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**BIOGRAPHICAL SKETCH**

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<i>NAME Richard P. Beyer</i>		<i>POSITION TITLE</i>	
<i>eRA COMMONS USER NAME RBEYER</i>		<i>Research Scientist, Bioinformatics &amp; Statistics</i>	
<i>INSTITUTION AND LOCATION</i>	<i>DEGREE</i>	<i>YEAR(s)</i>	<i>FIELD OF STUDY</i>
<i>Oregon State University, Corvallis, OR</i>	<i>B.S.</i>	<i>1976</i>	<i>Chemical Engineering</i>
<i>Oregon State University, Corvallis, OR</i>	<i>M.S.</i>	<i>1982</i>	<i>Chemical Engineering</i>
<i>University of Washington, Seattle, WA</i>	<i>M.S.</i>	<i>1986</i>	<i>Applied Mathematics</i>
<i>University of Washington, Seattle, WA</i>	<i>Ph.D.</i>	<i>1989</i>	<i>Applied Mathematics</i>

**A. Personal Statement**

I have more than 20 years of experience with mathematical, statistical, and computing methods used for analysis of various types of data. Since 2002, I have served as the lead bioinformatician for three NIH centers, The Center for Ecogenetics and Environmental Health (CEEH), The Center on Human Development and Disability, and The Nathan Shock Center of Aging. I have carried out quality control, normalization and statistical analysis of thousands of gene expression microarrays. I provide biostatistics/bioinformatics support to investigators on the mathematical, statistical, and computational methods used to analyze and interpret genomics, proteomics, and metabolomics data. In addition, I have considerable experience with database technologies and have been instrumental in establishing and maintaining a database for gene expression microarray. I continue to update and maintain a suite of state-of-the-art microarray software tools. I also serve as IEHSFC Co-Manager. Since 2003, I have co-authored approximately 70 publications. I am collaborating with Drs. Ray Monnat, William Grady, and Nancy Maizels concerning microrarray analysis for the Human RecQ Helicases in Biology and Oncology NCI project, as well as other investigators at NCI. Finally, I'm confident that my established analysis expertise in these high-throughput technologies will substantially contribute to this project.

**B. Positions**

2002-present Research Scientist, Bioinformatics and Statistics, UW, Center for Ecogenetics and Environmental Health, Center for Human Development and Disability, Nathan Shock Center of Excellence in Basic Biology of Aging, Seattle, WA  
2001-2002 Chief Executive Officer, Computational Sciences Corporation, Seattle, WA  
1999-2001 Computational Scientist, Cray Inc., Seattle, WA.  
1992-present Affiliate Assistant Professor, Center for Bioengineering, UW, Seattle, WA.  
1992-99 Chief Executive Officer, Concurrent Systems, Inc., Seattle, WA  
1990-92 Post-Doctoral Fellow, Center for Bioengineering, Acting Asst. Prof., Applied Math, UW, Seattle, WA.  
1984-89 Research Assistant and Teaching Assistant, Applied Math, UW, Seattle, WA.  
1984-89 Research Engineer, Hewlett-Packard Co., Everett, WA (Part-time)  
1977-84 Chemical Engineer, Principal Investigator, Thermodynamics Laboratory, Albany Research Center, U.S. Department of Interior, Albany, OR.  
1976-77 Chemical Engineer, DuPont Company, Antioch, CA.

**C. Selected peer-reviewed publications**

1. J Tay-Sontheimer, L Shireman, RP Beyer, T Senn, D Witten, RE Pearce, A Gaedigk, CLG Fomban, JD Lutz, N Isoherranen, KE Thummel, O Fiehn, JS Leeder, YS Lin. Discovery of an Endogenous Urinary Marker of CYP2D6 Activity, **Submitted** May 2014, Clinical Pharmacology and Therapeutics.
2. BD Stamper, DQ Nguyen, M Garcia, RP Beyer, TK Bammler, FM Farin, TJ Kavanagh, SD Nelson. p53 is a key regulator in differentiating the toxicities of acetaminophen and its less hepatotoxic regioisomer both in vitro and in vivo. **Submitted** April 2014, Chemical Research in Toxicology.
3. GH Nguyen, W Tang, AI Robles, RP Beyer, LT Gray, JA Welsh1, AJ Schetter, K Kumamoto, XW Wang, ID Hickson, N Maizels, RJ Monnat, Jr., CC Harris. Regulation of microRNA and gene expression by the BLM helicase: correlation with the presence of G4 motifs, **Submitted** March 2014, PNAS.

