

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME David J. Dix	POSITION TITLE Research Biologist		
eRA COMMONS USER NAME			
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i>)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Illinois at Chicago	B.S.	1985	Biological Sciences
Rush University, Chicago IL	Ph.D	1990	Physiology
North Carolina State University, Raleigh NC	Post-doc	1990-1992	Biochemistry
National Institute of Environmental Health Sciences, RTP, NC	Post-doc	1992-1995	Reproductive and Developmental Toxicology

A. POSITIONS and HONORS**Research and Professional Experience:**

- 2007-present Adjunct Assistant Professor, Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, NC.
- 2005-present Research Biologist, National Center for Computational Toxicology, ORD, U.S. EPA, RTP, NC
- 2004-2005 Lead Research Biologist, Genomic Effects Team, U.S. EPA, ORD/NHEERL/RTD, RTP, NC.
- 2001-present Adjunct Assistant Professor, Department of Molecular and Environmental Toxicology, North Carolina State University, Raleigh, NC.
- 1997-1998 Adjunct Assistant Professor, Department of Biology, North Carolina Central University, Raleigh, NC.
- 1995-2004 Research Biologist, Gamete and Early Embryo Branch, Reproductive Toxicology Division, National Health and Environmental Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, RTP, NC.
- 1992-1995 Intramural Research Fellow, Laboratory of Reproductive and Developmental Toxicology, National Institute of Environmental Health Sciences, Research Triangle Park, NC (Mentor: Dr. E.M. Eddy).
- 1990-1992 Postdoctoral Research Associate, Department of Biochemistry, North Carolina State University, Raleigh, NC (Mentor: Dr. Elizabeth Theil).

Professional Societies and Affiliations:

- 1999-2006 Society for the Study of Reproduction
- 2001-present Society of Toxicology

Honors and Awards:

- 2001 Superior Accomplishment Recognition Award (SARA) for developing hsp70-1/hsp70-3 gene knockout mice.
- 2001 SARA for leadership in launching toxicogenomics effort in RTD.
- 2002 SARA for developing infrastructure necessary for NHEERL research to advance in genomics and proteomics.
- 2003 SARA for development and implementation of genomics, proteomics, and bioinformatics capabilities within NHEERL.
- 2003 SARA for outstanding teamwork in producing NHEERL's first multiyear implementation plan for human health research.

- 2004 SARA for research supporting use of toxicogenomics data in risk assessment.
- 2004 SARA for development and application of mouse testis DNA microarray.
- 2006 SARA for forming and chairing the EPA Chemical Prioritization Community of Practice.
- 2007 SARA for fostering coordination between ToxCast and OECD Molecular Screening Project.
- 2007 EPA Quality Step Increase for outstanding performance.
- 2007 ORD Bronze Medal Award for characterizing toxicity pathways of conazoles.

Selected invitations at National & International Symposia:

