Keith Raymond Cooper, Ph.D.

Professor of Toxicology
Department of Biochemistry and Microbiology

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76 Lipman Drive, Lipman Hall Room
123 New Brunswick, New Jersey 08903

EDUCATION

1981	Thomas Jefferson University, Philadelphia, PA, M.S. Industrial Toxicology
1979	University of Rhode Island, Kingston, RI, Ph.D. Animal Pathology
1976	Texas A&M University Galveston, TX, M.S. Marine Biology
1973	The College of William & Mary, Williamsburg, VA, B.S. Biology

EMPLOYMENT HISTORY

1994 – present	Professor I, Department of Biochemistry/Microbiology
1986 - 1994	Associate Professor, Department of Biochemistry/Microbiology
1981 – 1986	Assistant Professor, Rutgers University, Joint Graduate Program in

	Toxicology, Department of Biochemistry/Microbiology, Cook College, New Brunswick, NJ
2005 – 2006	Executive Vice Dean of Agriculture and Natural Resources and Executive Director of Rutgers' EcoComplex
2002 - 2005	Dean of Research & Graduate Programs/Cook College, Senior Associate Director/New Jersey Agricultural Experiment Station (NJAES)
2003 - 2005	Acting Executive Dean of Agriculture and Natural Resources, Executive Director of New Jersey Agricultural Experiment Station, Dean of Cook College
2001 - 2002	Associate Dean of Research and NJAES, Cook College, Rutgers University
1999 - 2001	Chairman, Department of Biochemistry and Microbiology, Cook College Rutgers University
1979 -1981	NIEHS Postdoctoral Fellow in Toxicology, Department of Pharmacology, Thomas Jefferson University, Philadelphia, PA

GRADUATE PROGRAM AFFILIATIONS

2005 – present	Ecology, Evolution and Natural Resources
1993 - 2008	Option Coordinator: Environmental Toxicology Option in Environmental Science Graduate Program
1984 - present	Member: Environmental Science Graduate Program
1992 - 2011	Deputy Director: NIEHS Training Grant, Joint Graduate Program in Toxicology (JGPT)
1998 - 1999	Acting Director JGPT
1992 - 1997	Environmental Toxicology Track Coordinator
1981 - present	Member: Joint Graduate Program in Toxicology
1992 - present	Member: Institute for Marine and Coastal Sciences

HONORS

Sigma Xi, Vice President Hudson/Delaware SETAC Chapter (1988), President and President Elect Hudson/Delaware Society of Environmental Toxicology and Chemistry (SETAC) Chapter (1989-1991), SETAC Academic Committee (1987-1989), Liaison between SETAC and Society of Toxicology (1989-1996), Chairman and member NJ Governors Pesticide Council 1991-2005, Member N.J. Bioterrorism Task Force (2001-2006). NJ Sea Grant Chair SGOC Board of Trustees 2011-present. Section Editor Water: Handbook of Sustainable Engineering (2013). Hudson/Delaware SETAC Chapter Board (2012-2015). NJDEP SAB Water Quality and Quantity Standing Committee 2012-2017. Chair Drinking Quality Institute, NJDEP 2014-present.

PUBLICATIONS
2000 - 2017

1. Ravit, B., **Cooper, K.R**., Buckley, B. Moreno, G. Yang, A. Deshpande, S. Meola, D. Jones, A. Hsieh D. (2017). Microplastics in Urban Freshwaters: Conduit for Persistent Organic Pollution. AIMS Environmental Sciences (Environ 2017245 Under Review)

2. Post, G., Gleason, J.A., and **Cooper K.R.** (2017). Key scientific issues in developing drinking water guidelines for perfluoroalkyl acids -contaminants of emerging concern. Plos One Biology. (Accepted).

3. Jantzen, C.E., Annunziato, K.M, and **Cooper K.R**. (2017). Effects of Chronic Perfluorooctanoic Acid (PFOA) at Low Concentration on Morphometrics, Gene Expression, and Fecundity in Zebrafish (Danio rerio). Reproductive Toxicology 69:34-42. doi: 10.1016/j.reprotox.2017.01.009.

4. Jantzen, C.E., Annunziato, K.M, and **Cooper K.R**. (2016). Behavioral, morphometric, and gene expression effects in adult zebrafish (Danio rerio) embryonically exposed to PFOA, PFOS, and PFNA. Aquatic Toxicology 80:123-130. doi: 10.1016/j.aquatox.2016.09.011.

5. Butler, J.D., Letinskia, D.J., Parkerton, T.F., Redmana, A.D., and **Cooper, K.R**.. (2016) Application of passive dosing and quantitative structure-activity relationships to characterize aromatic hydrocarbon toxicity to zebrafish. *Environ. Sci. Technol.*, *50* (15), pp 8305–8315 DOI**:** 10.1021/acs.est.6b01758

6. Jantzen, C.E, Annunziato, K.A, Bugel, S.M. and **Cooper, K.R**. (2016). PFOS, PFNA, and PFOA sub-lethal exposure to embryonic zebrafish have different toxicity profiles in terms of morphometrics, behavior and gene expression. Aquatic Toxicology Vol 175, 160-170. Doi 10 1016/j.aquatox 2016.03.016.

7. Bentivegna, C., **Cooper, K.R**. Olson, G., Pena, E.A., Millemann, D.R. and Portier, R.J. (2015). Chemical and histological comparisons between Brevortia sp. (menhaden) collected in Fall 2010 from Barataria Bay, LA and Delaware Bay, NJ following the Deep Water Horizon (DWH) oil spill. Marine Pollution Bulletin Mar Environ Res. 112(Pt A):21-34. doi: 10.1016/j.marenvres.2015.08.011. Epub 2015 Sep 4 DOI:10.1016/j.marenvres .2015.08.011.

