

KATRINA M. WATERS

BIOSKETCH

Dr. Waters is currently an Associate Division Director in the Computational Sciences and Mathematics Division at the Pacific Northwest National Laboratory (PNNL). Her research interests are focused on the reconstruction of cell response networks from integrated gene and protein expression data to enable predictive mechanistic modeling of disease and toxicity pathways. Her current programs include pathway-based biomarker discovery for environmental exposure to toxicants, toxicogenomic analysis of PAH mixtures bioactivity, and host-pathogen interactions during pandemic respiratory infections.

EDUCATION

- 1988 – 1992 A.B., Ripon College, Ripon, WI
Major: Chemistry, Minor: Biology
- 1992 – 1996 Ph.D., University of Wisconsin, Madison, WI
Major: Biochemistry
- 1997 – 1999 Postdoctoral fellowship in Biochemistry & Molecular Biology
Mayo Clinic, Rochester, MN
- 1999 – 2001 Postdoctoral fellowship in Molecular Toxicology
Chemical Industry Institute of Toxicology

PROFESSIONAL EXPERIENCE

- 07/2010 – Present Technical Group Manager/Associate Division Director, Computational Sciences & Mathematics Division, Pacific Northwest National Laboratory, Richland WA.
- Responsible for day-to-day management and performance evaluation of Computational Biology & Bioinformatics staff
 - Responsible for developing research investment priorities and hiring strategies for Computational Biology & Bioinformatics
 - Facilitate integration of computational biology into Biological Sciences research, including BER Genome Sciences Program, Radiation biology and Systems Toxicology programs.
- 01/2013 – Present Adjunct Faculty, Department of Environmental and Molecular Toxicology, Oregon State University, Corvallis, OR.
- Support training activities for Graduate program, mentor graduate students and serve on thesis committees, supervise experiential learning externships for student at PNNL, and advise OSU to develop a new Masters program in Risk Assessment.
- 08/2004 – present Senior Research Scientist, Computational Biology and Bioinformatics Group, Pacific Northwest National Laboratory, Richland WA. (Promoted to Senior Staff Scientist in 2010)
- Develop bioinformatics methods and software to support integration of microarray and proteomics data for systems biology research programs
 - Identify biosignatures of nanomaterial toxicity in alveolar epithelial cells and macrophages using integrated microarray and proteomic data

- Develop computational methods for predictive modeling of cell stress response using modular/pathway-based approaches
- Apply computational methods to investigate host response to respiratory viral infection for influenza and SARS viruses

09/2001 – 08/2004 Senior Research Biochemist – Molecular & Investigative Toxicology, Merck Research Labs – West Point, PA.

- Developed experimental methods to determine toxicity modes of action for pharmaceutical compounds in safety assessment
- Used microarray technology/data to determine toxicity modes of action for pharmaceutical compounds in development and post-market
- Used microarray data to identify biomarkers for tissue-specific toxicity

03/1999 – 09/2001 Postdoctoral Fellowship, Chemical Industry Institute of Toxicology (CIIT Centers for Health Research) – Research Triangle Park, NC.

- Post-doctoral advisor: Kevin Gaido
- Research focus: Reproductive toxicity of methoxychlor pesticide through estrogen receptors and androgen receptor using microarray technology.

01/1997 – 03/1999 NRSA Postdoctoral Fellowship, Mayo Graduate School of Medicine, Rochester, MN.

- Post-doctoral advisor: Thomas C. Spelsberg
- Research focus: Regulation of osteoblast differentiation through estrogen receptors.

08/1992 – 12/1996 Graduate Fellowship in the Department of Biochemistry, University of WI, Madison.

- Graduate advisor: James Ntambi
- Research focus: Hormonal and dietary regulation of stearoyl-CoA desaturase genes in mouse liver and adipose tissue.

HONORS AND AWARDS

Best Presentation in Mixtures, Awarded by the SOT Mixtures Specialty Section, March 2012

Outstanding Poster Travel Award, Gordon Conference on Toxicogenomics, June 2007

Outstanding Performance Award, Pacific Northwest National Laboratory, 2006, 2008

Plenary Poster Award, American Society for Bone and Mineral Research, June 1998

National Research Service Award, NCI Postdoctoral Fellowship, 1997-1999

ADVISORY, EDITORIAL, AND PROFESSIONAL ACTIVITIES

2009 – Full Member, Society of Toxicology

2008 – DOE Q Clearance

2009 – 2012 Board of Scientific Counselors, Environmental Protection Agency Subcommittee for Computational Toxicology

2013 Scientific Advisory Panel on Methods for Prioritizing Endocrine Disrupting Chemicals using Computational Toxicology Tools, Environmental Protection Agency

2008 – 2012 Editorial Board: *Toxicology and Applied Pharmacology*

2006 – 2011 Associate Member, Society for Toxicologic Pathology

Journal Reviews: *Endocrinology, Journal of Bone and Mineral Research, Toxicological Sciences, Environmental Health Perspectives, Journal of Toxicologic Pathology, BMC Systems Biology.*

Grant Reviews:

Department of Energy: SBIR 2007, BER 2008, SBIR 2008, BER 2012

NIOSH intramural program 2008

NIH study section ZRG1 DKUS, Sept 2009

NSF EPSCOR Program, 2012

PUBLICATIONS (in chronological order)

