Raymond J. Hendricks

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Education

August 2021- Present — University of North Texas, Denton, TX

PhD Student
Major Professor: Dr. Pamela Padilla
Research Projects:

- Investigated the impact of low-oxygen (0.5% O_2) conditions on the *C. elegans* matrisome via collagen gene modulation.
- Investigated the effect of excess dietary glucose on intergenerational morphology of lipid deposition in *C. elegans*.

September 2006 - June 2010 — The Evergreen State College, Olympia, WA
Bachelor of Arts, Emphasis: Biology and Entrepreneurship
Seminar Professor: Dr. James Neitzel
Research Projects:

- Completed the genome annotation of Pseudomonas aeruginosa bacteriophage PEV2 from raw DNA sequence data
- Prepared annotated genome for submission to NCBI Entrez

Research Experience

January 2019 - April 2020 — University of Washington, Seattle, WA
Dr. Alexander Mendenhall Laboratory

- Independently designed and implemented a full photolithography workflow from CAD layout through clean-room fabrication to produce SU-8/PDMS microfluidic chips optimized for confocal and wide-field imaging of live *C. elegans*
- Imaged *C. elegans* mutants using an epifluorescence microscope and high-throughput automated screening apparatus as part of a genetic screen
- Quantified and analyzed total pixel intensity of C. elegans images using ImageJ, R, and Python

October 2018 - January 2019 — University of Washington, Seattle, WA
Dr. Matthew Kaeberlein Laboratory

- Performed yeast tetrad microdissection and culture inoculation
- Assisted postdoctoral and graduate students in experiments
- Scored yeast lifespan and phenotypic microfluidic data using an internally designed MATLAB program

Professional Work Experience

February 2018 - October 2019 — Bloodworks Northwest, Seattle, WA
Cell Technologist I

- Worked in a GxP regulated manufacturing lab and used established processes to cryopreserve human umbilical cord blood hematopoietic stem cells
- Processed collections and coordinated completion of testing including fractionation, cryopreservation, acquisition and distribution of appropriate samples for testing
- Reviewed batch records including flow cytometry production and research data sourced from Beckman FC500 flow cytometer to ensure product quality and regulatory compliance
- Used Gordineer LN_2 steprate freezers and fixed freezers for long-term sample storage, performed maintenance and troubleshooting as needed
- Expanded equipment maintenance logbook SOP to maintain FDA compliance, collected staff input for new SOP and processes as needed, and used document control software for SOP control

August 2015 - August 2017 Taylor Shellfish
Larvae Technician Quilcene, WA

- Responsible for all aspects of larvae rearing and quality including mass spawning, strip spawning, feeding, and shipping
- Edited flow cytometry lab protocol for use with updated equipment guidelines and to reduce the amount of DAPI environmental waste generated
- Used flow cytometer to determine ploidy of shellfish eggs, larvae, and tissue
- Used coulter counter to monitor algae cell density in tanks and adjust pumps to control algal food delivery
- Assisted Chief Technological Officer and research department as needed
- Instructed colleagues in the use of Microsoft Excel and provided technical support
- Modeled *Magallana gigas* (Pacific Oyster) genotype breeding efficiency for supervisors to optimize growth and fertilization

October 2012 - April 2013 Google Maps
Visual Data Specialist Bothell, WA

- Oversaw ingestion and quality control of extensive geospatial datasets for Google Maps
- Used proprietary GIS tooling to process raw spatial information into map layers
- Developed an automation pipeline to streamline the evaluation and reporting of employee performance metrics

Core Technological Skills

Computational Biology

- Analyzed evolutionary dynamics of the *C. elegans* matrisome and related nematode genomes using OrthoFinder, MEGA, BLAST, and R/Bioconductor packages

Scripting & Data Science

- Developed reproducible Snakemake pipelines in Python (pandas, numpy, Biopython) and R/tidyverse

Microscopy & Computational Image Analysis
- Captured and quantified *C. elegans* phenotypes on a Zeiss Imager M2; automated image analysis in FIJI, CellProfiler, StarDist, and Cellpose

Bioengeneering and Microfabrication
- Designed and fabricated SU-8/PDMS microfluidic chips for live-worm assays; trained in UW Nanofabrication Facility cleanroom protocols
- Adapted an osmolarity assay to investigate cuticle mechanical properties.
- Engineered a flow-through hypoxia chamber for *C. elegans* and *Danio rerio*, integrating gas-mixing and sensor feedback for precise O_2 control

Teaching and Mentorship Activities

Classes taught (Teaching Assistant)
SEA-GENES: HHMI-designed research course that is the sequel to HHMI SEA-PHAGES, and is designed to introduce students to phage gene function through molecular cloning, phenotypic assays, and phage-host interaction experiments
Genetics laboratory: University level genetics laboratory
Molecular biology laboratory: Advanced undergraduate laboratory that emphasized molecular cloning and bioinformatic databases

Undergraduate Student Mentorship

Marco Stevens – Mentored UNT undergraduate student in general laboratory skills and the use of microscopy to examine *C. elegans* cuticle morphology
Audrey Kenada – Mentored UNT undergraduate student in the use of assays to quantify cuticle integrity of *C. elegans*, and statistical software to plot data
Brianna Smith – Mentored UNT undergraduate student in the maintenance of C. elegans, microscopy, and statistical software to plot data
Abbigail Olson – Mentored UNT undergraduate student in *C. elegans* maintenance, microscopy, and statistical software to plot data

Publications and Poster Presentations

Robledo, J., Nahar, S. R., Ruiz, M. A., **Hendricks, R. J.**, Burks, D. J., Ladage, M. L., ... & Padilla, P. A. (2024). RNA Sequencing Experimental Analysis Workflow Using Caenorhabditis elegans. In Transcriptome Data Analysis (pp. 115-141). New York, NY: Springer US.
Hendricks, R. J., Ladage, M. L., Nahar, S. R., Robledo, J., Ruiz, M. A., & Padilla, P. A. (2024, June 5–8). Exploration and analysis of glucose-induced stress responses and cellular pathways in C. elegans Poster session presented at the 2024 *C. elegans* Conference: Aging, Metabolism, Stress, Pathogenesis, and Small RNAs in C. elegans, Madison, WI, United States.

References

Dr. Pamela Padilla
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Relationship: Major Professor (PhD advisor)

Dr. Alexander Mendenhall
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Professor, University of Washington
Box 357470 1959 NE Pacific St. Seattle, WA 98195
Relationship: Research mentor

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Professor, University of Washington
Relationship: Research mentor

Julia York, MS
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Cell Therapy Laboratory Manager
921 Terry Ave, Seattle, WA 98104
Relationship: Former supervisor