

SIERRA PALUMBOS, PhD

Philadelphia, PA | spalumb1@swarthmore.edu | (801)859-8846

EDUCATION

PhD in Neuroscience, Vanderbilt University, Nashville, TN

Dec 2021

BA in Biological Sciences (*magna cum laude*), Cornell University, Ithaca, NY

May 2013

CURRENT POSITION

Assistant Professor, Department of Biology Swarthmore College

2026-Current

- Lead research lab with undergraduate researchers using *C. elegans* and N2A cells to investigate contributions of extracellular vesicles to neurodegeneration
- Served as direct mentor to seven undergraduate researchers
- Designed three courses: Neurobiology, Cell Biology, Hallmarks of Neurodegeneration

RESEARCH EXPERIENCE

Postdoctoral Fellow, Perelman School of Medicine, University of Pennsylvania

2021-2025

- Harnessed cell biology and biochemistry techniques to demonstrate Parkinson's Disease neurons upregulate secretion as to expel cellular waste. Presented findings at international conferences.
- Served as an undergraduate FERBS scholar and Vagelos scholar mentor
- Joined the Aligning Science Across Parkinson's network to connect with Parkinson's Disease researchers

Graduate Research Fellow, Vanderbilt University School of Medicine

2016-2021

- Used cell biology and genetic approaches to ask how synapses form selectively in *C. elegans* nervous system
- Contributed to six manuscripts and presented findings at national and international conferences
- Served as direct mentor to graduate students, undergraduates, and high school students

FELLOWSHIPS AND AWARDS

F32 Postdoctoral Training Grant, NINDS

2023-2025

American Heart Association Predoctoral Fellow

2019-2021

Dean's Award for Exceptional Achievement, Vanderbilt University

2018

National Science Foundation Graduate Research Fellow

2015-2019

University Graduate Fellowship, Vanderbilt University Top Off Award

2015-2020

***magna cum laude* in Biological Sciences**, Cornell University

2013

TEACHING EXPERIENCE

Visiting Assistant Professor, BIOL022, Swarthmore College (Full-time)

2025-2026

- Designed lecture and accompanying lab course for Neurobiology using backward design
- Incorporated student-driven experimental design into two lab modules focused on electrophysiology in the crawfish and sensory behavior in *C. elegans*

Visiting Assistant Professor, BIOL123A, Swarthmore College (Part-time)

Fall 2023

- Designed an upper-level seminar, "Hallmarks of Neurodegeneration"
- Integrated primary research articles as a mechanism to understand the scientific process, responsible conduct in research, experimental design, and scientific communication

TEACHING EXPERIENCE (CONT.)

Inclusive STEM Teaching Project , National Science Foundation	2022
- Completed 6-week certificate on DEI within teaching and mentoring environments - Incorporated training into my own mentorship and course design	
Certificate in College Teaching , Vanderbilt University	2020
- Attended didactic seminar series on lesson design, presentation style, active learning and student relations - Completed practicum where I designed a potential course and performed teaching demonstration	
Teaching Faculty , Citizen Science, Bard College	2019
- Led intensive three-week course with two daily lectures to 20 students - Organized final science fair of 200 students and coordinated feedback of all projects - Developed lesson plans, lecture slides, and immersive learning activities for non-science majors	
Guest Lecturer , Methods and Experimental Design in Neuroscience, Vanderbilt University	2018-2020
Guest Lecturer , Developmental Neuroscience NSC 3269, Vanderbilt University	2019

PROFESSIONAL DEVELOPMENT

Academic Mentor , Swarthmore, UPenn and Vanderbilt	2015-Current
- Mentored 3 graduate students, 13 undergraduates, and 1 high school student to develop hypothesis-driven research and to succinctly and accurately communicate scientific findings - Organized microscopy training series for faculty, postdocs, and graduate students - Edited student research reports, theses, grant proposals, and reviews	
Diversity, Equity, and Inclusivity Committee (former) Department of Physiology	2023-2025
- Lead organizer for “At the Leading Edge” lecture series where scientists from underrepresented backgrounds had a platform to share their research and interact with trainees - Facilitator of departmental panel discussions discussing challenges faced by different groups in science. Themes of discussions: “How to be an effective mentor,” “Inclusivity across academia”	
Founder and Organizer, NSF Grant Writing Workshop , Vanderbilt University	2016-2021
- Secured departmental funds to sponsor annual workshop series - Created and presented PowerPoint for series of interactive workshops and information sessions - Increased number of funded grants for Vanderbilt students by over 300% (over \$750,000k in first year)	
Online Academy Project Assistant , Tuberous Sclerosis Complex Alliance	2020
- Created two online courses communicating the process of pharmaceutical research and development - Designed infographics that effectively communicated domain-specific knowledge of new drug to patients	
Academic Officer , Vanderbilt Brain Institute	2017-2019
- Conducted department-wide survey and presented findings to departmental leadership - Served as student representative for improving didactic curriculum - Prepared 15 graduate students to clearly convey their research proposals	

UNDERGRADUATE MENTEES

Alex Hearn , Swarthmore Undergraduate	2026-Current
Joseph Gamez , Swarthmore Undergraduate	2026-Current
Lilly Goldberg , Swarthmore Undergraduate	2025-Current