1. **Waters, KM** and JM Ntambi. 1994. Insulin and dietary fructose induce stearyl-CoA desaturase 1 gene expression in liver of diabetic mice. *Journal of Biological Chemistry*, 269(44), 27773-27777.
2. **Waters, KM** and JM Ntambi. 1996. Polyunsaturated fatty acids inhibit hepatic stearyl-CoA desaturase 1 gene in diabetic mice. *Lipids*, 31, S33-36.
3. **Waters, KM**, CW Miller, and JM Ntambi. 1997. Localization of a polyunsaturated fatty acid response region in stearyl-CoA desaturase gene 1. *Biochimica Biophysica Acta*, 1349, 33-42.
4. **Waters, KM**, CW Miller, and JM Ntambi. 1997. Localization of a negative thyroid hormone-response region in hepatic stearyl-CoA desaturase gene 1. *Biochemical and Biophysical Research Communications*, 233, 838-843.
5. Miller, CW, **KM Waters**, and JM Ntambi. 1997. Regulation of hepatic stearyl-CoA desaturase gene 1 by vitamin A. *Biochemical and Biophysical Research Communications*, 231, 206-2104.
6. Tau, KE, TE Hefferan, **KM Waters**, JA Robinson, M Subramaniam, BL Riggs, and TC Spelsberg. 1998. Estrogen regulation of a transforming growth factor- β inducible early gene that inhibits deoxyribonucleic acid synthesis in human osteoblasts. *Endocrinology* 139, 1346-1353.
7. **Waters, KM** and TC Spelsberg. 1999. Gonadal Steroids and Receptors. *Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism*, 4th Edition, M.J. Favus (Ed), Lippincott, Williams & Wilkins, pp 104-110.
8. Hefferan, TE, GG Reinholz, **KM Waters**, M Subramaniam, and TC Spelsberg. 2000. TGF- β inducible early gene (TIEG) overexpression mimics TGF- β action in human osteoblast cells. *Journal of Biological Chemistry*, 275, 20255-20259.
9. **Waters, KM**, DJ Rickard, JB Gebhart, M Subramaniam, S Khosla, BL Riggs, J Moore, and TC Spelsberg. 2000. Potential roles of estrogen receptor-alpha and -beta in the regulation of human osteoblast functions and gene expression. *The Menopause at the Millennium*, T. Aso, T. Yanaihara & S. Fujimoto (Eds), Parthenon Publishing Group, New York, pp. 303-313.
10. Robinson, JA, **KM Waters**, RT Turner, and TC Spelsberg. 2000. Direct action of naturally occurring estrogen metabolites on human osteoblastic cells. *Journal of Bone and Mineral Research*, 15, 499-506.
11. Spelsberg, TC, M Subramaniam, **KM Waters**, TE Hefferan, DJ Rickard, and GG Reinholz. A TGF- β /estrogen-inducible early gene (TIEG): A candidate tumor suppressor or cell cycle regulator? *Hormonal Carcinogenesis III*, Eds. Li, J.J., Dahling, J.R., and Li, S.A., Springer-Verlag, New York, pp. 250-260.
12. **Waters, KM**, DJ Rickard, BL Riggs, S Khosla, JA Katzenellenbogen, BJ Katzenellenbogen, JT Moore and TC Spelsberg. 2001. Estrogen regulation of human osteoblast function is determined by the stage of differentiation and the estrogen receptor isoform. *Journal of Cellular Biochemistry*, 83, 448-462.
13. **Waters, KM**, S Safe, and KW Gaido. 2001. Differential gene expression in response to methoxychlor and estradiol through ER α , ER β and AR in reproductive tissues of female mice. *Toxicological Sciences*, 63, 47-56.
14. Rickard, DJ, **KM Waters**, TJ Ruesink, S Khosla, JA Katzenellenbogen, BS Katzenellenbogen, BL Riggs, and TC

