

CURRICULUM VITAE

NAME: Shaw, Joseph R.

EDUCATION:

Virginia Polytechnic Institute and State University, Blacksburg, VA
B.S. in Biology, 1992

University of Kentucky, Lexington, KY
Ph.D. in Toxicology, 2001

Dissertation: *The toxicological effects of silver and other metals on aquatic biota: an integrated approach*

Dartmouth College, and Dartmouth Medical School, Hanover, NH
Post-Doctoral Research Associate, April 2001 through July 2007

ACADEMIC APPOINTMENTS:

Mount Desert Island Biological Laboratory, Adjunct Assistant Professor, Jan 2011 to present
Indiana University, School of Public and Environmental Affairs, Bloomington, Indiana
Assistant Professor of Public and Environmental Affairs, 2007-present
Associated investigator of The Center for Genomics and Bioinformatics, 2007-present

OTHER APPOINTMENTS:

Mount Desert Island Biological Laboratory (summer), Salisbury Cove, ME
Seasonal investigator, 2004 to 2010 (summer)

Dartmouth College and Dartmouth Medical School, Department of Biology and Center for Environmental Health, Hanover, NH
Research Associate, 2007-2001

Mount Desert Island Biological Laboratory, Salisbury Cove, ME
Roy P. Forster Fellow, 2003

University of Kentucky, Graduate Center for Toxicology, Lexington, KY
SETAC/Procter and Gamble Graduate Research Fellow, 1999 to 2000

University of Kentucky, Graduate Center for Toxicology, Lexington, KY
NIEHS Graduate Research Fellow, 1994 to 1999

PROFESSIONAL SOCIETIES

Society of Environmental Toxicology and Chemistry
Daphnia Genomics Consortium, Founding member
Fundulus Genomics Consortium, Founding member

HONORS AND AWARDS:

Named an Outstanding New Environmental Scientist by the National Institute of Environmental Health Sciences, August 2010 to present

Invited to deliver keynote address, Daphnia Genomics Consortium meeting, Leuven, Belgium, March 2010 to feature work in our laboratory relating genomic structure and evolved metal tolerance in *Daphnia*

Elected to the editorial board of *Environmental Toxicology and Chemistry*, Jan 2009 to present

Invited participant, Omics 2007, a workshop aimed establishing a framework for Environment Canada to incorporate genomic tools into its assessment programs. October 25-26, 2007, Burlington, ON.

Nominated to the Steering Committee for *Daphnia pulex* genome release, Toxicology section, 2007

Invited participant, *Fundulus* Genomics Strategy Workshop. May 4-5, Charleston, SC and founding member of the *Fundulus* Genomics Consortium, 2006

Invited participant, Society of Toxicology and Society of Environmental Toxicology and Chemistry, Pellston workshop. "Molecular and computational approaches to cross-species extrapolation". July 18-22, Portland, OR, 2004

Invited speaker and Panel member, Society of Environmental Toxicology and Chemistry International Ecotoxicogenomics Workshop. "An Ecological Perspective of Genomics: Assessing Ecological Risk Through Partnerships". September 23-25, Pensacola Beach, FL, 2002

Invited speaker, Water Environment Research Foundation, Workshop on Online Toxicological Monitoring of Re-used Water Sources, December 12-14, Washington, DC, 2001

TEACHING ASSIGNMENTS

Indiana University, School of Public and Environmental Affairs, Bloomington, Indiana

1. E162: Environment and People (Fall 2007, Spring 2008, Fall 2008, Spring 2009)
2. E555-710: Toxicology for the 21st Century (Fall 2009, Fall 2010)
3. E520: Environmental Toxicology (Spring 2010, Spring 2011)
4. E570: Reading Course in Environmental Genomics (Spring 2011)

Mount Desert Island Biological Laboratory, Salisbury Cove, Maine

1. Environmental Genomics- A technical course exploring how environmental conditions influence gene responses and the fitness of organisms (Summer, 2010)

SERVICE

Committee service, Bloomington Campus

1. Search and Screen Committee for Environmental Molecular Toxicologist, Department of Environmental Health, School of Health, Physical Education, Recreation (Fall 2010 to present)
2. Search and Screen Committee for Environmental Toxicologist, Department of Environmental Health, School of Health, Physical Education, Recreation (Fall 2010 to present)
3. Search and Screen Committee for the Chair of the Department of Environmental Health, School of Health, Physical Education, Recreation (Fall 2009 to Spring 2010)

