Joseph Arballo, PhD

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EDUCATION

North Carolina State University, Plants for Human Health Institute
Postdoctoral Research Scholar
Research Training: Analytical Chemistry & Multi-omics
PI: Mary Ann Lila, Ph.D., David H. Murdock Distinguished Professor of Food Bioprocessing & Nutrition Sciences

University of California, Davis
Ph.D., Nutritional Biology, 6/2025
Dissertation: *New Insights into Early-Life Vitamin A Deficiency: Disrupted Metabolic Health in an Early-Life Maternal–Infant Rodent Model*
Advisor: Peng Ji, Ph.D., Associate Professor of Nutrition

University of Illinois Urbana-Champaign
M.S., Nutritional Sciences, 5/2021
Thesis: *Lycopene Metabolism in Transgenic Mice*
Advisor: John W. Erdman Jr., Ph.D., Professor Emeritus of Nutrition

California State University, Chico
B.S., Exercise Physiology, 5/2019

Mt. San Jacinto College
A.A, Science & Mathematics

RESEARCH EXPERIENCE

Post Doctoral Research Scholar
Plants for Human Health Institute @ North Carolina State University | July 2025 – present

- Developing proficiency in LC-MS/MS and applying HPLC workflows to characterize circulating polyphenol metabolites in human biospecimen
- Perform epigenomic analysis including pathway enrichment (Enrichr), disease association analysis, and cross-platform gene overlap mapping
- Conduct epigenomic analyses in collaboration with Dragan Milenković, identifying nutrient–genomic interactions impacting cardiovascular, metabolic, and neuronal pathways
- Execute in silico molecular docking and structure–function analyses to evaluate flavonoid interactions with epigenetic enzymes (e.g., DNMTs, KDMs), linking bioactive exposure to regulatory mechanisms
- Apply multivariate statistical modeling (PCA, PLS-DA) and visualization pipelines (MetaboAnalyst, R/GraphPad) to resolve bacteria-induced bioactive production

Graduate Student Researcher
University of California, Davis | Aug 2021 – June 2025

- Established and led a murine metabolic biology program, designing and executing dietary and maternal-infant studies to investigate retinoid regulation of metabolic health
- Developed a novel vitamin A deficiency model with clinically relevant phenotypes (ocular, neurological, metabolic), enabling mechanistic studies of micronutrient deficiency
- Analyzed targeted and untargeted LC-MS/MS data to quantify oxylipins and lipid mediators across tissues, identifying tissue-specific metabolic remodeling
- Conducted RT-qPCR and gene expression profiling to link metabolic phenotypes with transcriptional regulation of lipid signaling pathways
- Designed and executed behavioral assays (Barnes Maze, Rotarod, Elevated Plus Maze, Grip Strength) to assess neurocognitive and functional outcomes
- Secured multi-year fellowships, supporting independent project development and dissemination

Graduate Student Researcher
University of Illinois, Urbana-Champaign | May 2019 – May 2021
Rodent Models of Carotenoid Metabolism

- Managed a transgenic mouse colony to investigate carotenoid metabolism and enzyme-mediated bioaccumulation
- Developed lipid extraction and HPLC-based quantification workflows for carotenoids and lipid-soluble compounds

- Optimized formulation strategies for lycopene delivery, improving solubility and bioavailability in dietary interventions
- Performed quantitative data analysis in SAS, linking dietary exposure to tissue-specific metabolic outcomes