- Spelsberg. 2002. Estrogen receptor isoform-specific induction of progesterone receptors in human osteoblasts. *Journal of Bone and Mineral Research*, 17, 580-592.
15. **Waters, KM**, JG Pounds and BD Thrall. 2006. Data merging for integrated microarray and proteomic analysis. *Briefings in Functional Genomics and Proteomics*, 5(4), 261-272 (invited review).
 16. **Waters, KM**, M. Singhal, E.G. Stephan, B.J. Webb-Robertson, and J.Gephart. 2006. Breaking the bottleneck: New tools help biologists integrate complex datasets. *Scientific Computing*, Mar 2006.
 17. **Waters, KM**, R Tan, DC Genetos, S Verma, CE Yellowley, and NJ Karin. 2007. DNA microarray analysis reveals a role for lysophosphatidic acid in the regulation of anti-inflammatory genes in MC3T3-E1 cells. *Bone*, 41, 833-841.
 18. Shah, AR, M Singhal, KR Klicker, EG Stephan, HS Wiley, and **KM Waters**. 2007. Enabling high-throughput data management for systems biology: The Bioinformatics Resource Manager. *Bioinformatics*, 23(7), 906-909.
 19. Jacobs, JM, **KM Waters**, LE Kathmann, DG Camp II, HS Wiley, RD Smith and BD Thrall. 2007. The Mammary Epithelial Cell Secretome and its Regulation by Signal Transduction Pathways. *Journal of Proteome Research*, 7(2), 558-569.
 20. Rickard, DJ, UT Iwaniec, G Evans, TE Hefferan, JC Hunter, **KM Waters**, JP Lydon, BW O'Malley, S Khosla, TC Spelsberg, and RT Turner. 2008. Bone growth and turnover in progesterone receptor knockout mice. *Endocrinology*, 149(5), 2383-2390. PMID: PMC2329269.
 21. Webb-Robertson, BJ, WR Cannon, CS Oehmen, AR Shah, V Gurumoorthi, MS Lipton, and **KM Waters**. 2008. A Support Vector Machine model for the prediction of proteotypic peptides for accurate mass and time proteomics, *Bioinformatics*, 24 (13), 1503-1509.
 22. Rogers, S, M Girolami, W Kolch, **KM Waters**, T Liu, BD Thrall, and HS Wiley. 2008. Investigating the correspondence between transcriptomic and proteomic expression profiles using coupled cluster models. *Bioinformatics*, 24(24), 2894-2900.
 23. Ding S, Y Wang, JM Jacobs, W Qian, F Yang, AV Tolmachev, X Du, W Wang, RJ Moore, ME Monroe, SO Purvine, **KM Waters**, T Heibeck, JN Adkins, DG Camp, II, RL Klemke, and RD Smith. 2008. Quantitative Phosphoproteome Analysis of Lysophosphatidic Acid Induced Chemotaxis applying Dual-step ¹⁸O Labeling Coupled with Immobilized Metal-ion Affinity Chromatography. *Journal of Proteome Research*, 7(10), 4215-4224.
 24. Shah AR, M Singhal, TD Gibson, C Sivaramakrishnan, **KM Waters**, and I Gorton. 2008. An extensible, scalable architecture for managing bioinformatics data and analysis. In *4th IEEE International Conference on e-Science*, pp.190-197, 7-12 Dec. 2008.
 25. Castro DJ, CV Löhr, KA Fischer, **KM Waters**, BJM Webb-Robertson, RH Dashwood, GS Bailey, and DE Williams. 2009. Identifying efficacious approaches to chemoprevention with chlorophyllin, purified chlorophylls and freeze-dried spinach in a mouse model of transplacental carcinogenesis. *Carcinogenesis*, 30(2): 315-320. PMID: PMC2722150
 26. Cannon WR, BJM Webb-Robertson, M Singhal, LA McCue, JE McDermott, RC Taylor, **KM Waters**, and CS Oehmen. 2009. An Integrative Computational Framework for Hypotheses-Driven Systems Biology Research in Proteomics and Genomics. In *Computational and Systems Biology: Methods and Applications*, Humana Press, pp. 63-85.
 27. **Waters KM**, LM Masiello, RC Zangar, BJ Tarasevich, NJ Karin, RD Quesenberry, S Bandyopadhyay, JG Teeguarden, JG Pounds, and BD Thrall. 2009. Macrophage responses to silica nanoparticles are highly conserved across particle sizes. *Toxicological Sciences*, 107:553-569. PMID: PMC2639757
 28. **Waters KM**, R Tan, LK Opresko, RD Quesenberry, S Bandyopadhyay, WB Chrisler and TJ Weber. 2009. Cellular dichotomy between AIG responses to bFGF and TPA reflects molecular switch in commitment to carcinogenesis. *Molecular Carcinogenesis*, 48(11), 1059-1069.
 29. Diamond DL, AJ Syder, JM Jacobs, CM Sorensen, KA Walters, S Proll, JE McDermott, MA Gritsenko, Q Zhang, R Zhao, TO Metz, DG Camp, II, **KM Waters**, RD Smith, CM Rice, and MG Katze. 2010. Temporal Proteome and

Lipidome Profiles Reveal HCV-Associated Reprogramming of Hepatocellular Metabolism and Bioenergetics. *PLOS Pathogens*, 6(1), e1000719. PMID: PMC2796172