- Department of Animal Science, North Carolina State University, Raleigh, NC, 2002. "Gene expression profiling to identify mode of action for male reproductive toxicants".
- American College of Toxicology annual meeting, 2002, Hershey, PA. "Application of genomics to reproductive toxicology: working from research towards risk assessment".
- ORD Internal Workshop on Computational Toxicology, U.S. EPA, RTP, NC, 2002. "Current Focus of NHEERL's Genomics and Proteomics Research".
- NHEERL Workshop on Computational Toxicology, U.S. EPA, RTP, NC, 2002. "Principles and Examples of Computational Toxicology Research".
- U.S. EPA Review of Pilot Studies for the National Children's Study, RTP, NC, 2002. "Use of Biomarkers of Response for Assessing Potential Sensitivity of Children to Adverse Health Outcomes from Exposure to Environmental Chemicals".
- U.S. EPA NCEA Genomics and Risk Assessment Colloquium, Alexandria, VA, 2003. "Integration of Toxicogenomics and Risk Assessment".
- U.S. EPA- U.S. Triazole Task Force joint research meeting, 2003, RTP, NC. "Project 1: Profiling of toxic effects, P450s, and gene expression in multiple tissues following conazole exposures in adult male rats and mice", and "Project 3: EPA Rat Developmental Conazole Study".
- U.S. EPA Region 10/ORD Genomics Seminar Series, 2003, Seattle, WA. "Integration of Toxicogenomics and Risk Assessment".
- Society of Toxicology annual meeting, 2003, Salt Lake City, UT. "Genomic and Proteomic Analysis of Surrogate Tissues for Assessing Toxic Exposures and Disease States".
- U.S. EPA and NIEHS CEBS-Metabonomics Collaboration Workshop, Aug31-Sept01, 2004, RTP, NC. "Integrating Genomics and Metabonomics: the ORD Conazole Pilot Project".
- U.S. EPA (ORD and OPP) and U.S. Triazole Task Force joint research meeting, Nov09, 2004, RTP, NC. "Overview of Past, Present and Future Conazole Studies Focused on Reproductive Effects", and "Reproductive Effects of Exposure to Conazole Fungicides in the Male Rat".
- EPA's Region 7 and National Center for Environmental Research Environmental Research for the Future Seminar, Dec 16, 2004, Kansas City, MO. "Translating Genomics from Research to Risk Assessment".
- Society of Toxicology annual meeting 2005, New Orleans, LA. "Gene Expression Profiling to Identify Biomarkers of Reproductive Toxicity".
- EPA-FDA workshop on Tools of the Trade: Common Ground in the Application of Genomics in Regulatory Decision-Making, Aug4-5, 2005, RTP, NC. "Development of Computational Tools for Application of Genomics Information to Environmental Regulations and Risk Assessment"
- International Society Regulatory Toxicology Pharmacology annual meeting, Nov 2005, Baltimore, MD. "ORD's Computational Toxicology Research Program".
- NAS/NRC workshop on Applications of Genomic Signatures, Dec 2005, Welches, OR. "Antifungal Toxicogenomics".
- CARCINOGENOMICS 1st Annual EU Consortium Meeting, Nov 2007, Valencia, SPAIN. "EPA's ToxCast Program: Prioritizing the Toxicity Testing of Environmental Chemicals".

Selected Expert Committees/Advisory Panels/Organizing Committees:

- 1995-present Mentored 9 undergraduate, 5 graduate, and 6 postdoctoral students; one EPA intern.
- 2003 WHO/ICSP Workshop on Toxicogenomics and the Risk Assessment of Chemicals for the Protection of Human Health, Berlin, Germany.
- 2003 Co-chair, Society of Toxicology annual meeting symposium "Genomic analysis of surrogate tissues for measuring toxic exposures and drug action", Salt Lake City UT.

- 2004 Workgroup co-chair, SETAC-SOT Pellston Workshop on Emerging Molecular and Computational Approaches for Cross-Species Extrapolations, Portland, OR.
- 2005-2006 Program Committee for Society for the Study of Reproduction
- 2005-2006 External Advisory Committee, Duke University Superfund Basic Research Center.
- 2005-2007 Science Advisory Board, Center of Excellence- Paternal Impact of Toxicological Exposure, Wayne State University, Detroit, MI.
- 2005 Co-chair, symposium, "Beyond Liver Toxicogenomics: Gene Expression Based Biomarkers in Non-Hepatic Tissues", Society of Toxicology annual meeting, New Orleans, LA..
- 2005-present Organizing Committee of Microarray Quality Control Project.
- 2005-present Editorial Board, Toxicological Sciences.
- 2007-present Editorial Board, Systems Biology in Reproductive Medicine
- 2007-present Scientific Advisory Board, EU project CARCINOGENOMICS

Selected Assistance/Advisory Support to the Agency:

