William (Bill) D. Klaren, Ph.D., DABT

SENIOR SCIENTIST II

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Dr. William (Bill) Klaren is a board-certified toxicologist in ToxStrategies' Health Practices Division. With a Ph.D. in Human Toxicology and more than 7 years of experience across both academia and industry, he brings broad toxicological, risk assessment, and project management expertise to the consulting environment. Dr. Klaren has experience in systematic review and distilling essential concepts from published literature. Furthermore, he has expertise on the reliability and relevance of publications to advance prioritization initiatives. He has also worked with mechanistic and *in vivo* data sets for subsequent incorporation into mode-of-action or adverse-outcome pathway frameworks, with a particular focus on endocrine disruption (ED).

Dr. Klaren has performed numerous risk assessments on consumer products, covering pest control, cosmetics, and air-care products. In that capacity, he has evaluated a wide range of chemistries, including agrochemical active ingredients, preservatives, food flavorings, fragrances, and inert ingredients. He has also reviewed chemical portfolios and overseen Good Laboratory Practice (GLP) acute toxicity testing. Additionally, he has supported exposure studies to refine consumer goods risk assessments and has acquired broad expertise in the inhalation exposure that results from consumer product use. This experience, coupled with an in-depth knowledge of regulations related to biocidal products, has allowed him to support registration efforts for multiple pest control products in the US and EU. In conjunction with this support, Dr. Klaren has served on several task forces instituted to expand the robust safety profiles, through ongoing toxicity testing and governmental registrations, of the pyrethroid class of insecticides.

Dr. Klaren has expertise with new-approach methods, highlighted by research into alternative approaches to animal testing by developing and qualifying high-throughput *in vitro* assays utilizing organotypic cultures. By multiplexing the assays with transcriptomics and morphology data, many endpoints could be leveraged to generate bioactivity profiles for test substances. Dr. Klaren also evaluated the appropriateness of *in vitro* data by understanding the degree of concordance between available *in vitro* assay data and DrugMatrix transcriptomic data, noting that key variables, such as physiochemical properties, can have a great impact on the magnitude of agreement between these orthogonal data sources. In all, Dr. Klaren has extensive experience working with a diversified portfolio of toxicity data to incorporate into a risk assessment.

Dr. Klaren has collaborated with academicians in the development of predictive models for ED potential. This work encompassed all the EATS (estrogen, androgen, thyroid, and steroidogenesis) modalities involving thorough evaluations of existing sources of endocrine-related data—notably, the ToxCast and Tox21 assay data. This work allowed for a preliminary evaluation of ED potential for data-poor chemicals found in consumer goods. Dr. Klaren has conducted ED potential assessments following current guidance—in particular, the ECHA/EFSA ED guidance, and has also conducted screening-level ED assessments on a variety of chemicals and components of consumer goods. He has advised decision makers on the complexity of endocrine disruption toxicity and relevant regulations in pursuit of business goals and strategic decision making.

Dr. Klaren has a strong record of communication through publications and presentations. He is active in the Society of Toxicology, supports younger career toxicologists via guest lecturing and mentoring, and has received multiple awards from employers and in academia. Additionally, Dr. Klaren became a Diplomate of the American Board of Toxicology in the fall of 2021.

EDUCATION AND DEGREES EARNED

2016 Ph.D. in Human Toxicology, University of Iowa, Iowa City

2010 B.S. in Biochemistry (minor in Mathematics), Loras College, Dubuque, Iowa *(magna cum laude)*

CERTIFICATIONS

2021–present Diplomate of the American Board of Toxicology

PROFESSIONAL AFFILIATIONS

2011–present Society of Toxicology

- In Vitro and Alternative Methods Specialty Section
- Risk Assessment Specialty Section
- Regulatory and Safety Evaluation Specialty Section (serving as a Junior Councilor since 2022)

2008–2010 American Chemical Society

RECOGNITIONS/AWARDS

2022 Employer recognition for assistance on a key high-profile project.

2020 Technical Award and Officer's Award — Employer recognition of contributions and accomplishments in endocrine disruption regulatory science