30. Bailey, VL, SJ Fansler, S Bandyopadhyay, JL Smith, **KM Waters**, and H Bolton Jr. 2010. Detection of mRNAs in Soils using Targeted Microarrays for Genes Associated with Lignin Degradation. *Soil Biology & Biochemistry*, 42:1793-1799.
31. Webb-Robertson BJM, LA McCue, **KM Waters**, MM Matzke, JM Jacobs, TO Metz, SM Varnum, and JG Pounds. 2010. Combined Statistic Analyses of Peptide Intensities and Peptide Occurrence Improves Identification of Significant Peptides from MS-based Proteomics Data. *Journal of Proteome Research*, 9(11): 5748-5756. PMID: PMC2974810.
32. Yang F, **KM Waters**, JH Miller, MA Gritsenko, R Zhao, X Du, EA Livesay, SO Purvine, ME Monroe, DG Camp, II, RD Smith, and DL Stenoien. 2010. Phosphoproteomic profiling of human skin fibroblast cells reveals pathways and proteins affected by low doses of ionizing radiation. *PLOS One*, 5(11):e14152. PMID: PMC2994767.
33. McDermott, JE, M Archuleta, BD Thrall, JN Adkins, and **KM Waters**. 2011. "Controlling the Response: Predictive Modeling of a Highly Central, Pathogen-Targeted Core Response Module in Macrophage Activation." *PLoS One*, 6(2): e14673. doi:10.1371/journal.pone.0014673. PMID: PMC3038849.
34. Teeguarden JG, BJ Webb-Robertson, **KM Waters**, AR Murray, ER Kisin, SM Varnum, JM Jacobs, JG Pounds, RC Zangar, and AA Shvedova. 2011. 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. PMID:PMC3044201.
35. **Waters KM**, JM Jacobs, MA Gritsenko, and NJ Karin. 2011. "Regulation of gene expression and subcellular protein distribution in MLO-Y4 osteocytic cells by lysophosphatidic acid." *Bone*, 48:1328-1335. PMID: PMC3095666
36. Matzke MM, **KM Waters**, TO Metz, JM Jacobs, AC Sims, RS Baric, JG Pounds, and BJM Webb-Robertson. 2011. "Improved quality control processing of peptide-centric LC-MS proteomics data." *Bioinformatics*, 27(20):2866-72. PMID: PMC3187650.
37. Li, C, A Bankhead, AJ Einfeld-Fenney, Y Hatta, S Jeng, JH Chang, LD Aicher, S Proll, GL Law, **KM Waters**, G Neumann, MG Katze, SK McWeeney, and Y Kawaoka. 2011. "Host Regulatory Network Response to Infection with Highly Pathogenic H5N1 Avian Influenza Virus." *Journal of Virology*, 85(21):10955-67. Epub 2011 Aug 24. PMID:PMC3194976.
38. Rasmussen, A, DL Diamond, JE McDermott, TO Metz, X Gao, MM Matzke, V Carter, S Belisle, MJ Korth, **KM Waters**, RD Smith, and MG Katze. 2011. "Systems Virology Identifies a Mitochondrial Fatty Acid Oxidation Enzyme, Dodecenoyl-CoA Delta Isomerase (DCI), Required for HCV Replication and Pathogenesis." *J Virol*. 85(22):11646-54. Epub 2011 Sep 14. PMID:PMC3209311.
39. Webb-Robertson, BJM, MM Matzke, JM Jacobs, JG Pounds, and **KM Waters**. 2011. "A Statistical Protocol for the Selection of Appropriate LC-MS Proteomics Peptide Dataset Normalizations." *Proteomics*, 11(24):4736-41. doi: 10.1002/pmic.201100078. PMID: PMC2974810
40. McDermott, JE, H Shankaran, AJ Einfeld-Fenney, G Neumann, C Li, S Belisle, CL Sabourin, Y Kawaoka, MG Katze, and **KM Waters**. 2011. "Conserved Host Response to Avian Influenza Infection in Human Cell Culture, Mouse and Macaque Model Systems." *BMC Syst Biol*. 5(1):190. PMID:PMC3229612.
41. Shorey, L, Castro DJ, Baird W, Siddens B, Löhr C, Matzke M, **Waters KM**, Corley RA, Williams DE. 2012. Transplacental Carcinogenesis with Dibenzo[def,p]chrysene (DBC): Timing of Maternal Exposures Determines Target Tissue Response in Offspring . *Cancer Letters*, 317, pp.49-55. PMID:PMC3269513
42. Tal T, J Franzosa, SC Tilton, KA Philbrick, UT Iwaniec, RT Turner, **KM Waters**, and R Tanguay. 2012. "MicroRNAs Control Neurobehavioral Development and Function in Zebrafish." *Faseb Journal*, 26(4): 1452-61. PMID:PMC3316906.