4. JP Vanderhoeven, CJ Bierle, RP Kapur, RM McAdams, RP Beyer, TK Bammler, FM Farin, A Bansal, M Spencer, M Deng, MG Gravett, CE Rubens, L Rajagopal, KM Adams Waldorf. Group B Streptococcal Infection of the Choriodecidua Induces Dysfunction of the Cytokeratin Network in Amniotic Epithelium: A Pathway to Membrane Weakening. *PLOS Pathogens*, March 2014.
5. DF Dai, PP Karunadharm, YA Chiao, N Basisty, D Crispin, EJ Hsieh, T Chen, H Gu, D Djukovic, D Raftery, RP Beyer, MJ MacCoss, PS Rabinovitch. Altered proteome turnover and remodeling by subacute caloric restriction and rapamycin rejuvenate the aging heart. Feb, 2014, *Aging Cell*. PMID: 24612461
6. Dai DF, Hsieh EJ, Chen T, Menendez LG, Basisty NB, Tsai L, Beyer RP, Crispin DA, Shulman NJ, Szeto HH, Tian R, Maccoss MJ, Rabinovitch PS. Global Proteomics and Pathway Analysis of Pressure-overload Induced Heart Failure and Its Attenuation by Mitochondrial Targeted Peptides. Aug 9, 2013, *Circ Heart Fail*. PMID: 23935006. PMCID: PMC3856238
7. Wright, JH, Johnson, M, Shimizu-Albergine, M, Bauer, R, Hayes, B, Surapisitchat, J, Hudkins, K, Riehle, K, Johnson, S, Yeh, M, Bammler, T, Beyer, R, Gilbertson, D, Alpers, C; Fausto, Nn; Campbell, J. Paracrine activation of hepatic stellate cells in platelet-derived growth factor C transgenic mice; evidence for stromal induction of hepatocellular carcinoma, August 2013 *International Journal of Cancer*. PMID: 23929039. PMCID: PMC3876966
8. AG Mason, S Tomé, J Simard, RT Libby, TK Bammler, RP Beyer, AJ Morton, CE Pearson, AR La Spada. Expression levels of DNA replication and repair genes predict regional somatic repeat instability in the brain but are not altered by polyglutamine disease protein expression or age. Nov 2013, *Human Molecular Genetics*. PMID: 24191263. PMCID: PMC3929096
9. ES Vincow, G Merrihew, RE Thomas, NJ Shulman, RP Beyer, MJ MacCoss, LJ Pallanck. The PINK1-Parkin pathway promotes both mitophagy and selective respiratory chain turnover in vivo. Apr PNAS. PMID:23509287. PMCID: PMC3631677.
10. L Wang, TK Bammler, RP Beyer, EP Gallagher. Copper-induced deregulation of microRNA expression in the zebrafish olfactory system. July 2013 to *Environmental Science & Technology*. PMID: 23745839.
11. Zhen Su, Xueqi Wang, Xiang Gao, Yang Liu, Maja T Lindenmeyer, Catherine Pan, Huimin Hu, Richard P Beyer, Min Shi, Jing Zhou, Jing Zhang, Clemens D Cohen, Andreas L Serra, Rudolf P Wüthrich and Changlin Mei. Excessive activation of the alternative complement pathway in autosomal dominant polycystic kidney disease. Feb 2014, *JIM*. PMID: 24494798
12. GD Anderson, TD Peterson, FM Farin, TK Bammler, RP Beyer, ED Kantor, M Hoane. The effect of nicotinamide on gene expression in a traumatic brain injury model. Feb 2013, *Frontiers in Neuropharmacology*. PMID:23550224.
13. RM Krishnan, J Sullivan, C Carlsten, H Wilkerson, RP Beyer, TK Bammler, FM Farin, A Peretz, JD Kaufman. A Randomized Cross-Over Study of Inhalation of Diesel Exhaust, Hematological Indices, and Endothelial Markers in Humans. Mar 2013. *Particle and Fibre Toxicology*. PMID:23531317.
14. DL Shuster, TK Bammler, RP Beyer, JW MacDonald, JM Tsai, FM Farin, MF Hebert, KE Thummel, Q Mao. Gestational Age-Dependent Changes in Gene Expression of Metabolic Enzymes and Transporters in Pregnant Mice. *Drug Metab Dispos* Nov 2012. PMID:23175668