2020 Now Thanks! Employer recognition of long-term effort on complex chemical dossier

2020 Now Thanks! Employer recognition of support for re-registration of pest control portfolio

2019 Officer's Award — Employer recognition of leadership on human safety assessments required under the European Biocidal Products Regulation

2016 T32 Postdoctoral Training Fellowship, Texas A&M University

2015 Health Sciences Student Poster Award, Superfund Research Program Annual Meeting; National Institute of Environmental Health Sciences

2014 Graduate Student Travel Support Award, Society of Toxicology

2014 KC Donnelly Externship Award Supplement, National Institute of Environmental Health Sciences, Argonne National Laboratory

2014 Best Poster Award, Health Sciences Research Week, University of Iowa

2012 Best Poster Award, Health Sciences Research Week, University of Iowa

SELECTED PROFESSIONAL EXPERIENCE

Served as a project manager on diverse projects, ensuring timelines and budgets were met.

Provided technical and scientific support for a wide-ranging transcriptomic project on a PFAS substance.

Evaluated several genetically modified organisms for their potentially altered biochemistry as part of a Generally Recognized as Safe (GRAS) determination.

Supported several systematic literature reviews covering pharmaceutical agents, food flavorings, agrochemical active ingredients, and the toxicological impact of non-chemical stressors.

Reviewed existing carcinogenicity data on a non-caloric sweetener to assess its potential for cancer-causing effects.

Performed a carcinogenicity evaluation on permethrin: reviewed the animal and human effects data on permethrin to assess its potential cancer-causing effects in humans.

Conducted several study quality evaluations to advance incorporation of published literature into risk assessments.

Conducted multiple risk assessments for consumer products, notably pesticidal and cosmetic products. Developed and reviewed toxicity studies and implemented exposure modeling.

As a Visiting Scientist in the United Kingdom, gained experience and proficiency with EU Biocidal Products Regulation (BPR) and registration of biocidal products. This work entailed learning the guidance and the unique approach to risk assessment outlined under EU regulations. Gained substantial knowledge of other EU regulations, including European Food Safety Authority (EFSA)-specific guidance and Classification, Labeling and Package Regulation (CLP).

Working as an intern for ToxStrategies (funded by the T32 Training Fellowship from Texas A&M mentioned above), completed a study to identify attributes that influence *in vitro*–to–*in vivo* concordance by comparing Tox21 bioactivity with DrugMatrix transcriptomic responses to 130 chemicals.

Designed and conducted high-throughput *in vitro* assays incorporating high-throughput transcriptomics (HTT) (e.g., TempO-Seq) and high-content confocal imaging (e.g., ImageXpress). Built on this test system to evaluate and develop biological profiles for a range of petroleum chemicals.

Conducted post-doctoral research at Texas A&M under the project title, “Development and implementation of high-throughput multiplexed organotypic assays for evaluation of toxicity and use in chemical-biological read-across applications.”

Worked as a Visiting Scientist at the Argonne National Labs, Advanced Photon Source (funded by the KC Donnelly Externship of the NIEHS Superfund Program). Study title: “Spatial distribution of hepatic metals and their perturbation by PCB126.”

Completed doctoral study at the University of Iowa, titled: “Assessment of hepatic micronutrient disruption and the hepatotoxicity of 3,3’,4,4’,5-pentachlorobiphenyl (PCB126).”

PEER REVIEWER

Applied Physiology, Nutrition, and Metabolism

Environmental Science and Pollution Research

Journal of Applied Toxicology

Journal of Toxicology and Environmental Health, Part A

Toxicological Sciences

Toxicology

Regulatory Toxicology and Pharmacology

Computational Toxicology

PUBLISHED MANUSCRIPTS

Heintz MM, **Klaren WD**, East AW, Haws LC, McGreal SR, Campbell RR, Thompson CM. 2024. Comparison of transcriptomic profiles between HFPO-DA and prototypical PPARα, PPARγ, and cytotoxic agents in wild-type and PPARα knockout mouse hepatocytes. Toxicol Sci kfae045. doi: 10.1093/toxsci/kfae045. Online ahead of print. PMID: 38574385.