Committee service, School of Public and Environmental Affairs

1. Master of Science in Environmental Science, Admissions committee (2008, 2009, 2010)
2. Ph.D. in Environmental Sciences Admissions committee (2008, 2009, 2010)

Student Service

1. MSES Environmental Chemistry and Toxicology Concentration Advisor (2008, 2009, 2010)
2. MPA/MSES Program Advisor (2008, 2009, 2010)

Public Service

State and Regional

1. Environmental Detectives, Prepared local middle school teachers for implementation of a new science curriculum, which included basic concepts of toxicology, Montshire Museum, Norwich, Vermont (2002)
2. Presented, *What is a toxicologist* with 6th graders, Thetford Academy, Thetford, Vermont (2003)
3. Taught 6th graders about copper toxicity, which was a regional issue, Sharon Academy, Sharon, Vermont (2004)
4. Helped middle school students design and analyze dose-response experiments with *Daphnia*, Rivendale School, Orford, New Hampshire (2005)
5. Volunteered at a Center for Environmental Health Sciences at Dartmouth run display informing the public on fish consumption advisories for mercury, Connecticut River Festival, Hartford, Vermont (2005)
6. Consultant for the California Regional Water Quality Control Board, reviewed proposed Total Maximum Daily Load amendments for the San Diego Basin, San Diego, California (2006)
7. Served as an adviser during a public meeting on research efforts and Superfund guided activities at the Callahan Mine site, Brooksville, Maine (2010)
8. Advised New England EPA on the Callahan Mine located in Goose Cove Maine, Boston, Massachusetts (2010)

National

1. Developed white paper to aid advisors from the Department of Defense Strategic Environmental Research and Development Program in incorporating genomic technologies into a risk assessment framework, (2008)
2. Informed the Tri-Services Risk Assessment Working Group of the potential impact of *Daphnia* genomics on the field of risk assessment through a talk titled, "Environmental Genomics in *Daphnia*", Omaha, Nebraska (2010)

International

1. Advised Environment Canada on a framework for incorporating genomic tools into its assessment programs, Burlington, Ontario (2007)

PROFESSIONAL ACTIVITIES

Editorial Board

Environmental Toxicology and Chemistry, 2009 to present

Peer Review for Grant Proposals (since 2007)

1. Swiss National Science Foundation, interdisciplinary programme, Environmental Genomics Initiative (2008)
2. Natural Environment Research Council, United Kingdom, Inherited metal tolerance, (2009)

Peer Review for Book Chapter

Homeostasis and Toxicology of Non-Essential Metals (Fish Physiology Volume 31b), edited by Chris M. Wood, Anthony P. Farrell, and Colin J. Brauner, Elsevier

Peer Review for Professional Journals (since 2007)

2007 (10 manuscripts total)

Aquatic Toxicology, Archives of Environmental Contamination and Toxicology, Environmental Science and Technology, Environmental Toxicology and Chemistry, Science of the Total Environment

2008 (13 manuscripts total)

Archives of Environmental Contamination and Toxicology, Ecotoxicology and Environmental Safety, Environmental Science and Technology, Environmental Toxicology and Chemistry, Science of the Total Environment

2009 (12 manuscripts total)

BMC Molecular Biology, Comparative Biochemistry and Physiology, Ecotoxicology and Environmental Safety, Environmental Science and Technology, Environmental Toxicology and Chemistry, Evolutionary Applications, Journal of Applied Ecology

2010 (15 manuscripts total)

BMC Molecular Biology, BMC Evolutionary Biology, Comparative Biochemistry and Physiology, Ecotoxicology and Environmental Safety, Environmental Science and Technology, Environmental Toxicology and Chemistry, Journal of Experimental Zoology

