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PROFESSIONAL GOAL

My broad professional goal is to lead development and application of multidisciplinary capabilities that solve environmental, health and security problems related to exposure to chemical and biological agents.

EDUCATION

1985	University of California Berkeley. High School U.C. System Enrollment
1990	University of California, Davis, B.S. Biochemistry, Minor Environmental Toxicology
1999	University of Wisconsin, Madison, Ph.D. Environmental Toxicology
2002	Diplomate, American Board of Toxicology

PROFESSIONAL EXPERIENCE

1990 – 1992	Toxicologist, Radian Corporation, Sacramento, CA
1999 – 2004	Toxicologist, K.S. Crump Group and Environ International
2004 – 2010	Senior Scientist, Pacific Northwest National Laboratory
2010-Present	Staff Scientist, Pacific Northwest National Laboratory
2014-Present	Joint Faculty, Environ & Molecular Toxicology, Oregon State University
2016-Present	Chief Scientist, Exposure Science, Pacific Northwest National Laboratory
2020-Present	Laboratory Fellow
2020-Present	Chief Science Officer, Environmental Molecular Sciences Laboratory, PNNL

LEADERSHIP EXPERIENCE

Leadership found me regularly over the last 35 years. I have had the good fortune of serving people in scientific, technical, and managerial positions in professional societies, charitable organizations, national academy of science committees, and conferences. My leadership philosophy is to set clear goals, discover the strengths of others, inspire and enable individuals and teams, provide clear guidance, stay positive and be honest, direct and inclusive.

Relevant experience:

2020-Present	Chief Science Officer, Environmental Molecular Sciences Laboratory, PNNL

2020-2022	Lead, Effective Research Culture Planning Team, PNNL.
2019-Present	Chair, National Academy of Sciences Committee to review the DoD physiologically based pharmacokinetic model for establishing occupational exposure limits for lead exposure
2019-Present	Interim Deputy Director of Science, EMSL, PNNL (Part time)
2019-Present	Defense Health Subsector Lead, National Security Directorate, PNNL
2019-Present	Team Lead, Chemical Biology and Exposure Science, PNNL
2018-Present	Lead, Biomedical Resilience and Readiness in Adverse Operating Environments (BRAVE) Agile Investment, PNNL
2016-2021	Scoutmaster, Boy Scout Troop 190, Richland, WA. 75 Scouts.
2012-2016	Assistant Scoutmaster, Boy Scout Troop 190, Richland, WA. 45 Scouts.
2011 – 2012	President, Nanotoxicology Specialty Section, Society of Toxicology
2010-2013	Cubmaster, Cub Scout Pack 231, Richland, WA
2008 – 2009	Councilor, Biological Modeling Specialty Section, Society of Toxicology
2004 – 2006	Chair, Dose-Response Specialty Group, Society of Risk Analysis
2000 – 2001	Secretary, Research Triangle Chapter, Society of Risk Analysis
1998	Student Representative to the Midwest Chapter, Society of Toxicology
1992	Scoutmaster, Boy Scout Troop 215, Fair Oaks, CA
1989-1990	Student Career Planning Councilor, University of CA, Davis CA
1989-1990	Instructor, U.C. Davis Tae Kwon Do Club Sport, Davis, CA
1989	President, Environmental Toxicology Club, U.C. Davis, Davis, CA
1985	Senior Class President, De Anza High School, Richmond, CA

STRATEGY DEVELOPMENT

Working outside of my own professional expertise, across multiple, sometimes unfamiliar science and technology domains, and between the laboratory's directorates, has been the most enjoyable part of my PNNL career. Because insights into trends, transformative ideas, intelligence on competitors and sponsor priorities come from all parts of our laboratory team, I've learned that openness to ideas, advice and mentorship from our sector, line and science and technology leadership and our exceptional staff scientists are all essential for developing strategies built on goals with broad strategic benefit.

In each example below, the success is shared by many talented staff and the leadership of the Earth and Biological Sciences Directorate (EBSD) and the National Security Directorate (NSD).

- Exposure Science and Advanced Metabolomics: During my service on the National Academy of Sciences Committee (2011-2012) formulating a decadal vision for the field of exposure science, I recognized an opportunity for PNNL to lead the nation in a new area of analytical chemistry for environmental compounds. I partnered with the integrated

omics group in PNNL's Biological Sciences Division and was awarded LDRD funds for development of a global chemical forensics capability. The LDRD effort led to ideas for advancing computational metabolomics that became the Decoding the Molecular Universe Directorate Objective, and the m/q Initiative stewarded by the National Security Directorate. Along the way I led development of EBSD's Decoding Molecular Universe Directorate objective, developed and stewarded the associated action plan, including assuring the m/q Initiative was aligned with the Directorate Objective, and steering funds through the seed LDRD program in 2019. The outcomes of these efforts were a new National Institute of Health Center for advanced metabolomics, A new Superfund Research Program, the growth of a new team, Q-Clearance of Biological Science Division staff, and new work in the classified space.

- Defense Health: Asked by NSD and EBSD leadership to lead efforts to engage the Department of Defense in the health sciences, I crafted a three-part strategy—science, business and legislative—to capture what appeared to be a very large, new opportunity for biomedical research. With strong support and guidance from Directorate, Sector and S&T Leadership in both divisions, I led two LDRD investments that culminated in the development of the Biomedical Resilience and Readiness in Adverse Operating Environments (BRAVE) Agile Investment, including establishing the goals, the team, and presenting it to the laboratory leadership, and directorate advisory committees. PNNL now has more than 10 new partners, $>2M in leveraged funding from partners, a strong and growing reputation in the Department of Defense and Department of Homeland Security research spaces, an Air Force Research Fellows Program, new staff and a new strategic joint appointment with Washington State University. We are also positioned for a new joint program with the Department of Defense Biomedical Research Hub.

- EMSL Benchmarking and Roadmapping: In August of 2019 I was asked to serve temporarily as the Deputy Director for Science for the Environmental and Molecular Sciences Laboratory (EMSL). In this role I led the development and implementation of a tool for assessing the position and impact of EMSL science and technology relative to external leaders in the field. Notable challenges were the absence of a PNNL tool or guidance, limited knowledge of the technical and scientific space, lack of familiarity with EMSL as an organization overall, and the staff. Exciting! The tool is nearing completion, the staff are engaged, the benchmarking exercises are scheduled and the EMSL Director remains supportive. I am also working with the EMSL Director and a hired consultant to conduct a strategic landscape analysis and produce a strategic roadmap for EMSL and the Environmental and Molecular Sciences Directorate. These efforts are providing me with much stronger grasp of the more formal elements and metrics of benchmarking, landscape analysis and strategic plan development as applied to multidisciplinary space.

