ALEXANDRE R. SATHLER

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PhD student & NSF fellow with extensive experience researching neurological disorders, diagnostics, and bioprocesses utilizing diverse skills in neurobiology, AI-driven & computational analysis, and synthetic biology.

- Five years of engineering novel computational and AI analyses for imaging and omics data.
- Three and a half years of wet-lab experience investigating frontiers in neurobiology.
- Three years of leadership and business development in academic, private, and non-profit organizations.
- Four years of STEM instruction and student mentorship.

Research Interests: Integrating wet-lab and computation for discovery · Synthetic biology & associated applications · AI-driven predictive biology · Imaging & tool development · Aging disorders & neurodegeneration

SKILLS:

Laboratory: Mammalian cell culture (2D and 3D) · primary cell culture · cell-based assays (viability, proliferation, mitochondrial flux) · label-free imaging · confocal & Airyscan microscopy · western blotting · plasmid amplification · transformation · transfection · genetic code expansion · murine cortical dissection

Computational & AI: Python · AI / ML · computer vision · TensorFlow · PyTorch · MLOps · MLFlow · Jupyter · Matplotlib · Pandas · Seaborn · R · MATLAB · OpenCV · Scikit-Learn · Scikit-Image

Personal & Operational: Product development · leadership experience · grant writing · Monday · Jira · email & social media marketing · venture research · event planning · Portuguese · French · Spanish

EDUCATION:

PhD: Bioengineering (In Progress) — **UC Berkeley & UC San Francisco 2025 – 30**

BS: Biochemistry & Molecular Biology (Data Science Minor) — **Oregon State University 2020 – 22**
Summa Cum Laude; 6X Honor Roll

AAS: Bioscience Technology — **Portland Community College 2018 – 20**
Honors; 5X President's List, 1X Dean's List

FIELD EXPERIENCE:

Associate Specialist, Machine Learning — **05.2025 – Present**
Beckman Laser Institute, UC Irvine – Irvine, CA

- Developed a robust denoising computer vision model and associated command-line tool that reduced acquisition timelines by 75% in FLAME imaging of epidermal fluorescence for predictive skin diagnostics.
- Created de-novo ML pipelines for dataset curation, model training, model evaluation, model performance tracking, and model deployment on intranet-based server infrastructure.

Models & Methods: Computer vision · Predictive epidermal diagnostics · FLAME microscopy · Content-aware image restoration · Fluorescence lifetime imaging · ML operations · Python · TensorFlow · MLFlow

Associate Computer Vision Engineer **05.2024 – 03.2025**

Phi Optics, Inc. – Chicago, IL

- Trained a 90% accurate computer vision model enabling real-time live cell viability quantification in mammalian cell bioreactor, allowing real-time culture monitoring and informing feedstock delivery to reduce waste by 3-5% in pharmaceutical manufacturing pipelines.
- Reported on model performance in prediction of cell viability across three eukaryotic and two bacterial, driving receipt of SBIR funding for commercialization of QPI as a novel label-free imaging modality.

Models & Methods: Computer vision · mammalian bioreactors · instance segmentation · digital staining · cell viability · quantitative phase imaging (QPI) · Python · C++ · PyTorch · Detectron2 · bacterial cell culture

Postbaccalaureate Fellow **08.2022 – 05.2024**

National Institutes of Health (NIH) – Bethesda, MD

- Revealed redox-mediated separation of mitochondrial DNA into transcriptionally deficient phenotypes, suggesting a novel explanation for aging-associated neuronal energy crises and cognitive declines.
- Achieved 96% pixel-level classification accuracy and 86% intersection-over-union semantic segmentation ML model with a small dataset of six manually annotated images.
- Elucidated novel mechanistic hypothesis for aging-associated reductions in mitochondrial transcription and translation through literature review to reveal a novel experimental avenue for a senior NIH investigator.
- Communicated novel scientific findings regularly in lab meetings and during weekly journal clubs.
- Co-led a community resilience response to a career-altering facilities crisis.

Models & Methods: Computer vision · Aging & neurodegeneration · Mitochondrial transcription & translation · Culture of murine cortical neurons & dorsal root ganglia neurons · Airyscan confocal microscopy · Live & fixed immunofluorescence · MTT assay · Mitochondrial flux analysis · High-performance computing · Experimental design · Python · TensorFlow · UNet · Plasmid amplification · HEK293 culture · ImageJ/FIJI · R-Loops

Teaching Assistant **12.2021 – 03.2022**

Oregon State University (OSU) – Corvallis OR

Shaped coursework and student success in the first offering of Computational Approaches to Biological Data.

Research Assistant **11.2020 – 06.2022**

Oregon State University (OSU) – Corvallis OR

- Unveiled a metabolic switch in Glioblastoma Multiforme caused by the post-translational nitration of specific tyrosine residues in heat shock protein 90 that mimic the Warburg effect by reducing oxygen consumption in tumor periphery and increasing glycolysis in the tumor core.
- Built a qualitative suite for protein distribution validation in any 3D culture model, enabling cost-effective visualization of spatio-temporal gene expression in cell biology, pathology, and tissue modeling.

Models & Methods: Glioblastoma multiforme · U87 culture · Western blotting · Crystal violet assay · Genetic code expansion · Redox biology · Protein engineering · Confocal microscopy · Python · Jupyter · OpenCV

Bioinformatics Intern **Portland, OR** **06.2019 – 09.2019**

Providence Health and Services – Earle A. Chiles Research Institute (EACRI). Designed CAR-T cell therapy quality control for all cancer patients in the nation's 11th largest health system.

