

Curriculum Vitae

Grayson Ostermeyer, MSc

Contact Information

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Integrative Physiology and Neuroscience
College of Veterinary Medicine
Washington State University
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Outpatient Heart & Vascular/Endoscopy
Emergency Department
St. Joseph Regional Medical Center
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Education

2016, Aug – 2019, May Master of Science, Plant Biology, Washington State University, Pullman
2011, Aug – 2016, May Bachelor of Science, Biology, Purdue University Fort Wayne
Psychology Minor, Honors Program

Publications

Ostermeyer GP, Franzen AR, Peters WS, Jensen KH, Knoblauch M. 2022. Spatial patterns of protophloem sieve element plasmodesmata shape vascular unloading dynamics in roots. (in prep)

Ostermeyer GP, Jensen KH, Franzen AR, Peters WS, Knoblauch M. 2021. Diversity of funnel plasmodesmata: the impact of geometry on plasmodesmal resistance.
DOI: <https://doi.org/10.1101/2021.05.05.442713>

Song Y, Ostermeyer GP, Du D, Lin Y. 2021. Escherichia coli detection using carbon nanodot-hybridized silica nanospheres in immunoassay. *Sens Actuators B Chem* **349**:130730

Song Y, Cai X, Ostermeyer GP, Du D, Lin Y. 2021. Zeptomole imaging of cytosolic microrna cancer biomarkers with a light-controlled nanoantenna. 2021. *Nanomicro Lett* **13**:213.
DOI: <https://doi.org/10.1007/s40820-021-00732-1>, PMID: 34674052

Song Y, Cai X, Ostermeyer GP, Yu J, Du D, Lin Y. 2021. Self-assembling allochroic nanocatalyst for improving nanozyme-based immunochromatographic assays. 2021. *ACS Sens* **6**:220–228.
DOI: <https://doi.org/10.1021/acssensors.0c02148>, PMID: 33433202

Ostermeyer GP. Modeling the root protophloem unloading network. 2019. [Master's thesis]. Pullman, WA: Washington State University.

Song Y, Yan X, Ostermeyer GP, Li S, Qu L, Du D, Li Z, Lin Y. 2018. Direct cytosolic microRNA detection using single-layer perfluorinated tungsten diselenide nanoplatform. *Anal Chem* **90**:10369–10376. DOI: <https://doi.org/10.1021/acs.analchem.8b02193>, PMID: 30078310

Work History

Washington State University – Research Intern Integrative Physiology and Neuroscience	Aug 2021 – present
St. Joseph Regional Medical Center – CNA/Patient Care Tech Outpatient Heart & Vascular Endoscopy Emergency Department	Nov 2019 – present Nov 2019 – present Apr 2020 – present Jan 2020 – present
Washington State University – Graduate Student/Teaching Assistant Franceschi Microscopy and Imaging Center School of Biological Sciences	Aug 2016 – Dec 2019
Purdue University Fort Wayne – Peer Health Educator Health and Wellness, Lead Peer Health Educator	Jul 2013 – Jul 2016 Jul 2014 – Jul 2016
Kroger Company – Frozen/Dairy Clerk	Jun 2011 – Feb 2013
Dupont Hospital – Student Intern	May 2010 – Aug 2010

Distinguishing Awards

2021	Clinical Employee of the Quarter (St. Joseph Regional Medical Center)
2019	People Invested In Excellent Service (x3) (P.I.E.S., St. Joseph Regional Medical Center) Outstanding CNA Student (Gritman Medical Center)
2016	Outstanding Senior in Biology (PFW Department of Biology) Undergraduate Worker of the Year (PFW Career Services) PFW Top 50 (PFW Office of the Dean of Students) Audrey Moore Excellence in Leadership Nomination (PFW Office of the Dean of Students) Youth Advocate and Partner (Drug and Alcohol Consortium of Allen County)

Research Positions

2021, Aug – present	Research Intern (Brown lab) , Washington State University; resolving signaling pathways in intrinsically photosensitive retinal ganglion cell subtypes and examining the potential regulatory role of dopamine in retinal accommodation to
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different light intensities. Also, assisting with projects characterizing transporter function in bipolar cells and in heterologous systems. I am leading the electrophysiology portions of these experiments and partnering with Tiffany Schmidt, PhD (Northwestern University) and Phyllis Robinson, PhD (John Hopkin's University) who are performing the behavioral components.