Kevin Xiang , Swarthmore Undergraduate	2025-Current
Yuxuan Guo , Swarthmore Undergraduate	2025-Current
Ava Chon , Swarthmore Undergraduate	2025-2026
Yamin Phyu , Swarthmore Undergraduate	2025-2026
Peace Oloko , PennFERBS Scholar	2024- 2025
Jacob Popolow , Penn Vagelos Scholar, Current position: Postbac NIH	2022- 2025
Becca Collings , Current Position: Nurse Practitioner, Vanderbilt University	2020-2021
Grace Lee , Current Position: High School Chemistry Teacher	2020 – 2021
Eduard Tataru , Current Position: Software Developer	Summer 2019
Isaiah Swann , Current Position: MSTP Student, UVA	Summer 2018
Amanda Mitchell , Current Position: Medical Student, Columbia University	Summer 2017

PUBLICATIONS AND REVIEWS

*Mentored Undergraduate Students

Chon A*, Jiang R., Phyu YK*, Schiksnis, Pasquinelli AE, **Palumbos SD**. The miRNA Argonaute protein, ALG-2, maintains neurobehaviors in adult *C. elegans* (2026) *microPublication Biology*, In Revision.

Palumbos SD, Basak B, Popolow J*, Oloko P*, Holzbaur E. Rubicon monitors lysosomal health in neurons (2026). *In preparation*.

Gallagher L, **Palumbos SD**, Holzbaur E. Lysosomal quality control in neurodegeneration (2026). *In preparation (Invited Review) Journal of Clinical Investigation*.

Palumbos SD, Popolow J*, Goldsmith J, Holzbaur E. Autophagic stress activates complementary secretory pathways in Parkinson's Disease neurons (2025). [*Proc. Natl. Acad. Sci. U.S.A.* 122 \(28\) e2421886122](#).

Palumbos SD, Holzbaur E. VAB-8 stops dynein in its tracks to regulate synaptic delivery (2022). [*Developmental Cell* 57\(15\):1789-1791](#).

Palumbos SD, Skelton RL, McWhirter R, Mitchell A*, Swann I*, Heifner S*, Von Stetina S, Miller III DM. cAMP controls a trafficking mechanism that maintains the neuron specificity and subcellular placement of electrical synapses during development (2021). [*Developmental Cell* 56\(23\) 3234-3249](#).

Miller-Fleming TW, Cuentas-Condori A, Manning L, **Palumbos S**, Richmond J, Miller III DM. Transcriptional regulation of parallel-acting pathways that remove discrete active zone proteins in remodeling GABAergic neurons (2021). [*Journal of Neuroscience* 41\(27\) 5849-5866](#)

Konietzka J, Fritz M, Silvan S, McWhirter R, Leha A, **Palumbos S**, Steuer Costa W, Oranth A, Gottschalk A, Miller III DM, Hajnal A, Bringmann H. Epidermal Growth Factor signaling promotes sleep through combined series and parallel neural circuit (2020). [*Current Biology* 30, 1-16](#).

Cuentas-Condori A, Mulcahy B, He **S**, **Palumbos S**, Zhen Mei, Miller III DM. *C. elegans* neurons have functional dendritic spines (2019). [*eLIFE* 2019:e47918](#)

Orath A, Schultheis C, Tolstenkov O, Erbguth K, Nagpal J, Hain D, Wabnig S, Steuer Costa W, Mcwhirter R, Zels S, **Palumbos SD**, Miller III DM, Beets I, Gottschalk A. Food Sensation Modulates Locomotion by Dopamine and Neuropeptide Signaling in a Disturbed Neuronal Network (2018). [*Neuron* 100\(6\):1414-1428](#)

O'Brien BMJ, **Palumbos SD**, Novakovic M, Shang X, Sundararajan L, Miller III DM. Separate transcriptionally regulated pathways specify distinct classes of sister dendrites in a nociceptive neuron (2017). [*Developmental Biology* 432, 248-257](#).

Pozner A, Xu B, **Palumbos S**, Capecchi MR, Tvrdik P. Intracellular Calcium Transients in Cortical Microglia Responding to Focal Laser Injury in the PC::G5-tdT Reporter Mouse (2015). [*Frontiers in Molecular Neuroscience* 8:12](#).

Gee MJ, Gibbons MB, Taheri M, **Palumbos S**, Moris SC, Smeal RM, Flood KP, Economo MN, Cizek C, Capecchi MR, Tvrdik P, Wilcox KS, White JA. Imaging astrocytic-neuronal networks in the adult rat brain with genetically encoded calcium indicators following in-utero electroporation (2015) [*Frontiers in Molecular Neuroscience* 8:10.](#)

Gee MJ, Smith NA, Fernandez FR, Economo MN, Brunert D, Rothermel M, Morris SC, Talbot A, **Palumbos S**, Ichida J, Shepherd JD, West PJ, Wachowiak M, Capecchi MR, Wilcox KS, White JA, Tvrdik P. Imaging activity in neurons and glia with a Polr2a-based and cre-dependent GCaMP5G-IRES-tdTomato reporter mouse (2014). [*Neuron* 83\(5\):1058-72.](#)

Gahring LC, Myers EJ, **Palumbos S**, Rogers SW. Nicotinic Receptor alpha7 Expression in the Developing and Adult Adrenal Gland, Implications in Norepinephrine Regulation (2014). [*PLOS ONE* 9\(8\):e103861](#)

Williams EO, Sickles HM, Dooley AL, **Palumbos S**, Bisogni AJ, Lin DM. *Delta protocadherin 10* is regulated by activity in the mouse main olfactory system (2011). [*Frontiers in Neural Circuits* 5:9.](#)