Heintz MM, **Klaren WD**, East AW, Haws LC, McGreal SR, Campbell RR, Thompson CM. 2024. Comparison of transcriptomic profiles between HFPO-DA and prototypical PPARα, PPARγ, and cytotoxic agents in mouse, rat, and pooled human hepatocytes. Toxicol Sci kfae044. doi: 10.1093/toxsci/kfae044. Online ahead of print. PMID: 38574381

Ring C, Blanchette A, **Klaren WD**, Fitch S, Haws L, Wheeler MW, Devito M, Walker N, Wikoff D. 2023. A multi-tiered hierarchical Bayesian approach to derive toxic equivalency factors for dioxin-like compounds. Regul Toxicol Pharmacol 143:105464, online ahead of print. PMID: 37516304.

Cordova AC, **Klaren WD**, Ford LC, Grimm FA, Baker ES, Zhou YH, Wright Fa, Rusyn I. 2023. Integrative chemical-biological grouping of complex high production volume substances from lower olefin manufacturing streams. Toxics 11(7):586, PMID: 37505552.

Borghoff SJ, Cohen SS, Jiang X, Lea IA, **Klaren WD**, Chappell GA, Britt JK, Rivera BN, Choksi NY, Wikoff DS. 2023. Updated systematic assessment of human, animal and mechanistic evidence demonstrates lack of human carcinogenicity with consumption of aspartame. Food Chem Toxicol 172:113549, online ahead of print. PMID: 36493943

House JS, Grimm FA, **Klaren WD**, Dalzell A, Kuchi S, Zhang S, Lenz K, Boogaard PJ, Ketelsegers HB, Gant TW, Wright FA, Rusyn I. 2022. Grouping of UVCB substances with dose-response transcriptomics data from human cell-based assays. ALTEX 39(3):388-404, PMID: 35288757.

Ring C, Sipes NS, Hsieh JH, Carberry C, Koval LE, **Klaren WD**, Harris MA, Auerbach SS, Rager JE. 2021. Predictive modeling of biological responses in the rat liver using in vitro Tox21 bioactivity: benefits from high-throughput toxicokinetics. Comput Toxicol 18:100166, PMID: 34013136.

Zorn KM, Foil DH, Lane TR, Hillwalker W, Feifarek DJ, Jones F, **Klaren WD**, Brinkman AM, Ekins S. 2020. Comparing machine learning models for aromatase (P450 19A1). Environ Sci Technol 54(23):15546–15555, PMID: 33207874

Zorn KM, Foil DH, Lane TR, Hillwalker W, Feifarek DJ, Jones F, **Klaren WD**, Brinkman AM, Ekins S. 2020. Comparison of machine learning models for the androgen receptor. Environ Sci Technol 54(21):13690–13700, PMID: 33085465.

House JS, Grimm FA, **Klaren WD**, Dalzell A, Kuchi S, Zhang S, Lenz K, Boogaard PJ, Ketelsegers HB, Gant TW, Wright FA, Rusyn I. 2020. Grouping of UVCB substances with new approach methodologies (NAMs) data. ALTEX 38(1):123–137, PMID: 33086383.

Zorn KM, Foil DH, Lane TR, Russo DP, Hillwalker W, Feifarek DJ, Jones F, **Klaren WD**, Brinkman AM, Ekins S. 2020. Machine learning models for estrogen receptor bioactivity and endocrine disruption prediction. Environ Sci Technol 54(19):12202–12213, PMID: 32857505.

Grimm FA, **Klaren WD**, Li X, Lehmler HJ, Karmakar M, Robertson LW, Chiu WA. Rusyn I. 2020. Cardiovascular effects of polychlorinated biphenyls and their major metabolites. Environ Health Persp 128(7):77008, PMID: 32701041.

Klaren WD, Ring C, Harris MA, Thompson CM, Borghoff S, Sipes NS, Hsieh JH, Auerbach SS, Rager JE. 2018. Identifying attributes that influence in vitro-to-in vivo concordance by comparing Tox21 bioactivity versus DrugMatrix transcriptomic responses across 130 chemicals. Toxicol Sci 167(1):157–171, PMID: 30202884.

Klaren WD, Rusyn I. 2018. High-content assay multiplexing for muscle toxicity screening in human-induced pluripotent stem cell-derived skeletal myoblasts. Assay Drug Dev Technol 16(6):333–342, PMID: 30070899.