15. BD Stamper, B Mecham, SS Park, H Wilkerson, F Farin, RP Beyer, TK Bammler, L Mangravite, and ML Cunningham. Transcriptome correlation analysis identifies two unique craniosynostosis subtypes associated with IRS1 activation. Dec 2012 *Physiological Genomics* PMID:23073384.
16. RM McAdams, J Vanderhoeven, RP Beyer, TK Bammler, FM Farin, MG Gravett, CE Rubens, HD Liggitt, KM Adams Waldorf. Choriodecidual Infection Downregulates Angiogenesis and Morphogenesis Pathways in Fetal Lungs from Macaca Nemestrina, Sept 2012, *PLOS ONE*. PMID:23056493. PMCID:PMC3467273
17. M Suzuki, L Becker, DK Pritchard, S A Gharib, E Wijsman, TK Bammler, RP Beyer, R Bumgarner, T Vaisar, J. Oram, JW Heinecke. Cholesterol Accumulation Regulates the Expression of Macrophage Proteins Implicated In Proteolysis and Complement Activation. *ATVB* Sept 2012. PMID:23042816.
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19. K Doronin, JW Flatt, NC Di Paolo, O Kalyuzhniy, JW MacDonald, TK Bammler, RP Beyer, FM Farin, PL Stewart, and DM Shayakhmetov. Coagulation factor X activates innate immunity to human species C adenovirus. *Science* Sept 2012. PMID:23019612.
20. BD Stamper, SS Park, RP Beyer, TK Bammler, ML Cunningham. Unique Sex-Based Approach Identifies Transcriptomic Biomarkers Associated with Non-Syndromic Craniosynostosis. May 2012 *Gene Regulation and Systems Biology*. PMID:22654505
21. Thompson CK, Meitzen J, Replogle K, Drnevich J, Lent KL, Wissman AM, Farin FM, Bammler TK, Beyer RP, Clayton DF, Perkel DJ, Brenowitz EA. Seasonal changes in patterns of gene expression in avian song control brain regions. *PLoS One*. 2012;7(4):e35119. Epub 2012 Apr 18. PMID:22529977
22. KA Lefebvre, ER Frame, F Gulland, JD Hansen, PS Kendrick, RP Beyer, TK Bammler, FM Farin, EM Hiolski, DR Smith, DJ Marcinek, A Novel Antibody-Based Biomarker for Chronic Algal Toxin Exposure and Sub-Acute Neurotoxicity, Jan 2012, *PLoS ONE*. PMID:22567140
23. McConnachie, LA; White, CC; Botta, D; Zadworny, ME; Cox, DP; Beyer, RP; Hu, X; Eaton, DL; Gao, X; Kavanagh, T, Heme oxygenase expression as a biomarker of exposure to amphiphilic polymer-coated CdSe/ZnS quantum dots. *Nanotoxicology*. March 2013, PMID:22264017
24. DF Dai, EJ Hsieh, Y Liu, Ty Chen, RP Beyer, MT Chin, G Finney, MJ MacCoss, PS Rabinovitch, Mitochondrial proteome remodeling in pressure-overload induced heart failure and the role of mitochondrial oxidative stress, *Cardiovascular Research*, 2012 Jan 1;93(1):79-88, PMID 22012956.
25. Anderson GD, Farin FM, Bammler TK, Beyer RP, Swan A, Wilkerson HW, Kantor ED, Hoane MR. The Effect of Progesterone Dose on Gene Expression Following Traumatic Brain Injury, *Journal of Neurotrauma*, Vol. 28, No. 9, September 2011: 1827-1843, PMID:21770760.
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30. SE Juul, RP Beyer, TK Bammler, FM Farin, CA Gleason, Effects of neonatal stress and morphine on murine hippocampal gene expression. *Pediatric Research* Dec, 2010, PMID: 21178816.
31. M Suzuki, DK Pritchard, L Becker, AN Hoofnagle, N Tanimura, TK Bammler, RP Beyer, R Bumgarner, T Vaisar, M C de Beer, FC de Beer, K Miyake, JF Oram, JW Heinecke. High-density lipoprotein suppresses the type I interferon response, a family of potent antiviral immunoregulators, in macrophages challenged with lipopolysaccharide. *Circulation*, 2010, PMID: 20974999.
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## Other Support