- EMSL Chief Science Officer: EMSL is a $50M/year DOE scientific user facility. I steward a team of nine science area and research platform leaders in the development and implementation of science and technology roadmaps that support EMSL's Strategic Science Plan. These roadmaps drive technological advancements in the molecular and environmental fields that collectively empower a large research community to address national level challenges in bioenergy, and environmental security. In this capacity, I direct $12M/year in major equipment purchases and intramural research.

RESEARCH THEMES

- Modeling of Chemical, Metal, Particle and Drug Movement (pharmacokinetics) in Biological Systems: Working across experimental, theoretical, computational and statistical domains, I have developed biokinetic models describing the adsorption, distribution, metabolism, elimination of a broad array of chemicals, metals and nanoparticles in cells, animals and humans. Some of the models were used by the Food and Drug Administration, the U.S. Environmental Protection Agency and international agencies for controlling human exposure (Regulatory Decisions).

- Human Biomonitoring for Environmental Estrogens. Over the course of a decade I led development of a methodology for accurate biomonitoring of environmental and endogenous estrogens using statistically supported spot blood and urine sampling and biokinetic models of human physiology and metabolism to reconstruct internal exposures. The approach set the standard for the field, resulting in the data from the studies used by U.S and European Regulatory Agencies to make safety determinations. This work integrated human studies conducted off-site (including pregnant women), analytical chemistry, computational modeling and statistics, and chemical fate and transport. The work was also highly visible, scrutinized publicly, and influential.

- Dosimetry Tools for Hazard and Risk Assessment of Nanomaterials: Building from investments made through the Environmental Biomarkers Initiative, and supported by a National Institute of Environmental Health Sciences (PI, B. Thrall), I led a group PNNL scientists to develop computational models that describe the movement of nanoparticles in cell culture systems. We were the first to articulate these concepts and their importance to the field of nanotoxicology. We described the essential processes, integrated existing theory, constructed and tested models that calculate nanoparticle exposure to cells base on the characteristics of the system and the particles. These models are the most widely used in the field, improving the accuracy and translatability of nanotoxicology studies.

Selected External Funding (see complete list under Funding Record section, below)

- U.S. Environmental Protection Agency. (2009-2012). Teeguarden (PI). PBPK Enabled Urine Biomarker Based Human BPA Exposure Assessment. $745,000
- National Institute of Environmental Health Sciences (2010-2016). Teeguarden (PI), Thrall (Director and PI): Nanotoxicology Center. $5,976,874.00
- National Institute of Environmental Health Sciences. (2020-2025). Teeguarden (PI), Tanguay (PI, Director): Oregon State-PNNL Superfund Center. $1,964,368.00
- National Institute of Environmental Health Sciences. (2017-2021). Teeguarden (PI), Rusyn (Director, PI): Texas A&M Superfund Center. $1,120,000.00
- United States Air Force. (2020-2022). Teeguarden (PI): Proteomics and Bioinformatics Training for Systems Toxicology and Biomarker Discovery. $543,000.
- American Chemistry Council. (2013-2017). Teeguarden (PI). Bisphenol A Exposure and Modeling in Pregnant Women. $1,200,000.
- U.S. Environmental Protection Agency. (2009-2012). Teeguarden (PI). Chemical Pharmacokinetic Modeling for Human Risk Assessment Support Program. $943,864.00

LABORATORY DIRECTED RESEARCH AND DEVELOPMENT

- Environmental Biomarkers Initiative (Project Leader, Nanodosimetry): Leveraged to win a National Institute of Environmental Health Sciences Nanotoxicology Center (PI, Thrall)
- Global Chemical Forensics for the Environmental Exposome (Project Leader, Open Call): Leveraged to win a NIH Center (T. Metz, PI), establish a Directorate Objective and develop an Initiative.
- Biomedical Resilience and Resistance in Adverse Operating Environments (BRAVE) Agile Investment (Project Leader): Driving new capabilities and programs in Department of Homeland Security and Department of Defense biomedical research.

AWARDS AND HONORS

2019 Pacific Northwest National Laboratory **Pathway to Excellence Award**. Highly cited researcher, service to the U.S. EPA Board of Scientific Councilors.

2019 **Scoutmaster of the Year Award**, 3-Rivers District, ScoutsUSA

2019 Pacific Northwest National Laboratory **Shining Stars Award**. Advancing PNNL's mission though outreach and hosting DoD visitors.

2018 Pacific Northwest National Laboratory **Pathway to Excellence Award**. Highly cited researcher.

2018 Clarivate Analytics, **Highly Cited Researcher** (Top 1% in field)

2017 Pacific Northwest National Laboratory **Pathway to Excellence Award**. Top 20 Downloaded publications of 2017

2017 Clarivate Analytics, **Highly Cited Researcher** (Top 1% in field)

2016 Pacific Northwest National Laboratory **Pathway to Excellence Award**. Service to the National Academy of Sciences.

2016 Biological Modeling Specialty Section, Society of Toxicology. **Best Biological Modeling Paper**: Comparative Risks of Aldehyde Constituents in Cigarette Smoke Using Transient Computational Fluid Dynamics/Physiologically Based Pharmacokinetic Models of the Rat and Human Respiratory Tracts.

2014 Risk Assessment Specialty Section, Society of Toxicology. **Best Overall Abstract Award at the Annual Meeting**: "Improving Urine-Based Human Exposure Assessment of Short-Lived Chemicals Using Reverse Dosimetry and NHANES Physiological and Behavior Data: A Value-of-Information Approach for Bisphenol A."

2013 Risk Assessment Specialty Section, Society of Toxicology. **Top 10 Abstracts in Risk Assessment at the Annual Meeting**: "Computational Dosimetry Driven Hazard Ranking of 25 Metal Oxide Nanomaterials Using Low- and High-Throughput In Vitro Toxicity Data."

2013 Risk Assessment Specialty Section, Society of Toxicology. **Top 10 Abstracts in Risk Assessment at the Annual Meeting**: "Systematic Review of "Low Dose" Literature in

the Context of Human Dosimetry Exposes a Need to Set Standards for Responsibility Communication of Both Toxicity and Exposure Data"

2013 Risk Assessment Specialty Section, Society of Toxicology. **Best paper award for demonstrating application in risk assessmen**t: A Multi-route Model of Nicotine-cotinine Pharmacokinetics and Brain Nicotinic Acetylcholine Receptor Binding in Humans, Pharmacology and Toxicology 65, 12-28., 2013.

2013 Oregon State University. **James and Mildred Oldfield and E.R. Jackman Foundation Team Award** given to the OSU-PNNL research team.

2012 **National Institute of Occupational Safety and Health Alice Hamilton Award Honorable Mention. 2012**: Comparative Proteomics and pulmonary Toxicity of Instilled Single Walled Carbon Nanotubes, Crocidolite Asbestos and Ultrafine Carbon Black in mice. Toxicological Sciences 120(1) 123-135.

