum
- TLS 324 – Teaching Science in Elementary Schools
 - Methods of elementary school science instruction with emphasis on the knowledge and practices necessary to teach science in K-8 classrooms with diverse student populations
- TLS 409 – Foundations of Education for Social Justice
 - Foundations of the legal, social, historical, cultural, and political contexts of public education with a focus on marginalized student populations and developing socially just systems

First-Year Teacher Mentor

JUL 2026 – PRESENT

ARIZONA TEACHERS ASSOCIATION

- Mentor three first-year elementary teachers through regular contact addressing classroom routines, parent-teacher conferences, lesson planning, and socioemotional wellness

University Supervisor – Preservice Teacher Preparation

DEC 2025 – MAY 2026

UNIVERSITY OF ARIZONA, COLLEGE OF EDUCATION, TUCSON, AZ

- Observed and evaluated six preservice elementary teachers during their student teaching semester
- Supported six preservice teachers by providing classroom resources, engaging in productive discussions to improve pedagogy, and providing guidance through challenging placements
- Coordinated evaluation meetings and university obligations with cooperating mentor teachers
- Drafted and submitted midterm evaluations, final evaluations, and final teaching portfolio evaluations

High School Science Teacher

AUG 2015 – AUG 2023

BEACHWOOD HIGH SCHOOL, BEACHWOOD, OH

- Designed and taught an Honors Anatomy & Physiology course to bridge Honors and AP coursework, including writing the curriculum, learning standards, and assessments
- Used modeling-based instruction to teach Biology and Chemistry at multiple levels
- Implemented standards-based grading (SBG) based on student mastery of content, with reassessment opportunities and student self-monitoring of understanding
- Collaborated with a Professional Learning Community (PLC) to align curriculum across science courses, identify effective pedagogical practices, and analyze state test data
- Extracurriculars: Gender & Sexuality Alliance (GSA) Advisor, Student Council Advisor (Class of 2019)

Junior Medical Camp Instructor

JUN – JUL 2015

CLEVELAND MUSEUM OF NATURAL HISTORY, CLEVELAND, OH

- Designed and led interactive anatomy and health science activities for middle and high school campers

High School Science Teaching Intern

AUG 2014 – JUN 2015

ST. IGNATIUS HIGH SCHOOL, CLEVELAND, OH

- Conducted action research on the experiences of queer students in parochial schools
- Designed and taught biology units using the Understanding by Design (UbD) framework

PUBLICATIONS

Paulchell, A., Gunckel, K. L., Morell, L., & Hubbard, M. (Accepted). Unraveling Three Dimensions: How Learning Progressions Can Guide Formative Assessment. *Science Scope*.

Paulchell, A. (In Review). Experimental Queer Epistemologies: A Learning Framework for Expansive Inquiry. In R. Mendoza & K. Tran (Eds.), *Queering STEM*. Springer Publishing.

Gunckel, K. L., Xue, M., **Paulchell, A.**, Hubbard, M., Morell, L., MacPherson, A., Wilson, M., & Dozier, S. (In Preparation). Three-Dimensional Learning about Water as a Limited and Threatened Resource.

PUBLIC SCHOLARSHIP

Paulchell, A. (2026, September). Seedless Future: How Diminishing Scientific Trust Leaves Bananas to Rot. *The Recipes Project*, Theorizing Food | Special Edition | Summer 2026: Recipes and Research in the Classroom. <https://recipes.hypotheses.org/?p=28119>

Paulchell, A. (2022). Examining the Lymphatic System through the Lens of Type 1 Diabetes. *The American Association of Immunologists High School Science Curriculum Databank*.

PRESENTATIONS

Paulchell, A. (2026, April). A Queer Theory Approach to Selective Teaching Traditions in Genetics Education. In S. Porter (Presider), *Dilemmas in Queering STEM Education Research*. Poster presented at the NARST Annual International Conference, Seattle, WA.

Gunckel, K. L., Morell, L., Xue, M., **Paulchell, A.**, Hubbard, M., Dozier, S., & Wilson, M. (2026, April). Three-Dimensional Learning about Water as a Limited and Threatened Resource. Paper presented at the NARST Annual International Conference, Seattle, WA.

Paulchell, A., & Gunckel, K. L. (2025, March). Queering the Scientific Method: How Rosalind Franklin's DNA Work "Reveals" the Queer Nature of Inquiry. In E. Tan (Presider), *Creating a Rightful Presence for LGBTQ+ People in STEM*. Paper presented at the NARST Annual International Conference, Washington, D.C.

