

Adam P. Williamson, Ph.D.

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Research Appointments

8/2019-	Assistant Professor, Department of Biology, Bryn Mawr College
2014 -2019	University of California, San Francisco Postdoctoral Fellow (Funding: CRI-Irvington Postdoctoral Fellowship) <i>Mentor: Dr. Ron Vale</i> <i>Mechanisms Underlying Phagocytosis</i>
2012-2013	University of California, Berkeley Bridging Postdoc in Graduate Lab <i>Mentor: Dr. Michael Rape</i>
2007-2012	University of California, Berkeley <i>Mentor: Dr. Michael Rape</i> <i>Thesis title: "Mechanisms of Ubiquitin-Driven Cell Cycle Control"</i>
2004 –2006	Carleton College Undergraduate Researcher <i>Mentor: Dr. Susan Singer</i> <i>Identification and Characterization of Pisum sativum Developmental Genes</i>

Education

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

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

Project 1: Molecular insight into ancient mechanisms of receptor-mediated phagocytosis.

Phagocytes use transmembrane engulfment receptors as molecular hands to recognize and eat targets such as dead cells and bacteria. We are interested in learning how these receptors initiate phagocytosis with the aim of defining fundamental mechanisms underlying immunity.

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.

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. We are currently building new tools to define the mechanobiology of phagocytosis.

Publications

Peer-reviewed papers about our work on phagocytes 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 (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)

* denotes equal contribution

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. 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

Selected Research Presentations Since Starting at Bryn Mawr

- 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) FASEB Immunoreceptors and Immunotherapy Conference, Nova Scotia, Canada
06/2020 “Cellular eating machines for therapy”
- 08/2019 Yale School of Medicine, Cell Biology Department
“Engineering phagocytes to clear corpses and eat cancer”

Courses Taught at Bryn Mawr

AY 2021-2022

Spring 2022: BIOL B317 Evolution and Medicine (20 students)

Spring 2022: BIOL B352 Immunology with Lab (24 students)

Spring 2022: BIOL B400 Senior Research (4 lab research students + 1 doing research at UPENN)

Fall 2021: HLTH B115 Introduction to Health Studies (69 students)

Fall 2021: BIOL B398 Biology Senior Seminar: Cancer Biology (2 senior thesis students)

Fall 2021: BIOL B400 Senior Research (4 lab research students + 1 doing research at UPENN)

AY 2020-2021

Spring 2021: BIOL B398 Science and Society: Epidemics (10 senior thesis students)

Spring 2021: BIOL B352 Immunology with Lab (28 students)

Spring 2021: BIOL B400 Senior Research (2 lab research students + 1 doing research at U. Pittsburgh)

Fall 2020: BIOL B110 Explorations in Biology I (Intro. Bio) (97 students)

Fall 2020: HLTH B115 Introduction to Health Studies (69 students)

Fall 2020: BIOL B400 Research (2 lab research students + 1 doing research at U. Pittsburgh)

AY 2019-2020

Spring 2020: BIOL B398 Science and Society: Drug Discovery (8 senior thesis students)

Spring 2020: HLTH B115 Introduction to Health Studies (30 students)

Fall 2019: BIOL B352 Immunology with Lab (7 students) (*new laboratory course*)

Fall 2019: One course release: Bi-Co Teaching and Learning Institute Pedagogy Seminars

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

2020-2022	Co-Director, Bi-Co Health Studies Program, Bryn Mawr and Haverford College
2020-present	Member, Institutional Biosafety Committee, Bryn Mawr College
2021-present	Mentor, STEM in the Liberal Arts (STEMLA) Program
2020-present	Health Studies Minor Advisor: 15 current Health Studies minor advisees
2019-present	Biology Major Advisor: 8 current Biology major advisees
8/2021	Guest Speaker, STEMLA summer course on Environmental Chemistry: “Evil Elements: Environmental Racism and the Poisoning of Flint.”
6/2020, 6/2021 6/2022	Instructor, STEM Posse Immersion Summer Program, Biology Module
Feb. 2020	Co-organized a Coronavirus info session for the Bi-Co community with Dr. Michelle Wien - Dr. Pia MacDonald, RTI International, February 19 th , 2020
Spring 2020	Departmental Seminar Organizer (Biology), Spring 2020 Worked with colleagues Tom Mozdzer and Sydne Record to bring three speakers to campus as guests of the Biology department: Dr. Phoebe Lostroh, NSF/Colorado College, 1/27/2020 (Williamson, host) Dr. Ashley Bulseco, MBL (Dr. Tom Mozdzer, host), 3/2/2020 Dr. Rob Salguero-Gómez, Oxford (Dr. Sydne Record, host)* <i>canceled (COVID)</i>
Fall 2020	Member, Search Committee TT Position in Genomics, Bryn Mawr College
Fall 2019	Member, Search Committee for TT Position in Organismal Biology, Bryn Mawr College

Selected External Service

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
2020	External Reviewer, Book Project, SUNY Press: STEM Education Inside U.S. Prisons

Selected Professional Development Focused on Inclusive Pedagogy and Mentoring

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	STEM in the Liberal Arts Mentoring Training

8/2021 Inclusive STEM Mentoring Workshop with Dr. Becky Wai-Ling Packard (2021)

Selected Fellowships and Awards

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| 2018 | Best Poster, FASEB Conference: Immunoreceptors and Immunotherapy, Keystone, CO, USA |
| 2014-2017 | CRI-Irvington Postdoctoral Fellow (\$164,000 over three years) (<i>national award</i>) |
| 2013 | Weintraub Award for Outstanding Graduate Research (<i>national award</i>) |
| 2006 | Honors on Comprehensive Exam (Senior Thesis), Carleton College |