8. Millemann, D.R., Portier, R.J. Bentivegna, C.S. and **Cooper, K.R**. 2015. Particulate accumulation in the vital organs of wild *Brevortia patronus* from the northern Gulf of Mexico after the Deepwater Horizon Oil spill. Ecotoxicology. 24:1831-1847. DOI :10.1007/s10646-015-1520-y.

9. Kung, T.S., Richardson, J.R., **Cooper, KR**., and White, LA. 2014. Developmental deltamethrin exposure causes persistent changes in dopaminergic gene expression, neurochemistry, and locomotor activity in zebrafish. Toxicological Science. In Press. *Toxicol. Sci. first published online April 24, 2015 doi:10.1093/toxsci/kfv087*

10. Ravit, B., **Cooper, K.R**., Quierolo, S., Buckley, B. and Cavendish, E. 2014. Improving Management Support Tools for Reintroducing Bivalve Species [Eastern Oyster (Crassostrea virginica Gmelin)] in Urban Estuaries. Integrated Environmental Assessment & Management Vol. 10, No.4 555-565..

11. Bugel, S.M**.**, Bonventre, J.A., White, L.A., Tanguay, R.L., **Cooper, K.R**., 2014. Chronic exposure of killifish to a highly polluted environment desensitizes estrogen-responsive reproductive and biomarker genes. Aquatic Toxicology 152, 222-231. PMID: 24794048. doi: 10.1016/j.aquatox.2014.04.014

12. Chambers, R.C., Candelmo A.C., Habeck, E.A., Poach M.E., Wieczorek D., **Cooper, K.R**., Greenfield, C.E. and Phelan B.A. 2014. Ocean acidification in the early life-stages of summer flounder, *Paralichthys dentatus*. Biogeosciences,11:1613-1626, doi:10.5194/bg-11-1613-2014.

13. Bonventre, J.A**.**, Kung, T.S., White, L.A., and **Cooper, K.R.** (2013) Manipulation of HIF-Vegf pathway rescues methyl tert-butyl ether (MTBE)-induced vascular lesions, *Toxicol. Appl. Pharmacol*. 273(3):623-34, DOI: 10.1016/j.taap.2013.10.008 [Epub 2013 Oct 12]

14. Butler, J., Parkerton T.F., Letinski, D.J., Bragin, G.E. and **Cooper, K.R**. 2013. A novel passive dosing system for determining the toxicity of phenanthrene to early life stages of zebrafish. Science of the Total Environment. 463-464, 952-958.

15. Bugel, S.M., White, L.A., **Cooper, K.R**., 2013. Inhibition of vitellogenin gene induction by 2,3,7,8-tetrachlorodibenzo-p-dioxin is mediated by aryl hydrocarbon receptor 2 (AHR2) in zebrafish (*Danio rerio*). Aquatic Toxicology 126, 1-8. PMID: 23142599. doi: 10.1016/j.aquatox.2012.09.019

16. Bonventre J.A., White L.A., and **Cooper K.R**. 2012. Craniofacial abnormalities and altered wnt and mmp mRNA expression in zebrafish embryos exposed to gasoline oxygenates ETBA and TAME. *Aquatic Toxicology* 120-1212: 45-53.

17. Ming-Wei C., Po I.P., Laumbach R., Koslosky J., **Cooper K.R**., and Gordon, M. 2012. DEP Induction of ROS in Capillary-like Endothelial Tubes Leads to VEGF-A. Expression. Toxicology 279:73-84.

18. Post, G.A., Cohn, P.D. and **Cooper, K.R**. 2012. Perfuorooctanoic acid (PFOA), and emerging drinking water contaminant: a critical review of recent literature. Environmental Research. 116:93-117.

19. Kozlosky, J., Bonventre, J. and **Cooper, K.R**. 2012. Methyl tert butyl ether (MTBE) is anti-angiogenic in both *in vitro* and *in vivo* mammalian model systems. Journal of Applied Toxicology. March 2012 DOI 10.1002/jat2737.

20. McElroy A., Clarke C.C., Duffy T., Cheng;, B. Gondek, J., Fast, M., **Cooper, K**. and White, L.. 2012. Interactions Between Hypoxia and Sewage-Derived Contaminants on Gene Expression in Fish Embryos. Aquatic Toxicology 108:60-69. http://dx.doi.org/10.1016/j.aquatox.2011.10.017 (2011)

21. Bonventre, J.A., White, L.A., **Cooper, K.R**., (2011) Methyl tert butyl ether targets developing vasculature in zebrafish (Danio rerio) embryos. Aquatic Toxicology, 105: 29-40. DOI: 10.1016/j.aquatox.2011.05.006 [Epub 2011 May 13]

22. McCormick J.M., Van Es T., **Cooper K.R**., White L.A., and Häggblom M.A 2011. Microbially Mediated *O*-methylation of BPA results in metabolites with increased toxicity to the developing zebrafish (*Danio rerio*) embryo. *Environmental Science and Technology*. 45(15):6567-74.

23. Bugel, S.M., White, L.A., **Cooper, K.R.,** 2011. Decreased vitellogenin inducibility and 17β-estradiol levels correlated with reduced egg production in killifish (*Fundulus heteroclitus*) from Newark Bay, NJ. Aquatic Toxicology 105 (1-2), 1-12. PMID: 21684236. doi: 10.1016/j.aquatox.2011.03.013

24. Ming-Wei Chao, John Kozlosky, Iris P. Po, Kathy K. H. Svoboda, Robert Laumbach, **Keith Cooper** and Marion K. Gordon 2011. Capillary endothelial tubes as an in vitro culture model to study the effects of diesel exhaust particles. *Toxicology.* 279:73-84.