PUBLICATIONS

Refereed Journal Articles

1. Shaw JR, Wood CM., Birge WJ, Hogstrand C. 1998. Toxicity of silver to the marine teleost *Oligocottus maculosus*: Effects of salinity and ammonia. *Environ Toxicol Chem.* 17: 594-600.
2. Birge WJ, Price DJ, Shaw JR, Spromberg JA, Wigginton AJ, Hogstrand C. 1999. Metal body burden and biological sensors as ecological indicators. *Environ Toxicol Chem.* 19:1199-1212.
3. Hogstrand C, Ferguson EA, Galvez F, Shaw JR, Webb N, Wood CM. 1999. Physiology and acute silver toxicity in the starry flounder (*Platichthys stellatus*) in seawater. *J Comp Physiol.* 169B:461-473.
4. Webb NA, Shaw JR, Morgan IJ, Hogstrand C, Wood CM. 2001. Acute and chronic physiological effects of silver exposure in three marine teleosts. *Aquat Toxicol.* 54(3-4):161-178.
5. Bury NR, Shaw JR, Glover C, Hogstrand C. 2002. Derivation of a toxicity based model to predict how water chemistry influences silver toxicity to invertebrates. *Comp Biochem Physiol C* 133:259-270.
6. Shaw, JR, Dempsey TD, Chen CY, Hamilton JW, Folt CL. 2006. Comparative toxicity of cadmium, zinc, and mixtures of cadmium and zinc to daphnids. *Environ Toxicol Chem.* 25:182-189.

7. Sofyan A, Shaw JR, Birge WJ. 2006. Metal trophic transfer from algae to cladocerans and the relative importance of dietary metal exposure. *Environ Toxicol Chem.* 15:1034-1041.
8. Stanton CR, Thiobodeau R, Lankowski A, Shaw JR, Hamilton JW, Stanton BA. 2006. Arsenic inhibits CFTR-mediated chloride secretion by killifish (*Fundulus heteroclitus*). *Cell Physiol Biochem.* 17:269-278.
9. Colbourne JK, Eads BD, Shaw JR, Bohuski E, Bauer DJ, Andrews J. 2007. Sampling Daphnia's expressed genes: preservation, expansion and invention of crustacean genes with reference to insect genomes. *BMC genomics.* 8:217 (<http://www.biomedcentral.com/1471-2164/8/217>)
10. Miller DS, Shaw JR, Stanton CR, Barnaby R, Karlson KH, Hamilton JW, Stanton BA. 2007. MRP2 and acquired tolerance to inorganic arsenic in the kidney of killifish (*Fundulus heteroclitus*). *Toxicol Sci.* 97:103-110.
11. Shaw, JR, Gabor K, Hand E, Lankowski A, Durant L, Thigodeau R, Stanton CR, Barnaby R, Coutermarsh B, Karlson KH, Sato JD, Hamilton JW, Stanton BA. 2007. Role of glucocorticoid receptors in acclimation of killifish (*Fundulus heteroclitus*) to seawater and effects of arsenic. *Am J. Physiol Regul Integr Comp Physiol.* 292:R1052-60.
12. Shaw JR, Glaholt SP, Greenberg N, Sierra-Alvarez R, Folt CL. 2007. Acute toxicity of arsenic to *Daphnia pulex*: Influence of organic functional groups and oxidation state. *Environ Toxicol Chem* 26:1532-7.
13. Shaw JR, Jackson, Gabor K, Hand E, Stanton S, Hamilton JW, Stanton BA . 2007. The influence of exposure history on arsenic accumulation and toxicity in the killifish, *Fundulus heteroclitus*". *Environ Toxicol Chem.* 26:2704-2709.
14. Shaw JR, Colbourne JK, Davey JC, Glaholt SP, Hampton TH, Chen CY, Folt CL, Hamilton JW. 2007. Gene response profiles for *Daphnia pulex* exposed to the environmental stressor cadmium reveal novel crustacean metallothioneins. *BMC Genomics.* 8:477, p.60 (<http://www.biomedcentral.com/1471-2164/8/477>); (article flagged as highly accessed with 4422 views between December 21, 2007 and January 10, 2010); (article reviewed and recommended by the Faculty of 1000; <http://www.f1000biology.com/article/id/1097571>)
15. Shaw JR, Sato D, VanderHeide J, LaCasse T, Stanton CR, Lankowski A, Stanton SE, Chapline C, Coutermarsh B, Barnaby R, Karlson K, Stanton BA. 2008. The Role of SGK and CFTR in Acute Adaptation to Seawater in *Fundulus heteroclitus*. *Cell Physiol Biochem.* 22:69-78.
16. Gard AL, Lenz PH, Shaw JR, Christie AE. 2009. Identification of putative paracrines/hormones in the water flea *Daphnia pulex* (Crustacea; Branchiopoda; Cladocera) using transcriptomics and immunohistochemistry. *Gen Comp Endocrinol.* 160:271-287.
17. Shaw JR, Bomberger JM, VanderHeide J, LaCasse T, Coutermarsh B, Barnaby R, Stanton BA. 2010. Arsenic inhibits SGK1 activation of CFTR Cl⁻ channels in the gill of the killifish, *Fundulus heteroclitus*. *Aquat Toxicol.* 98:157-164.
18. Colbourne JK, Pfrender ME, Gilbert D, et al. 2011. The ecoresponsive genome of *Daphnia pulex*. *Science* 331 (6017): 555-561