2012 Risk Assessment Specialty Section, Society of Toxicology. **Best Presentation in Risk Assessment at the Annual Meeting**: Pharmacokinetics-enabled reverse dosimetry improves the accuracy of bisphenol A exposure assessment.

2011 **Presidents Excellence in Leadership Award**, Blue Mountain Council, BSA

2010 Department of Energy Office of Science **Outstanding Mentorship Award**

2004 Risk Assessment Specialty Section, Society of Toxicology. **Outstanding Published Paper Advancing the Science of Risk assessment**: Development of a Physiologically-Based Pharmacokinetic Model for Estradiol in Rats and Humans: A Biologically Motivated Quantitative Framework for Evaluating Responses to Estradiol and other Endocrine Acting Compounds. Toxicological Sciences 69, 60-78 (2002).

2002 **Society of Risk Analysis meeting Best Paper Award**. Accounting for Serum Binding Proteins in Extrapolations Among Chemicals and Across Life-Stages and Species for Endocrine Active Compounds

2001 Risk Assessment Specialty Section, Society of Toxicology. **Best Abstract award** for PBPK modeling of the relative receptor binding potency of endocrine active compounds.

2001 Risk Assessment Specialty Section, Society of Toxicology. **Best paper award** for PBPK modeling (Family Approach) of butyl series compounds.

2000 Biological Modeling Specialty Section, Society of Toxicology. **Poster award** for PBPK modeling (Family Approach) of butyl series compounds.

1999 Dr. Razia Zaman-Dr. Shahanara Zaman Saroya **Graduate Student Award for Excellence** in Research and Scholarship, The School of Pharmacy and the Environmental Toxicology Center, University of WI-Madison, 1999

1992 Wisconsin Alumni Research Foundation **Fellowship Award**

1991 Radian Corporate **Achievement Award**, 1991

1985 **Eagle Scout Award**

1985 Brian Sanders Leadership Award, De Anza High School

1985 **Justin Teeguarden Leadership Award Named in my honor**, De Anza High School,

1985 De Anza High School Early Enrollment to U.C. Berkeley Award

CERTIFICATIONS and TRAINING

- Diplomate, American Board of Toxicology. 2002-Current.
- PNNL Management Skills Development Program, 2017-2018???
- Battelle Laboratory Operations Supervisors Academy (LOSA), November 2019

PROFESSIONAL SOCIETIES, ADVISORY BOARDS, EDITORIAL BOARDS

2001 – Present	Member, Society of Toxicology
2005 – 2006	Member, EPA Science Advisory Board (Arsenic)
2008	National Academy of Sciences, panel reviewing the federal strategy for Nano Environmental Health and Safety
2009 – 2011	National Toxicology Program, Board of Scientific Counselors
2011 - Present	Associate Editor, Nanotoxicology
2011-2012	NAS Committee on Exposure Science in the 21st Century. Member
2012	SOT Committee on Contemporary Concepts in Toxicology
2014--Present	Editorial Board, Journal of Exposure Science and Environmental Epidemiology
2016—Present	Editorial Board, Computational Toxicology
2015-2017	NAS Committee on Incorporating 21st Century Science into Risk Based Decisions. Member.
2018--Present	U.S. EPA Board of Scientific Councilors, Homeland Security Subcommittee.
2019-2020	Chair, National Academy of Sciences Committee to review the DoD physiologically based pharmacokinetic model for establishing occupational exposure limits for lead exposure
2022-Present	U.S. EPA Board of Scientific Councilors, Executive Committee, Chemical Safety for Sustainability subcomittee
2021-Present	NAS Committee on Assessing Causality from a Multidisciplinary Evidence Base for National Ambient Air Quality Standards

PUBLICATIONS

Citations: 6343
H-Index 41
Full publication list:
https://scholar.google.com/citations?user=DFxZG9QAAAAJ&hl=en

1. Septiadi, D., L. Rodriguez-Lorenzo, S. Balog, M. Spuch-Calvar, G. Spiaggia, P. Taladriz-Blanco, H. Barosova, S. Chortarea, M.J.D. Clift, **J.G. Teeguarden**, M. Sharma, A. Petri-Fink and B. Rothen-Rutishauser, *Quantification of Carbon Nanotube Doses in Adherent Cell Culture Assays Using UV-VIS-NIR Spectroscopy*. Nanomaterials (Basel), 2019. **9**(12).
2. Pande, P., S.C. Fleck, N.C. Twaddle, M.I. Churchwell, D.R. Doerge and **J.G. Teeguarden**, *Comparative estrogenicity of endogenous, environmental and dietary estrogens in pregnant women II: Total estrogenicity calculations accounting for competitive protein and receptor binding and potency*. Food Chem Toxicol, 2019. **125**: p. 341-353.
3. Nunez, J.R., S.M. Colby, D.G. Thomas, M.M. Tfaily, N. Tolic, E.M. Ulrich, J.R. Sobus, T.O. Metz, **J.G. Teeguarden** and R.S. Renslow, *Evaluation of In Silico Multifeature Libraries for Providing Evidence for the Presence of Small Molecules in Synthetic Blinded Samples*. J Chem Inf Model, 2019. **59**(9): p. 4052-4060.
4. Colby, S.M., D.G. Thomas, J.R. Nunez, D.J. Baxter, K.R. Glaesemann, J.M. Brown, M.A. Pirrung, N. Govind, **J.G. Teeguarden**, T.O. Metz and R.S. Renslow, *ISiCLE: A Quantum Chemistry Pipeline for Establishing in Silico Collision Cross Section Libraries*. Anal Chem, 2019. **91**(7): p. 4346-4356.
5. Yesiltepe, Y., J.R. Nunez, S.M. Colby, D.G. Thomas, M.I. Borkum, P.N. Reardon, N.M. Washton, T.O. Metz, **J.G. Teeguarden**, N. Govind and R.S. Renslow, *An automated framework for NMR chemical shift calculations of small organic molecules*. J Cheminform, 2018. **10**(1): p. 52.
6. Thomas, D.G., J.N. Smith, B.D. Thrall, D.R. Baer, H. Jolley, P. Munusamy, V. Kodali, P. Demokritou, J. Cohen and **J.G. Teeguarden**, *ISD3: a particokinetic model for predicting the combined effects of particle sedimentation, diffusion and dissolution on cellular dosimetry for in vitro systems*. Part Fibre Toxicol, 2018. **15**(1): p. 6.
7. Tan, Y.M., J.A. Leonard, S. Edwards, **J.G. Teeguarden**, A. Paini and P. Egeghy, *Aggregate Exposure Pathways in Support of Risk Assessment*. Curr Opin Toxicol, 2018. **9**: p. 8-13.
8. Tan, Y.M., J.A. Leonard, S. Edwards, **J.G. Teeguarden** and P. Egeghy, *Refining the aggregate exposure pathway*. Environ Sci Process Impacts, 2018. **20**(3): p. 428-436.
9. Smith, J.N., D.G. Thomas, H. Jolley, V.K. Kodali, M.H. Littke, P. Munusamy, D.R. Baer, M.J. Gaffrey, B.D. Thrall and **J.G. Teeguarden**, *All that is silver is not toxic: silver ion and particle kinetics reveals the role of silver ion aging and dosimetry on the toxicity of silver nanoparticles*. Part Fibre Toxicol, 2018. **15**(1): p. 47.
10. Rietjens, I., P. Dussort, H. Gunther, P. Hanlon, H. Honda, A. Mally, S. O'Hagan, G. Scholz, A. Seidel, J. Swenberg, **J.G. Teeguarden** and G. Eisenbrand, *Exposure assessment of process-related contaminants in food by biomarker monitoring*. Arch Toxicol, 2018. **92**(1): p. 15-40.
11. Fleck, S.C., N.C. Twaddle, M.I. Churchwell, D.R. Doerge, P. Pande and **J.G. Teeguarden**, *Comparative estrogenicity of endogenous, environmental and dietary estrogens in pregnant women I: Serum levels, variability and the basis for urinary biomonitoring of serum estrogenicity*. Food Chem Toxicol, 2018. **115**: p. 511-522.
12. Fantke, P., L. Aylward, J. Bare, W.A. Chiu, R. Dodson, R. Dwyer, A. Ernstoff, B. Howard, M. Jantunen, O. Jolliet, R. Judson, N. Kirchhubel, D. Li, A. Miller, G. Paoli, P. Price, L. Rhomberg, B. Shen, H.M. Shin, **J.G. Teeguarden**, D. Vallero, J. Wambaugh, B.A. Wetmore, R. Zaleski and T.E. McKone, *Advancements in Life Cycle Human Exposure and Toxicity Characterization*. Environ Health Perspect, 2018. **126**(12): p. 125001.
13. Metz, T.O., E.S. Baker, E.L. Schymanski, R.S. Renslow, D.G. Thomas, T.J. Causon, I.K. Webb, S. Hann, R.D. Smith and **J.G. Teeguarden**, *Integrating ion mobility*

