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Lindsey St. Mary, Ph.D.

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Professional Profile

Dr. Lindsey St. Mary is an applied toxicologist with over 16 years of experience evaluating chemical safety at the intersection of human health and the environment. She specializes in leveraging the aquatic model organisms and complementary laboratory systems to assess adverse outcomes from a wide range of pollutants, with expertise spanning molecular, analytical, and predictive toxicology approaches.

Her doctoral and postdoctoral research was conducted within international, multidisciplinary consortia under the EU Horizon 2020 framework, including the EUROPAH and PATROLS projects. These efforts advanced understanding of nanomaterial and pollutant interactions, photochemistry, and environmental health risk, using cutting-edge tools such as qPCR, GC-MS, and high-content assays. Dr. St. Mary has also collaborated with industry partners to integrate in vitro and in vivo platforms, improving early-stage prediction of chemical toxicity and supporting safer product design.

Her portfolio includes toxicological investigations across diverse contexts—ranging from immunotoxicity and developmental neurotoxicity to nanoparticle safety, high-nitrogen compounds, arsenic, and cancer-related pathways. She has contributed to high-throughput screening efforts with the U.S. EPA's TOXCast program and the National Toxicology Program's (NTP's) developmental neurotoxicant libraries, focusing on predictive models and structure–activity relationships linked to human disease.

Dr. St. Mary brings a proven track record of cross-disciplinary collaboration, assay development, and innovation to every project. She partners with clients in the environmental, pharmaceutical, and consumer product sectors to deliver actionable insights that drive chemical safety, regulatory readiness, and product stewardship.

Academic Credentials & Professional Honors

Ph.D., Life Sciences, Heriot-Watt University, 2020

M.S., Toxicology, North Carolina State University, 2015

B.S., General Science, Pre-Vet, Oregon State University, 2013

Marie Curie Fellowship, HORIZON 2020 Initiative. EUROPAH (The Extensive and Ubiquitous Role of Polycyclic Aromatic Hydrocarbons (PAHs) in Space) Project Fellow (2017-2020).

Prior Experience

Research Associate, Oregon State University, 2024-2025

NIEHS Postdoctoral Fellow, Oregon State University, 2021-2024

Postdoctoral Research Associate, Heriot-Watt University, 2020-2021

PhD Research Fellow, Heriot-Watt University, 2017-2020

Research Technician, Oregon State University, 2015-2017

Graduate Researcher, North Carolina State University, 2013-2015

Professional Affiliations

Society of Toxicology

Pacific Northwest Association of Toxicologists- PANWAT

Society of Environmental Toxicology and Chemistry (SETAC)

Publications

Yvonne Rericha, **St. Mary, Lindsey**, et al., Diverse PFAS Produce Unique Transcriptomic Changes Linked to Developmental Toxicity in Zebrafish. Frontiers in Toxicology. (2024)

St. Mary, Lindsey, et al., Environmental Significance of PAH Photoproduct Formation: TiO2 Nanoparticle Influence, Altered Bioavailability, and Potential Photochemical Mechanisms. Chemosphere. (2024)

St. Mary, Lindsey, et al. Comparative Analysis between Zebrafish and an Automated Live-Cell Assay to Classify Developmental Neurotoxicant Chemicals. Toxicology and Applied Pharmacology. (2023)

Perkins, Edward J., To, Kimberly T., **St. Mary, Lindsey**, et al. Developmental, Behavioral and Transcriptomic Changes in Zebrafish Embryos after Smoke Dye Exposure. Toxics. (2022)

St. Mary, Lindsey et al. Time-Related Alteration of Aqueous-Phase Anthracene and Phenanthrene Photoproducts in the Presence of TiO2 Nanoparticles. Environmental Science and Technology. (2021).

To, Kimberly, **St. Mary, Lindsey** et al. Morphological and behavioral effects in zebrafish embryos after exposure to smoke dyes. Toxics. (2021).

Axton, Elizabeth R., Beaver, Laura M., **St. Mary, Lindsey** et al. Treatment with Nitrate, but Not Nitrite, Lowers the Oxygen Cost of Exercise and Decreases Glycolytic Intermediates While Increasing Fatty Acid Metabolites in Exercised Zebrafish. Journal of Nutrition. (2019).

Truong, Lisa, Reif, David, **St. Mary, Lindsey** et al. Multidimensional In Vivo Hazard Assessment Using Zebrafish. Toxicol Sci 137, 212–233 (2014).

Select Presentation

Lindsey St. Mary, Yvonne Rericha, Lisa Truong, Michael T. Simonich, Ryan McClure, Robyn L. Tanguay. Identifying bioactive per- and polyfluoroalkyl (PFAS) from a diverse library and their mode of action in zebrafish. Society of Toxicology (SOT) Conference, 2024. Salt Lake City, Utah. (Poster)

Lindsey St. Mary, Yvonne Rericha, Lisa Truong, Michael T. Simonich, Ryan McClure, Robyn L. Tanguay. Transcriptomic characterization of structurally diverse per- and polyfluoroalkyl substances (PFAS) to elucidate mode of action in zebrafish. Society of Environmental Toxicology and Chemistry (SETAC) European Conference, 2023. Dublin, Ireland. (Poster)

Lindsey St. Mary, Lisandra Trine, Courtney Roper, Martin McCoustra, Staci Simonich, Theodore Henry.