Klaren WD, Vine D, Vogt S, Robertson LW. 2017. Spatial distribution of metals within the liver acinus and their perturbation by PCB126. Environ Sci Pollut Res Int 25(17):16427–16433, PMID: 28940161.

Iwata Y, **Klaren WD**, Lebakken CS, Grimm FA, Rusyn I. 2017. High-content assay multiplexing for vascular toxicity screening in induced pluripotent stem cell-derived endothelial cells and human umbilical vein endothelial cells. Assay Drug Dev Technol 15(6):267–279, PMID: 28771372.

Klaren WD, Gibson-Corley KN, Wels B, Simmons DL, McCormick ML, Spitz DR, Robertson LW. 2016. Assessment of the mitigative capacity of dietary zinc on PCB126 hepatotoxicity and the contribution of zinc to toxicity. Chem Res Toxicol 29(5):851–859, PMID: 26967026.

Klaren WD, Flor SS, Gibson-Corley KN, Ludewig G, Robertson LW. 2016. Metallothionein's role in PCB126 induced hepatotoxicity and hepatic micronutrient disruption. Toxicol Rep 3:21–28, PMID: 26770886.

Wang BW, **Klaren WD**, Wels B, Simmons DL, Olivier AK, Wang K, Robertson LW, Ludewig G. 2016. Dietary manganese modulates PCB126 toxicity, metal status and MnSOD in the rat. Toxicol Sci150(1):15–26, PMID: 26660635.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. 2016. PCB126-Induced disruption of gluconeogenesis and fatty acid oxidation precedes fatty liver in male rats. Toxicol Sc 149(1):98–110, PMID: 26393156.

Klaren WD, Gadupudi GS, Wels B, Simmons DL, Olivier AK, Ludewig G, Robertson LW. 2015. Progression of micronutrient alteration and hepatotoxicity following acute exposure to PCB126. Toxicology 338:1–7, PMID: 26410179.

Lai IK*, **Klaren WD***, Li M, Wels B, Simmons DL, Olivier AK, Haschek WM, Wang K, Ludewig G, and Robertson LW. 2013. Does dietary copper supplementation enhance or diminish PCB126 toxicity in the rodent liver? Chem Res Toxicol 26(5):634–644 (*Co-First Authors), PMID: 23527585.

ORAL PRESENTATIONS

Toxic response of the skin. Guest Lecturer, Advanced Toxicology Course, Texas A&M University, April 2023.

Study quality: Sources used in risk assessment. Guest Lecturer, Toxicology II, University of Wisconsin-Madison, April 2023.

Refining inhalation risk assessment by integrating new approach methodologies. Co-Chair. Society of Toxicology Annual Meeting, Nashville, TN, March 2023.

Using NHANES data to quantify magnitude of allostatic load in relation to existing risk assessment uncertainty/variability factors. SETAC Annual Meeting, Pittsburg, Pa. November 2022.

Toxic response of the skin. Guest Lecturer, Advanced Toxicology Course, Texas A&M University, April 2022.

Study quality: Sources used in risk assessment. Guest Lecturer, Toxicology II, University of Wisconsin-Madison, April 2022.

Toxic response of the skin. Guest Lecturer, Advanced Toxicology Course, Texas A&M University, April 2021.

Thirty years after wingspread: Endocrine disruptors in consumer products. S.C. Johnson and Son, Inc., Internal Scientific Symposium (virtual) Feb 2021.

Human health assessment by the industry — Consumer Products Guest Lecturer, Professional Development in Toxicology Course, University of Iowa, Sept. 2020.

Toxic response of the skin. Guest Lecturer, Advanced Toxicology Course, Texas A&M University, April 2020.

Human health assessment by the industry — Consumer Products Guest Lecturer, Practice in Risk Assessment Course, Texas A&M University, April 2020.

Incorporating advances in *in vitro* technology to risk assessment and important considerations for relevant usage of data. Technical Presentation, S.C. Johnson and Son, Inc., Racine, Wi (platform presentation), 2017.

Identifying attributes that influence *in vitro*-to-*in vivo* concordance by comparing Tox21 bioactivity versus DrugMatrix transcriptomic responses to 130 chemicals. Toxicology Seminar Series, Texas A&M University, 2017.