25. Bugel S.M., White, L.A**., Cooper, K.R**., 2010. Impaired reproductive health of killifish (*Fundulus heteroclitus*) inhabiting Newark Bay, NJ, a chronically contaminated estuary. Aquatic Toxicology 96 (3), 182-193. PMID: 20079544. doi: 10.1016/j.aquatox.2009.10.016

26. McCormick J.M., Haggblom M.M., **Cooper, K.R**., and White L.A. 2010. The Brominated flame Retardant, Tetrabromobisphenol A (TBBPA) and its metabolites, bisphenol A (BPA) and Tetrabromobisphenol A dimethyl ether (TBBPA DME), cause chemical specific lesions in the developing zebrafish (*Dania rerio*) embryo. *Aquatic Toxicology* 100:255-262

27. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: Assateague Island National Seashore. Natural Resource Technical Report NPS/NCBN/NRTR—2010/348. National Park Service, Fort Collins, Colorado. 234p

28. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats at Thomas Stone National Historic Site. Natural Resource Technical Report NPS/NCBN/NRTR—2010/343. National Park Service, Fort Collins, Colorado.

29. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: Sagamore Hill National Park. Natural Resource Technical Report NPS/NCBN/NRTR—2010/344. National Park Service, Fort Collins, Colorado. 184p.

30. **Cooper, K. R.,** M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: Colonial Historical National Park. Natural Resource Technical Report NPS/NCBN/NRTR—2010/355. National Park Service, Fort Collins, Colorado.312p.

31. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: Fire Island National Seashore. Natural Resource Technical Report NPS/NCBN/NRTR—2010/332. National Park Service, Fort Collins, Colorado. 300p.

32. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: Gateway National Recreation Area. Natural Resource Technical Report NPS/NCBN/NRTR—2010/339. National Park Service, Fort Collins, Colorado. 392p.

33. **Cooper, K. R**., M. Borjan. 2010. Northeast Coastal and Barrier Network assessment of contaminant threats: George Washington Birthplace National Monument. Natural Resource Technical Report NPS/NCBN/NRTR—2010/330. National Park Service, Fort Collins, Colorado. 224p.

34. Domico, L. Yang I, Buckley B., Zeevalk, G.D. and **Cooper, K.R**. 2010. Measurement of the Mn/Zn-ethylene-bis-dithiocarbamate Mancozeb in biological matrixes and demonstration of uptake by neuronal cells. *Tox. Sci*. (submitted).

35. Hillegass, J., Villano, C.V., **Cooper, K.R**., and White, L.A**.** 2010. The role of matrix metalloproteinase expression in zebrafish (*Danio rerio*) craniofacial development. *Matrix Biology* (in revision).

36. DeMicco, A.. **Cooper, K.R.,** Richardson, J.R. and White, L.A.. 2010. Developmental Neurotoxicity of Pyrethroid Pesticides in Zebrafish Embryos. *Tox. Sci*. 2010 113(1):177-186; 2009 doi:10.1093/toxsci/kfp258.

37. **Cooper** K.R.and Wintermyer M. 2009. A Critical Review: 2,3,7,8 –tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) effects on gonad development in bivalve mollusks. *J. Envir. Science and Health Part C* . 27:226-245.

38. Post, G.B., Louis J.B. Louis, **Cooper**, K.R., Boros-Russo, B.J. and Lippincott, R.L. 2009. Occurrence and potential significance of perfluorooctanoic acid (PFOA) detected

in New Jersey public drinking water systems. *Envir. Sci. Technol*. 43, 4547-4554.

39. Gutierrez, M. M., Golden, D. M., **Cooper, K.R**., Reuhl, K.A., Ledoux, T. A. and Robson, M. G. 2009. Variation in secondary sexual characteristics in male frogs (*Rana catesbeiana* and *R. clamitans melanota*) from New Jersey agricultural fields. *Herpetological Review*.

40. Spitsbergen, J. M., Blazer, Vicki S., Bowser, Paul R., Cheng, Keith C., Cooper, **Keith R., Cooper**, Timothy K., Frasca Jr., Salvatore, Groman, David B., Harper, Claudia M., Law, Jerry M. (Mac), Marty, Gary D., Smolowitz, Roxanna M., St. Leger, Judy, Wolf, Douglas C., Wolf, Jeffrey C., (2008). Finfish and aquatic invertebrate pathology resources for now and the future, *Comparative Biochemistry and Physiology*, Part C 149 (2009) 249–257 doi: 10.1016/j.cbpc.2008.10.002

41. Hillegass, J.M., Villano, C.M., **Cooper, K.R.** and White, L.A. 2008. Glucocorticoids Alter Craniofacial Development and Increase Expression and Activity of Matrix Metalloproteinases in Developing Zebrafish (Danio rerio). *Tox Sci* 102, 413-424.

42. Hillegass, J.M., Villano, C.M., **Cooper, K.R**. and White, L.A. 2007. Matrix metalloproteinase-13 (MMP-13) is required for zebrafish (*Danio rerio*) development and is a target for glucocorticoids. *Tox. Sci*.100(1), 168-179.

43. Domico, L. **Cooper, K.R**., Bernard, l.P. and Zeevalk, G. 2007. Reactive oxygen species generation by the ethylene-bis-diothiocarbamate (EBDC) fungicide mancozeb and its contribution to neuronal toxicity in mesencephalic cells. *Neurotoxicology,* doi:10.1016/j.neuro.2007.04.008.

