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Education:

1973	A.B., Princeton University, Biology and Physics
1977	Ph.D., Duke University, Physiology and Pharmacology
1977-1978	Postdoctoral Research, Max Planck Institute, Munich, Germany, Biophysics
1979-1980	Postdoctoral Research, Harvard Medical School, Neurobiology

Research and Professional Experience:

1971-1973	Undergraduate researcher with Alan Gelperin, Princeton University
1973-1977	Graduate researcher with John Moore, Duke University, Durham, NC
1977-1978	Research Associate with Dieter Lux, Max-Planck-Institüt, Munich, Germany
1979-1980	Research Associate with Eric Frank, Neurobiology Department, Harvard Medical School, Boston, MA
1980-present	Assistant, then Associate, then Professor, Institute of Neuroscience and Department of Biology, University of Oregon, Eugene, OR
1987-1988	Sabbatical fellow with Walter Gehring and John Nichols, Biocenter, University of Basel, Switzerland
1988-1990	NSF Developmental Neurobiology Review Panel
1988-1989	Instructor, Neurobiology, Marine Biological Laboratory, Woods Hole, MA
1989-1995	Associate Editor, *Journal of Neuroscience*
1990-1998	Director, Institute of Neuroscience, University of Oregon, Eugene, OR
1991-present	Editor, *Zebrafish Science Monitor*
1994	Visiting lecturer, University of Auckland, Auckland, New Zealand
1994-present	Director, ZFIN - the Zebrafish Model Organism Database
1995	Sabbatical fellow with Nigel Holder and Stephen Wilson, Kings College, London, United Kingdom
1996	Organizer and Instructor, EMBO workshop on Development and Genetics of Zebrafish and Medaka, Würzburg, Germany
1996	Organizer, 1996 Cold Spring Harbor Laboratory Conference on Zebrafish Development and Genetics
1997	DOE Subcommittee on the Human Genome Project
1998	Organizer, EMBO workshop on Development, Genetics and Genomics of Zebrafish and Medaka, Freiburg, Germany
1998-present	Director, Zebrafish International Resource Center
1999-2005	Vice President and Secretary, Winter Conference on Brain Research
2001-2002	Sabbatical fellow with Wolfgang Driever, Department of Developmental Biology, University of Freiburg, Freiburg, Germany
2001-2002	Mouse Genome Informatics Advisory Board
2001-2005	Advisory Council, National Institutes of Health, NCRR
2002	Organizer, EMBO course on Molecular and Genetic Tools for the Analysis of Medaka & Zebrafish Development, Heidelberg, Germany
2002-2006	Editorial Board, Journal of Anatomy
2003-2005	Chair, Scientific Program Committee, Winter Conference on Brain Research

2003-present Advisory Council, Oregon Deafblind Project
2004-present Editor, BMC Developmental Biology
2004-present Advisory Board, EU consortium for ZF-MODELS
2005-2008 Advisory Board, NeuronBank
2005-present Advisory Board, Xenbase, the *Xenopus* Model Organism Database
2009-2013 Advisory Board, Mouse Genome Database
2011-2014 Advisory Board, Sanger Institute Mouse and Zebrafish Genetics Program
2013-present Advisory Board, TEFOR
2013-present Advisory Board, National *Xenopus* Resource
2013-present Advisory Council, National Institutes of Health, NIDCD
2014-present Advisory Board, ZENCODE
2017-present Advisory Board, FlyBase
2017-present Advisory Board, *Saccharomyces* Genome Database

Scholarships and Awards:
Biomedical Engineering Pre-doctoral Fellow, 1974-1977
Talbot Award, 1976
Duke University Graduate School Research Award, 1976-1977
Fulbright-Hays Scholarship, 1977-1978
Max Planck Society Senior Research Fellowship, 1977-1978
NIH Postdoctoral Training Fellowship, 1979
Muscular Dystrophy Postdoctoral Fellowship, 1979-1981
Alfred P. Sloan Fellow, 1981-1982
Research Career Development Award, 1986-1991
US-Switzerland Scientist Exchange Fellow (NSF), 1987-1988
Fogarty Senior International Fellowship, 1987-1988
McKnight Development Award, 1991-1993
Auckland Foundation Fellow, 1994
Fellow of the Anatomical Society of Great Britain & Ireland, 1995
US-UK Cooperative Research Program Fellowship, 1995-1996
Guggenheim Fellow, 2001-2002
Alexander von Humboldt Prize, 2001
Medical Research Foundation Discovery Award, 2002
Research Innovation Award, 2006