- 2019 – present **Volunteer Research Collaborator (Knoblauch lab)**, Washington State University; advancing insights into root vasculature structure and physiology in collaboration with Jensen lab (Technical University of Denmark)

- 2018 – present **Volunteer Research Collaborator (Lin lab)**, Washington State University; collaborating on projects describing novel functional nanomaterials for bioscience

- 2016 – 2019 **MSc Candidate (Knoblauch lab)**, Washington State University; trialed tissue preservation protocols to optimize fixation quality of plant cells; investigated root protophloem structure in a variety of plant species by way of electron microscopy and 3D electron tomography; generated conceptual models of protophloem tissue ultrastructure and flow dynamics in plasmodesmata; catalogued root protophloem anatomical models, with a focus on cell typing and ultrastructure analysis

- 2016 – 2019 **Teaching Assistant (Franceschi Microscopy and Imaging Center)**, Washington State University; mentoring students in the EMIC 586/587 graduate-level microscopy courses by providing instruction on equipment operation, assisting students with techniques to procure data, sustaining laboratory equipment and reagents, conducting experiments as requested by FMIC staff, and supporting day-to-day facility operations as needed

- 2016, Mar – Sep **Laboratory Assistant (Peters lab)**, Purdue University Fort Wayne; systematically procured serial sections of *Olivella columellaris* shells and produced over 10,000 images for data analysis of polyp colony morphological development

- 2015, Aug – Nov **BSc Student (Mustafa lab)**, Purdue University Fort Wayne; managed a laboratory study investigating the physiological effects of immunomodulatory diets on tilapia cultivated under variable stress conditions

- 2013 – 2016 **Laboratory Assistant (Mustafa lab)**, Purdue University Fort Wayne; assisted with laboratory procedures to investigate the immunological effects of stressors on aquatic invertebrates and fish; aquatic animal caretaking volunteer

Research Involvement (beyond publications)

- 2019, June **Research Talk** “Modeling the Protophloem Unloading Network” Fifth International Conference on Plant Vascular Biology, Monterey, CA

- 2019, March **Research Talk** “Modeling the Protophloem Unloading Network” Biology Graduate Student Association Symposium Presentation, Moscow, ID

- 2018, December **Research Talk** “Exploring Root Protophloem Anatomy in Angiosperms” WSU School of Biological Sciences, Biolunch Presentation

2018, September	Applied Design Submitted a self-closing forceps model to a public database (Thingiverse.com) that catalogues designs for 3D printing (https://www.thingiverse.com/thing:3110594)
2018, April	Poster Presentation "A Survey of Protophloem Unloading Patterns in Divergent Plant Species" Biology Graduate Student Association Symposium, Moscow, ID
2018, March	Poster Presentation "A Survey of Protophloem Unloading Patterns in Divergent Plant Species" WSU Academic Showcase
2018, February	Professional Workshop "Molecular Biology Workshop for Professionals" University of British Columbia, Vancouver, CA
2017, November	Research Talk "Investigating Phloem Physiology Using Modern Microscopy Techniques" WSU Biology Club Presentation
2017, June	Poster Presentation "A Survey of Protophloem Unloading Patterns in Divergent Plant Species" American Society of Plant Biologists Conference, Honolulu, HI
2016, April	Conference Talk "Step Up Speak Up: Be a Positive Bystander" BACCHUS/NASPA Regional Conference, Indianapolis, IN
2016, April	Conference Attendance Aquaculture 2016, Las Vegas, NV
2015, April	Conference Attendance BACCHUS/NASPA Regional Conference, Saginaw, MI
2014, October	Research Discussion During a biology student excursion to Belgium and the Netherlands, I participated in a colloquial discussion of my research involvements while part of PFW's aquatic biology laboratory with biology faculty members and graduate students at the University of Ghent in Belgium
2013, Fall	Human Prosection Conducted cadaveric dissections for Basic Human Anatomy students and presented labeled anatomical structures to students during laboratory sessions

Grants and Scholarships

2019	Higginbotham Travel Grant (\$950)
2017	Higginbotham Travel Grant (\$1,500)
2015	IPFW ORES Summer Research Support Fund (\$1,000)
2015	Office of the Dean of the College of Arts and Sciences has awarded a grant to attend the World Aquaculture Conference in Spring 2016 (\$200)
2015	Office of Sponsored Programs awarded a grant to attend the World Aquaculture Conference in Spring 2016 (\$250)

2015	The Department of Biology awarded a grant to attend the World Aquaculture Conference in Spring 2016 (\$150)
2013-2016	Dr. Beaumont S. Cornell Scholarship (\$30,000 over 3 years)
2013	Mary F. and Clara A. Wehnert Scholarship (\$2,000)
2011-2012	The Lutheran Foundation Scholarship (\$1,000)