44. Wintermyer M.L. and **Cooper, K.R**. 2007. The development of an aquatic bivalve model: Evaluating the toxic effects on gametogenesis following 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) exposure in the eastern oyster (*Crassostria virginica*). *Aquatic Toxicology*. **81**, 10-26.

45. Domico, L., Zeevalk, G., Bernard, L., and **Cooper, K**., 2006. Acute neurotoxic effects of Mancozeb and Maneb in mesencephalic neuronal cultures are associated with mitochondrial dysfunction. *Journal of NeuroToxicology.* **27**, 816-825.

46. Patyna, P.J., Brown, R.A., Davi, R.A., Letinski, D.J., Thomas, P.E., **Cooper, K.R**. and Parkerton, T.F. 2005. Hazard evaluation of diisononyl and diiodecyl phthalate in a Japanese Medaka multigeneration assay. *Ecotoxicology and Environmental Safety.* **65** (1), 36-47.

47. Wintermyer, M., Skaidas, A., Roy, A., Yang, Y., Georgapoulos, P., Burger, J. and **Cooper, K**., 2005. The development of a physiological-based-pharmacokinetic (PBPK) model using the distribution of 2,3,7,8-tetrachlorodibenzo-p-dioxin in the tissues of the eastern oyster (*Crassostrea virginica*). *Marine Environmental Research* **60**, 133-152.

48. Gemma J, Mesia-Vela S., Wintermyer ML, **Cooper K.R**, Kauffman FC and Porte C. 2004. Esterification of vertebrate-like steroids in the eastern oyster (Crassostrea virginica). *Marine Environmental Research* **58**, 481-484.

49. Hunter J.G., Burger, J and **Cooper K.R**. 2003. Use of an integrated food web model for Ecological Risk Assessment. *J. Environmental Science and Health.* **38,** 1201-1214.

50. Wintermyer M. and **Cooper K**. 2003. Dioxin/furan and polychlorinated biphenyl concentrations in eastern oysters (*Crassostrea virginica* Gmelin) tissues and the effects on egg fertilization and development. *J. Shellfish Res.* **22**, 737-746.

51. Burger J, Hunter J.G. and **Cooper K. R**. 2001 Using integrated food web and population based models for environmental monitoring and decision making. *Remediation* **12**(1), 87-102.

52. Ward P.M., Wohlt J.E., Zajac P.K. and **Cooper K.R**. 2000. Chemical and physical properties of processed newspaper compared to wheat straw and wood shavings as animal bedding. *J. Dairy Sci*. **83**, 359-367.

53. Rappe C., Anderson R., **Cooper K**., Bopp R., Fiedler H., Howell F., and Bonner M. 2000. PCDDs in naturally-formed and man-made lake sediment cores from southern Mississippi, USA. *Organohalogen Compounds*.

54. Nacci D., Coiro L., Champlin D., Jayaraman S., Munns Jr., W., Specker J. and **Cooper, K.R.** 2000. Adaptation of wild fish populations to dioxin-like environmental contamination. *Marine Envir. Research* **134**, 9-17.

55. **Cooper K.R**. and Patyna S. A 2000. Multi-generation assay evaluating phthalates in Japanese medaka (*Oryzias latipes*) and biochemical imprinting. Endocrine-disrupting Substance Testing in Medaka, International Symposium. Environmental Agency, Government of Japan. pp. 44-46.

56. Iba I. M., Fung J., **Cooper K.R**., Thomas P.E., Wagner G., Park Y. 2000. Effect of gestational and lactational 2,3,7,8-tetrachlorodibenzo-p-dioxin exposure on the level and catalytic activities of hepatic microsomal Cyp1A in prepubertal and adult rats. *Biochemical Pharmacology* **59**, 1147-1154.

57. Patyna, P.J. , Davi, R.D , Parkerton, T.F., Brown, R.P., and **Cooper K.R**. 1999. A proposed multi generational protocol for Japanese medaka *Oryzias latipes* to evaluate effects of endocrine disrupters. *The Science of the Total Environment* **233**, 211-220.

CHAPTERS IN BOOKS

Cooper, K.R. and Snyder, R. 1988. Benzene Metabolism as it Relates to Molecular Aspects of Benzene Toxicity, Chapter 4: In: *Benzene Carcinogenicity*. Ed. Muzaffer Askoy, CRC Press, Inc. Boca Raton, FL. 33-58 pp.

Cooper, K.R. 1989. Regression of Neoplasms in Invertebrates, Chapter 72: *In: Progressive Stages of Malignant Neoplastic Growth*. Ed. H.E. Kaiser, Martinus Nijhoff, Dordrecht, The Netherlands. 37-40 pp.

Cooper, K.R. 1989. Metastasis of Invertebrate Neoplasms, Chapter 106a: *In: Progressive Stages of Ma*lignant *Neoplastic Growth*. Ed. H.E. Kaiser, Martinus Nijhoff, Dordrecht, The Netherlands, 30-37 pp.

Cooper, K.R. 1990. Effects of Pesticides on Wildlife, Chapter 11: *In: Encyclopedia of Pesticide Toxicology*, Eds. W. J. Hayes, Jr. and E. R. Laws, Academic Press, Inc., 463-491 pp.

Cooper, K.R., Christini, A. and Bernard, S. 1991. The Distribution of 2,3,7,8 -tetrachlorodibenzo -p-dioxin in juvenile blue crabs (*Callinectes sapidus*) and the Physiological Effect of Consumption of Food from a Polluted Environment on this Species :*In: Persistent Pollutants in the Marine Environment*, Eds. C.S. Walker and D. Livingston, Plennum Press, 49-62 pp.

Cooper, K.R. and Cristini A. 1994. The Effects of Oil Spills *o*n Bivalve Mollusks and Blue Crabs: In*: Before and After an Oil Spill*: The Arthur Kill Eds. J. Burger and M. Gochfeld, Rutgers Press.

