BIOGRAPHICAL SKETCH

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NAME: Vanden Heuvel, John Patrick

eRA COMMONS USER NAME (credential, e.g., agency login): jpvheuvel2

POSITION TITLE: Professor of Molecular Toxicology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Wisconsin-Madison	B.S.	1986	Pharmacol./Toxicol.
University of Wisconsin-Madison	Ph.D.	1991	Toxicology
National Institutes of Environmental Health Sciences (NIEHS)	Post-Doc	1991-1993	Biochem. Toxicol.

A. Personal Statement

The main focus of research is in the area of nuclear receptors, chemoprevention, and gene expression. Of particular interest are the peroxisome proliferator-activated receptors (PPARs) and their role in lipid metabolism, inflammation, obesity, diabetes and cancer and their ability to be regulated by ω3-PUFAs. These studies are performed in a variety of cell culture, animal and human clinical studies utilizing biochemical and molecular biology tools. The present application represents an area of research focus and all the tools necessary are available.

B. Positions and Honors

1987-1991	Research Assistant and NIEHS trainee, Environmental Toxicology Center, University of Wisconsin-Madison
1991-1993	Intramural Research Training Award post-doctoral Fellow, National Institute of Environmental Health Sciences, Research Triangle Park, N.C.
1993-1996	Assistant Professor, Department of Pharmacology and Toxicology, Purdue University, West Lafayette, IN
1997-2000	Assistant Professor, Department of Veterinary Science, Penn State University, University Park, PA
2000-2006	Associate Professor, Department of Veterinary Science, Penn State University, University Park, PA
2006-present	Professor, Department of Veterinary and Biomedical Sciences, Penn State University, University Park, PA
2004--present	Program Coordinator, Toxicology Program, Penn State University, University Park, PA
2004-present	Co-Director, Center for Excellence in Nutrigenomics, Penn State University, University Park, PA
2005-present	Founder and Chief Scientific Officer, Indigo Biosciences, Inc., State College, PA
2016	Spectrum Award, Institute for the Advancement of Human Potential, Philadelphia PA
2018	Pharmacology-Toxicology Alumni of the Year, University of Wisconsin, School of Pharmacy, Madison WI

C. Contribution to Science

For a complete list of peer reviewed publications by John P. Vanden Heuvel go to https://www.ncbi.nlm.nih.gov/sites/myncbi/john.vanden heuvel.1/bibliography/52574241/public

Nutrigenomics of dietary fatty acids

Diets rich in ω3 polyunsaturated fatty acids (ω3-PUFAs) such as alpha-linolenic acid, eicosapentaenoic acid, and docosahexaenoic acid are associated with decreased incidence and severity of several chronic diseases including cardiovascular disease (CVD) and cancer. At least some of the beneficial effects of these dietary fatty acids are via metabolites such as prostaglandins, leukotrienes, thromboxanes, and resolvins. The effects of ω3-PUFAs are in contrast to those of fatty acids with virtually identical structures, such as the ω6-PUFAs linoleic acid and arachidonic acid, and their corresponding metabolites. We are interested in the nutrigenomics (nutrient-gene interactions) and nutrigenetics (genetic variation in nutrition) of dietary fatty acids with a focus on the ω3-PUFAs. Important in the biological response for these fatty acids or their metabolites are cognate receptors that are able to regulate gene expression and coordinately affect metabolic or signaling pathways associated with CVD and cancer.