PUBLICATIONS [T]= intern or trainee under my mentorship

- **Arballo, J. R.,** Yang, J, Engle-Stone R., ZhaoZhao, K.[T], Ji, P. Early-Life Vitamin A Deficiency Modulates Oxylipin Metabolism in a Tissue Specific Manner and Induces Hepatic Inflammation. *Nutrients* https://doi.org/10.3390/nu18121988
- Strauch. R, Bennett, A., Valdez-Alvarado, A., Castaneda-Reyes, E., **Arballo, J.R.,** de Mejia, E., Valacchi, G, Lila, M. Can Exogenous Bacterial Fermentation Generate Berry Phenolics That Mimic Circulating Gut-Derived Metabolites? *Journal of Agricultural and Food Chemistry*; https://doi.org/10.1021/acs.jafc.6c01674.
- Mjaaseth, U., Hsu, MF., **Arballo, J.R.,** Haj, F., Viharkumar, P. Dysregulated Glucose Metabolism in the Visual Cortex of Human Subjects with Mild Cognitive Impairment and Alzheimer's Disease *Frontiers in Aging Neuroscience*; https://doi.org/10.3389/fnagi.2026.1710075
- **Arballo, J. R.,** Rutkowski, J., Haskell, M., De Las Alas, K.[T], Engle-Stone, R., Du, X, Ramsey, J., Ji, P. (2024). Pre- and Postnatal Vitamin A Deficiency Impairs Motor Skills without a Consistent Effect on Trace Mineral Status in Young Mice. *International Journal of Molecular Sciences.* https://doi.org/10.3390/ijms251910806
- Bradley, M. J., Black, M., **Arballo, J. R.,** Amengual, J., Erdman Jr, J. W. (2023). Lycopene Accumulation in Transgenic Mice Lacking One or Both Carotenoid Cleaving Enzymes. *The Journal of Nutrition* https://doi.org/10.1016/j.tjnut.2023.05.025
- Perng, V., Navazesh, S.E., Park, J., **Arballo, J.R**., Ji, P. (2022). Iron Deficiency and Overload Modulate the Inflammatory Responses and Metabolism of Alveolar Macrophages. *Nutrients.* https://doi.org/10.3390/nu14153100
- **Arballo, J.R**., Amengual J., Erdman J. W. Jr. (2021). Lycopene: A Critical Review of Digestion, Absorption, Metabolism, and Excretion. *Antioxidants.* https://doi.org/10.3390/antiox10030342

BOOK CHAPTERS

- Zuo L., **Arballo J.R**., Liu Z., **He F**. (2020). ROS and Redox Mechanism in Neurodegenerative Diseases. In *Systems Medicine: Qualitative, Quantitative, & Computational Approaches*. Elsevier. https://doi.org/10.1016/B978-0-12-801238-3.11517-X

TECHNICAL SKILLS

In Vivo & Translational Models

- Designed and executed rodent studies (dietary, transgenic, maternal-infant models) under IACUC protocols
- Performed oral gavage, intraperitoneal injection, necropsy, and phenotypic characterization
- Conducted behavioral phenotyping (cognition, anxiety, motor function)

Molecular & Cellular Analysis

- RNA extraction, RT-qPCR, and gene expression quantification
- Hemoglobin quantification (Drabkin's assay)
- Histology: H&E staining, imaging, and quantitative morphology

Analytical Chemistry & Metabolomics

- LC-MS/MS (targeted and untargeted metabolomics) across plasma and tissue matrices
- HPLC-based quantification of retinoids and carotenoids
- ICP-OES for trace mineral analysis
- Folch lipid extraction and sample preparation workflows

Bioinformatics & Multi-Omics Integration

- Pathway and enrichment analysis (Enrichr, KEGG, Reactome)
- Epigenomic data analysis (DNA methylation/RRBS interpretation)
- Cross-omics integration: metabolomics + epigenomics
- Gene overlap and network analysis (Venn diagrams, pathway convergence mapping)
- In silico docking and structural modeling of metabolite–protein interactions
- Disease association mapping using curated databases (e.g., CTD)

Data Science & Statistics

- Multivariate analysis: PCA, PLS-DA, clustering approaches
- Statistical analysis in SAS, GraphPad Prism, MetaboAnalyst
- Data visualization: publication-quality figures (heatmaps, enrichment plots, PCA), Adobe Illustrator

PROFESSIONAL, DEPARTMENTAL & INSTITUTIONAL SERVICE

- **CAPS Scholar Application Reviewer, American Society for Nutrition Foundation (2026)** Reviewed and evaluated graduate student applications for the CRN and ASNF Program for Scholars (CAPS), contributing to selection of

scholars receiving support to attend CRN's 2026 scientific programming in Carlsbad, CA.