43. Goodale, B, JK La Du, WH Bisson, DB Janszen, **KM Waters**, and R Tanguay. 2012. AHR2 Mutant Reveals Functional Diversity of Aryl Hydrocarbon Receptors in Zebrafish. *PLOS One*, 7(1):e29346. PMID:PMC3252317.
44. **Waters KM**, T Liu, RD Quesenberry, AR Willse, S Bandyopadhyay, LE Kathmann, TJ Weber, RD Smith, HS Wiley, and BD Thrall. 2012. "Network Analysis of Epidermal Growth Factor Signaling using Integrated Genomic, Proteomic and Phosphorylation Data." *PLOS One*, 7(3):e34515. PMID:PMC3315547.
45. Diamond DL, A Krasnoselski, KE Burnum, ME Monroe, BJM Webb-Robertson, JE McDermott, MM Yeh, S Strom, S Proll, S Belisle, A Rasmussen, KA Walters, JM Jacobs, MA Gritsenko, DG Camp, II, R Bhattacharya, JD Perkins, RL Carithers, IW Liou, AM Larson, KM Waters, RD Smith, and MG Katze. 2012. "Proteome and Computational Analyses Reveal New Insights into the Mechanisms of Hepatitis C Virus Mediated Liver Disease Post-Transplantation." *Hepatology*. 56(1):28-38. doi: 10.1002/hep.25649. PMID: PMC3387320.
46. von Neubeck, CH, H Shankaran, NJ Karin, **KM Waters**, SC Tilton, and MB Sowa. 2012. "Cell Type-dependent Gene Transcription Profile in Three Dimensional Human Skin Tissue Model Exposed to Low Dose of Ionizing Radiation: Implications for Medical Exposures." *Environ Mol Mutagen.*, 53(4):247-59. doi: 10.1002/em.21682.
47. Yang, F, **KM Waters**, BM Webb-Robertson, M Markillie, R Wirgau, MA Gristenko, R Zhao, D López-Ferrer, DG Camp, RD Smith, and DL Stenoien. 2012. Quantitative phosphoproteomics identifies filaggrin and other targets of ionizing radiation in a human skin model. *Experimental Dermatology*, 21(5): 352-357. doi: 10.1111/j.1600-0625.2012.01470. PMID:PMC3387810.
48. McDermott, JE, CD Corley, A Rasmussen, DL Diamond, MG Katze, and **KM Waters**. 2012. "Topological analysis of protein co-abundance networks identifies novel host targets important for HCV infection and pathogenesis." *BMC Systems Biology*, 2012 Apr 30; 6(1):28. PMID: PMC3383540.
49. Thomas, SN, **KM Waters**, WF Morgan, AJ Yang, and JE Baulch. 2012. "Quantitative Proteomic Analysis of Mitochondrial Proteins Reveals Pro-Survival Mechanisms in the Perpetuation of Radiation Induced Genomic Instability." *Free Radical Biology & Medicine*, 53(3): 618-628.
50. Hobbie KA, ES Peterson, M Barton, **KM Waters**, and KA Anderson. 2012. "Integration of Data Systems and Technology Improves Research and Collaboration for a Superfund Research Center." *Journal of Lab Automation*, 17(4): 275-83. PMID: PMC3460553.
51. Schrimpe-Rutledge AC, G Fontes, MA Gritsenko, AD Norbeck, DJ Anderson, **KM Waters**, JN Adkins, RD Smith, V Poitout, and TO Metz. 2012. "Discovery of novel glucose-regulated proteins in isolated human pancreatic islets using LC-MS/MS-based proteomics." *Journal of Proteome Research*, 11(7):3520-32. PMID: PMC3391329.
52. Forsberg ND, D Stone, A Harding, BL Harper, SG Harris, MM Matzke, A Cardenas, **KM Waters**, and K Anderson. 2012. "Effect of Native American Fish Smoking Methods on Dietary Exposure to Polycyclic Aromatic Hydrocarbons and Possible Risks to Human Health." *Journal of Agricultural and Food Chemistry*, in press. 2012 Jun 27. [Epub ahead of print]
53. Siddens, LK, AJ Larkin, SK Krueger, CA Bradfield, **KM Waters**, SC Tilton, CB Pereira, CV Lohr, VM Arlt, DH Phillips, DE Williams, and WM Baird, 2012. "Polycyclic Aromatic Hydrocarbons as Skin Carcinogens: Comparison of benzo[a]pyrene, dibenzo[def,p]-chrysene and three environmental mixtures in the FVB/N mouse." *Toxicology & Applied Pharmacology*, 264(3): 377-386. PMID:PMC3483092.
54. Matzke, MM; Allan, S; Anderson, KA; **Waters, KM**. 2012. "An Improved Approach for Calculating a Confidence Interval from a Single Aquatic Sample for Monitoring Hydrophobic Organic Contaminants." *Environ Toxicol Chem*. 31(12):2888-92. doi: 10.1002/etc.2014.
55. Chen J, C Huang, L Truong, JK La Du, SC Tilton, **KM Waters**, K Lin, R Tanguay, and Q Dong. 2012. Early life stage trimethyltin chloride exposure disrupts embryonic development. *Toxicology*, 302(2-3):129-39. doi: 10.1016/j.tox.2012.09.004. PMID: PMC3511642.
56. Matzke MM, JN Brown, MA Gritsenko, TO Metz, JG Pounds, KD Rodland, AK Shukla, RD Smith, **KM Waters**, JE McDermott, and BJM Webb-Robertson. 2012. "A Comparative Analysis of Computational Approaches to Protein