Informing ranges of applicability for *in vitro* assays: A comparison of Tox21 and DrugMatrix databases. Company-wide teleconference, ToxStrategies, 2017.

Internship Experience with Toxicological Consulting. Toxicology Forum, Texas A&M University, 2017.

High-content assay multiplexing for vascular toxicity screening in induced pluripotent stem cell-derived endothelial cells and human umbilical vein endothelial cells. Toxicology Forum, Texas A&M University, 2016.

PCBs and the disruption of hepatic homeostasis: Overview and trace elements. U.S. EPA, National Center for Environmental Assessment, Integrated Risk Information Team (webinar), 2016.

Spatial distribution of hepatic metals following PCB126 exposure. Superfund Annual Meeting, San Juan, Puerto Rico, 2015.

Assessment of hepatic micronutrient disruption and the hepatotoxicity of 3,3',4,4',5-pentachlorobiphenyl (PCB126). Human Toxicology Seminar Series, University of Iowa, 2015.

Understanding TRAF6-mediated CD40 signaling in mouse B cells. Loras College Seminar Series, 2011.

POSTER PRESENTATIONS

Lynn SG, Lea IA, Urban J, Borghoff SJ, Wikoff D, Fitch S, Perry C, Choksi N, Britt J, Heintz M, **Klaren W**, et al. Development and application of systematic approach to inventory and interrogate thyroid hormone network information. Abstract 4357, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Thompson CM, Heintz MM, Rogers SI, Fitch SE, Rivera BN, **Klaren WD**, Vincent MJ, Wikoff DS, Haws LC. Evidence identification and appraisal supporting development of an updated toxicity value for HFPO-DA. Abstract 3654, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Heintz M, **Klaren W**, East A, Haws L, Thompson C. Delayed transcriptomic responses in PPARa knockout mouse hepatocytes compared to wild-type hepatocytes exposed to HFPO-DA or PPARa agonist GW7647: Support for a PPARa-dependent mode of action for HFPO-DA in mouse hepatocytes. Abstract 4100, Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

East A, Rish W, **Klaren WD**. Using NHANES data to characterize the magnitude of allostatic load in vulnerable communities: Impact to existing risk assessment uncertainty/variability factors. Poster presented at Society of Toxicology Annual Meeting, Nashville, TN, March 2023.

Klaren WD, Heintz MM, East AW, Thompson CM, Haws LC. *In vitro* transcriptomic analyses informing the mode of action of HFPO-DA (GenX) in the liver. Poster presented at Society of Toxicology Annual Meeting, Nashville, TN, March 2023.

Rivera BN, Svetlik A, **Klaren WD**, Wikoff DS, Henderson RG. Scoping review of the immunomodulatory effects of cannabidiol: Effects within T cells. Poster presented at Society of Toxicology Annual Meeting, Nashville, TN, March 2023.

Klaren WD, Hoberman AM, Hauswirth JW. Reproduction and developmental toxicological evaluation of piperonyl butoxide (PBO). Poster presented at Society of Toxicology Annual Meeting, San Diego, CA, 2022.

Fitch S, **Klaren WD**, Payne L, Wikoff D. Comparison of public and private literature databases for toxicological investigations. Poster presented at Society of Toxicology Annual Meeting, San Diego, CA, 2022.

Brinkman AM*, **Klaren WD***, Feifarek DJ, Hillwalker W, Jones F, Zorn KM, Ekins S. Use of a weighted scheme for the interpretation and contextualization of in vitro and in silico-derived estrogenic endpoints. Society of Toxicology Annual Meeting, virtual (*equal contributors), 2020.

Klaren WD, Grimm FA, Shen H, Rusyn I. In vitro approaches to grouping of complex substances and UVCBs: A case study of olefin streams. Society of Toxicology Annual Meeting, San Antonio, Tx, 2018.

Grimm FA, **Klaren WD**, Li X, House JS, Chiu W, Lehmler HJ, Robertson LW, Rusyn I. Cardiotoxicity screening of polychlorinated biphenyls and their major metabolites. Society of Toxicology Annual Meeting, San Antonio, Tx (presenter), 2018.