Cooper, K.R. 2013. Sustainable Water:Introduction. Handbook of Sustainable Engineering. (Section Editor Water). Editors J. Kauffman and KM Lee, Springer p.113-117.

Cooper, K.R. 2013. Fundamental Toxicology Methods and Resources for Assessing Water Related Contamination Chapter 10. Handbook of Sustainable Engineering. Editors J. Kauffman and KM Lee, Springer p. 137-162.

Annunziato, K and Cooper, K.R. 2017. The Impact of Early Developmental Exposure to Stressors Related to Individual Fitness in Aquatic Organisms and the Subsequent Reproductive Success and Failure on Populations. Chapter xx. (Accepted In Press).

INVITED SCIENTIFIC CONFERENCE PRESENTATIONS, LECTURES, DEMONSTRATIONS and FINAL REPORTS 2000-2017

Hudson Delaware SETAC Chapter, Dinner Meeting speaker. Our Current State of Knowledge Regarding Chronic Chemical Exposure and Genetic Selection in Teleosts. August 3, 2017.

NOAA Sandy Hook Laboratory, Seminar Series. Newar/Raritan Bay Studies Examining Oysters and F. heteroclitus as Biomonitoring Tools. July 18, 2017.

Hudson Delaware SETAC Chapter, Jamaica Bay Wildlife Refuge, NY. Evaluation of Chemicals of Concern (COC) and inputs into biota from Jamaica Bay carried out for the National Park Service. April 23 and 24, 2014.

NJDEP, Office of Science, Research Seminars, . Impacts of Crude Oil Exposure on Menhaden, a Filter Feeder with a High Functional Important Value, Trenton, NJ, April 3, 2014.

Seton Hall Department of Biology Seminar Series. Peflouro Compounds an Unusual Class of Environmental Chemicals of Concern. October 24, 2013.

Hudson Delaware SETAC Chapter. Perflouro Compounds (PFCs) as Persistent, Bioaccumulative, and Toxic (PBTs) Compounds in Drinking Water and Wildlife. Duke Farms, New Jersey. Spring October 23, 2013 meeting.

NOAA Howard Marine Laboratory, Sandy Hook Seminar Series. Impacts of PAHs on Menhaden living in Gulf of Mexico compared to Delaware Bay Menhaden. May 2013.

Hudson Delaware SETAC Chapter: Dinner meeting speaker Crude oil Impact on Gulf of Mexico Menhaden. February 2013.

NJDEP –Final Report: Examining the presence and biological activity of pharmaceutical and organic waste products in waste water treatment facilities. p. 46. December 2012.

4rth Passaic River Symposium: Altered Gonadal Development in Aquatic Organisms in Newark Bay. June 2010.

Hudson/Delaware SETAC: In vivo and in vitro methods for detecting estrogenic compounds in waste streams. April 2010.

Fermentation Seminar: Perfluorooctanoic acid (PFOA) an Unusual Environmental Chemical of Concern. March 2010.

Exxon/Mobile Seminar Series: Methyl-tertbutyl ether is anti-angiogenic in rodent and fish model systems. What is the Mechanism(s)? March 2009.

NJDEP Seminar Series, Historical and Current Impacts from Environmental Chemicals.

Trenton, N.J. April 2008.

University of Maine, Impacts of Legacy and Emerging Contaminants on Coastal Aquatic Ecosystems. Orno, Maine October 2008

Society of Toxicology and Environmental Chemistry November 2007. Environmental Epidemiology using the Eastern Oyster (Crassostrea virginica) Examining Reproductive Endpoints. Invited platform presentation. Nov. 2007.

Cooper, K.R. Keynote Speaker: Hindsight 20/20 or 20/200? Historical Lessons from Environmental Chemicals. NESETAC meeting June 2007.

Cooper, K.R. Opening Remarks: Extinction of Toxicology? Mid-Atlantic Chapter Society of Toxicology, Fall 2006 meeting Neurotoxicology: Basics and Beyond. Bordentown, New Jersey October 2006.

Cooper, K.R. New Jersey State Agriculture Convention. Future of Land Grant Institutions & Cooperative Extension. Agricultural industry Joint Leadership Meeting. January 24-25, 2005.

Cooper, K.R. Reproductive Impacts of Persistent Organic Compounds on Aquatic Invertebrate Organisms: Passaic River Symposium: Who's Doing What? Montclair State University and NJDOT. Montclair, New Jersey June 9, 2004.

Cooper, K.R. What is The Role of Good Science in Assessing Comparative Risks Dealing with Seafood Consumption? Symposium: Seafood: Assessing the Benefits and Risks. Rutgers Cooperative Extension. New Brunswick, New Jersey. June 8, 2004.

Cooper, K. R. Reproductive Effects of Low Dose Chronic Exposure of Dioxin-Like Compounds on Aquatic Organisms, Implications for Ecosystem Health: A Case study of Eastern Oyster (*C. virginica*) during Gametogenesis. Baltic Envirovet. Vilinius, Lithuania October 15-19, 2003.

Cooper, K.R. Determination of New Jersey Specific Soil Bioaccumulation Factors Using *Lumbricus terrestus*. N.J. Department of Environmental Protection Lecture Series. Trenton, N.J. March 4, 2003.

Cooper, K.R. and Patyna, S. A multi-generation assay evaluating phthalates in Japanese medaka (*Oryzias latipes)* and biochemical imprinting. International Symposium: Endocrine-Disrupting Substance testing in Medaka Nagoya, Japan, March 17-20, 2000

Cooper, K.R. Endocrine disruptors. (Platform Presentation) Hudson-Delaware SETAC Meeting. Stockton, NJ April 27, 2000

Cooper, K.R. Impact of endocrine compounds on reproductive success at the population level (Keynote Speaker). Persistent Contaminants Taipai, Taiwan. May 31, 2000.