spectrometry into mass spectrometry-based exposome measurements: what can it add and how far can it go? Bioanalysis, 2017. **9**(1): p. 81-98.
14. Ma, J., C.P. Casey, X. Zheng, Y.M. Ibrahim, C.S. Wilkins, R.S. Renslow, D.G. Thomas, S.H. Payne, M.E. Monroe, R.D. Smith, **J.G. Teeguarden**, E.S. Baker and T.O. Metz, *PIXiE: an algorithm for automated ion mobility arrival time extraction and collision cross section calculation using global data association*. Bioinformatics, 2017. **33**(17): p. 2715-2722.
15. Knecht, A.L., L. Truong, S.W. Marvel, D.M. Reif, A. Garcia, C. Lu, M.T. Simonich, **J.G. Teeguarden** and R.L. Tanguay, *Transgenerational inheritance of neurobehavioral and physiological deficits from developmental exposure to benzo[a]pyrene in zebrafish*. Toxicol Appl Pharmacol, 2017. **329**: p. 148-157.
16. Davie-Martin, C.L., K.G. Stratton, **J.G. Teeguarden**, K.M. Waters and S.L.M. Simonich, *Implications of Bioremediation of Polycyclic Aromatic Hydrocarbon-Contaminated Soils for Human Health and Cancer Risk*. Environ Sci Technol, 2017. **51**(17): p. 9458-9468.
17. Zhang, X., M. Romm, X. Zheng, E.M. Zink, Y.M. Kim, K.E. Burnum-Johnson, D.J. Orton, A. Apffel, Y.M. Ibrahim, M.E. Monroe, R.J. Moore, J.N. Smith, J. Ma, R.S. Renslow, D.G. Thomas, A.E. Blackwell, G. Swinford, J. Sausen, R.T. Kurulugama, N. Eno, E. Darland, G. Stafford, J. Fjeldsted, T.O. Metz, **J.G. Teeguarden**, R.D. Smith and E.S. Baker, *SPE-IMS-MS: An automated platform for sub-sixty second surveillance of endogenous metabolites and xenobiotics in biofluids*. Clin Mass Spectrom, 2016. **2**: p. 1-10.
18. **J.G. Teeguarden**, N.C. Twaddle, M.I. Churchwell and D.R. Doerge, *Urine and serum biomonitoring of exposure to environmental estrogens I: Bisphenol A in pregnant women*. Food Chem Toxicol, 2016. **92**: p. 129-42.
19. **J.G. Teeguarden**, Y.M. Tan, S.W. Edwards, J.A. Leonard, K.A. Anderson, R.A. Corley, M.L. Kile, S.M. Simonich, D. Stone, R.L. Tanguay, K.M. Waters, S.L. Harper and D.E. Williams, *Completing the Link between Exposure Science and Toxicology for Improved Environmental Health Decision Making: The Aggregate Exposure Pathway Framework*. Environ Sci Technol, 2016. **50**(9): p. 4579-86.
20. **J.G. Teeguarden**, Y.M. Tan, S.W. Edwards, J.A. Leonard, K.A. Anderson, R.A. Corley, M.L. Kile, L.M.S. S, D. Stone, R.L. Tanguay, K.M. Waters, S.L. Harper and D.E. Williams, *Expanding on Successful Concepts, Models, and Organization*. Environ Sci Technol, 2016. **50**(17): p. 8921-2.
21. Paulik, L.B., B.W. Smith, A.J. Bergmann, G.J. Sower, N.D. Forsberg, **J.G. Teeguarden** and K.A. Anderson, *Passive samplers accurately predict PAH levels in resident crayfish*. Sci Total Environ, 2016. **544**: p. 782-91.
22. Fleck, S.C., M.I. Churchwell, D.R. Doerge and **J.G. Teeguarden**, *Urine and serum biomonitoring of exposure to environmental estrogens II: Soy isoflavones and zearalenone in pregnant women*. Food Chem Toxicol, 2016. **95**: p. 19-27.
23. Yang, X., D.R. Doerge, **J.G. Teeguarden** and J.W. Fisher, *Development of a physiologically based pharmacokinetic model for assessment of human exposure to bisphenol A*. Toxicol Appl Pharmacol, 2015. **289**(3): p. 442-56.
24. **J.G. Teeguarden**, N.C. Twaddle, M.I. Churchwell, X. Yang, J.W. Fisher, L.M. Seryak and D.R. Doerge, *24-hour human urine and serum profiles of bisphenol A: Evidence against sublingual absorption following ingestion in soup*. Toxicol Appl Pharmacol, 2015. **288**(2): p. 131-42.
25. **J.G. Teeguarden**, N.C. Twaddle, M.I. Churchwell, X. Yang, J.W. Fisher, L.M. Seryak and D.R. Doerge, *24-hour human urine and serum profiles of bisphenol A following ingestion in soup: Individual pharmacokinetic data and emographics*. Data Brief, 2015. **4**: p. 83-6.