Klaren WD, Iwata Y, Grimm FA, Rusyn I. Development of a high-throughput multiplexed assay for determining chemical effects on macrophage function. Society of Toxicology Annual Meeting, Baltimore, Md, 2017.

Iwata Y, **Klaren WD**, Lebakken CS, Grimm FA, Rusyn I. High-content assay multiplexing for vascular toxicity screening in induced pluripotent stem cell-derived endothelial cells and human umbilical vein endothelial cells. Society of Toxicology Annual Meeting, Baltimore, Md, 2017.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. Diminished phosphorylation of CREB Is a key event in the dysregulation of gluconeogenesis, glycogenolysis and fatty acid oxidation in PCB126 hepatotoxicity. Society of Toxicology Annual Meeting, Baltimore, Md, 2016.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. Diminished phosphorylation of CREB is a key event in the dysregulation of gluconeogenesis, glycogenolysis and fatty acid oxidation in PCB126 hepatotoxicity. NIEHS Environmental Health Science FEST, Durham, NC, 2016.

Klaren WD, Iwata Y, Lebakken CS, Grimm FA, Rusyn I. High-content assay multiplexing for vascular toxicity screening in induced pluripotent stem cell-derived endothelial cells and human umbilical vein endothelial cells. College of Veterinary Medicine Graduate Student and Postdoc Research Symposium, Texas A&M University, 2016.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. Diminished phosphorylation of CREB Is a key event in the dysregulation of gluconeogenesis, glycogenolysis and fatty acid oxidation in PCB126 hepatotoxicity. Society of Toxicology, Central States Regional Meeting, Iowa City, IA, 2016.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. Diminished phosphorylation of CREB Is a key event in the dysregulation of gluconeogenesis, glycogenolysis and fatty acid oxidation in PCB126 hepatotoxicity. NIEHS obesity grantee meeting and 25 years of endocrine disruption: Workshop. NIH, Bethesda, Md, 2016.

Klaren WD, Vine D, Vogt S, Robertson LW. Evaluation of the spatial distribution of hepatic metals following PCB126 exposure with x-ray fluorescence microscopy. Society of Toxicology Annual Meeting, New Orleans, La, 2016.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. PCB126-induced disruption in gluconeogenesis and fatty acid oxidation precedes fatty liver in male rats. Superfund Annual Meeting, San Juan, Puerto Rico, 2015.

Klaren WD, Gadupudi GS, Wels B, Simmons DL, Olivier AK, Robertson LW. Progression of micronutrient alteration and hepatotoxicity following acute PCB126 exposure. Best Poster Award, Superfund Annual Meeting, San Juan, Puerto Rico, 2015.

Gadupudi GS, **Klaren WD**, Olivier AK, Klingelhutz AJ, Robertson LW. PCB126-induced disruption in gluconeogenesis and fatty acid oxidation precedes fatty liver in male rats. Society of Toxicology, Central States Regional Chapter Annual Meeting, Kansas City, Ks, 2015.

Klaren WD, Vine D, Vogt S, Robertson LW. Spatial distribution of hepatic metals following PCB126 exposure. Society of Toxicology, Central States Regional Chapter Annual Meeting, Kansas City, Ks, 2015.

Klaren WD, Robertson LW. PCB126-mediated disruption of hepatic metal homeostasis in mice and the role of metallothionein. Society of Toxicology Annual Meeting, San Diego, Ca, 2015.

Klaren WD, Robertson LW. PCB126-mediated disruption of hepatic metal homeostasis in mice and the role of metallothionein. Superfund Annual Meeting, San Jose, Ca, 2014.

Klaren WD, Robertson LW. PCB126-mediated disruption of hepatic metal homeostasis in mice and the role of metallothionein. Society of Toxicology, Central States Regional Chapter Annual Meeting, Kansas City, Mo, 2014.

Klaren WD, Robertson LW. PCB126-mediated disruption of hepatic metal homeostasis in mice and the role of metallothionein. Eighth International PCB Workshop, Woods Hole, Ma, 2014.

Klaren WD and Robertson LW. PCB126-mediated disruption of hepatic metal homeostasis in mice coincides with increased metallothionein expression and appears to be independent of the canonical AhR pathway. Best Poster Award, University of Iowa Research Week, 2014.

