

Phillip E. Mirkes

Professor
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EDUCATION:

- B.S., Biology, St. Norbert College, W. DePere, WI, 1965
- M.S., Zoology, University of Michigan, 1967
- Ph.D., Zoology, University of Michigan, 1970
- Postdoctoral, Zoology, University of Washington, 1970-1971
- Postdoctoral, Genetics, University of Washington, 1971-1973

FIELD OF INTEREST:

- Developmental Biology
- Developmental Toxicology

PROFESSIONAL SOCIETIES:

- American Association for the Advancement of Science
- Society for Developmental Biology
- Society of Toxicology
- Teratology Society

RESEARCH EXPERIENCE:

- Director, Center for Environmental and Rural Health, and Professor, Department of Veterinary Physiology and Pharmacology, Texas A&M University, 2004-current
- Research Professor, Department of Pediatrics, University of Washington, 1991-2004
- Research Professor & Associate Head, Division of Congenital Defects, Department of Pediatrics, University of Washington, 1992-1998
- Adjunct Research Professor, Department of Biological Structure, University of Washington, 1994-2004
- Fogarty Senior International Fellow, Experimental Embryology and Teratology Unit, Medical Research Council, London, England, 1988-89, Host: Dr. Nigel Brown
- Research Associate Professor, Department of Pediatrics, University of Washington, 1983-91
- Research Assistant Professor, Department of Pediatrics, University of Washington, 1979-1982
- Assistant Professor, Department of Biology, University of South Carolina, 1973-1979
- NIH Postdoctoral Fellow, Department of Genetics, University of Washington, 1971-1973
- NIH Postdoctoral Trainee, Department of Zoology, University of Washington, 1970-1971
- Dissertation Research, Department of Zoology, University of Michigan, 1967-1970
- NIH Traineeship, Woods Hole Biological Station, Fertilization and Gamete Physiology course, 1968
- NSF Traineeship, Bermuda Biological Station, Experimental Embryology Course, 1966

FUNDED RESEARCH:

Current:

- Title 70kD HSPs: Modulators of Developmental Toxicity
R01 ES08744
- Funding Agency NIH, National Institutes of Environmental Health
- Project period 12/01/00-11/30/04
- Role Principal Investigator

- Title The FHCRC/UW Toxicogenomics Consortium
U19 ES11387
- Funding Agency NIEHS, National Institutes of Environmental Health

Project Period 9/30/01-8/31/06
Role Project Leader: Toxicogenomic pathway analysis of sensitive and resistant mammalian models for neurodevelopmental toxicology

• Title A proteomic approach to the identification of proteins playing a role in hyperthermia-induced exencephaly
R21 ES11765

Funding Agency NIEHS, National Institutes of Environmental Health
Project Period 04/01/02-01/31/05
Role Principal Investigator

Pending

• Title Bcl-2, ROS and Cell Death in Developmental Toxicity
R01 ES07026

Funding Agency NIH, National Institutes of Environmental Health Sciences
Project period 05/01/04-04/30/08 (renewal)
Role Principal Investigator

Title Cell Death in the Etiology of Birth Defects
Funding Agency March of Dimes
Project period 06/01/05-05/31/08
Role Principal Investigator

SELECTED RESEARCH PUBLICATIONS: (last 10 years)

Barrier M and **Mirkes PE** (2004) Proteomics in Developmental Toxicology. *Repro. Toxicol.* (in press).

- Mikheeva S, Barrier M, Little SA, Beyer R, Mikheev AM, Kerr MK, and **Mirkes PE** (2004) Alterations in gene expression induced in day 9 mouse embryos exposed to hyperthermia or 4 hydroperoxycyclophosphamide (4CP): Analysis using cDNA microarrays. *Tox. Sci.* 79:345-359.
- Won-Kyu K and **Mirkes PE** (2003) Alterations in mitochondrial morphology are associated with hyperthermia-induced apoptosis in early postimplantation mouse embryos. *Birth Defects Res. (Part A)* 67:929-940.
- Little SA and **Mirkes PE** (2003) Teratogen-induced activation of caspase-6 and caspase-7 in early postimplantation mouse embryos. *Cell Biol. Toxicol.* 19:215-226.
- Soleman D, Cornel L, Little SA and **Mirkes PE** (2003) Teratogen-induced activation of the mitochondrial apoptotic pathway in the yolk sac of day 9 mouse embryos. *Birth Defects Res. (Part A)* 67:98-107.
- Little SA and **Mirkes PE** Teratogen-induced activation of caspase-9 and the mitochondrial apoptotic pathway in early postimplantation mouse embryos. *Toxicol. Appl. Pharmacol.* 181:142-151, 2002.
- **Mirkes, PE** 2001 Warkany Lecture: To die or not to die, the role of apoptosis in normal and abnormal mammalian development. *Teratology* 65:228-239, 2001.
- Umpierre, CC, Little, SA and **Mirkes, PE** Co-localization of active caspase-3 and DNA fragmentation (TUNEL) in normal and hyperthermia-induced abnormal mouse development. *Teratology* 63:134-143, 2001 (Nominated for James G. Wilson Publication Award-best paper published in the journal *Teratology* in 2000-2001).
- **Mirkes PE** and Little SA Cytochrome c release from mitochondria of early postimplantation murine embryos exposed to cyclophosphamide, heat shock and staurosporine. *Toxicol. Appl. Pharmacol.* 162:197-206, 2000 (Selected as the best paper published in *Toxicology and Applied Pharmacology* in 2000 by the Reproductive and Developmental Toxicology Specialty Section of the Society of Toxicology).
- **Mirkes, PE**, Wilson KL and Cornel LM Teratogen-induced activation of ERK, JNK, and p38 MAP kinases in early postimplantation murine embryos. *Teratology* 62:14-25, 2000.