RESEARCH INTERESTS

My main research interest is comparative toxicology. Over the years, I have carried out research that involves rodent models to understand potential human hazards from xenobiotics, and I am still involved in an anti-angiogenesis compound for brain tumors. My main research involves using invertebrates and lower vertebrates as model systems to better characterize environmental impacts on sentinel species in the wild. My current research examines the effects of endocrine disrupting compounds on finfish and bivalve mollusks. The compounds of current interest include dioxin-like compounds and phthalates. The model systems used for these studies include the Fundulus species, Zebra fish, and the Eastern oyster. The research on the finfish involves the development of multi-generational studies examining the effects at multiple levels of organization from biochemical to population endpoints. The studies on the American oyster are examining the effects on gonad development and larval development. Both food web and physiological-based-pharmacokinetic models are also being developed in collaboration with researchers at Rutgers and several other institutions. These models will enable to better predict chemical movement both in the environment, as well as within the organism of concern.

TEACHING UNDERGRADUATE AND GRADUATE COURSES

Most my teaching has focused around the development of graduate courses related to the Joint Graduate Program in Toxicology which I was involved in establishing in 1981 and continue today as the Deputy Director. I have also developed several undergraduate courses that are elective courses in the Biochemistry curriculum and graduate course for the Environmental Sciences graduate program.

Courses lectured in since 1981 (multiple lectures/sections). General Pharmacology I & II (undergraduate-lecturer), General Toxicology I & II (graduate-lecturer), Pathology and Histology (graduate-lecturer & co-course director), Molecular Toxicology (graduate/undergraduate-lecturer), Mammalian Physiology (graduate-lecturer & co-course director), Perspectives on Agriculture and the Environment (undergraduate-section lecturer).

Courses developed:

Biochemical Mechanisms of Toxicology: 01:115:422. This course is an upper level undergraduate elective in Biochemistry. 1983-present offered every year.

Toxicology Laboratory: 16:963:602. This course is an elective course in the Joint Graduate Program in Toxicology program. It has been recently updated to include a number of molecular techniques. The course is currently offered in alternate years.

Environmental Toxicology Seminar: 16:963:601. This course is a required seminar series taught by myself every other year.

Ecological Risk Assessment: 16:215:555. This course was co-developed with another faculty

member in ecology. This is the track course for the Environmental Toxicology Track in both the JGPT and Environmental Science graduate programs.

STUDENT TRAINING

Postdoctoral Trainees/Public Health Intern*: (identified by name and years of training).

Dr. Quasar Tarique	2015-1017
Ms. Pooja Chung	2009-2010*
Dr. Zhanpeng Yuan	2002 –2005.
Dr. Shaoyuan Zhang	2000 - 2002
Dr. Rupindar Kaur	1993 - 1996
Dr. Maria Moreno	1989 - 1991
Dr. Anita George-Ayers	1988 - 1989
Dr. Jan Spitzbergen	1987 - 1988
Dr. Francis Doherty	1986 - 1987

GRADUATE STUDENTS: graduated-23 Doctor of Philosophy students, and have graduated 12 Master of Science Degree students. What is shown below is a table listing the students that I have been their primary advisor, their research area and where they are currently employed.

Doctor of Philosophy Students (1985 – present)

Name, Degree/yr. Program	Area of Research	Current Position
1. V. Kindt, Ph.D./1985, JGPT	Benzene/finfish/model	V.P. Toxicology Merck, PA (*Retired* now private consulting)
2. M.Berardi, Ph.D./1985, JGPT	MCA/Mice/toxicity	Sr. Toxicologist, Schering, NJ *Retired* Consulting
3. J. Schell, Ph.D./1987, JGPT	Low mol wt. Chlorine cmpds.	Principal Consulting firm TX (*Retired*)
4. J. Matroka, Ph.D./1989, JGPT	MCA/Rat/antidote	Metabolite Identification, Bristol/Meyers/Squibb, NJ (*Retired* Assoc. Prof. FSU)
5. J. Wisk, Ph.D./1990, JGPT	Dioxin/finfish embryos	Sr. Toxicologist, BSFS, NC
6. C. Bentivegna, Ph.D./1991, Env. Sci.	B(a)P/aquatic insect/ chromosome puffing	Former Chair, Dept. Biology Seton Hall, NJ Faculty Member
7. R. Prince, Ph.D./1993, JGPT	Dioxin/resistant populations/ genetic selection	Program Director Human/Envir. Health Risk, USEPA, Region III
8. R. Brown, Ph.D./1995, JGPT	Dioxin/bivalve/endocrine	Sr. Environmental Manager, Exxon/Mobile TX
9. C. Olivieri, Ph.D./1996, Env. Sci.	Dioxin & PCBs/finfish/ development	International Envir. Affairs/ BSFS, NC Deceased 2010
10. J. Gould, Ph.D./1996, Envir. Sci.	PCBs/avian/endocrine	Director Bristol/Meyers/Squibb, Envir. Toxicologist, NJ
11. Y.K.Kim, Ph.D./1997, Env. Sci.	PCB congener mixtures & dioxins/finfish	Professor, Seoul National Univ., Korea
12. C.M. Chen, Ph.D./1998, Envir. Sci.	Dioxin congener toxicity/finfish	Chairman/Provost, Dept. Envir. And Health, Taiwan University
13. P.J. Patyna, Ph.D./2000, JGPT	Phthalates/finfish/ Endocrine	Reproductive Toxicologist, Pfizer Phama., CA
14. M. Wintermyer, Ph.D./2004 JGPT	Dioxin/bivalve/reproduction	EPA Post Doctoral Fellow RTP, North Carolina (*Retired*)
15. R. Zalesky Ph.D./ 2006 Envir. Sci. Co-Adv.	Ozone Toxicity in Plants	Exxon/Mobile Research Scientist Milltown, NJ
16. L. Domico. Ph.D/~2006/JGPT	Fungicide/mice/neurologic PD	Assistant Professor, Chestnut Hill College, Pennsylvania
17. J. Hillegass, Ph.D./2007/JGPT	Corticosteroids effects on zebrafish	Senior Toxicologist Bristol/Myers Squibb, NJ
18. S. Bugel, PhD Env. Sci. 2011.	Endocrine Biomarkers in finfish	Research Assist. Professor Univ. of Oregon, NIEHS Training Grant.
19. J. Kozlosky, Env. Sci. PhD/2010	MTBE/Diesel Particle on Angiogenesis	Bristol Meyers Squibb, Princeton, Senior Researcher
20. J. Bonventre / JGPT PhD/2012	MTBE, ETBE, TAME Effects on Angiogenesis	Post-Doctoral Fellow Univ. of Oregon, NIEHS Training Grant.
21. J. Butler/ Envir. Sci. PhD/2013	Passive Exposure and Developmental Effects Using Zebrafish	Manager/Research Scientist Exxon/Mobile, NJ
22. Carrie Greenfield/Envir. Sci. PhD 2016	PFOS/PFOA/PFNA Effects on Zebrafish	Avon PCP Toxicologist I Suffern, NY
23. Daniel Millemann/ Envir. Sci. PhD 2016	BP Oil Spill and Particulate Toxicity	Research Scientist I, NJDEP Office of Sci. & Research
24. Kate Annunziato/JGPT PhD	Alternative PFC MOA chemical exposure/ JGPT	4th year anticipated graduation 8/2018
25. Gina Moreno Env. Sci. MS	Plastic Beads & Particulate Toxicity /	1rst yr.

