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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 17 years of experience evaluating chemical safety at the intersection of human health and the environment. She applies molecular, analytical, and predictive toxicology approaches to assess pollutant impacts, leveraging aquatic model organisms and complementary laboratory systems to inform risk evaluation and safer product design. Dr. St. Mary possesses advanced knowledge of polycyclic aromatic hydrocarbon (PAH) chemistry and toxicity, integrating this expertise into mechanistic studies of pollutant behavior and health outcomes across species.

Her research and project portfolio span international collaborations under the EU Horizon 2020 framework (EUROPAH, PATROLS), U.S. federal initiatives (EPA TOXCast, NTP), and industry partnerships supporting regulatory compliance and innovation. She has conducted comprehensive hazard and risk assessments that synthesize transcriptomic, mechanistic, and traditional toxicology data; performed dose–response modeling to support California Proposition 65 compliance; and delivered medical device TRAs and OECD-compliant study summaries for EPA and European evaluation. Her technical strengths include qPCR, molecular profiling technologies, GC-MS, high-content analysis, and advanced statistical modeling, supported by custom R-based workflows for data interpretation and visualization.

Dr. St. Mary brings a proven record of scientific rigor, technical innovation, and interdisciplinary collaboration. She has contributed to peer-reviewed publications, regulatory submissions, and technical reports addressing immunotoxicity, developmental neurotoxicity, carcinogenicity, nanoparticle safety, pesticide evaluation, and environmental forensics. Partnering with clients across environmental, pharmaceutical, and consumer product sectors, she delivers clear, actionable insights that advance 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

Rothenberg, S., Johnson, E., LaDu, J., **St. Mary, Lindsey**, et al., Zebrafish Parental Co-exposure to Environmentally Relevant Levels of Inorganic Arsenic and Methylmercury Impacts Neurobehavior in Parents and Progeny. Environmental Toxicology and Pharmacology. (2026).

St. Mary, Lindsey, et al., Phenotypically anchored transcriptomics across diverse agrichemicals reveals conserved pathways and unique gene expression signatures in zebrafish. Frontiers in Toxicology.7. (2025)

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

St. Mary, Lindsey, Ryan McClure, Lisa Truong, Steven J. Carrell, Katrina M. Waters, Robyn L. Tanguay. Phenotypically Anchored Transcriptomics of Diverse Agrichemicals Reveal Distinct Gene Expression Signatures and Shared Biological Pathways in Zebrafish. Society of Toxicology (SOT) Conference, 2026. San Diego, CA. (Poster)

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□ 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□ 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.
- Derived Maximum Allowable Dose Levels (MADLs) and No Significant Risk Levels (NSRLs) under California Proposition 65, integrating dose–response modeling and mechanistic data to support compliance strategies and labeling requirements.
- Performed toxicological risk assessments (TRAs) of medical devices, applying structure-activity relationships and toxicokinetic considerations to the characterization of extractable and leachable compounds.
- Prepared U.S. EPA endocrine disruption screening program (EDSP)–related evaluations of pesticide active ingredients and formulations for clients, assessing endocrine activity and hazard potential from multiple mechanistic perspectives.
- Authored a comparative thyroid assessment submitted to the U.S. EPA in support of a weight-of-evidence waiver request.
- Independently selected, implemented, and interpreted statistical tests using custom R workflows to assess dose-response relationships and characterize potential human health risk.
- Applied appropriate statistical methodologies for historical control data (HCD) and carcinogenicity analyses, to support interpretation of carcinogenicity studies and weight-of-evidence hazard evaluations.
- Supported exposure assessments for litigation, evaluating whether estimated chemical exposures were sufficient to plausibly result in adverse health effects.
- Developed and maintained custom R scripts to support statistical analyses, systematic literature searches, data visualization, and advanced data analytics, including transcriptomic, morphological, and carcinogenicity datasets.
- Authored Toxic Substances Control Act (TSCA) Premanufacture Notice (PMN) submissions on behalf of industry clients, ensuring technical accuracy and regulatory compliance.
- Developed OECD-compliant and Detailed Evaluation Report (DER) study summaries from client-provided study reports, ensuring consistency with regulatory guidance and clarity of scientific interpretation across study reports (acute, subchronic, chronic, carcinogenicity, *in vitro* etc.)

- Collaborated in the development of Acute Toxicity Estimates (ATEs) for mixtures and individual constituents to inform GHS classification and labeling, supporting data synthesis and weight of evidence evaluation.
- Provided technical support for litigation involving petroleum refinery operations and CERCLA-related releases, applying environmental forensics, chemical characterization, and spatial analyses (e.g., pipeline corridor mapping) to evaluate source attribution and liability.
- 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.
- 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- Co-Editor-in-Chief 2025-present

Peer Reviews

Environmental Science and Technology

Journal of Pharmacology