26. Crowell, S.R., J.N. Smith, J.A. Creim, W. Faber and **J.G. Teeguarden**, *Physiologically based pharmacokinetic modeling of ethyl acetate and ethanol in rodents and humans*. Regul Toxicol Pharmacol, 2015. **73**(1): p. 452-62.
27. Corley, R.A., S. Kabilan, A.P. Kuprat, J.P. Carson, R.E. Jacob, K.R. Minard, **J.G. Teeguarden**, C. Timchalk, S. Pipavath, R. Glenny and D.R. Einstein, *Comparative Risks of Aldehyde Constituents in Cigarette Smoke Using Transient Computational Fluid Dynamics/Physiologically Based Pharmacokinetic Models of the Rat and Human Respiratory Tracts*. Toxicol Sci, 2015. **146**(1): p. 65-88.
28. **J.G. Teeguarden**, V.B. Mikheev, K.R. Minard, W.C. Forsythe, W. Wang, G. Sharma, N. Karin, S.C. Tilton, K.M. Waters, B. Asgharian, O.R. Price, J.G. Pounds and B.D. Thrall, *Comparative iron oxide nanoparticle cellular dosimetry and response in mice by the inhalation and liquid cell culture exposure routes*. Part Fibre Toxicol, 2014. **11**: p. 46.
29. Sharma, G., V. Kodali, M. Gaffrey, W. Wang, K.R. Minard, N.J. Karin, **J.G. Teeguarden** and B.D. Thrall, *Iron oxide nanoparticle agglomeration influences dose rates and modulates oxidative stress-mediated dose-response profiles in vitro*. Nanotoxicology, 2014. **8**(6): p. 663-75.
30. Larson, J.K., M.J. Carvan, 3rd, **J.G. Teeguarden**, G. Watanabe, K. Taya, E. Krystofiak and R.J. Hutz, *Low-dose gold nanoparticles exert subtle endocrine-modulating effects on the ovarian steroidogenic pathway ex vivo independent of oxidative stress*. Nanotoxicology, 2014. **8**(8): p. 856-66.
31. LaKind, J.S., J.R. Sobus, M. Goodman, D.B. Barr, P. Furst, R.J. Albertini, T.E. Arbuckle, G. Schoeters, Y.M. Tan, **J.G. Teeguarden**, R. Tornero-Velez and C.P. Weisel, *A proposal for assessing study quality: Biomonitoring, Environmental Epidemiology, and Short-lived Chemicals (BEES-C) instrument*. Environ Int, 2014. **73**: p. 195-207.
32. Cohen, J.M., **J.G. Teeguarden** and P. Demokritou, *An integrated approach for the in vitro dosimetry of engineered nanomaterials*. Part Fibre Toxicol, 2014. **11**: p. 20.
33. Asgharian, B., O.T. Price, M. Oldham, L.C. Chen, E.L. Saunders, T. Gordon, V.B. Mikheev, K.R. Minard and **J.G. Teeguarden**, *Computational modeling of nanoscale and microscale particle deposition, retention and dosimetry in the mouse respiratory tract*. Inhal Toxicol, 2014. **26**(14): p. 829-42.
34. **J.G. Teeguarden**, C.J. Housand, J.N. Smith, P.M. Hinderliter, R. Gunawan and C.A. Timchalk, *A multi-route model of nicotine-cotinine pharmacokinetics, pharmacodynamics and brain nicotinic acetylcholine receptor binding in humans*. Regul Toxicol Pharmacol, 2013. **65**(1): p. 12-28.
35. **J.G. Teeguarden** and S. Hanson-Drury, *A systematic review of Bisphenol A "low dose" studies in the context of human exposure: a case for establishing standards for reporting "low-dose" effects of chemicals*. Food Chem Toxicol, 2013. **62**: p. 935-48.
36. **J.G. J.G. Teeguarden**.W. Fisher and D.R. Doerge, *Exposure conditions and pharmacokinetic principles: interpreting bisphenol a absorption in the canine oral cavity*. Environ Health Perspect, 2013. **121**(11-12): p. A323.
37. **J.G. Teeguarden**., S. Hanson-Drury, J.W. Fisher and D.R. Doerge, *Are typical human serum BPA concentrations measurable and sufficient to be estrogenic in the general population?* Food Chem Toxicol, 2013. **62**: p. 949-63.
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INVITED PRESENTATIIONS

1. **Teeguarden, J.G.** *"Revealing Flaws in in Vitro Toxicity Testing of Nanoparticles: An Exploratory Particokinetic Model for Addressing the Unique Challenges of Nanoparticle Dosimetry In Vitro"* Society of Toxicology Annual Meeting – San Diego, CA. 03/07/2006
2. **Teeguarden, J.G.** *"Preserving Margins of Safety in the Application of Uncertainty Factors in Chemical Risk Assessment"* Society for Risk Analysis Annual Meeting – Baltimore, MD. 12/06/2006
3. **Teeguarden, J.G.** *"State of the Art Approaches for Nanomaterial Safety Assessment"* Third International Congress of Nanotechnology – San Francisco, CA. 01/25/2007