- **Graduate Student Liaison, Faculty Hiring Committee in Nutritional Immunology**, UC Davis (2024) Participated as non-voting committee member for Assistant Professor search; coordinated graduate student interviews, facilitated candidate meetings, and contributed structured evaluations of research and teaching statements of applicants.

CONFERENCE PRESENTATIONS ***= presenting author** T= intern or trainee under my mentorship

Oral:

- **Arballo, J.*.** Olson-Sakaguchi, C., Lila, M. Milenkovic, D. Blueberry Supplementation in Older Adults Alters the Epigenomic Landscape Across Neuronal, Cardiovascular, and Metabolic Networks. Nutrition 2026. **Emerging Leaders in Nutrition Award** https://doi.org/10.1016/j.cdnut.2026.109204
- **Arballo, J.*** Blueberry Supplementation in Older Adults Alters the Epigenomic Landscape Across Neuronal, Cardiovascular, and Metabolic Networks. **Invited Talk.** Pharmacology Department, University of Oslo, April 7, 2026
- **Arballo, J.*** Early-Life Vitamin A Deficiency Disrupts Metabolic Health in a Maternal–Infant Rodent Model. **Invited Talk**. Plants for Human Health Institute Research Seminar, January 9, 2026
- **Arballo, J.*,** Yang, J., Ji, P. Dietary Vitamin A Deficiency in Rodents Impacts Oxylipin Metabolism and Gene Expression of Oxidative Enzymes. *Current Developments in Nutrition*; **Emerging Leaders in Nutrition award (Awarded to top 5% of abstracts/5,000 submissions).** https://doi.org/10.1016/j.cdnut.2024.103723
- **Arballo J.*,** Haskell M., Engle-Stone R., Rutkowsky J., Ji P Developmental Consequences of Concurrent Vitamin A and Iron Deficiency: Insight from a Murine Model, *Current Developments in Nutrition*, Volume 7, Supplement 1, 2023, **Hand-selected for oral talk for vitamins and minerals section** https://doi.org/10.1016/j.cdnut.2023.101801
- **Arballo, J.*,** Yang J., Haskell M., Engle-Stone R., Ji P. Dietary Vitamin A Deficiency in Rodents Impacts Oxylipin Metabolism and Gene Expression of Oxidative Enzymes. *Graduate Group in Nutritional Biology Symposium 2023.* **Oral presentation earned second place in the departmental competition for oral talks**

Poster:

- **Arballo, J.*,** Pena, M. T, Sran, S. T, Bhardwaj, L. T, Haskell, M., Engle-Stone, R., Ji. P., Early-Life Energy Overconsumption and Vitamin A Deficiency Alters Growth, Metabolic Health, and Motor Functions: A Mouse Model of Double-Burden Malnutrition. *Current Developments in Nutrition;* **Poster.** https://doi.org/10.1016/j.cdnut.2025.107400
- Ji, P., Perng, V. and **Arballo, J.*** (2022), Iron Deficiency and Overload Attenuate Inflammatory Response and Modulate Metabolism in Alveolar Macrophage *in Vitro*. *The FASEB Journal*, 36: **Poster** https://doi.org/10.1096/fasebj.2022.36.S1.R4382
- **Arballo, J*;** Ji, P. Developmental consequences of concurrent iron and subclinical vitamin A deficiencies in a mouse model *Graduate Group in Nutritional Biology Symposium 2022* **Poster**
- **Arballo, J.*,** Amengual, J, Black M., Erdman J. W. Jr. Impact of carotenoid cleaving enzymes on lycopene in transgenic mice. *Current Developments of Nutrition.* 2021 5 (Supplement): 69 **Poster** https://doi.org/10.1093/cdn/nzab034_003

TEACHING, MENTORING, & OUTREACH

Graduate Teaching Assistant | Bioenergetics & Metabolism (Biochemistry for pre-med students)
College of Biological Sciences, UC Davis | Sept 2024 – June 2025 (2 quarters)

- Led weekly office hours, structured review sessions, and developed supplemental study materials to support student learning.
- Responded to student questions on Piazza, reinforcing conceptual understanding and problem-solving strategies.
- Assisted in exam design, administration, and proctoring; contributed to lecture support and in-class guidance.