- Quantification in Label-Free LC-MS Proteomics Experiments." *Proteomics, in press*. 2012 Sep 28. doi: 10.1002/pmic.201200269. [Epub ahead of print] PMID:PMC23019139.
57. Varnum SM, DL Springer, ME Chaffee, KA Lien, BJM Webb-Robertson, **KM Waters**, and CA Sacksteder. 2012. "The Effects of Low Dose Irradiation on Inflammatory Response Proteins in a 3D Reconstituted Human Skin Tissue Model." *Radiation Research*, 178(6):591-9. doi: 10.1667/RR2976.1.
 58. Tilton SC, T Tal, SM Scroggins, TD Gibson, J Franzosa, ES Peterson, R Tanguay, and **KM Waters**. 2012. "Bioinformatics Resource Manager v2.3: An Integrated Software Environment for Systems Biology with microRNA and Cross-species Analysis Tools." *BMC Bioinformatics*, 13:311. doi: 10.1186/1471-2105-13-311. PMID: PMC3534564.
 59. Larkin AJ, LK Siddens, SK Krueger, SC Tilton, **KM Waters**, DE Williams, and WM Baird. 2012. "Development of a Fuzzy Neural Network Model for Predicting Polycyclic Aromatic Hydrocarbon-Mediated Perturbations of the Cyp1b1 Transcriptional Regulatory Network in Mouse Skin." *Toxicol Appl Pharmacol*, 267(2):192-199. doi: 10.1016/j.taap.2012.12.011.
 60. Truong, L; SC Tilton, T Zaikova, E Richman, **KM Waters**, JE Hutchison, and RL Tanguay. 2013. "Surface Functionalities of Gold Nanoparticles Impact Embryonic Gene Expression Responses." *Nanotoxicology*, 7:192-201. doi:10.3109/17435390.2011.648225.
 61. **Waters KM**, DL Stenoien, MB Sowa, WB Chrisler, X Wang, R Tan, RL Sontag, and TJ Weber. 2013. "Annexin A2 Influences Signaling Pathways Induced by Ionizing Radiation through Transcriptional Reprogramming." *Radiation Research*, 179: 53-61. doi: 10.1667/RR3056.1.
 62. Tilton SC, KM Waters, BJM Webb-Robertson, RC Zangar, MK Lee, DJ Bigelow, JG Pounds, and RA Corley. 2013. "Diet-Induced Obesity Reprograms the Inflammatory Response of the Murine Lung to Inhaled Endotoxin." *Toxicol Appl Pharmacol*. 267(2):137-148. doi: 10.1016/j.taap.2012.12.020.
 63. Long JP, MS Kotur, GV Stark, RL Warren, MD Kasoji, JL Craft, R Albrecht, A Garcia-Sastre, MG Katze, **KM Waters**, D Vasconcelos, PJ Sabourin, HS Bresler, and CL Sabourin. 2012. "Accumulation of CD11b+GR-1+ Cells in the Lung, Blood and Bone Marrow of Mice Infected with Highly Pathogenic H5N1 and H1N1 Viruses." *Archives of Virology, in press*.
 64. Sims AC, SC Tilton, JH Chang, ML Luna, V Menachery, L Gralinski, C Long, MM Matzke, BJM Webb-Robertson, AK Shukla, A Bankhead, S Burkett, G Zornester, CK Tseng, TO Metz, R Pickles, SK McWeeney, RD Smith, MG Katze, **KM Waters**, and R Baric. 2012. "Release of SARS-CoV Nuclear Import Block Enhances Host Transcription in Human Lung Cells." *Journal of Virology, in press*.
 65. Webb-Robertson BJM, MM Matzke, TO Metz, JE McDermott, J Walker, KD Rodland, JG Pounds, and **KM Waters**. 2013. Sequential Projection Pursuit PCA – dealing with missing data associated with new Omics technologies. *Biotechniques*, in press.
 66. Waters KM, RL Sontag, and TJ Weber. 2013. "Hepatic Leukemia Factor Promotes Resistance To Cell Death: Implications For Therapeutics and Chronotherapy." *Toxicology and Applied Pharmacology, in press*.
 67. Goodale, BC, LaDu, JK, Tilton, SC, Janszen, DB, **Waters, KM**, and Tanguay, RL. "Developmental PAH exposure induces structure-dependent differential gene expression in zebrafish." *Submitted to Toxicological Sciences*.
 68. Karin, NJ, MJ Gaffrey, MH Littke, JG Teeguarden, **KM Waters**, W Wang, JA Price, and BD Thrall. "Transcriptional Reprogramming of Lung Epithelial Cells by Non-Cytotoxic Exposures to Silica Nanoparticles Leads to Enhanced Susceptibility to Metal Toxicity." *Submitted to ACS Nano*.
 69. Gralinski L, A Bankhead, S Jeng, V Menachery, S Proll, MM Matzke, BJM Webb-Robertson, ML Luna, AK Shukla, MT Ferris, M Bolles, JH Chang, LD Aicher, **KM Waters**, TO Metz, RD Smith, L Law, MG Katze, SK McWeeney, and R Baric. "Pathophysiology of Virus Induced Acute Lung Injury." *Submitted to PLOS Pathogens*.