Research Articles (invited for submission to Science)

Shaw JR, Paland S, Gilbert D, Pfrender M, Glaholt S, Bugge D, Doubleday A, Dudycha J, Davey J, Yan N, Keller B, Hamilton H, Folt C, Chen C, Colbourne J. Copy number variation allows adapted asexual *Daphnia* to thrive in toxic environments. In prep

Refereed Book Chapters

1. Kramer JR, Benoit G, Bowles KC, Di Toro DM, Herrin RT, Luther III GW, Manolopoulos H, Robillard KA, Shafer MM, Shaw JR. 2000 Environmental chemistry of silver. In: Andren AW, Bober TW, eds, *Toxicity of Silver in the Environment: Transport, Fate, and Effects*. SETAC Press, Pensacola, FL. 200pp.
2. Luoma S, Bell R, Bielmyer G, Galvez F, Hogstrand C, LeBlanc G, Lee BW, Purcell T, Santore R, Santschi P, Shaw JR. 2000. Biological Processes of silver uptake, distribution, and elimination. In: Andren AW, Bober TW, eds, *Toxicity of Silver in the Environment: Transport, Fate, and Effects*. SETAC Press, Pensacola, FL.
3. Cook JC, Denslow ND, Iguchi T, Linney EA, Miracle A, Shaw JR, Viant MR, Zacharewski TR. 2007 "Omic" approaches in the context of environmental toxicology. In: Benson W, DiGulio R, eds, *Genomic Approaches for Cross Species Extrapolation in Toxicology*. Boca Raton, FL: CRC Press. pp. 1-31.
4. Shaw JR, Pfrender ME, Eads BD, Klaper R, Callaghan A, Sibly R, Colson I, Jansen B, Gilbert D, Colbourne JK. 2008. *Daphnia* as an emerging model for toxicological genomics. In: *Recent Advances in Experimental Biology, Volume 2: Comparative Toxicogenomics*, C Hogstrand and P Kille, eds. Elsevier, London, p.165-219.

Conference Proceedings/Technical Publications/News Articles (denotes peer-reviewed)

*Birge WJ, Price DJ, Kercher MD, and Shaw JR. 1995. Transport, Fate, and Effects of Metals in Sediment Systems Associated with the Raccoon and Leading Creek Watersheds, Southeastern Ohio. Report to U.S. Department of Justice. University of Kentucky, Lexington, KY.

Grant AJ, Shaw JR, and Birge WJ. 1995. Risk Assessment Plan for Petroleum Underground Storage Tanks in Kentucky, Part II: Diesel, Heating Oil, Other Middle Distillates, and Waste Oil, Appendix I: Risk Assessment Procedures and Calculations. University of Kentucky, Lexington, KY.

*Ferguson EA, Shaw JR, Wood CM, and Hogstrand C. 1996. The effects of salinity on the acute toxicity of silver to marine fish. Proceedings: 3rd International Conference on the Transport, Fate, and Effects of Silver in the Environment, August 6-9, 1995, Washington, D.C.

*Hogstrand C, Shaw JR, Ferguson EA, Birge WJ, and Wood CM. 1996. Physiological effects of silver on marine fish. Proceedings: 3rd International Conference on the Transport, Fate, and Effects of Silver in the Environment, August 6-9, 1995, Washington, D.C.

*Schmittschmitt JP, Shaw JR, and Birge WJ. 1997. Effects of silver on green algae and prospects for foodchain transfer to primary and secondary consumers. Proceedings: 4th International Conference on the Transport, Fate, and Effects of Silver in the Environment, August 25-28, 1996, Madison, WI.