Graduate Teaching Assistant | Systemic Physiology Laboratory
College of Biological Sciences, UC Davis | Sept 2023 – March 2024 (2 quarters)

- Independently instructed laboratory and discussion sections covering neuromuscular, cardiovascular, and respiratory physiology.
- Taught core hands-on skills, including electrocardiography, mammalian dissection, and graph construction/data interpretation.
- Achieved a 4.5/5.0 average TA evaluation score (median 5.0/5.0 across N=22 students) indicating exceptional instructional effectiveness and student engagement.

Undergraduate & Graduate Research Mentoring
University of California, Davis | 2021 – 2025

- Mentored seven undergraduates and one master intern in experimental design, data analysis, and scientific writing.
- Trainees produced enough data toward **first author presentations (3)** and abstracts toward the UC Davis Undergraduate Research Symposium. Trainees are co-authored on one published research manuscript, with additional

co-authorships allocated and confirmed as manuscripts enter submission, reflecting meaningful scientific contributions and clear authorship development.
- Provided hands-on training in murine handling, behavioral assays (e.g., RotaRod, Barnes Maze), microtomy, RNA extraction, RT-qPCR, and histological staining, emphasizing scientific rigor, reproducibility, and confidence in independent research execution.

Mentor & Panelist, SACNAS & Educational Opportunity Program (EOP)
University of California, Davis | 2022 – 2025

- Participated in diversity and inclusion efforts, guiding students on application to graduate school, preparing forms to guarantee fee waivers, preparation of personal statements and application material, and interview conduct
- Panelist to answer questions on graduate school, my personal journey, and advice for surviving graduate school
- Served as a mentor for first generation college students, helping them prepare application material, essays

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FELLOWSHIPS

- Mars Dissertation Fellowship, UC Davis ($4,000, Spring 2025)
- Robert Rucker Fellowship, UC Davis ($5,000, Spring 2024)
- **Graduate Research Mentorship Fellowship, UC Davis ($48,900, Fall 2022)**
- Rustici GSR Summer Award, UC Davis ($7,000, Summer 2022)
- **Nutritional Biology Fellowship, UC Davis ($39,725, Fall 2021)**
- **Kraft-Heinz Human Nutrition Fellowship, UIUC ($57,000, Fall 2019)**
- Summer Pre-Doctoral Institute Fellowship, UIUC (Summer 2019)

AWARDS

- Emerging Leaders in Nutrition Award (Nutrition 2026; top 10% of abstracts selected)
- Emerging Leaders in Nutrition Award (Nutrition 2024; top 5% of abstracts selected)
- CRN and ASNF Program for Scholars (CAPS) Award (2023) — Fully funded travel award
- Campbell Nutrition Research Scholarship ($2,500, Summer 2023)
- Henry A. Jastro Research Award ($7,500 total, Fall 2022, 2023, 2024)
- Carpenter Travel Award ($3,500, Spring 2022–2023)
- Kari W. Memorial Award ($800, Spring 2020)
- Kraft-Heinz Travel Funding ($1,000, Fall 2019–Spring 2020)
- Division of Nutrition Travel Funding ($2,000, Fall 2020–Spring 2021)

MEDIA COVERAGE & EXPERT COMMENTARY

- **Arballo, J.** Expert commentary in: Melegrito, R. A. “The Best Way to Eat Blueberries.” The Epoch Times, September 3, 2026. Interviewed regarding blueberry consumption, epigenetic regulation, and healthy aging.
- **Arballo, J.** “On to New Beginnings.” Chico State Today, May 29, 2019. First-person essay on the first-generation college experience, undergraduate research, and transition to graduate training.

AD HOC REVIEWER

Current Developments in Nutrition