Recent and selected publications:

1. Liu, X., Garban, J., Jones, P. J., Vanden Heuvel, J., Lamarche, B., Jenkins, D. J., Connelly, P. W., Couture, P., Pu, S., Fleming, J. A., West, S. G., and Kris-Etherton, P. M. (2018) Diets Low in Saturated Fat with Different Unsaturated Fatty Acid Profiles Similarly Increase Serum-Mediated Cholesterol Efflux from THP-1 Macrophages in a Population with or at Risk for Metabolic Syndrome: The Canola Oil Multicenter Intervention Trial, *J Nutr 148*, 721-728.
2. **Eser, P. O., Vanden Heuvel, J. P., Araujo, J., and Thompson, J. T.** (2013) Marine- and plant-derived ω-3 fatty acids differentially regulate prostate cancer cell proliferation, *Mol Clin Oncol 1*, 444-452. PMCID: PMC3916163
3. **Belda, B. J., Thompson, J. T., Sinha, R., Prabhu, K. S. and Vanden Heuvel, J. P.** (2012) The dietary fatty acid 10E12Z-CLA induces epiregulin expression through COX-2 dependent PGF(2α) synthesis in adipocytes. Prostaglandins Other Lipid Mediat **99**, 30-37.
4. **Vanden Heuvel J. P.** 2012. Nutrigenomics and Nutrigenetics of ω3 Polyunsaturated Fatty Acids. Prog Mol Biol Transl Sci **108**:75-112.

Molecular mechanisms of toxicity

Human health risk assessments are conducted to derive "acceptable" levels of exposure to chemicals that may exist as contaminants in food, drinking water, air, or the environment. In order to perform risk assessment research that spans across species, is cost-effective, efficient and uses the fewest number of laboratory animals, it is essential to incorporate the newest cell and molecular biology techniques. The discipline of Molecular Toxicology utilizes several “omics” technologies to address human health risk posed by xenobiotics includes drugs, pollutants and food additives.

Recent and selected publications:

1. Tasker, T. L., Burgos, W. D., Piotrowski, P., Castillo-Meza, L., Blewett, T. A., Ganow, K. B., Stallworth, A., Delompré, P. L. M., Goss, G. G., Fowler, L. B., Vanden Heuvel, J. P., Dorman, F., and Warner, N. R. (2018) Environmental and Human Health Impacts of Spreading Oil and Gas Wastewater on Roads, Environ Sci Technol 52, 7081-7091.
2. Vanden Heuvel, J. P., Maddox, E., Maalouf, S. W., Iorns, E., Tsui, R., Denis, A., Perfito, N., and Errington, T. M. (2018) Replication Study: Systematic identification of genomic markers of drug sensitivity in cancer cells, Elife 7. PMC5760202
3. **Paul, K. B., Thompson, J. T., Simmons, S. O., Vanden Heuvel, J. P., and Crofton, K. M.** (2013) Evidence for triclosan-induced activation of human and rodent xenobiotic nuclear receptors, *Toxicol In Vitro 27*, 2049-2060.
4. **Vanden Heuvel, J. P.** (2013) Comment on "associations between PFOA, PFOS and changes in the expression of genes involved in cholesterol metabolism in humans" by Fletcher et al., Environment International 57-58 (2013) 2-10, *Environ Int 61*, 150-153.

Biology of the Peroxisome Proliferator-Activated Receptors (PPARs)
Peroxisome proliferator-activated receptors (PPARs) are nuclear receptors (NRs) that control many cellular and metabolic processes. These proteins are ligand-activated transcription factors and three isotypes called PPARalpha, PPARbeta/delta and PPARgamma have been identified in lower vertebrates and mammals. They display differential tissue distribution and each of the three subtypes fulfills specific functions; however, all three PPARs affect energy homoeostasis and inflammatory responses. In addition, their activity can be modulated by drugs such as the hypolipidemic fibrates and the insulin sensitizing thiazolidinediones. Thus, understanding the biology and identifying small molecule modulators of the PPARs is an active area of research and may impact chronic diseases such as diabetes, obesity, heart disease and atherosclerosis.