*Shaw JR, Birge WJ, and Hogstrand, C. 1997. Parameters that influence silver toxicity: ammonia and salinity. Proceedings: 4th International Conference on the Transport, Fate, and Effects of Silver in the Environment, August 25-28, 1996, Madison, WI.

Birge WJ, Shaw JR, Linder GL. 1998. Can present regulatory strategies protect against pollution related losses in biodiversity? *SETAC NEWS* 18(3):25-26.

*Shaw JR, Hogstrand C, Price DJ, Kercher MD, and Birge WJ. 1998. The acute and chronic toxicity of silver to marine fish. Proceedings: 5th International Conference on the Transport, Fate, and Effects of Silver in the Environment, September 29-October 1, 1997, Hamilton, Ontario, Canada.

Shaw, JR, Chen, CY, Davey, JC, Folt, CL, Hamilton, JW. 2004. The *Daphnia* Genomics Consortium. *Mar Environ Res.* 58:591.

Lynch MA, Colbourne JK, Hamilton JW, Shaw JR, Chen CY, Folt CL, Thomas WK, Pfrender M. 2003. Proposal to sequence the genome of *Daphnia pulex*. White Paper submitted to the Joint Genome Institute, Walnut Creek, California.

*Shaw, JR, Curtis-Burnes, J, Stanton, BA, Hamilton, JW. 2004. The toxicity of arsenic to the killifish, *Fundulus heteroclitus*: Effects of salinity. *The Bulletin*. Vol 43:134.

De Schamphelaere KAC, Glaholt S, Asselman J, Messiaen M, DeConick D, Janssen CR, Colbourne JK, Shaw JR. 2011. Will genetic adaptation of natural populations to chemical pollution result in lower or higher tolerance to future climate change? *Integrated Environmental Assessment and Management*. 7:141–143. (published online-Dec. 23, 2010, DOI: 10.1002/ieam.149)

PRESENTATIONS

Invited Conference, Workshop, and Symposium Presentations

New biomarkers of metal exposure and effects. Presented at the 8th Annual meeting of the European Society of Environmental Toxicology and Chemistry, April, 14-18, 1995, Bordeaux, France. **Invited Platform Presentation, Co-chaired (with R. Dalinger)**

The Daphnia Genomics Consortium: Shared efforts, shared rewards. Presented at the International Ecotoxicogenomics Workshop focused on Ecological Perspective of Genomics: Assessing Ecological Risk Through Partnerships, sponsored by Society of Environmental Toxicology and Chemistry, September 23-25, 2002, Pensacola Beach, Florida. **Invited Platform Presentation, Panel Participant**

The standardized culture of Daphnia for genomics. Presented at the 1st Annual meeting of the *Daphnia* Genomics Consortium. October 3-5, 2002, Bloomington, Indiana.

Comparative toxicity of Daphnia to metals. Presented at the 2nd Annual meeting of the *Daphnia* Genomics Consortium, September 3-8, 2003, Manchester, New Hampshire.

Genomics in cross-species extrapolation. Presented at the Pellston workshop on Molecular and computational approaches to cross-species extrapolation, sponsored by the Society of Toxicology and Society of Environmental Toxicology and Chemistry, July 18-22, 2005, Portland, Oregon, **Invited participant**

The costs of a heavy metal life-style platform presentations. 3rd Annual meeting of the *Daphnia* Genomics Consortium, January 16-20, 2006, Bloomington, Indiana, January 16-20, **Invited Platform Presentation, Chaired symposium session on Toxicological Genomics**

Metal tolerance in *Daphnia pulex*. 4th Annual meeting of the Daphnia Genomics Consortium 4th Annual meeting, July 7-9, 2007, Bloomington, Indiana. **Invited platform presentation, Chaired symposium session on Toxicological features of the Daphnia Genome**

Mechanisms and costs of multi-generation tolerance acquisition. International Mining and the Environment Conference: Sudbury 2007, October 22-24, 2007, Sudbury, Ontario. **Invited Keynote Address**

Evolved metal tolerance in *Daphnia*. Gordon Research Conference: Ecological and Evolutionary Functional Genomics, July 13-17, 2003, Tilton, NH. **Invited participant**