- **Mirkes, P.E.**, Cornel, L.M., Wilson, K.L. and Dillman, W.H. Heat shock protein 70 (Hsp 70) protects postimplantation murine embryos from the embryo-lethal effects of hyperthermia. *Develop. Dynamics* 214:159-170, 1999.
- **Mirkes, P.E.** and Little, S.A. Teratogen-induced cell death in postimplantation mouse embryos: differential tissue sensitivity and hallmarks of apoptosis. *Cell Death Differen.* 5:592-600, 1998
- **Mirkes, P.E.** Molecular/cellular biology of the heat stress response and its role in agent-induced teratogenesis. *Mutation Res.* 396:163-173, 1997.
- **Mirkes, P.E.**, Cornel, L.M., Park, H.W. and Cunningham, M.L. Induction of thermotolerance in early postimplantation rat embryos is associated with increased resistance to hyperthermia-induced apoptosis. *Teratology* 56:210-219, 1997.
- Bratton, S.L., Jardine, D.S. and **Mirkes, P.E.** Constitutive synthesis of heat shock protein (72kD) in human peripheral blood mononuclear cells: Implications for use as a clinical test of recent thermal stress. *Int. J. Hyperthermia* 13:157-168, 1997
- Thayer, J.M. and **Mirkes, P.E.** Induction of Hsp 72 and transient nuclear localization of Hsc 73 and Hsp 72 correlate with the acquisition and loss of thermotolerance in postimplantation rat embryos. *Develop. Dynamics* 208:227-243, 1997.
- Sadler, T.W., Rogers, M., Slavkin, H. Lauder, J., Maness, P., Linney, E., Sulik, K., and **Mirkes, P.** Growth and differentiation factors. *Repro. Toxicol.* 11:331-337, 1997.
- **Mirkes, P.E.**, Little, S.A., Cornel, L., Welsh, M.J., Laney, T-N.N. and Wright, F.H. Induction of Heat Shock Protein 27 (Hsp 27) in rat embryos exposed to hyperthermia. *Mol. Repro. Develop.* 45:276-284, 1996.
- **Mirkes, P.E.** Prospects for the development of validated screening tests that measure developmental toxicity potential: the view of one skeptic. *Teratology* 53:334-338, 1996.
- Qwihee P. Lee, Park, H.W., Thayer, J., **Mirkes, P.E.** and Juchau, M.R. Apoptosis induced in cultured rat embryos by intra-amniotically microinjected sodium nitroprusside. *Teratology* 53:21-30, 1996.
- Little, S.A. and **Mirkes, P.E.** Clusterin expression during programmed and teratogen-induced cell death in the postimplantation rat embryo. *Teratology* 52:41-54, 1995
- Thayer, J.M. and **Mirkes, P.E.** Programmed cell death and N-Acetoxy-2 Acetylaminofluorene induced apoptosis in the rat embryo. *Teratology* 51: 418-29, 1995
- Thayer, J.M., Giachelli, C.M., **Mirkes, P.E.** and Schwartz, S.M. Expression of osteopontin in the head process late in gastrulation in the rat. *J. Expt. Zool.* 272:240-44, 1995
- Fujinaga, M., Park, H.W., Shepard, T.H., **Mirkes, P.E.** and Baden, J.M. Staurosporine does not prevent adrenergic-induced situs inversus, but causes a unique syndrome of defects in rat embryos grown in culture. *Teratology* 50:261-274, 1994.
- Cunningham, M.L. MacAuley, A. and **Mirkes, P.E.** From gastrulation to neurulation: transition in retinoic acid sensitivity identifies distinct stages of neural patterning in the rat. *Develop. Dynamics* 200:227-241, 1994.
- Burk, D.T., and **Mirkes, P.E.** Summary of the 1993 Teratology Society Public Affairs Committee Symposium: "Folic Acid Prevention of Neural Tube Defects: Public Policy Issues. *Teratology* 49:239-241, 1994.
- **Mirkes, P.E.**, Doggett, B., Cornel L. Induction of a heat shock response (HSP 72) in rat embryos exposed to selected chemical teratogens. *Teratology* 49:135-142, 1994.