Recent and selected publications:

1. Hinds, T. D., Burns, K. A., Hosick, P. A., McBeth, L., Nestor-Kalinoski, A., Drummond, H. A., AlAmodi, A. A., Hankins, M. W., Vanden Heuvel, J. P., and Stec, D. E. 2016. Biliverdin Reductase A Attenuates Hepatic Steatosis by Inhibition of Glycogen Synthase Kinase (GSK) 3β Phosphorylation of Serine 73 of Peroxisome Proliferator-activated Receptor (PPAR) α, J Biol Chem 291, 25179-25191.
2. Gopinathan L., D. B. Hannon, J. M. Peters, and J. P. Vanden Heuvel. 2009. Regulation of peroxisome proliferator-activated receptor-alpha by MDM2. Toxicol Sci 108:48-58. PMCID: PMC2644403
3. Gopinathan L., D. B. Hannon, R. W. Smith Iii, J. M. Peters, and J. P. Vanden Heuvel. 2008. Regulation of peroxisome proliferator-activated receptors by e6-associated protein. PPAR Res 2008:746935. PMCID: PMC2605849
4. Coleman J. D., K. S. Prabhu, J. T. Thompson, P. S. Reddy, J. M. Peters, B. R. Peterson, C. C. Reddy, and J. P. Vanden Heuvel. 2007. The oxidative stress mediator 4-hydroxynonenal is an intracellular agonist of the nuclear receptor peroxisome proliferator-activated receptor-beta/delta (PPARbeta/delta). Free Radic Biol Med 42:1155-1164. PMCID: PMC1892209

Toxicology Education
Program Coordinator, Penn State University undergraduate Toxicology (TOX) program. The Toxicology major helps prepare students for professional school or careers in industry, research, and government with coursework in pharmacology, molecular and cellular toxicology, and environmental toxicology. Started in 2004, over 100 students have matriculated through the TOX program.

Courses developed:
VBSC 433 (B M B 433) **Molecular and Cellular Toxicology** (3 credits) In-depth coverage of processes by which drugs/chemicals interact with biological systems and the experimental approaches used to study these interactions.

VBSC 431 (ERM 431) Environmental Toxicology (3 Credits) Effects of pollutants on animal health at the chemical, physical, and cellular level.

Textbooks edited (or co-edited) to support education activities:

1. 2006. Regulation of gene expression: Molecular mechanisms. Eds., G. H. Perdew, J. P. Vanden Heuvel, and J. M. Peters. Humana Press, Totowa, NJ
2. 2002. Cellular and molecular toxicology. Eds., J. P. Vanden Heuvel, G. H. Perdew, W. B. Mattes, and W. F. Greenlee. Elsevier Science, Amsterdam, The Netherlands.
3. Vanden Heuvel J. P., W. B. Mattes, J. C. Corton, D. A. Bell, and G. Pittman. 1998. PCR Protocols in Molecular Toxicology. Eds., J. P. Vanden Heuvel. CRC Press, Boca Raton, FL

D. Research Support

ACTIVE
1 UL1 TR002014-01 (Sinoway) 9/15/2016-5/31/2020 Cal/Smr/Acad: 0
National Center for Advancing Translational Sciences $15,614,466
Penn State Clinical and Translational Science Institute (UL1)
The major goals of this project are:

CBET-1703412 (Burgos) 8/1/2017-7/31/2020 Summer: 0.13
National Science Foundation $330,000
Impact of Oil & Gas Wastewater Disposal on Lake and River Sediments
The major goals of this project are:

4100079742-EXT (Cheng) 6/1/2018-6/30/2020 Calendar: 0.24
PA Tobacco Settlement Fund (TSF) $60,000
Digital environmental monitoring of human water supply watersheds by high-throughput phenotyping of plankton and meiofauna
The major goals of this project are:

Completed Awards
Project Title: "Penn State Clinical and Translational Science Institute"
PI: Lawrence Sinoway
Sponsor: National Center for Research Resources
Period of Performance: 3/1/2012-11/30/2016
Total Budget: $4,465,551
Candidate's Role: Other
Award #: 8 UL1 TR000127-02

Project Title: "Visiting Scientist Agreement"
PI: John Vanden Heuvel
Sponsor: DuPont Company
Period of Performance: 8/12/2013-8/11/2015
Total Budget: $150,000
Candidate's Role: Principal Investigator
Award #: 147947