Genomic basis for evolved metal tolerance in *Daphnia pulex*. 5th Daphnia Genomics Consortium meeting, March 26-30, 2010, Leuven, Belgium. **Invited Keynote Address**

Evolved metal tolerance in *Daphnia pulex* results from changes in genome architecture, 31st Annual meeting of the Society of Environmental Toxicology and Chemistry, November 2010, Portland, Oregon., **Hosted and Chaired symposium on Environmental Contributions to Phenotype, Fitness and Population Structure in Light of the Genome Biology of *Daphnia*, Invited Platform Presentation**

Invited Seminar Presentations (does not include seminars for job interviews)

An integrated approach to aquatic toxicity studies, University of Kentucky, School of Biological Sciences, February 6, 2000, Lexington, Kentucky.

An old model for an emerging field: *Daphnia* and toxicogenomics, University of Kentucky, Graduate Center for Toxicology, March, 27, 2006, Lexington, Kentucky.

Daphnia pulex, an emerging model species for ecology, evolutionary biology, and toxicology, University of Colorado, Center for Ecology and Evolutionary Biology, November 9, 2006, Boulder, Colorado.

Causes and Consequences of Variation in Toxic Response: Understanding Susceptibility, ERDC, US Army Corp of Engineers, February 12, 2007, Vicksburg, Mississippi.

Effects of arsenic on CFTR function: The role of serum glucocorticoid kinase, Dartmouth College, Center for Environmental Health, September 24, 2008, Hanover, New Hampshire.

Arsenic disrupts ion transport in the killifish, Indiana University, Center for Environmental Health, October 23, 2008, Indianapolis, Indiana.

Molecular adaptation to stress, Butler University, Department of Biology, April 8, 2009, Indianapolis, Indiana

Exploring genomes to understand how populations are shaped by the environment, Wabash College, Department of Biology, November 18, 2010, Crawfordsville, Indiana.

Selected national/international presentations

Metallothionein promoter activation in artificial gill epithelia: a biosensor of intracellular metal reactivity and toxicity. Presented at the 3rd World Congress of the Society of Environmental Toxicology and Chemistry (SETAC), May 21-25, 2000, Brighton, United Kingdom. .

Metal burden as a physiological and ecological indicator of metal stress. Presented at the Society of Environmental Toxicology and Chemistry (SETAC) 21st Annual Meeting, November 11-15, 2001, Baltimore, Maryland.

Comparative Effects of Metals and Metal Mixtures on Cladocerans. 23rd Annual meeting of the Society of Environmental Toxicology and Chemistry, November 16-20, 2002, Salt Lake City, Utah.

An emerging model for toxicological, ecological, and evolutionary genomics. 24th Annual meeting of the Society of Environmental Toxicology and Chemistry. November, 19-21, 2003, Austin, Texas.

Using microarrays to determine metal induced gene-response in *Daphnia*, 25th Annual meeting of the Society of Environmental Toxicology and Chemistry, November 19-21, 2004, Portland, Oregon.

Differences in microarray gene expression profiles of *Daphnia pulex* exposed to metals, characterization and comparative sequence analysis of responsive genes. 26th Annual meeting of the Society of Environmental Toxicology and Chemistry, November 18-20, 2005, Baltimore, Maryland.

Adaptation costs less than acclimation. 29th Annual meeting of Society of Environmental Toxicology and Chemistry. November 16-20, 2008, Tampa, Florida.

Polymorphisms in gene copy number reveal mechanisms of adaptation. 30th Annual meeting of the Society of Environmental Toxicology and Chemistry, November 19-23, 2009, New Orleans, Louisiana.

VISITING SCIENTIST

Bamfield Marine Station, 1995 (4 weeks), Bamfield, BC, Canada

Bamfield Marine Station, 1996 (8 weeks), Bamfield, BC, Canada

McMaster University, Laboratory of Chris M. Wood, 1997 (4 weeks), Hamilton, ON, Canada.

Mount Desert Island Biological Laboratory, seasonal scientist, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, Salisbury Cove, Maine

NON-FEDERAL GRANTS AND RESEARCH SUPPORT

Funded

Understanding the Transcriptomic Response of *Daphnia* to Particulate Iron, The School of Public and Environmental Affairs Seed Grant, 2010 to present, \$16,000, (Flynn Picardal, PI, Joseph Shaw, Co-PI.