Models & Methods: Adaptive T-Cell therapy · Variant call format · Python · Cloud-based bioinformatics workflows

OTHER EXPERIENCE:

Business Development Associate **05.2024 – 03.2025**
Phi Optics, Inc – Chicago, IL

- Led venture research on novel QPI- and AI-based solutions for pharmaceutical manufacturing and precision fermentation applications, driving investment opportunities in a $1.5 billion market.
- Managed email, social media, and in-person marketing campaigns, launching bi-monthly initiatives that increased email opens by 1.5x, click-through rates by 70x, and established 3 OEM partnerships.
- Updated user manuals for flagship microscope software and initiated a global customer feedback campaign, engaging clients across 4 continents.

Trustee, Capital Development Chair **08.2023 – 08.2024**
The DMV Petri Dish – Bethesda, MD

- Managed a cross-functional team executing a feasibility study to justify a $100k award from the State of Maryland to build the first community lab in the DC Metro Area (DMV).
- Spearheaded two 10-speaker seminar series and organized educational workshops, establishing the 501(c)3 organization's first revenue streams, and achieving 100% growth in income.
- Established institutional collaborations with Montgomery College, the City of Rockville, and TEDCO.

Founder & President **10.2022 – 05.2024**
Office of Intramural Training and Education Biotech Interest Group – Bethesda, MD

- Founded and led a biotech industry-focused professional organization, addressing a critical need by providing training in non-academic career development to over 5,000 NIH fellows.
- Orchestrated impactful seminar series, workshops, and networking events in collaboration with OITE and researchers nationwide to fostering professional growth and industry connections among 500 attendees.
- Cultivated a leadership succession plan and trained a successor, maintaining organizational stability continuing professional development of NIH fellows beyond term of presidency.

Mentor – Paths Mentorship Program	**Alexandria, VA**	**2022 – 2023**
ICM Cares Clinic – Committee Member, MA	**Gaithersburg, MD**	**2023 – 2024**
Wyzant – Independent Tutor	**Portland, OR & Chicago, IL**	**2019 – 21, 2024 – 25**
Presidential Campaign – Regional Coordinator	**Portland, OR**	**2019 – 2020**
Eagle Scout	**Portland, OR**	**2018**

PUBLICATIONS:

Cheng XT[1], Gao YF[1], Chan CY, Dai YY, **Sathler AR**, Xie YX, Li SN, Roney J, Li Y, Wu LG, Sheng ZH. "Redox-Driven Phase Transitions in Mitochondrial Nucleoid Condensates Impair Energy Metabolism in Aging Neurons" *Science*. Under Review.

Cheng AZ, Yin CZ, Lamba AS, Sertorio M, DeJesus M, Alexis J, Sathler AR, Chiritescu C, Best CA, Ionascu D, Kotov N, Nazarian S, Bogdan P. "AI-enabled live-dead cell viability classification and motion forecasting" Submitted.

Nguyen KT[1] & **Sathler AR**[1], Estevez AG, Logan IE, Franco MC. "ProDiVis: A Method to Normalize Fluorescence Signal Localization in 3D Specimens". *Frontiers in Cell & Dev. Bio.* (2024) DOI: 10.3389/fcell.2024.1420161

[1] Authors contributed equally to this work.

CONFERENCE PROCEEDINGS:

Sathler AR, Nguyen KT, Marean-Reardon C, Estevez AG, Franco MC. "A Computational Method for the Visualization of Nitrated Hsp90 Distribution in 3D Culture Models" ASBMB (2022). Poster Presentation. *Undergraduate Poster Competition Honorable Mention*.

Sathler AR, Sung AL, Nguyen KT, Estévez AG, Franco MC. "A Computational Method to Visualize Nitrated Hsp90 Distribution in 3D Culture Models" SfRBM (2021). Oral Presentation. *Undergraduate YIA*.

Sathler AR, Sung AL, Nguyen KT, Estévez AG, Franco MC. "A Computational Method to Visualize Nitrated Hsp90 Distribution in 3D Culture Models" CQLS Fall Conference (2021). Oral and Poster Presentation. *Best Undergraduate Poster and Best Overall Lightning Talk*.

FELLOWSHIPS & SCHOLARSHIPS:

NSF Graduate Research Fellowship UCSF **$159,000** **2025**
For outstanding graduate students pursuing research-based master's and doctoral degrees in STEM fields.

George T. Abed Award OSU **$3,000** **2022**
Competitive yearly award for an Acacian exhibiting exceptional leadership, scholarship, and community service.

CURE Summer Fellowship OSU **$5,000** **2021**
Competitive research grant from OSU's College of Science for carrying out a proposed summer research project.

Merrill Family Foundation Scholarship OSU **$4,500** **2020**
An OSU College of Science competitive scholarship awarded to students embodying service and leadership.

AWARDS:

Spirit of NINDS Award **2023**
National Institutes of Neurological Disorders & Stroke (NINDS) – Bethesda, MD
"In recognition of invaluable insights and recommendations for program enhancement, contributing to improved working conditions, training and mentorship opportunities, and a positive workplace culture."

Honorable Mention – Undergraduate Poster Competition **2022**
American Society of Biochemistry and Molecular Biology – Philadelphia, PA

Undergraduate Young Investigator Award (YIA) **2021**
Society for Redox Biology & Medicine – Online

Best Lightning Talk & Undergraduate Poster **2021**
Center for Quantitative Life Sciences Fall Conference – Corvallis, OR

CERTIFICATIONS:

Nanodegree – Generative AI **Udacity – 2025**

Nanodegree – Introduction to Machine Learning w/ TensorFlow **Udacity – 2020**

MENTORSHIP:

Sara Woube **PATHS** **2023**
Provided mentorship through monthly phone calls and letter of recommendation. Resulted in her acceptance into Massachusetts Institute of Technology Introduction to Technology, Engineering, and Science (MITES) program.