70. Tilton, SC, NJ Karin, A Tolic, Y Xie, X Lai, RF Hamilton, **KM Waters**, A Holian, FA Witzmann, and G Orr. "Three human cell types respond to multi-walled carbon nanotubes and titanium dioxide nanobelts with cell-specific transcriptomic and proteomic expression patterns." Submitted to *Toxicological Sciences*.
71. Hengel, SM, JT Aldrich, **KM Waters**, L Pasa-Tolic, and DL Stenoien. "Quantitative proteomic profiling of low dose ionizing radiation effects in a human skin model." Submitted to *Radiation Research*.
72. Motorykin O, MM Matzke, KM Waters, and SL Simonich. "Association Between Polycyclic Aromatic Hydrocarbons Emission and Lung Cancer Mortality Rates on the World Scale." Submitted to *American Journal of Public Health*.
73. Eisfeld AJ, JR Teuton, C Li, RA Heegel, ML Luna, AA Schepmoes, ME Monroe, JM Jacobs, MM Matzke, BJM Webb-Robertson, SC Tilton, L Law, G Neumann, MG Katze, Y Kawaoka, RD Smith, **KM Waters**, and TO Metz. "Integrated Proteome Analysis of Epithelial Cells Infected with Highly Pathogenic Avian Influenza Virus Reveals Novel Inflammatory and Cytopathic Mechanisms". Submitted to *PLOS Pathogens*.
74. Saili KS, SC Tilton, **KM Waters**, and R Tanguay. "Global gene expression analysis reveals pathway differences between teratogenic and non-teratogenic exposure concentrations of bisphenol A and 17 β -estradiol in embryonic zebrafish." Submitted to *Reproductive Toxicology*.
75. Franzosa J, T Tal, SC Tilton, **KM Waters**, and R Tanguay. "Developmental Teratogenicity of MicroRNAs: The Role of miR-19 in Vertebrate Axis Development." Submitted to *PLOS Biology*.
76. Menachery V, AC Sims, AJ Eisfeld, S Fan, G Neumann, L Josset, SC Tilton, JH Chang, L Gralinski, C Long, R Green, MM Matzke, BJM Webb-Robertson, AK Shukla, S Burkett, S Belisle, L Law, TO Metz, R Pickles, RD Smith, **KM Waters**, Y Kawaoka, MG Katze, and R Baric. "SARS-CoV and Influenza H5N1 Utilize Contrasting Approaches to Control Global Interferon Stimulated Gene Responses." Submitted to *Cell Host & Microbe*.
77. McDermott JE, L Gralinski, AJ Eisfeld-Fenney, HD Mitchell, A Bankhead, L Josset, N Tchitchek, G Neumann, SC Tilton, C Li, S Fan, SK McWeeney, Y Kawaoka, R Baric, **KM Waters**, and MG Katze. "Identification and Validation of Common Regulators of Pathogenesis in Highly Pathogenic Respiratory Viruses using a Systems Biology Approach." Submitted to *Molecular Systems Biology*.
78. Tilton SC, NJ Karin, BJM Webb-Robertson, KM Waters, VB Mikheev, RA Corley, JG Pounds, and DJ Bigelow. "Impaired Transcriptional Response of the Murine Heart to Cigarette Smoke in the Setting of High Fat Diet and Obesity." Submitted to *Chemical Research in Toxicology*.
79. Zhang X, BJM Webb-Robertson, MA Gritsenko, ME Monroe, KM Waters, DJ Bigelow, W Qian, JT Aldrich, MB Scholand, JR Hoidal, JG Pounds, and JM Jacobs. "Human Redox Plasma Proteome Is Altered by Smoking and Obesity." Submitted to *Clinical Proteomics*.
80. Knecht A, B Goodale, M Simonich, A Swanson, MM Matzke, KA Anderson, KM Waters, and R Tanguay. "Comparative Developmental Toxicity of Environmentally Relevant Oxygenated PAHs." Submitted to *Environmental Health Perspectives*.
81. Mitchell HD, AJ Eisfeld, A Sims, JE McDermott, MM Matzke, BJM Webb-Robertson, SC Tilton, N Tchitchek, L Josset, A Benecke, JH Chang, TO Metz, G Neumann, R Baric, Y Kawaoka, MG Katze, and KM Waters. "A Network Integration Approach to Identify Highly Conserved Regulatory Targets Related to Pathogenicity for Influenza and SARS-CoV Respiratory Viruses." Submitted to *PLOS One*.
82. Saili KS, J Chen, MM Corvi, SC Tilton, KM Waters, C Huang, and R Tanguay. "Estrogen-Related Receptor Gamma Mediates Bisphenol A-Induced Neurodevelopmental Impairment in Zebrafish." Submitted to *PLOS One*.
83. Govey PM, JM Jacobs, SC Tilton, AE Loiselle, Y Zhang, KM Waters, NJ Karin, and HJ Donahue. "Integrative Transcriptomic and Proteomic Analysis of Osteocytic Cells Exposed to Fluid Flow Reveals Novel Mechano-Sensitive Signaling Pathways." Submitted to *PLOS One*.

INVITED PRESENTATIONS

- Waters KM, and JG Teeguarden. 2012. "Dosimetry Anchored Systems Models of Toxicity for Derivation of No Effect Levels." Presented at Special Symposium on Novel Interdisciplinary Approaches to Complex Exposures, Raleigh, NC, on October 24, 2012.
- Waters KM. 2012. "Integration of Multiple Omic Data Types for Pathway Analysis and Network Reconstruction." Presented at US Human Proteome Organization Annual Meeting, San Francisco, CA on March 7, 2012.
- Waters KM. 2010. "Computational Challenges of 'Omics Data for Biomarker Discovery." Presented at Bio International Convention, Chicago, IL on May 5, 2010.
- Waters KM. 2010. "Dynamic Network Analysis of Nanosilica-induced Toxicity Pathways using Microarray and Proteomic Data." Presented at Society of Toxicology 2010 Annual Meeting, Salt Lake City, UT on March 10, 2010.
- Waters KM. 2010. "Data Integration for Cell Stress Responses after Irradiation." Presented at Gordon Conference on Radiation Oncology, Galveston, TX on January 26, 2010.
- Waters KM. 2009. "Bioinformatic Integration of Omics Data for Network and Pathway Reconstruction." Presented at Washington State University – Tri-Cities, Richland, WA on November 13, 2009.
- Waters KM. 2009. "Modular Network Modeling of Toxicity Pathways for Extrapolation." Presented at National Research Council Symposium for Toxicity Pathway-Based Risk Assessment, National Academy of Sciences, Washington, DC, on May 12, 2009.
- Waters KM. 2009. "Data Integration for PNNL's Low Dose Radiation Program." Presented at BER Low Dose Investigators Workshop, Bethesda, MD, on April 7, 2009.
- Waters KM. 2009. "Informatic and statistical integration of 'omics data to model cellular response to stress." Presented at Society of Toxicology 2009 Annual Meeting, Baltimore, MD, on March 16, 2009.
- Waters KM. 2008. "The Bioinformatics Resource Manager and Gaggle: An Integrated Software Environment for Systems Biology." Presented at Institute for Systems Biology Gaggle Workshop, Seattle, WA, on August 25, 2008.
- Waters KM. 2008. "Computational Challenges for the Integration of Genomics and Proteomics Data in Determining Toxicity Pathways." Presented at National Institute on Aging BioSignatures Workshop, Bethesda, MD, on May 2, 2008.
- Waters KM. 2007. "Bioinformatics Resource Manager: Data Management for Systems Biology." Presented at Gaggle Workshop 2007, Seattle, WA , on August 27, 2007.
- Waters KM, HS Wiley, and BD Thrall. 2007. "Pathway and network analyses of EGFR signaling from integration of time course microarray and proteomic data." Presented at Experimental Biology 2007, Washington, DC, on May 2, 2007.
- Waters KM. 2006. "Enabling high-throughput data management for systems biology: The Bioinformatics Resource Manager." Presented at American Society for Cell Biology Annual Meeting, San Diego, CA on December 10, 2006.
- Waters KM. 2006. "Managing Data Overload for Systems Biology." Presented by Katrina Waters at WBBA/Washington Biotechnology and Biomedical Association Monthly Meeting, Seattle, WA, on June 9, 2006.
- Waters KM. 2006. "Bioinformatics for Data Integration at PNNL." Presented at Institute for Systems Biology, Seattle, WA ,on April 13, 2006.
- Waters KM. 2006. "Combined Analysis of Microarray and Proteomics Data." Presented at GeneGo User Group Meeting, Boston, MA, on March 16, 2006.