Paulchell, A., Hubbard, M., Xue, M., Gunckel, K. L., Morell, L., & Wilson, M. (2025, March). Designing three-dimensional assessment tasks for classroom formative assessment. Paper presented at the NARST Annual International Conference, Washington, D.C.

Paulchell, A. (2024, October). Growing a growth mindset: characterizing how and why undergraduate students' mindsets change [Remote presentation/discussion]. STEM Education Research and Practice Faculty Learning Community, Academic Affairs, University of Arizona, Tucson, AZ.

Paulchell, A., & Bugenske, L. (2018, November). Natural Selection: Using Simulations and Storyboards to Demonstrate How Populations Change. Biology teaching workshop hosted by STEMteachersCLE, Beachwood, OH.

INVITED TALKS

Paulchell, A. (2025, May). How queer theory informs scientific inquiry and the development of science identity [Remote presentation/discussion]. Seminar: Fostering Science Identity in Physics and Science Education, Freie Universität, Berlin, Germany.

SERVICE

Queer Research Interest Group Steering Committee Member NARST: NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING	APR 2026 – PRESENT
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Professional Learning and Institutes Committee Member NARST: NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING	MAR 2025 – PRESENT
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Conference Proposal Reviewer NARST ANNUAL INTERNATIONAL CONFERENCE	FALL 2024
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Founding Board Member: Treasurer STEMTEACHERSCLE – 501(C)(3), CLEVELAND, OH	AUG 2018 – AUG 2023
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Mentor Teacher, Ohio Resident Educator Program BEACHWOOD HIGH SCHOOL, BEACHWOOD, OH	AUG 2019 – MAY 2023
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Learning & Professional Development Committee Member BEACHWOOD CITY SCHOOLS, BEACHWOOD, OH	NOV 2019 – MAY 2022
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GRANTS & FELLOWSHIPS

TLS Department Travel Award (\$500) APR 2026
DEPT. OF TEACHING, LEARNING, & SOCIOCULTURAL STUDIES, UNIVERSITY OF ARIZONA, TUCSON, AZ

College of Education Travel Award (\$500) APR 2026
UNIVERSITY OF ARIZONA, TUCSON, AZ

NARST Graduate Student Travel Award (\$550) APR 2026
NARST: NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING

AAI Summer Research Fellowship (\$5,000) JUN – JUL 2022
AMERICAN ASSOCIATION OF IMMUNOLOGISTS HIGH SCHOOL TEACHERS PROGRAM — RAMAKRISHNAN IMMUNOLOGY LAB, CASE WESTERN RESERVE UNIVERSITY

Competitively selected national fellowship supporting attendance at the AAI Summer Immunology Course at UCLA, a hands-on research placement in an immunology lab studying Type 1 diabetes in mice, and development of an immunology curriculum unit for secondary classrooms, archived on AAI's website for use by other educators.

AWARDS

TGA Teaching with Joy Award, Finalist MAR 2026
TEACHING EXCHANGE SYMPOSIUM, UNIVERSITY OF ARIZONA, TUCSON, AZ

Everett L. and Marian G. Holden Memorial Scholarship (\$1,500) MAY 2025
UNIVERSITY OF ARIZONA, TUCSON, AZ — RECOGNIZES ACADEMIC EXCELLENCE IN THE COLLEGE OF EDUCATION

Sally H. Wertheim Educational Leadership Award (\$5,000) MAY 2015
JOHN CARROLL UNIVERSITY, UNIVERSITY HEIGHTS, OH

Golden Apple Award: Excellence in AYA Life Science Education MAY 2015
JOHN CARROLL UNIVERSITY, UNIVERSITY HEIGHTS, OH

SKILLS & METHODS

- Software: R, MAXQDA, PRISMA (systematic review methodology)
- Methods training: qualitative and quantitative research design, including ANOVA and regression analysis

CERTIFICATIONS

- CITI Certified – Human Research (Curriculum Group), Behavioral Research Investigators (Course Learner Group), Responsible Conduct of Research
- Ohio 5-Year Professional Adolescent to Young Adult License 2019-2024
 - Life Sciences & Physical Sciences
- Ohio 4-Year Resident Educator Adolescent to Young Adult License 2015-2019
 - Life Sciences & Physical Sciences

PROFESSIONAL MEMBERSHIPS

- NARST: National Association for Research in Science Teaching
- NSTA: National Science Teaching Association
- AERA: American Educational Research Association