- 2001-2004 Project Officer, contracts for DNA microarrays for Health Divisions of NHEERL.
- 2002-2003 Genomics Coordinator, NHEERL Genomics and Proteomics Committee.
- 2002-2003 Principal Investigator, CRADA with Duke University to produce DNA microarrays for NHEERL.
- 2003-2006 Project Officer, GeneChip processing contract for ORD/NHEERL.
- 2004-2005 Principal Investigator, CRADA with Affymetrix to develop in vitro toxicogenomics.
- 2004-2005 Project Officer, contract for toxicogenomics with Iconix Pharmaceuticals for ORD.
- 2004-present Co-Chair, Genomics Task Force Data Analysis Workgroup of EPA Science Policy Council.
- 2006-present Contracting Officer's Representative (Project Officer) on eight ToxCast contracts.
- 2003-present Consulting with Office of Pesticide Programs on conazole reproductive toxicity.
- 2006-present Developing ToxRefDB for OPP use
- 2007 ORD Future of Toxicology Working Group

B. SELECTED PUBLICATIONS (selected from a total of 64 peer-reviewed).

- Ostermeier GC, DJ Dix, D Miller, P Khatri, SA Krawetz. Spermatozoal RNA profiles of normal fertile men. *Lancet*, 360, 772-777, 2002.
- Rockett JC, RJ Kavlock, C Lambright, L Parks, JE Schmid, VS Wilson, C Wood, DJ Dix. DNA arrays to monitor gene expression in rat blood and uterus following 17-beta-estradiol exposure – biomonitoring environmental effects using surrogate tissues. *Toxicological Sciences*, 69, 49-59, 2002.
- Richburg, JH, Johnson, K, Schoenfeld, HA, Meistrich, ML and Dix, DJ (2002). Defining the cellular and molecular mechanisms of toxicant action in the testis. *Toxicology Letters* 135: 167-183.
- Hampton CR, A Shimamoto, CL Rothnie, J Griscavage-Ennis, A Chong, DJ Dix, ED Verrier, TH Pohlman (2003). HSP70.1 and -70.3 are required for late-phase protection induced by ischemic preconditioning of mouse hearts. *Am J Physiol Heart Circ Physiol* 285: H866–H874.
- Schmitt E, A Parcellier, S Gurbuxani, C Cande, A Hammann, M Celia Morales, CR Hunt, DJ Dix, RT Kroemer, F Giordanetto, M Jäättelä, JM Penninger, A Pance, G Kroemer, C Garrido (2003). Chemosensitization by a non-apoptogenic heat shock protein 70-binding apoptosis inducing factor mutant. *Cancer Research*, 63(23):8233-
- Hunt CR, DJ Dix, GG Sharma, RK Pandita, A Gupta, M Funk, TK Pandita (2004). Genomic instability and enhanced radiosensitivity in Hsp70.1/3-deficient mice. *Molecular and Cellular Biology*, 24(2):899-911.
- Rockett JC, ME Burczynski, AJ Fornace Jr, PC Herrmann, SA Krawetz, DJ Dix (2004). Surrogate tissue analysis: monitoring toxicant exposure and health status of inaccessible tissues through the analysis of accessible tissues and cells. *Toxicology and Applied Pharmacology* 194:189-199.
- Rockett JC, P Patrizio, JE Schmid, NB Hecht, DJ Dix (2004). Gene expression patterns associated with infertility in humans and rodent models. *Mutation Research*, 549:225–240.
- Tully DB, JC Luft, JC Rockett, H Ren, JE Schmid, CR Wood, DJ Dix (2005). Reproductive and genomic effects in testes from mice exposed to the water disinfectant byproduct bromochloroacetic acid. *Reproductive Toxicology* 19(3):353-366.
- Bao W, JE Schmid, AK Goetz, H Ren, DJ Dix (2005). A database for tracking toxicogenomic samples and procedures. *Reproductive Toxicology* 19(3):411-419.