Laboratory and research start-up funds, The School of Public and Environmental Affairs and the Office of the Vice Provost for Research, Indiana University, 2007 to present, \$500,000.

Pioneering the Use of Genomic Biomarkers in the Study of Environmental Human Health Indiana University President's Initiative in the Environmental Sciences, 2008 to 2009, \$50,000. (John Colbourne, PI, Jim Klaunig, Co-PI, Peter Cherbas, Co-PI, Lisa Kamendulis, Co-PI, Joseph Shaw, Co-PI, and Keith Clay Co-PI)

Pending

Quantifying reproductive transfer of cadmium burden in *Daphnia*, Indiana University Collaborative Research Grant, \$54,955. (Laura Wasylenki, PI, Joseph Shaw, Co-PI)

Not-funded

Pioneering the Use of Genomic Biomarkers in Assessing Risk to Environmental and Human Health, Collaboration in Biomedical/Translational Research Pilot Grant Program, Indiana, \$74,771. (John Colbourne, PI, Barbara Hocevar, Co-PI, Lisa Kamendulis, Co-PI, Joseph Shaw, Co-PI)

FEDERAL GRANTS AND RESEARCH SUPPORT

Funded

Effects of environmental contamination on gene copy number variation: Molecular blueprint for adaptation, susceptibility, and disease, NIEHS ONES 1R01ES019324-01, 2010 to 2015, \$2,270,000 total, \$1,542,005 direct. (Joseph Shaw, PI).

Biological Processes Affecting Bioaccumulation, Transfer, and Toxicity of Metal Contaminants in Estuarine Sediments, DOD SERDP ER-1503, 2006 to 2010, \$1,430,000 total, \$195,135 IU. (Celia Chen, PI, Joseph Shaw, Co-PI, Nicholas Fisher, Co-PI).

Development of Methods Linking Genomic and Ecological Responses in a Freshwater Sentinel Species, 2002 to 2008, NSF-DEB-BE#0221837, \$2,000,000. (Joshua Hamilton, PI, Celia Chen, Co-PI, John Colbourne, Carol Folt, Co-PI, Michael Lynch, Co-PI, Joseph Shaw, Co-PI).

Pending

Collaborative Research: Genomic basis of dramatic, rapid, convergent evolution in the killifish *Fundulus heteroclitus*, NSF DEB-PEP-#1020453, Submitted January 2011, \$889,604 total, \$318,924 IU. (Joseph Shaw, PI, John Colbourne, Co-PI with Andrew Whitehead, PI, Mark Hahn, PI, Margie Oleksiak, PI, Wes Warren, PI)

Next-Generation Transcriptome Analysis to Determine Mechanisms of Microbial Nitrate-Dependent Fe(II) Oxidation, DOE-#10654801, Submitted July 2010, \$901,958. (Flynn Picardal, PI, Joseph Shaw, Co-PI, Haixu Tang, Co-PI).

Not funded

Collaborative Research: Genomic basis of dramatic, rapid, convergent evolution in the killifish *Fundulus heteroclitus*, NSF DEB-PEP-#1050919, Submitted July 2010, \$286,379 IU. (Joseph Shaw, PI, with Andrew Whitehead, PI, Mark Hahn, PI, Margie Oleksiak, PI, Wes Warren, PI)

Collaborative Research: Genomic basis of dramatic, rapid, convergent evolution in the killifish *Fundulus heteroclitus*, NSF DEB-PEP-#1025276, Submitted January 2010, \$253,384 IU. (Joseph Shaw, PI, with Andrew Whitehead, PI, Mark Hahn, PI, Margie Oleksiak, PI, Wes Warren, PI)

Collaborative Research: Genomic basis of dramatic, rapid, convergent evolution in the killifish *Fundulus heteroclitus*, NSF DEB-PEP-#0918859, Submitted January 2009, \$172,219 IU. (Joseph Shaw, PI, with Andrew Whitehead, PI, Mark Hahn, PI, Margie Oleksiak, PI, Wes Warren, PI)

Mercury and arsenic speciation and bioaccumulation in sentinel seafood and biomarker species, Oceans and Human Health Initiative, NOAA, Submitted 2005. (Celia Chen, PI, Joseph Shaw, Co-PI, Michele Dionne, Co-PI, Brian Jackson, Co-PI)