4. **Teeguarden, J.G.** *"State of the Art Approaches for Nanomaterial Safety Assessment"* Regulations for Nanotechnology in Consumer Products Meeting – Washington D.C. 01/30/2007
5. **Teeguarden, J.G.** *"Computational & Experimental Dosimetry: A Basis for Extrapolation: A Fundamental for Safety Assessment"* Cosmetics, Toiletries and Fragrance Association Nanotoxicology Web Seminar – Online Conference, 03/09/2007
6. **Teeguarden, J.G.** *"Betraying Paracelsus, Ignoring Newton: A flaw in the Nanotoxicology Paradigm"* Society of Toxicology Annual Meeting – Charlotte, N.C. 03/29/2007
7. **Teeguarden, J.G.** *"Selecting Materials for Understanding the Human Health and Ecological Risks of Nanomaterials, Considerations and Approach"* Workshop on Standards for EHS Research Needs for Engineered Nanoscale Materials – Gaithersburg, MD. 09/12/2007
8. **Teeguarden, J.G.** *"Advancing Hazard Assessment and Dosimetry for Nanomaterial Risk Assessment"* California EPA Department of Toxic Substance/Nanotechnology Symposium II – Sacramento, CA. 12/12/2007
9. **Teeguarden, J.G.** *"Nanomaterial Dosimetry and Risk Assessment"* Society of Toxicology Annual Meeting – Seattle, WA. 03/16/2008
10. **Teeguarden, J.G.** *"Advances in Bisphenol A Biomonitoring Linking Urine Biomarkers to Exposure and Effects Through Computational Pharmacokinetics and Pharmacodynamics"* Short Course: Emerging Technologies in Occupational and Environmental Health – Seattle, WA. 10/15/2008
11. **Teeguarden, J.G.** *"Nanomaterial Dosimetry and Risk Assessment"* Short Course: Emerging Technologies in Occupational and Environmental Health – Seattle, WA. 10/15/2008
12. **Teeguarden, J.G.** *"The Importance of Pharmacokinetics and Target Tissue Dosimetry in Risk Assessment"* Toxicology Program at Santa Cruz – Santa Cruz, CA. 03/30/2009
13. **Teeguarden, J.G.** *"The Importance of Pharmacokinetics and Target Tissue Dosimetry in Risk Assessment"* University of Washington Molecular & Environmental Toxicology Center – Madison, WI. 04/27/2009
14. **Teeguarden, J.G.** *"Genomic and Proteomic Assessment for the Pulmonary Response to Asbestos and Single Walled Carbon Nanotubes in Mice"* Nanotechnology Health and
15. **Teeguarden, J.G.** *"What's on YOUR X-axis? In Vitro Dosimetry for Nanotoxicology"* Battelle Multiscale Toxicology Initiative – Richland, WA. 02/19/2010
16. **Teeguarden, J.G.** *"The Particokinetic and Physiological Basis for In Vitro-in Vivo Extrapolation of Nanomaterial Toxicity Studies"* Society of Toxicology Annual Meeting – Salt Lake City, UT. 03/08/2010
17. **Teeguarden, J.G.** *"Solutions to Key Challenges in Dosimetry for Nanotoxicology"* Multiscale Toxicology Institute – Jefferson, AR. 04/08/2010
18. **Teeguarden, J.G.** *"Physics, Physiology and Kinetics, The Foundation for Predictive Modeling of Nanomaterial Dosimetry for EHS Assessments"* National Academy of Sciences Committee on Environmental, Health and Safety Research on Nanomaterials – Richland, WA. 05/03/2010
19. **Teeguarden, J.G.** *"The Dosimetry Contribution to An Integrative Program for Multi-Scale Nanotoxicology"* Multiscale Toxicology Initiative External Review Board Meeting – Oak Ridge, TX. 06/16/2010
20. **Teeguarden, J.G.** *"In Vitro Nanotoxicology: The Risk Assessor's Little House of Horrors"* Oregon Nanoscience and Nanotechnologies Institute Green Nano Meeting – Portland, OR. 06/17/2010

21. **Teeguarden, J.G.** *"Biomonitoring and Variability of Bisphenol A in Human Subjects Linking Urine Biomarkers to Exposure and Effects Through Computational Pharmacokinetics and Pharmacodynamics"* Toxicology Forum – Aspen, CO. 07/14/2010
22. **Teeguarden, J.G.** *"Bisphenol A Pharmacokinetics: Implications for Exposure Assessment"* Clarifying the Controversies of BPA, Online Meeting, 10/26/2010
23. **Teeguarden, J.G.** *"Project 3: Dosimetry & Structure-Activity Relationships for Nanomaterial Risk Assessment PNNL Center for Nanotoxicology"* U19 Consortium Meeting – Raleigh-Durham, N.C. 11/15/2010
24. **Teeguarden, J.G.** *"Nanomaterial Dosimetry and Risk Assessment"* Washington State University Tri-Cities – Richland, WA. 11/18/2010
25. **Teeguarden, J.G.** *"Particokinetic Modeling to Support QIVIVE for Particle Toxicity Assays"* Society of Toxicology Annual Meeting – Washington D.C. 03/11/2011
26. **Teeguarden, J.G.** *"Enabling Prediction and Extrapolation: A New Paradigm for Nanomaterial Dosimetry in Vitro"* Toxicology and Risk Assessment Conference – Cincinnati, OH. 04/26/2011
27. **Teeguarden, J.G.** *"Evaluating the Plausibility Estrogen Receptors as Mediators of BPA Toxicity in the Context of Human Serum Concentrations of Unconjugated BPA"* Society of Toxicology Annual Meeting – San Francisco, CA. 03/13/2012
28. **Teeguarden, J.G.** *"Dosimetry and Structure-Activity Relationships for Nanomaterial Risk Assessment; PNNL Project 3"* NIEHS Nano (U19) Workshop – Portland, OR. 07/31/2012
29. **Teeguarden, J.G.** *"Dosimetry: An Evolutionary Force for the Field of Nanotoxicology"* The 6th International Conference on Nanotoxicology – Beijing, China. 09/05/2012
30. **Teeguarden, J.G.** *"NAS Visions: Toxicology in the 21st Century meets Exposure Science in the 21st Century"* NIEHS Nanomaterial Exposure Science Meeting – Research Triangle Park, N.C. 01/09/2013
31. **Teeguarden, J.G.** *"Is Internal Exposure to Bisphenol A Sufficient for Estrogenic Effects in Humans?"* NIEHS Nano Project 3 Meeting – Dallas, TX. 01/25/2013
32. **Teeguarden, J.G.** *"Can Exposure Science Quell the Furor Over Environmental Endocrine Disruption?"* AAAS Annual Meeting – Boston, MA. 02/15/2013
33. **Teeguarden, J.G.** *"Consortium Wide Project 3: Collaborative Risk Assessment & Predictive Modeling for Silver Nanoparticles"* NIEHS BPA Grantee Meeting – Research Triangle Park, N.C. 02/28/2013
34. **Teeguarden, J.G.** *"Bisphenol A – Are Effects Expected at Human Exposure Levels?"* Coca Cola Beverage Institute, Online Conference. 11/05/2013
35. **Teeguarden, J.G.** *"BPA and Health: Is Any Exposure Safe?"* Oregon State University – Corvallis, OR. 11/05/2013
36. **Teeguarden, J.G.** *"What's on YOUR X-axis? How Science and the Media Created the Hysterigen Bisphenol A"* American Plastics Institute, Online Conference. 11/15/2013
37. **Teeguarden, J.G.** *"Low throughput, high-cost, but definitive: building the human exposure context for the weak estrogen bisphenol A"* Proctor and Gamble – Cincinnati, OH. 05/20/2015
38. **Teeguarden, J.G.** *"Avoiding the Axis-of-Ignorance: An Emerging Paradigm for Nanomaterial Dosimetry in Safety Assessment"* 3M Company– Minneapolis, MN. 09/09/2015
39. **Teeguarden, J.G.** *"The APB on BPA: Can Computational and Clinical Dosimetry Quell the Furor and End the Confusion?"* 3M Company– Minneapolis, MN. 09/09/2015