Clinical Education & Memberships

2021 – 2025	Trauma Nursing Core Course
2021 – 2023	Basic Life Support Training, American Heart Association
2021 – 2023	Pediatric Advanced Life Support, American Heart Association
2021 – 2022	Emergency Nurses Association
Unlimited	BACCHUS/NASPA Certification for Collegiate Health Educators
2019 – 2021	Certified Nursing Assistant, Idaho
2019 – 2021	Advanced Cardiovascular Life Support, American Heart Association
2019	Sigma Xi Scientific Research Honor Society Nomination
2017 – 2018	American Society of Plant Biologists
2016	Psi Chi Psychological Honor Society
2015 – 2016	Aquaculture Society of America
2013	Tri-Beta Biological Honor Society

Foremost Volunteering Commitments (non-research)

2021 – present	Stop the Bleed Campaign – American College of Surgeons
2016, 2017, 2018	WSU Biology Graduate Student Association Family Fun Day Volunteer
2013 – 2015	Kingston Healthcare
	<i>Student Volunteer</i> 2013 – 2015
2012 – 2019	Erin's House for Grieving Children
	<i>Grief Facilitator</i> 2012 – 2019

2012 – 2013

Green Action Club

President

2012 – 2013

2011 – 2012

Dupont Hospital

Student Volunteer

Core Laboratory Training: Techniques and Proficiencies

Microscopy

- Transmission electron microscopy
- 3D electron tomography
- Scanning electron microscopy
 - Including elemental analysis
- Confocal laser scanning microscopy
 - Including tile-scanning, z-stack generation, and spectral dye separation
- Light microscopy and applications
 - Including fluorescence microscopy and illumination techniques
- Familiar with microscope alignment and cleaning protocols

Specimen Prep and Microtechnique for Microscopy

- Fixing and embedding biological samples for electron and light microscopy
- Sectioning by ultramicrotome, histology microtome, and cryotome
- Staining techniques for LM and EM samples
- Sample dehydration by critical point dryer and freeze dryer
- General lab maintenance – preparing solutions, chemical inventory, waste disposal
- Familiarity with health and safety protocols in a laboratory setting

Electrophysiology

- Patch clamping, including voltage and current clamp
- Operating (and repairing) other rig equipment such as micromanipulators and vibration tables
- Aseptic surgery in mice
- Vibratome for preparing fresh tissue slices
- Intravitreal injections off AAV vectors
- Pulling pipettes
- Using lambda DG4 in light experiments
- Software: HEKA, PatchMaster

Microbiology Techniques

- Preparation of media and buffers
- Isolating, plating, and culturing specimens using aseptic technique
- Cleaning and autoclaving glassware
- Mounting, staining, and imaging microbial samples
- Cultivating bacteria, viruses, and fungi on differential, selective, and enriched media
- Performing biochemical assays on microbial cultures

Methods employed in Molecular Biology and Biochemistry

- Extraction, purification, and amplification of DNA

Polymerase chain reaction
Cloning and vector expression, transformation
Forward & reverse genetic approaches
Mini prep for plasmid preparation
Agarose gel electrophoresis, imaging
SDS PAGE
Spectrophotometry
Proteomics workflow, including western blotting

Bioinformatics

Genomic sequencing using the ion torrent platform
Using online tools and databases for sequence alignment, analysis, and retrieval
Finding patterns in protein and DNA/RNA sequences, including profiles and motifs
Protein structure prediction
An academic background in sequence data processing and interpretation
 High-throughput sequencing
 NGS sequencing and data analysis
 Variant calling and data visualization
 Microarray and sequencing applications, systems biology
 Analysis of mass spectrometry data

Instrumentation in Cellular Biology/Hematology

Experience handling micropipettes, centrifuges, and needled syringes
Hematocrit
Hemocytometer
Refractometer

Chemical Techniques

Manipulating chemical samples, data extraction and interpretation
Purification by filtration and distillation
Column, thin-layer, and gas chromatography
Infrared spectroscopy
Nuclear magnetic resonance spectroscopy (^1H and ^{13}C)
Mass spectrometry

Software and Scripting Languages

Python and its dependent libraries for data analysis and visualization
SQL, git/GitHub, and other applications in the IBM Data Science Professional Certificate (completed 7/10 modules so far)
Standard Microsoft Office programs
GIMP/Photoshop for image manipulation
MATLAB for basic mathematical calculations
SAS for statistical analysis
Perl for bioinformatics
Fiji/ImageJ
IMOD software for tomography volume reconstruction
Amira software for image visualization, processing, and analysis
Designing and printing 3D models

References available upon request