David C. Bencic, Research Biologist, in EPA's National Exposure Research Laboratory

Exposure Methods and Measurements Division
Mailing Address

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Area of Expertise: My current research focuses on using molecular methods, specifically changes in gene and protein expression, for the identification of ecological aquatic exposure indicators. I use microarray, quantitative polymerase chain reaction, next generation sequencing, and two dimensional polyacrylamide gel electrophoresis technologies to identify indicators of exposure to a variety of chemicals, including endocrine-disrupting chemicals, emerging contaminants, pesticides, metals, as well as chemical mixtures. I have previously served as the NERL lead for a computational toxicology project entitled, "Linkage of Exposure and Effects Using Genomics, Proteomics, and Metabolomics in Small Fish Models" and currently use these molecular-based expression tools in both laboratory- and field-based experiments.

Select Publications:

Wang, R. L.; Biales, A. D.; Garcia-Reyero, N.; Perkins, E. J.; Villeneuve, D. L.; Ankley, G. T.; Bencic, D. C., Fish connectivity mapping: linking chemical stressors by their mechanisms of action-driven transcriptomic profiles. *BMC genomics* 2016, *17* (1), 84.

Armstrong, B. M.; Lazorchak, J. M.; Jensen, K. M.; Haring, H. J.; Smith, M. E.; Flick, R. W.; Bencic, D. C.; Biales, A. D., Reproductive effects in fathead minnows (Pimphales promelas) following a 21 d exposure to 17alpha-ethinylestradiol. *Chemosphere* 2016, *144*, 366-73.

Bencic, D. C., The challenge: real-world application of 'omics endpoints. *Environmental toxicology and chemistry / SETAC* 2015, *34* (4), 700-706.

Wang, R. L.; Bencic, D. C.; Garcia-Reyero, N.; Perkins, E. J.; Villeneuve, D. L.; Ankley, G. T.; Biales, A. D., Natural Variation in Fish Transcriptomes: Comparative Analysis of the Fathead Minnow (Pimephales promelas) and Zebrafish (Danio rerio). *PloS one* 2014, *9* (12), e114178.

Garcia-Reyero, N.; Ekman, D. R.; Habib, T.; Villeneuve, D. L.; Collette, T. W.; Bencic, D. C.; Ankley, G. T.; Perkins, E. J., Integrated approach to explore the mechanisms of aromatase inhibition and recovery in fathead minnows (Pimephales promelas). *General and comparative endocrinology* 2014, *203*, 193-202.

Flick, R. W.; Bencic, D. C.; See, M. J.; Biales, A. D., Sensitivity of the vitellogenin assay to diagnose exposure of fathead minnows to 17alpha-ethynylestradiol. *Aquatic toxicology* 2014, *152*, 353-60.

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Education:

- Ph.D. in Zoology, 1999, University of Idaho
- B.A. in Biology, 1993, Kalamazoo College

Professional Experience:

- Research Biologist, USEPA, ORD/NERL, 2004 to Present
- Post-Doctoral Fellow, Duke University, Integrated Toxicology Program, 2002 to 2004
- Post-Doctoral Fellow, University of North Carolina, 2000 to 2002
- Post-Doctoral Fellow, University of Idaho, 2000

Honors and Awards:

- STAA Award - A Biological Framework for Studying the Toxicity of Endocrine-Disrupting Chemicals, Level II, 2012
- STAA Award - Delineation of a Novel Pathway of Endocrine disruption in Fish, Level III, 2012
- STAA Award - Application of Microarray Technology to Advance Ecotoxicology Research with Small-Fish Models, Level II, 2011
- ORD Teamwork Ward - Small Fish Computational Toxicology Team, 2010
- STAA Award - Applying Mechanistic Toxicology to Ecological Risk Assessment of Endocrine-Active Compounds, Level III, 2010
- STAA Award - Investigation of the Adaptive Capacities of Biological Systems and Their Responses to Chemical Stressors, Level III, 2010
- STAA Award – Work Which Aided States and US EPA Regional Laboratories in Estrogenic Exposure Assessments of Aquatic Ecosystems, Honorable Mention, 2008
- Honor Award - Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices, 2007