Master of Science Students (1999/2013)

M. Wintermeyer* - Effects of 2,3,7,8-TCDD on Development and Calcium Deposition in the Larvae of the American oyster (Crassostrea virginica) Environmental Science Graduate Program, Master of Science, **Graduated May 1999.** Primary Advisor

Susan Adair - Effects of multiple chemical exposures from wood treatment facilities on the Japanese medaka. Environmental Science Program, Master of Science. **Graduated May 2000**. Primary Advisor.

Amy Blankenship - Effects of Sewage Effluent on the Reproduction of Mysid Shrimp. Environmental Science Graduate Program, Master of Science. **Graduated May 2000**. Primary Advisor.

Christina A. Beck – Effects of Ergocryptine on reproduction and CNS dopamine levels in the Japanese medaka. Joint Graduate Program In Toxicology. Master of Science. **Graduated May 2001**. Primary Advisor.

Dawne Gaskin - Toxicity and Mutagenicity Associated with Different Sources of CCC. Environmental Science Graduate Program, Master of Science. **Graduated May 2002.** Primary Advisor.

Sebiha Ahmeti – Brownfield Regulation and their Approach to the Eastern European Countries. Environmental Science Graduate Program, Master of Science. **Graduated May 2002.** Primary Advisor.

Jedd Hillegass* - Development of NJ-Specific Soil Bioaccumlation Factors Using *Lumbricus terrestris*. Environmental Science.Graduate Program, Master of Science **Graduated May 2003**. Primary Advisor.

Ana Cardoso – Evaluation of 2,3,7,8-Tetrachlorodibenzo-p-dioxin effect on cells in mammalian skin., Environmental Science Graduate Program M.S. **Graduated January 2004**. Co-advisor with Dr. Lori White.

Dan Millemann* – Effects of BP Oil Spill on Menhaden. Environmental Science. Graduate Program, Master of Science. Primary Advisor. Defended 12/2013.

- Continued on after doing a Master's Degree for the PhD.

Thesis and/or Oral Examination Committees

K. Bircsak	Toxicology Program	2015
O. Nnodi	Toxicology Program	2014
R. Manning	Environmental Science	2012-present
C. Gibson	Toxicology Program, Ph.D.	2013
T. Kung	Toxicology Program, Ph.D.	2013
K. Cruz	Toxicology Program	2014
P. Crosby	Env. Sci.	2012
J. Gondek	Stony Brook, MS (outside member)	2011
Sophia Johnson	Env. Sci,/IMCS Ph.D.	2010
Katie Soko	JGPT, PhD.	2010
John Francois	Newark Biology (outside member)	2011
Jessica McCormick	Microbiology, Ph.D.	2010
Jen Louden	Env. Sci. MS	2010
Caren M. Villano	JGPT, Ph.D.	2007
Allison Candeno	EENR, Ph.D.	2007
Qaiser Tarique	EENR, Ph.D	2007
Yi-Hua Jan	JGPT, Ph.D.	2007
Marisol M. Guitierra	EENR, Ph.D.	2007

UMDNJ School of Public Health

Anupama Neelakanta: Site supervisor for her field work component on the National Park Service Project. 2005-2006.