- Ostermeier GC, RJ Goodrich, MP Diamond, DJ Dix, SA Krawetz (2005). Towards using stable spermatozoal RNAs for prognostic assessment of male factor fertility. *Fertility and Sterility*, 83:1687-94.
- Barton HA, Tang J, Sey YM, Stanko JP, Murrell RN, Rockett JC, Dix DJ (2006). Metabolism of myclobutanil and triadimefon by human and rat cytochrome P450 enzymes and liver microsomes. *Xenobiotica* 36:793-806.
- Denslow ND, JK Colbourne, DJ Dix, JH Freedman, CC Helbing, S Kennedy, PL Williams (2006). Selection of surrogate animal species for comparative toxicogenomics. In: *Emerging Molecular and Computational Approaches for Cross-Species Extrapolations*. Eds. W Benson and R Di Giulio. SETAC Press, Florida.
- Dix DJ, Gallagher K, Benson WH, Groskinsky BL, McClintock JT, Dearfield KL, Farland WH (2006). A framework for the use of genomics data at the EPA. *Nat Biotechnol* 24:1108-11.
- Goetz AK, Bao W, Ren H, Schmid JE, Tully DB, Wood C, Rockett JC, Narotsky MG, Sun G, Lambert GR, Thai SF, Wolf DC, Nesnow S, Dix DJ (2006). Gene expression profiling in the liver of CD-1 mice to characterize the hepatotoxicity of triazole fungicides. *Toxicol Appl Pharmacol* 215:274-84.
- Kim SJ, Dix DJ, Thompson KE, Murrell RN, Schmid JE, Gallagher JE, Rockett JC (2006). Gene expression in head hair follicles plucked from men and women. *Ann Clin Lab Sci* 36:115-26.
- Kim YK, Suarez J, Hu Y, McDonough PM, Boer C, Dix DJ, Dillmann WH (2006). Deletion of the inducible 70-kDa heat shock protein genes in mice impairs cardiac contractile function and calcium handling associated with hypertrophy. *Circulation* 113:2589-97.
- Rockett JC, Narotsky MG, Thompson KE, Thillainadarajah I, Blystone CR, Goetz AK, Ren H, Best DS, Murrell RN, Nichols HP, Schmid JE, Wolf DC, Dix DJ (2006). Effect of conazole fungicides on reproductive development in the female rat. *Reprod Toxicol* 22:647-58.
- Shi L et al. (2006). The MicroArray Quality Control (MAQC) project shows inter- and intraplatform reproducibility of gene expression measurements. *Nat Biotechnol* 24:1151-61.
- Tully DB, Bao W, Goetz AK, Blystone CR, Ren H, Schmid JE, Strader LF, Wood CR, Best DS, Narotsky MG, Wolf DC, Rockett JC, Dix DJ (2006). Gene expression profiling in liver and testis of rats to characterize the toxicity of triazole fungicides. *Toxicol Appl Pharmacol* 215:260-73.
- Cherney DP, Ekman DR, Dix DJ, Collette TW (2007). Raman spectroscopy-based metabolomics for differentiating exposures to triazole fungicides using rat urine. *Anal Chem* 79:7324-32.
- Dix DJ, Houck KA, Martin MT, Richard AM, Setzer RW, Kavlock RJ (2007). The ToxCast program for prioritizing toxicity testing of environmental chemicals. *Toxicol Sci* 95:5-12.
- Goetz AK, Ren H, Schmid JE, Blystone CR, Thillainadarajah I, Best DS, Nichols HP, Strader LF, Wolf DC, Narotsky MG, Rockett JC, Dix DJ (2007). Disruption of testosterone homeostasis as a mode of action for the reproductive toxicity of triazole fungicides in the male rat. *Toxicol Sci* 95:227-39.
- Kim SJ, Dix DJ, Thompson KE, Murrell RN, Schmid JE, Gallagher JE, Rockett JC (2007). Effects of storage, RNA extraction, genechip type, and donor sex on gene expression profiling of human whole blood. *Clin Chem* 53:1038-45.
- Martin MT, Brennan RJ, Hu W, Ayanoglu E, Lau C, Ren H, Wood CR, Corton JC, Kavlock RJ, Dix DJ (2007). Toxicogenomic study of triazole fungicides and perfluoroalkyl acids in rat livers predicts toxicity and categorizes chemicals based on mechanisms of toxicity. *Toxicol Sci* 97:595-613.
- Platts AE, Dix DJ, Chemes HE, Thompson KE, Goodrich R, Rockett JC, Rawe VY, Quintana S, Diamond MP, Strader LF, Krawetz SA (2007). Success and failure in human spermatogenesis as revealed by teratozoospermic RNAs. *Hum Mol Genet* 16:763-73.