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Research Appointments

08/2019-	Assistant Professor, Department of Biology, Bryn Mawr College
2014 -2019	University of California, San Francisco Postdoctoral Fellow (Funding: CRI-Irvington Postdoctoral Fellowship) *Mentor:* Dr. Ron Vale *Mechanisms Underlying Phagocytosis*
2012-2013	University of California, Berkeley Bridging Postdoc in Graduate Lab *Mentor:* Dr. Michael Rape
2007-2012	University of California, Berkeley *Mentor:* Dr. Michael Rape *Thesis title:* "Mechanisms of Ubiquitin-Driven Cell Cycle Control"
2004 –2006	Carleton College Undergraduate Researcher *Mentor:* Dr. Susan Singer *Identification and Characterization of Pisum sativum Developmental Genes*

Education

2012	University of California, Berkeley Ph.D., Molecular and Cell Biology
2006	Carleton College B.A., Biology

Current External Funding

2023-2026	NIH R15 through NINDS (1R15NS133939-01, $418,606 total $299,866 direct) "Elucidating and harnessing the molecular mechanisms of protective clearance in endogenous and engineered phagocytes"

Ongoing Projects in the Williamson Immunology Research Lab at Bryn Mawr College

Project 1: Cell biology of protective clearance in health and disease. My lab is interested in mechanisms of phagocytosis that enable the efficient removal of membrane-intact cells or parts of cells without induction of pro-inflammatory responses. Examples include engulfment of dead and dying cells (efferocytosis) and synapse elimination in the central nervous system (CNS). Collectively, we term these processes "protective clearance." Specifically, we use conserved immunoreceptors and a family of intracellular proteins mutated in a class of fatal lysosomal storage disorders to understand how phagocytes couple extracellular recognition of membrane-intact debris to beneficial, anti-inflammatory outcomes. This project is funded through our current NIH R15 grant.

Project 2: Engineering cellular eating machines for therapy. We previously developed a method to program phagocytes to ingest non-native targets by expressing synthetic receptors. We are currently developing new molecules that expand the capabilities of phagocytes and promote an array of non-destructive immunological responses. This project is funded through our current NIH R15 grant.

Project 3: How do phagocytes use physical cues to decide what to eat? The chemical "eat-me" and "don't eat-me" phagocytes use to differentiate between dangerous targets and innocuous healthy self are well understood. In contrast, how phagocytes use physical information to decide what to eat remains an open problem. In collaboration with Dr. Xuemei May Cheng (Bryn Mawr) and Dr. Elise Corbin (Univ. Delaware) we are currently building new tools to define the mechanobiology of phagocytosis.

Publications

Peer-reviewed papers about work on phagocytosis and cell-cycle control

Britt, E.A.* (BMC '21), Gitau, V.* (BMC '22), Saha, A.* (BMC '22), **Williamson, A.P.** *Modular Organization of Engulfment Receptors and Proximal Signaling Networks: Avenues to Reprogram Phagocytosis.* Frontiers in Immunology. 2021 (peer-reviewed review article)
https://www.frontiersin.org/articles/10.3389/fimmu.2021.661974/full

Williamson, A.P. and Vale, R.D. *Spatial Control of Draper Receptor Signaling Initiates Apoptotic Cell Engulfment*. The Journal of Cell Biology. 2018 (research paper)
http://jcb.rupress.org/content/early/2018/08/22/jcb.201711175/

Morrissey, M.A.*, **Williamson, A.P**.*, Steinbach, A.M., Roberts, E.W., Kern, N., Headley, M.B., Vale R.D. *Chimeric Antigen Receptors that Trigger Phagocytosis*. eLife. 2018 (research paper)
https://elifesciences.org/articles/36688

Williamson, A.*, Werner, A., Rape, M. *The Colossus of ubiquitylation: decrypting a cellular code*. Molecular Cell. 2013 (review article)

Wickliffe K.E., **Williamson, A.**, Meyer, H.J., Kelly, A., Rape, M. *K11-linked ubiquitin chains as novel regulators of cell division*. Trends in Cell Biology. 2011 (review article)

Williamson, A.*, Banerjee, S.*, Zhu, X., Philipp, I., Iavarone, A.T., Rape, M. *Regulation of Ubiquitin Chain Initiation to Control the Timing of Substrate Degradation*. Molecular Cell. 2011 (research paper)