Undergraduate Honors & Research Students

Kathleen Vincent Research GH Cook 2013-2016
Nicole Guzman, Reader GH Cook Honors 2016
Fatima Toor, Research 2013-1015
Ghadeer Abuhamdeh, Research 2012-2015
Lara Romano G.H. Cook 2013-2015
Luisa Becker Bertotto: Brazilian Mobility Program of Brazil 2012-2013
Amy Suhotliv: George H. Cook Honors Reader 2012-2013.
Karan Mirchandani: Biological Sciences, Independent Study 2011-2013
Geoffrey Tucker: Research 2010-2012
Shraddha Desai: Research 2010-2012
Aaron Lula: George H. Cook Honors 2009-2010
Vita Turutaite: Research 2009-2010
Arthur Omondi: Research 2009-2010
Cassandra Busler: George H. Cook Honors Sophomore Research 2009-2010
Victoria LaPrete: Mabel Smith Douglas Honors Program: faculty second reader 2005-2006.
Daniel Kagan: George H. Cook Scholars Project: reviewer 2005-2006.
Bret Elo: George H. Cook Scholars Project: reviewer 2005-2006.
Jenna Ciano: Cook Co-op, 2004-2005

Service Related Activities:

Department of Biochemistry & Microbiology:

Acting Chair Spring 2013 and when Chair is Out of the Office 2013-present
Session Chair Biochemistry Section G.H. Cook Honors 2009, 2010, 2011.
Outside reviewer for tenure/promotion Entomology 2013.
Mentoring Committee for Dr. Bill Beldon: 2009-2011.
Mentoring Committee for Dr. Lori White: 2005-2008.
Dept. of Biochemistry, Merit Awards Committee 2009, 2016 and 2017.
Departmental Seminar Coordinator or Co-coordinator: Fall 2007, Spring 2009.
JGPT: Curriculum Committee for the JGPT for the 2009-2012, Academic Standing Committee 2011-present, Examination Committee 2009-2011, 2013, Chair Examination Committee 2014-present.

University Related:

United States Geological Survey: NJ Water Resources Research Institute Board Member 1990 – 2005
University and State Bioterrorism Task force member 2001 – 2007.
Central University: Planning and Implementation Steering Committee (reorganization) Member 2003.
New Brunswick Faculty Council 2009-2012
Faculty Senate - Faculty Affairs and Personnel Committee Member 2003 –2006.
Rutgers University Presidential Search Committee 2002.
P-16 Committee for teacher education (science and math) 2004 – 2006.
University delegate for Council for Environmental Deans and Directors 2004 – 2006.
Dept. Animal Science (external member) Undergraduate Education Retreat August 2009. Endocrinology Working Group, for undergraduate minor.
General Honors Program Committee SEBS 2009-2011/2012-2015.
Buildings, Grounds, and Infrastructure SEBS 2009-2012.
Search committee: EOHSI Director/Chair Environmental & Community Medicine 2015.
Outside faculty member for promotions: Entomology, Landscape architecture.
Member EOHSI Director and Chair committee search 2015 and 2017.

State Related:

NJDEP: Chair Drinking Water Quality Institute & Member Health Effects 2014-present.
NJDEP: SAB: Water Quality & Quantity Standing committee 2010-Present.
NJDEP: Pesticide Control Council Member (1990-2005/Chair 1996-2000).
NJDOA: Aquaculture Advisory Council Member 2001-2006.
NJCAT: Member Board of Directors 2003-2006.
State Agriculture Development Committee (Farmland Affordability/Availability Working Group) 2003-2005.

NJ Sea Grant Member Board of Directors 2004-present.
NJ Sea Grant Chair SGOC Board of Trustees 2011-2015. Reappointed 2015-2019.

NJ Sea Grant Executive Committee of the Board of Trustees and Board Member:
the NJ Marine Sciences Consortium/NJ Sea Grant 2007-present.
NJDEP Drinking Water Health Effects sub-committee 2008 – present
NJDEP SAB- Nutrients Surface Water contaminants 2011-present.

NJ Agricultural Experiment Station Related:

Experiment Station North East Research Association: NRSP Review Committee Member national and regional.
NRSP 1: Administrative Advisor 2003-2005.
New Brunswick Faculty Council representing SEBS Extension Specialists 2007-2010.

Other Activities:

External Faculty Promotion Evaluator: University of Maryland, USEPA, Oregon State, University of Michigan.

EDITORIAL REVIEW: GRANT & STUDY SECTION REVIEWER & NATIONAL PANELS

Journal Reviewer :

Aquatic Toxicology (Editorial Board)
Bulletin of Environmental Contamination & Toxicology (Editorial Board)
J. SAR and QSAR

Chemosphere
Cell Biology and Toxicology
Environmental Health Perspectives
Toxicology and Applied Pharmacology
Ecotoxicology

Fundamental and Applied Toxicology
J. of Invertebrate Pathology
J. of Aquatic Health
J. National Cancer Institute
J. of Risk Research
J. of Water, Air and Soil Pollution
Environmental Toxicology and Chemistry
Toxicological Sciences
American Standards and Testing Materials
Histology and Histopathology

Panels and/or Grant Reviewer:

U.S. Environmental Protection Agency: Health Effects Working Group on 2,3,78-TCDD (Dioxin Reassessment); Workshop on Ecological Risks of 2,3,7,8-TCDD and "Framework for Ecological risk Assessment" document; STAR Fellowship grant reviewer and Office of Exploratory Research and Endocrine Disruption. USEPA ad hoc reviewer Technical Review Board for Promotion.
National Academy of Science: Committee member on the Implications of Dioxin in the Food Supply 2001-2003.
National Sea Grant Program Reviewer: Maryland, UNC, Connecticut, Maine, Michigan and

New York and Long Island Sound Review Committee..
Shota Rustaveli National Science Foundation of Georgia (SRNSF) International Peer-Reviewer (2009-present).

Miscellaneous Agencies: Hudson River Foundation, US Geological Society, Department of Defense (Gulf War Illness Program), NJ Department of Environmental Protection., Union of Concerned Scientist (member). Equine Science Center, reviewer 2006 – 2010