Klaren WD, Robertson LW. Increases in metallothionein expression caused by PCB126 are linked to species sensitivity and are potentially mediated through the AhR. Superfund Annual Meeting, Baton Rouge, La, 2013.

Klaren WD, Robertson LW. PCB126 induced increases in metallothionein expression may be species specific and AhR dependent. Society of Toxicology, Central States Regional Chapter Annual Meeting, Ames, Ia, 2013.

Klaren WD, Lai IK, Robertson LW. Search for the basis of PCB126-triggered disruption of hepatic metal homeostasis in rodents. Society of Toxicology Annual Meeting, San Antonio, Tx, 2013.

Klaren WD, Lai IK, Robertson LW. Search for the basis of PCB126-triggered disruption of hepatic metal homeostasis in rats. Superfund Annual Meeting, Raleigh, NC, 2012.

Klaren WD, Lai IK, Robertson LW. Search for the basis of PCB126-triggered disruption of hepatic metal homeostasis in rodents. Society of Toxicology, Central States Regional Chapter Annual Meeting, Manhattan, Ks, 2012.

Klaren WD, Lai IK, Robertson LW. Search for the basis of PCB-triggered in hepatic copper in rodents. Best Poster Award, University of Iowa Research Week, Iowa City, Ia, 2012.

Wang B, Wels BR, **Klaren WD**, Wang K, Robertson LW, Ludewig G. Regulation of MnSOD by the AhR agonist PCB126: The role of dietary manganese. Society of Toxicology Annual Meeting, San Francisco, Ca, 2012.

Wang B, Wels BR, **Klaren WD**, Wang K, Robertson LW, Ludewig G. Regulation of MnSOD by the AhR agonist PCB126: The role of dietary manganese. Superfund Annual Meeting, Lexington, Ky, 2012.

TRAINING

2023	Making the Most of Your Data: How to Build Machine-Learning Models for Toxicology. Continuing Education Session, Society of Toxicology Annual Meeting, Nashville, Tn.
2022	Juvenile Toxicology Testing: Assessing Pediatric Safety. Continuing Education Session, Society of Toxicology Annual Meeting, San Diego, Ca.
2021	Applications of In Vitro and In Silico New Approach Methodologies for Predictive and Mechanistic Thyroid Toxicity Testing. Continuing Education Session, Society of Toxicology Annual Meeting, Virtual.
2020	Assessing Carcinogenicity: Hazard Identification, Classification, and Risk Assessment. Toxicology Forum State-of-the-Science Workshop, Virtual.
2020	Modern Modeling Strategies to Address Uncertainty and Variability in Dose-Response Assessment. Continuing Education Session, Society of Toxicology Annual Meeting, virtual.
2019	Good Laboratory Practice (GLP) Internal Certification, employer-offered training, S.C. Johnson and Son, Inc.
2019	Current Dose-Response Modeling Strategies and Applications in Chemical Risk Assessment. Continuing Education Session, Society of Toxicology Annual Meeting, Baltimore, Md.
2018	Consumer Products Safety Assessment: Progress in the Use of Alternatives to Animal Models. Continuing Education Session, Society of Toxicology Annual Meeting, San Antonio, Tx.
2017	Molecular Imaging for Toxicologists. Continuing Education Session, Society of Toxicology Annual Meeting, Baltimore, Md.
2017	Practices in Evaluating Human Health Risk Assessment of Chemicals. Full semester audit, Texas A&M University, College Station, Tx.
2016	Principles of Human Health Risk Assessment of Chemicals. Full semester audit, Texas A&M University, College Station, Tx.
2016	Intellectual Property Boot Camp. Texas A&M University, College Station, Tx.
2016	Contribution of Mitochondria to Drug-Induced Organ Toxicities. Continuing Education Session, Society of Toxicology Annual Meeting, New Orleans, La.
2015	Strategies in Investigative Toxicology in Pharmaceutical Setting. Continuing education session, Society of Toxicology Annual Meeting, San Diego, Ca.
2013	Toxic Effects of Metals. Continuing education session, Society of Toxicology Annual Meeting, San Antonio, Tx.