Williamson, A.*, Wickliffe, K.E.*, Mellone, B.G., Song, L., Karpen, G.H., Rape, M. *Identification of a Physiological E2 Module for the Human Anaphase-promoting complex.* PNAS. 2009 (research paper)

Wickliffe, K., **Williamson, A.**, Jin, L., Rape, M. *The multiple layers of ubiquitin-dependent cell cycle control*. Chemical Reviews. 2009 (review article)

Williamson, A., Jin, L., Rape, M. Preparation of synchronized human cell extracts to study ubiquitination and degradation. Methods in Molecular Biology: Mitosis. 2009 (methods paper)

Jin, L.*, **Williamson, A.***, Banerjee, S., Phillip, I., Rape, M. *Mechanism of Ubiquitin-Chain Formation by the Human Anaphase-Promoting Complex*. Cell. 2008 (research paper)

Papers about pedagogy and inclusive teaching since starting at Bryn Mawr

Cook-Sather, A., Hong, E., Moss, T., **Williamson, A.P**. *Developing new faculty voice and agency through trustful, overlapping faculty-faculty and student-faculty conversations*. International Journal for Academic Development. 2021 (peer-reviewed).

https://www.tandfonline.com/doi/full/10.1080/1360144X.2021.1947296

Weiler, K. (BMC '20) and **Williamson**, **A.P**. *Partnering to Build Responsive Learning Communities that Support Students in Crisis.* Teaching and Learning Together in Higher Education. 2020 (non peer-reviewed).
https://repository.brynmawr.edu/tlthe/vol1/iss30/3/

Patent

Patent No. 11,041,023 B2. Inventors: Ron Vale, Meghan Morrissey, Adam Williamson. *Chimeric Antigen Receptors for Phagocytosis*. Date issued: June 22, 2021

* *denotes equal contribution*
BMC indicates Bryn Mawr College undergraduate student co-author

Courses Taught at Bryn Mawr

AY 2023-2024: BIOL B317 Evolution and Medicine (18 students)**;** BIOL B352 Immunology with Lab (21 students)**;** BIOL B110 Explorations in Biology I (Intro. Bio) (4 weeks of lecture, 96 students)**;** HLTH B398 Senior Seminar – Immunotherapy (10 senior Health Studies minors)**;** BIOL B400 Senior Research (2 senior research students)

AY 2022-2023 *Junior Faculty Research Leave (JFRL) – No Classroom Teaching.* BIOL B400 Senior Research (3 senior research students)

AY 2021-2022: BIOL B317 Evolution and Medicine (20 students); BIOL B352 Immunology with Lab (24 students); HLTH B115 Introduction to Health Studies (Co-taught with an Anthropologist, 69 students); BIOL B398 Biology Senior Seminar: Cancer Biology (2 senior thesis students); BIOL B400 Senior Research (4 senior research students + 1 doing research at UPENN)

AY 2020-2021: BIOL B398 Science and Society: Epidemics (10 senior thesis students); BIOL B352 Immunology with Lab (28 students)**;** BIOL B110 Explorations in Biology I (Intro. Bio) (7 weeks of lecture, 97 students): HLTH B115 Introduction to Health Studies (Co-taught with an Anthropologist, 69 students); BIOL B400 Research (2 senior research students + 1 doing research at U. Pittsburgh)

AY 2019-2020: BIOL B398 Science and Society: Drug Discovery (8 senior thesis students); HLTH B115 Introduction to Health Studies (Co-taught with a Chemist, 30 students); B352 Immunology with Lab (7 students) (*new laboratory course*)

Selected Research Presentations Since Starting at Bryn Mawr

03/2024	Invited seminar: Bryn Mawr Biology Department "Fantastic Phagocytes: Ancient Mechanisms of Immunity in Health and Disease"
12/2023	Poster presentation the American Society for Cell Biology (ASCB) Conference, Boston, MA: "Biomechanical Reconstitution of Phagocytosis in Reveals Cell Type-Dependent Responses to Variations in Stiffness of the Tissue Microenvironment." Three-student co-authors were listed on this poster.