### ACTIVE

**P30 AG13280-11 (Rabinovitch)**                      9/1/2010 – 6/30/2015                      2.4 calendar  
 NIH/NIA    \$782,039 ADC

*Nathan Shock Center for Excellence in the Basic Biology of Aging*

The Nathan Shock Center is intended to provide shared resources in support of a large community of University of Washington faculty investigators with research on basic biology of aging. The Cores include: I (Resources): A) Transgenic Animal Model Development, B) Flow Cytometry and Cell Sorting, and C) Gene Expression; Core II: Research Development with Pilot Study; and Core III: Program Administration and Enrichment. Role: Research Scientist

**5P01CA077852-12 (Monnat)**                      3/7/2000 – 6/30/2014                      1.2 calendar  
 NIH/NCI    \$1,501,977 ADC

*Human Recq Helicases in Biology and Oncology*

The goals of this Program are to delineate in vivo functions of the human RecQ helicase proteins, and to understand how loss of RecQ helicase function leads to genetic instability, an elevated risk of cancer and selective sensitivity to cancer chemotherapeutic agents. Role: Research Scientist

**1R01AG038550-01 (Rabinovitch)**                      5/1/2010 – 3/31/2014                      0.72 calendar  
 NIH/NIA    \$319,800 ADC

*The Importance of MTOR Signaling in Cardiac Aging and Lifespan in Mammals*

These genetic approaches will lead to fundamental insights into key regulators of longevity and determinants of health span, and that with this knowledge, pharmacologic interventions can be designed to confer similar health benefits to humans. Role: Research Scientist

**5 P30 HD O2274-35 (Guralnick)**                      07/01/04 - 06/30/14                      2.94 calendar  
 NIH/NICHHD    \$1,102,483 ADC

*Research in Mental Retardation and Child Development*

This project supports a comprehensive interdisciplinary research program in the field of developmental disabilities and related aspects of human development. This support is accomplished through the activities of the administrative core and the 5 scientific cores 1) Genetics 2) Neuroscience 3) Behavioral Science Core 4) Infant Primate Research Laboratory 5) Instrument Development Lab. Role: Research Scientist

**5 P42 ES 04696-14 (Farin, F)** 04/01/09-03/31/14 0.24 calendar  
NIH/NIEHS \$1,700,000

*Superfund Hazardous Substance Basic Research Program - Effects-Related Biomarkers of Toxic Exposure-  
The Functional Genomics and Bioinformatics Core*

This core provides molecular biology and bioinformatics support to all research projects of this Superfund program project, e.g., DNA sequencing, genotyping, microarray experiments, and data analyses.

Role: Research Scientist

**1R01HD058556-01A1** (Leeder and Lin co-PIs) 04/01/10 – 02/28/15 0.3 calendar  
NICHD \$140,946.07 ADC

*Exogenous and Endogenous Biomarkers of CYP2D6 Variability in Pediatrics*

The major goals of this project are to identify and characterize non-invasive tests for CYP2D6 phenotype that can be used to assess the ontogeny of CYP2D6 development and to enhance the clinical safety of CYP2D6-metabolized drugs in the pediatric population. Role: Research Scientist

**5U10HD047892-08** (Hebert, Easterling, Thummel) 07/01/04 – 12/31/14 0.3 calendar  
NICHD \$792,100 ADC

*UNIVERSITY OF WASHINGTON OBSTETRIC-FETAL PHARMACOLOGY RESEARCH UNIT*

The major goals of this project are to identify and characterize non-invasive tests for CYP3A phenotype that can be used to assess the ontogeny of CYP3A development and to enhance the clinical safety of CYP3A-metabolized drugs in the pediatric population. Role: Research Scientist

**P30 ES07033 (Eaton)** 4/1/2011 – 3/31/2016 3.66 calendar  
NIH/NIEHS \$1,042,627 ADC (approximately)

*Biochemical and Molecular Mechanisms Underlying Human Variability in Response to Environmental Exposures*

The major goals of this project are: This NIEHS Center Grant provides core support to enhance multidisciplinary collaborations among approximately 50 established investigators in the School of Public Health, College of Pharmacy, and the School of Medicine who are investigating the biochemical and molecular basis for human diseases with an environmental etiology. Role: Research Scientist

**2P01AI057005-06A2 (Mullins, Lingappa)** 7/15/2010 – 6/30/2015 0.24 calendar  
NIH/NIAID \$468,225 (approximately)

*VIRAL DETERMINANTS OF HIV-1 TRANSMISSION IN AFRICAN HETEROSEXUALS*

The major goals of this project are: to understand the interactions between host immunity and viral replication, evolution and fitness, during and beyond acute HIV-1 infection. Our work is targeted to the goals of enhancing control and prevention of infection.

Role: Research Scientist

OVERLAP: None