Waters KM. 2005. "Integrating Disparate Datasets using Commercial, Custom and Public Bioinformatic Tools." Presented at American Society for Cell Biology Annual Meeting, San Diego, CA on December 12, 2005.

Waters KM. 2005. "Toxicity Pathway Identification & Biomarker Discovery." Presented at Environmental Protection Agency, Research Triangle Park, NC, on May 20, 2005.

CURRENT FUNDING:

HHSN272200800060C M. Katze (PI) 09/26/08 – 09/25/2013

NIH/NIAID BAA-08-22

A Systems Biology Approach to Infectious Disease Research

The objective is to provide computational support for data analysis and modeling to identify potential therapeutic and vaccine targets for pathogenic respiratory viruses.

Role: PI of Mathematical Modeling and Informatics Core

P42 ES016465 D. Williams (PI) 04/01/09 – 03/31/2013

NIH/NIEHS

PAH's: New Technologies and Emerging Health Risks

The objective is to provide computational support for data storage, bioinformatics tools for data analysis and consultative statistics and data analysis services to the Superfund Basic Research Program on the Environmental Effects of Polycyclic Aromatic Hydrocarbons.

Role: PI of Statistics and Bioinformatics Core

DOE/BER Low Dose Radiation SFA Morgan (PI) 10/01/09 – 09/30/13

Linear and Nonlinear Tissue Signaling Mechanisms in Response to Low Dose and Low Dose-Rate Radiation

The goal of PNNL's Low Dose Radiation (LDR) Program is to use an integrated, systems-level approach to understand the fundamental signaling events mediated by LDR, focusing on the tissue response rather than individual cells.

Role: Lead for Bioinformatics and Data Integration

1DP3DK094343 Madupu (PI) 10/01/11 – 09/30/2016

NIH/NIDDK

T1D: Correlating the gastrointestinal microbiome, urinary proteome and metabolome

The objective is to provide computational support for analysis of proteomics and metabolomics data for type I diabetes and correlation of disease markers with microbiome.

Role: Task lead for Statistics and Bioinformatics

EPA-G2011-STAR-E1 Tanguay (PI) 02/01/12 – 01/31/2017

EPA Computational Toxicology Centers

High Content HTP Zebrafish Assays for Predicting Developmental Toxicity

The objective of this project is to identify and provide new assays to supplement the EPA's ToxCast program for classification of developmental and reproductive toxicants. PNNL will provide statistical modeling of zebrafish assay data for classification of chemical compounds and pathway analysis of RNAseq data to determine new assays to be developed which would enhance the predictiveness of the models.

Role: Task lead for data modeling

COMPLETED RESEARCH SUPPORT

1R21-ES020120 Anderson (PI) 11/1/2011 – 10/30/2012

NIEHS NIH

BRIDGES for Evaluation of Health Outcomes, Repercussions and Impacts in Zones of Oil-Spills in Nature

The goals of the project was to use a bio-analytical approach to assess spatial and temporal changes in the bioavailable fraction of contaminants at Gulf of Mexico before, during and post impact from the Deepwater Horizon Oil Spill of spring 2010.

Role: Task lead for statistics and data analysis

P30-DA015625

Katze (PI)

7/1/2007 – 06/30/2012

NIDA NIH

Bioinformatics and Biostatistics Core: Functional Genomics and HCL Associated Liver Disease

The objective of this project was to provide analysis and modeling of microarray and proteomics data for hepatitis C virus (HCV) and human immunodeficiency virus (HIV) to support the NIDA Center for Functional Genomics at the University of Washington.

Role: PI of Bioinformatics and Biostatistics Core

U54-AI081680

Nelson (PI)

3/1/2009 – 02/28/2012

NIAID NIH

PNWRCE Biostatistics Core

The objective was to apply PNPL's quantitative proteomics, metabolomics, and modeling to support a systems biology approach for investigating infectious viral disease progression and host interactions.

Role: Co-PI of Bioinformatics and Biostatistics Core

U54ES016015-01

J. Pounds (PI)

08/15/07 – 05/31/2011

NIH/NIEHS

Center for Novel Biomarkers of Response

The objective was to utilize proteomic technologies to characterize human biomarkers for systemic chronic inflammation and oxidative stress.

Role: Lead bioinformatics analyst

2-R01ES016212

Thrall (PI)

09/01/07 – 08/30/2011

NIH/NIEHS

Systems Analysis of Nanoparticle Biocompatibility

The goal of this project was to identify physiochemical properties of nanomaterials that stimulate biological responses in macrophages and in lungs of exposed mice.

Role: Co-investigator, lead bioinformaticist