Publications [1-200] (abstracts not included):

1. Anderson, W., R. Apweiler, A. Bateman, G.A. Bauer, H. Berman, J.A. Blake, N. Blomberg, et al. (2017). Towards coordinated international support of core data resources for the life sciences. *bioRxiv*.
2. Anderson, W.P., R. Apweiler, A. Bateman, G.A. Bauer, H. Berman, J.A. Blake, N. Blomberg, et al. (2017). Data management: A global coalition to sustain core data. *Nature*, **543**(7644), 179.
3. Blanco-Sanchez, B., A. Clement, J.B. Phillips, and M. Westerfield. (2017). Zebrafish models of human eye and inner ear diseases. *Meth Cell Biol*, **138**, 415-467.
4. Bradford, Y.M., S. Toro, S. Ramachandran, L. Ruzicka, D.G. Howe, A. Eagle, P. Kalita, et al. (2017). Zebrafish Models of Human Disease: Gaining Insight into Human Disease at ZFIN. *ILAR Journal*, **58**(1), 4-16.
5. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Disease Models and Chemical Screens*. 4 ed. Meth Cell Biol, ed. L. Wilson and P. Tran. Vol. 138. 2017, San Diego, CA: Academic Press.

6. Howe, D.G., Y.M. Bradford, A. Eagle, D. Fashena, K. Frazer, P. Kalita, P. Mani, et al. (2017). The Zebrafish Model Organism Database: new support for human disease models, mutation details, gene expression phenotypes and searching. *Nucleic Acids Res*, **45**(D1), D758-D768. PMC5210580.
7. Manolio, T.A., D.M. Fowler, L.M. Starita, M.A. Haendel, D.G. MacArthur, L.G. Biesecker, E. Worthey, et al. (2017). Bedside Back to Bench: Building Bridges between Basic and Clinical Genomic Research. *Cell*, **169**(1), 6-12.
8. Spillmann, R.C., A. McConkie-Rosell, L. Pena, Y.H. Jiang, N. Undiagnosed Diseases, K. Schoch, N. Walley, et al. (2017). A window into living with an undiagnosed disease: illness narratives from the Undiagnosed Diseases Network. *Orphanet J Rare Dis*, **12**(1), 71.
9. The Gene Ontology, C. (2017). Expansion of the Gene Ontology knowledgebase and resources. *Nucleic Acids Res*, **45**(D1), D331-D338. PMC5210579.
10. Wang, J., R. Al-Ouran, Y. Hu, S.Y. Kim, Y.W. Wan, M.F. Wangler, S. Yamamoto, et al. (2017). MARRVEL: Integration of Human and Model Organism Genetic Resources to Facilitate Functional Annotation of the Human Genome. *Am J Hum Genet*, **100**(6), 843-853.
11. Wangler, M.F., S. Yamamoto, H.T. Chao, J.E. Posey, M. Westerfield, J. Postlethwait, N. Members of the Undiagnosed Diseases, et al. (2017). Model Organisms Facilitate Rare Disease Diagnosis and Therapeutic Research. *Genetics*, **207**(1), 9-27.
12. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Genetics, Genomics, and Transcriptomics*. 4 ed. Meth Cell Biol, ed. L. Wilson and P. Tran. Vol. 135. 2016, San Diego, CA: Academic Press. 577.
13. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Cellular and Developmental Biology, Part B Developmental Biology* 4ed. Meth Cell Biol, ed. L. Wilson and P. Tran. Vol. 134. 2016, San Diego, CA: Academic Press.
14. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Cellular and Developmental Biology, Part A Cellular Biology*. 4 ed. Meth Cell Biol, ed. L. Wilson and P. Tran. Vol. 133. 2016, San Diego, CA: Academic Press.