Photochemical Transformation of PAHs by TiO_2 Nanoparticles and Their Implications for Environmental Health. Society of Environmental Toxicology and Chemistry (SETAC) North America Conference, 2022. Pittsburgh, Pennsylvania. (Platform)

Lindsey St. Mary, Lisa Truong, Andrew A. Bieberich, Raymond O. Fatig III, Robyn L. Tanguay. Comparative analysis between zebrafish and an automated live-cell assay to assess 87 developmental neurotoxicants. Pacific Northwest Association of Toxicologist (PANWAT) Conference, 2022. Spokane, Washington. (Platform)

Lindsey St. Mary, Lisandra Trine, Courtney Roper, Martin McCoustra, Staci Simonich, Theodore Henry. Time-related formation of bioactive polycyclic aromatic hydrocarbon (PAH) photoproducts upon interaction with TiO2 nanoparticles in the aqueous phase. The Lifecycle of Cosmic PAHs Conference, 2022. Aarhus, Denmark. (Invited speaker)

Lindsey St. Mary, Lisandra Trine, Courtney Roper, Martin McCoustra, Staci Simonich, Theodore Henry. Formation of Bioactive PAH Photoproducts Mediated by Photoactive TiO_2 Nanoparticles Over Time. International Symposium on Polycyclic Aromatic Compounds (PACs), 2019. Örebro, Sweden. (Platform)

Natalia Vinas, Lisa Truong, **Lindsey St. Mary**, Lyle Burgoon, Robert Tanguay, Ed Perkins. New Approach Methodologies to Elucidate Smoke Dyes Adverse Effects. Society of Environmental Toxicology and Chemistry (SETAC)-North America Conference, 2019. Toronto, Canada. (Poster)

St. Mary, Lindsey, Martin McCoustra, Theodore Henry. Assessing the Photoactivity of PAHs in the Presence of TiO2 Nanoparticles in an Aqueous Environment Over Time. Society of Environmental Toxicology and Chemistry (SETAC)- Europe Conference, 2019. Helsinki, Finland. (Poster)

St. Mary, Lindsey, Martin McCoustra, Theodore Henry. Tracking Physicochemical Changes of PAHs in the Presence of TiO2 Nanoparticles by Assessment of Biological Responses. Society of Environmental Toxicology and Chemistry (SETAC) – Europe Conference, 2018; Rome, Italy. (Poster)

St. Mary, Lindsey. Zebrafish as a Model for Chemoprevention of T-cell Acute Lymphoblastic Leukemia (T-ALL). Knight Cancer Institute Cancer Prevention and Control Science Symposium, 2017; Corvallis, OR. (Platform)

St. Mary, Lindsey, Carolyn Mattingly, Antonio Planchart. Low Levels of Arsenic Affect the Innate Immune Response in Embryonic Zebrafish. Society of Toxicology, 2015; San Diego, CA. (Poster)

Antonio Planchart, **St. Mary, Lindsey**, Elizabeth Cook, Katie Duke, Mark Ihrie, Carolyn Mattingly. The Antirheumatic Drug, Leflunomide, Interferes with the Dopamine Synthesis Pathway. Society of Toxicology, 2014; Phoenix, AZ. (Poster)

Chalker Lindsey, Truong Lisa, and Tanguay Robert. Using a High Throughput Approach to Assess the Toxicity of TOXcast Chemicals in vivo. Pacific Northwest Association of Toxicologists, 2012; Seattle, Washington. (Poster)

Chalker Lindsey, Truong Lisa, and Tanguay Robert. Rapid Throughput Screening Utilizing the Embryonic Zebrafish. Pacific Northwest Association of Toxicologists, 2011; Bonneville, WA. (Poster)

Project Experience

- Conducted toxicological hazard assessments by integrating transcriptomic data, mechanistic insights, and traditional toxicology endpoints to evaluate chemical safety and inform client decision-making.

- Designed and executed comparative toxicity analyses across species to address regulatory and product stewardship needs relevant to environmental exposures.
- Delivered expert interpretation of complex datasets (RNA-seq, developmental toxicity assays, and morphological endpoints) to support risk evaluation.
- Developed and optimized scientific methodologies and laboratory techniques to ensure robust, defensible data applicable to regulatory decision-making.
- Provided clear, client-ready communication of research findings, synthesizing complex toxicological results into actionable insights for industry partners and regulatory stakeholders.
- Facilitated interdisciplinary collaborations with industry, academic, and government partners to bridge regulatory science and product development.
- Authored and co-authored peer-reviewed publications and technical reports that highlight risk-relevant mechanisms of toxicity, relevant to both environmental policy and regulatory compliance.
- Applied extensive experience with zebrafish models, nanoparticle and chemical exposure studies to inform risk assessments in environmental and industrial contexts.
- Skilled in translating complex scientific findings into clear, actionable insights, fostering effective knowledge transfer in academic and professional settings and supporting decision-making for clients and stakeholders.

Editorships & Editorial Review Boards

Toxicology and Industrial Health- Associate Editor 2024-present

Peer Reviews

Environmental Science and Technology

Journal of Pharmacology