40. **Teeguarden, J.G.** *"What Understanding Loss of Normal Homeostatic Control of Endogenous Toxicants and Their Pathways Tell us about the Risk of Exposure"* Society of Toxicology Annual Meeting – New Orleans, LA. 03/15/2016
41. **Teeguarden, J.G.** *"Dishing Up Nanoparticle Risks: Exposure-Based Computational Translation of In Vitro Toxicity Data to Human Risk"* International Society of Exposure Science Conference – Utrecht, Netherlands. 10/10/2016
42. **Teeguarden, J.G.** *"A Conceptual Framework to Support Exposure Science Research and Complete the Source-to-Outcome Continuum for Risk Assessment"* International Society of Exposure Science Conference – Utrecht, Netherlands. 10/10/2016
43. **Teeguarden, J.G.** *"Beyond the Axis of Ignorance: How 21st Century Exposure Science will Transform Chemical Safety Assessment"* NC3Rs Meeting – London, United Kingdom. 02/14/2017
44. **Teeguarden, J.G.** *"ES21 Federal Working Group: Perspective on Progress and Opportunities"* Exposure Science in the 21st Century Federal Working Group – Richland, WA. 10/26/2017
45. **Teeguarden, J.G.** *"How Exposure and the AEP-AOP Concepts Increase the Impact and Relevance of Biomedical Research"* Superfund Research Program Risk-E-Learning Webinar Series – Online Conference. 11/29/2017
46. **Teeguarden, J.G.** *"A Convergence of Technologies: Improving our Understanding of Human Chemical Exposure"* American Association for the Advancement of Science – Austin, TX. 02/16/2018
47. **Teeguarden, J.G.** *"The Engines and Outcomes of Growth in the Field of Exposure Science"* Total Exposure Health Conference – Bethesda, MD. 09/07/2018
48. **Teeguarden, J.G.** *"Bridging Human Exposure and Precision Medicine"* Total Exposure Health Conference – Bethesda, MD. 09/07/2018
49. **Teeguarden, J.G.** *"Exposure and Response Technology and Teams"* National Lab Day – Toledo, OH. 10/10/2019
50. **Teeguarden, J.G.** *"Biomedical Research at PNNL"* IPRAMM Strategic Planning Session II – San Diego, CA. 10/21/2019

Human Exposure and Pharmacokinetics

Environmental Protection Agency. (2009-2012). PBPK Enabled Urine Biomarker Based Human BPA Exposure Assessment
Role: PI (Teeguarden). Award Amount: $745,000

Description: Established new methods for accurate exposure estimation of environmental compounds by reconstruction from urine spot sampling data. The first high accuracy humane clinical exposure study was conducted, a computational model of bisphenol A pharmacokinetics developed to demonstrate the exposure reconstruction method. Results used in regulatory settings in Europe, Japan and the US.

American Chemistry Council. (2013-2017). Human Environmental Estrome
Role: PI (Teeguarden). Award Amount: $1,200,000

Description: Conducted two human exposure and pharmacokinetic studies in humans, one in pregnant women to characterize environmental and endogenous estrogens that could contribute to health risks during pregnancy. Developed computational models of receptor affinity and response for multiple estrogens and attributed estrogenic equivalents to compounds like soy isoflavones, bisphenol A and the native estrogens in pregnant women. Results used in regulatory settings in Europe, Japan and the US.

National Institute of Safety and Health. (2012). Evaluation of bisphenol A Dermal Exposure and Toxicokinetics Among Cashiers.
Role: Co-I (Teeguarden) PI (Buckley) Award Amount: $44,358.69

Description: High human exposure to the environmental estrogen bisphenol A had been hypothesized, but not tested. In this collaboration with Dr. Buckley at Ohio State University, we designed and interpreted human cashier studies using our physiologically-based pharmacokinetic model for the compound.

3M Company. (2015). Evaluation of human bisphenol A exposure in dental sealants.
Role: PI (Teeguarden). Award Amount: $14,546.08

Description: To register a dental sealant containing bisphenol A, 3M corporation needed to assess human oral cavity exposure. We utilized our physiologically-based pharmacokinetic model for the compound to provide serum concentrations following multiple application scenarios and multiple dental sealant types.

National Institutes of Health via Antidote Therapeutics Corporation. (2017). Modeling anti-body-based therapeutics for nicotine addiction
Role: PI (Teeguarden). Initial Award Amount: $35,363.69

Description: This was the initial effort in a larger project to integrate the pharmacokinetics of nicotine and a novel antibody-based compound that targeted nicotine to determine the first-in-human dose for clinical trials. The effort proved the antibody approach could never work and the project was ended.

Pharmacokinetics and Risk Assessment

Private Company. (2008-2011) Integrating Structure Activity, Biokinetics and Response for Risk Assessment of Tobacco Smoke.
Role: Co-I (Teeguarden), PI (Timchalk). Award Amount: $3,085,000.00
Description: PNNL administered an integrated program of experimental and computational research to understand which components of tobacco smoke risk of disease can be attributed to. This work drove development of 3D models of the human respiratory tract.

Oxo Process Panel, American Chemistry Council. (2005-2006). Butyl Acetate Pharmacokinetics in Rats.
Role: PI (Teeguarden). Award amount: $112,392.55
Description: We conducted experimental studies and computational modeling of the pharmacokinetics of butyl acetate in rats and scaled the computational model to predict human blood concentrations of the parent compound and metabolites. The work was used to develop potential safety exposures for humans.

EPA Office of Research and Development. (2005-2008). Styrene: Review and Application of PBPK Model.
Role: PI (Teeguarden): $75,000
Description: We adapted our published physiologically-based pharmacokinetic model for the carcinogen Styrene for application to human risk assessment. This work supported the U.S. EPA Integrated Risk Information System (IRIS) assessment of this compound.

Dow Chemical Company. (2007-2008). Dioxin HRF for Liver Tumors.
Role: PI (Teeguarden). Award Amount: $93,430.19
Description: Supported the risk assessment of environmental dioxins in Michigan.

Glycol Ethers Panel, American Chemistry Council. (2007-2010). BEAA Pharmacokinetics in Rats.
Role: Co-I (Teeguarden, Hinderliter PI) $80,172.91
Description: We conducted experimental studies of the pharmacokinetics of BEAA after oral ingestion in rats.