07/2023	Invited informal research seminar: Kyle Bledsoe (BMC' 24) and I presented at the joint F.C. Bennett and M.L. Bennett lab meeting (Penn Medicine)
05/2023	Poster presentation the Company of Biologists Cellular Dynamics meeting (Lisbon, Portugal): "Biomechanical Reconstitution of Phagocytosis in 4D Reveals Cell Type-Dependent Responses to Variations in the Stiffness of the Tissue Microenvironment." Three-student co-authors were listed on this poster.
05/2021	Invited seminar: Center for Engineering MechanoBiology (CEMB), UPENN "Engineering phagocytosis to define mechanism and target disease"
09/2020	Invited seminar: Perelman School of Medicine, University of Pennsylvania "Building designer phagocytes to define mechanism and target disease"
*Canceled (Covid-19) 06/2020	FASEB Immunoreceptors and Immunotherapy Conference, Nova Scotia, Canada "Cellular eating machines for therapy"
08/2019	Yale School of Medicine, Cell Biology Department "Engineering phagocytes to clear corpses and eat cancer"

Selected External Service

2024-present	Founding member of a new Tri-Co Scientific Imaging interest group. I led a Tri-Co Mellon Brainstorming grant in Fall 2023 to start this group and received a Mellon Seed grant ($3000) in May 2024. We meet ~monthly as we organize the first Tri-Co Imaging Symposium, Spring 2025.
2019-2023	Faculty Committee, Mount Tamalpais College (College Program at San Quentin, an AA degree-granting college located inside a U.S. prison), San Quentin, CA
2019-present	Education Partner, Center for Engineering Mechanobiology (CEMB), NSF funded center centered at UPENN and Washington University, St. Louis

Selected Professional Development Focused on Inclusive Pedagogy and Mentoring

2023-2024	Faculty participant in workshops/meetings supported by HHMI-funded CATALYST grant. Regular discussions about inclusive pedagogy with other BMC STEM faculty and student consultants. Total commitment ~25 hrs/yr.
2021	Trauma-Informed Teaching Series Sponsored by PHENND– Four 1.5 hour discussions focused on inclusive teaching at the individual level, cohort level, and strategies to promote institutional change
8/2021	Inclusive STEM Mentoring Workshop with Dr. Becky Wai-Ling Packard (2021)

Selected Service at Bryn Mawr College (08/2019-)

2024-25	Departmental Seminar Organizer (Biology)
Fall 2023	Member, Search Committee TT Position in Neurobiology/Neuroscience Bryn Mawr College (successful recruitment of a new TT colleague).
2020-present	Member, Institutional Biosafety Committee (IBC), Bryn Mawr College

2021-present	Mentor, STEM in the Liberal Arts (STEMLA) Program
07/2023	Guest Speaker, STEMLA summer course on vaccines and immunity
06/2020-05/2022	Bryn Mawr Co-Director, Bi-College Health Studies Program
8/2021	Guest Speaker, STEMLA summer course on Environmental Chemistry: "Evil Elements: Environmental Racism and the Poisoning of Flint."
2020-2022	Instructor, STEM Posse Immersion Summer Program, Biology Module
02/2020	Co-organized a Coronavirus info session for the Bi-Co community with Dr. Michelle Wien - Dr. Pia MacDonald, RTI International, February 19th, 2020
Spring 2020	Departmental Seminar Organizer (Biology), Spring 2020
Fall 2020	Member, Search Committee TT Position in Genomics, Bryn Mawr College (successful recruitment of a new TT colleague).
Fall 2019	Member, Search Committee for TT Position in Organismal Biology, Bryn Mawr College (successful recruitment of a new TT colleague).

Student Mentoring in Research at Bryn Mawr College (08/2019-)

All work in my laboratory is led by Bryn Mawr College undergraduate students. Since founding my lab in 2019, eleven students have completed senior undergraduate research theses with me. I currently mentor five students, four of whom are rising seniors completing undergraduate thesis work. Ten out of eleven laboratory alums transitioned to full-time employment in STEM/medicine or graduate study in a STEM/medical field immediately upon graduation.

Selected Fellowships and Awards

2018	Winner, Best Poster Prize, FASEB Conference: Immunoreceptors and Immunotherapy, Keystone, CO, USA
2014-2017	CRI-Irvington Postdoctoral Research Fellowship ($164,000 over 3 years)
2013	Harold M. Weintraub Award for Outstanding Graduate Research