Environmental Protection Agency. (2009-2011). PBPK Model Support for EPA-ORD.
Role: PI. (Teeguarden). Award Amount: $759,594.59
Description: We assembled a multi-institutional team to provide support to the U.S. EPA in the acquisition, development and review of physiologically based pharmacokinetic models to be used by the agency for Risk Assessment. This included developing and receiving U.S. EPA approval for our review methodology, and building a novel database (ModelMap) for these kinds of models.

Environmental Protection Agency. (2012). PBPK Model Support for EPA-ORD.
Role: PI. (Teeguarden). Award Amount: $184,270.63
Description: We assembled a multi-institutional team to provide support to the U.S. EPA in the acquisition, development and review of physiologically based pharmacokinetic models to be used by the agency for Risk Assessment.

U.S. Environmental Protection Agency, National Risk Management Research Laboratory. (2010-2013). Evaluation of PB Biokinetic Model for Bacillus Anthracis.

Role: PI (Teeguarden). Award Amount: $518,282.60
Description: PNNL established a coalition of the U.S. EPA, a Naval Medical Research Unit, the National Institute for Integration of Mathematics and Biology to develop and apply a computational model of the biokinetics of anthrax infection.

Vinyl Acetate Council. (2005-2008 and 2010-2012). Vinyl Acetate Council Consulting.
Role: PI (Teeguarden). Award Amount: $215,000.00
Description: I developed and led a strategic research plan that addressed key questions about the nasal cavity genotoxicity, animal toxicity and human exposure to the compound vinyl acetate. This included recruiting leading scientists across the country (funded separately), negotiations with the U.S. Environmental Protection Agency, and publication of key findings.

Willem Faber Toxicology Consulting. (2011-2012). Propyl Acetate PBPK Modeling.
Role: Co-I (Teeguarden) PI (Smith). Award Amount: $138,052.00
Description: Led the development and publication of an animal-human pharmacokinetic model for propyl acetate and its metabolites for use in regulatory safety assessment.

Syngenta Crop Protection, Inc. (2015). Syngenta.
Role: PI (Teeguarden). Award Amount: $46,238.02
Description: Led the review of a pharmacokinetic model for an agrichemical for use in regulatory risk assessment and product registration.

Nanomaterial Exposure and Toxicology

Battelle Memorial Institute (not LDRD). (2009-2012). Multi-Scale Toxicology: Building the Next Generation of Tools for Safety Evaluation.
Role: Co-PI (Teeguarden) Program Manager and PI(Thrall) Award Amount: $1,747,086.00
Description: PNNL developed new in vitro tools, new assays, new biomarkers and integrated experimental and computational methods for assessing the toxicity of emerging nanomaterials in collaboration with Battelle and several other national laboratories.

DoD – Wright-Patterson Air Force Base. (2011). Phase I: Computational Models of Nanomaterial Dosimetry and Biological Pathway Response. Air Force Nano SBIR.
Role: Co-PI (Teeguarden): Award Amount: $32,808.81
Description: This was the first phase of an SBIR to develop computational dosimetry tools that allowed the calculation of human lung exposures equivalent to cellular exposure in common in vitro systems and prediction of adverse effects through specific biological pathways.

National Institute of Environmental Health Sciences. (2010-2016). Integrating Structure Activity, Biokinetics and Response for Nanotoxicology.
Role: PI (Teeguarden), PI, Director (Thrall). Award Amount: $5,976,874.00
Description: A five-year integrated exposure-and response program to improve our understanding of how the properties of nanomaterials influence their toxicity and their human exposure. The nanodosimetry concepts and models developed by my team in LDRD investments were key to the awarding of this grant.

National Institute of Environmental Health Sciences. (2015). SBIR Phase II: Computational Models of Nanomaterial Dosimetry and Biological Pathway Response.

Role: Co-PI (Teeguarden), Co-PI (Housand, AEGIS Corp). Award Amount: $282,000.00
Description: This was the second phase of an SBIR to develop computational dosimetry tools that allowed the calculation of human lung exposures equivalent to cellular exposure in common in vitro systems and prediction of adverse effects through specific biological pathways. This phase would complete the proof of concept and launch the software. The money was awarded to the prime (AEGIS) who then elected to return the money to the U.S. Government.

Human Exposure Science and the Exposome

National Institute of Environmental Health Sciences. (2014-2019). Oregon State University Joint Appointment.
Role: PI (Teeguarden). Award Amount: $199,000

Description: Directed the Research Translation Core. Lead efforts to translate exposure and toxicity data collected in the Superfund Program into information about human risk for the broad community.

United States Environmental Protection Agency. (2016-2017). EPA Suspect Screening.
Role: PI (Teeguarden). Award Amount: $13,477.94
Description: This was a critical test of the advanced compound identification methods developed under the Global Chemical Forensics for the Environmental Exposome LDRD. PNNL took part in a multi-laboratory competition to identify compounds in blinded samples. The effort established PNNL as a leader in the area.

National Institutes of Health. (2018-2021). Pacific Northwest Advanced Compound Identification Core.
Role: Investigator (Teeguarden, See description). PI (Metz). Award Amount: $4,193,000.00
Description: This NIH funded core seeks to establish high-performance computing computational chemistry enabled mass spectrometry methods that enable "identification" of compounds present in human and environmental samples for which no standards currently exist. Justin led the LDRD that produced the capabilities, the team and the two precursor grants.

National Institute of Environmental Health Sciences (2017-2021). TAMU Superfund Exposure Science Core.
Role: PI (Teeguarden). Award Amount: $1,120,000.00
Description: Develop and apply advanced compound identification methods for environmental compound and complimentary computational models of compound pharmacokinetics to translate exposures from in vitro toxicity test systems to humans.

United States Air Force, School of Aerospace Medicine. 2019. Training next generation scientists to advance health protection of Air Force Personnel.
Role: PI (Teeguarden). Award Amount: $588,237.86
Description: PNNL will train Post Docs in bioinformatics and proteomics for the U.S. Air Force Research Laboratory in Dayton Ohio. The post-docs will study the response of cells to various classes of compounds that pose a risk to Air Force personnel.

National Institute of Environmental Health Sciences. (2020-2025). Superfund Research Program - Elucidating Metabolic and Physicochemical Mechanisms of PAH Susceptibility in Toxicity Test Systems and Humans
Role: PI (Teeguarden). Award amount: $1,964,368.00

Description: The objectives of this project are to develop transformative activity-based proteomic probes and multi-modal chemical microscopy to measure the metabolic and distributional processes that contribute to differential susceptibility to PAH exposure toxicity test systems and humans.

Department of Homeland Security. (2019-2020). Non-protein toxins methods development pipeline.
Role: (see description). Award Amount: $1,590,000.00
Description: Technical advancements developed under the Global Chemical Forensics for the Exposome (Teeguarden, PI) are being applied to a group of toxins. Details not reportable here. My role was leading the team that developed the capability, connecting with the sponsor for the initial pitch and enabling the existing team.