15. Edmunds, R.C., B. Su, J.P. Balhoff, B.F. Eames, W.M. Dahdul, H. Lapp, J.G. Lundberg, et al. (2016). Phenoscape: Identifying Candidate Genes for Evolutionary Phenotypes. *Mol Biol Evol*, **33**(1), 13-24. PMC4693980.
16. Howe, D.G., Y.M. Bradford, A. Eagle, D. Fashena, K. Frazer, P. Kalita, P. Mani, et al. (2016). A scientist's guide for submitting data to ZFIN. *Meth Cell Biol*, **135**, 451-81.
17. Li, T., J. Fan, B. Blanco-Sanchez, N. Giagtzoglou, G. Lin, S. Yamamoto, M. Jaiswal, et al. (2016). Ubr3, a Novel Modulator of Hh Signaling Affects the Degradation of Costal-2 and Kif7 through Poly-ubiquitination. *PLoS Genet*, **12**(5), e1006054. PMC4873228.
18. Deans, A.R., S.E. Lewis, E. Huala, S.S. Anzaldo, M. Ashburner, J.P. Balhoff, D.C. Blackburn, et al. (2015). Finding Our Way through Phenotypes. *PLoS Biol*, **13**(1), e1002033. PMC25562316.
19. Elsayed, S.M., J.B. Phillips, R. Heller, M. Thoenes, E. Elsobky, G. Nurnberg, P. Nurnberg, et al. (2015). Non-manifesting AHI1 truncations indicate localized loss-of-function tolerance in a severe Mendelian disease gene. *Hum Mol Genet*, **24**(9), 2594-603. PMC4383865.
20. Gene Ontology, C. (2015). Gene Ontology Consortium: going forward. *Nucleic Acids Res*, **43**(Database issue), D1049-56. PMC4383973.
21. Rachel, L., S. Julie, B. Daniela, C. Sergio, H. Joshua, H. Fengyuan, K. Alex, et al. (2015). Cross-organism analysis using InterMine. *Genesis*, **53**(8), 547-60. PMC4545681.
22. Ruzicka, L., Y.M. Bradford, K. Frazer, D.G. Howe, H. Paddock, S. Ramachandran, A. Singer, et al. (2015). ZFIN, The zebrafish model organism database: Updates and new directions. *Genesis*, **53**(8), 498-509. PMC4545674.
23. Vize, P.D. and M. Westerfield. (2015). Model organism databases. *Genesis*, **53**(8), 449.
24. Beck, B.B., J.B. Phillips, M.P. Bartram, J. Wegner, M. Thoenes, A. Pannes, J. Sampson, et al. (2014). Mutation of POC1B in a Severe Syndromic Retinal Ciliopathy. *Hum Mutat*, **35**(10), 1153-62. PMC25044745.

25. Blanco-Sánchez, B., A. Clement, J. Fierro, Jr., P. Washbourne, and M. Westerfield. (2014). Complexes of Usher proteins preassemble at the endoplasmic reticulum and are required for trafficking and ER homeostasis. *Dis Model Mech*, **7**(5), 547-59. PMC4007406.
26. Köhler, S., S.C. Doelken, C.J. Mungall, S. Bauer, H.V. Firth, I. Bailleul-Forestier, G.C. Black, et al. (2014). The Human Phenotype Ontology project: linking molecular biology and disease through phenotype data. *Nucleic Acids Res*, **42**(Database issue), D966-74. PMC24217912.
27. Phillips, J.B. and M. Westerfield. (2014). Zebrafish models in translational research: tipping the scales toward advancements in human health. *Dis Model Mech*, **7**(7), 739-743. PMC24973743.
28. Van Slyke, C.E., Y.M. Bradford, M. Westerfield, and M.A. Haendel. (2014). The zebrafish anatomy and stage ontologies: representing the anatomy and development of Danio rerio. *J Biomed Semantics*, **5**(1), 12. PMC3944782.
29. Consortium. (2013). Gene Ontology annotations and resources. *Nucleic Acids Res*, **41**(Database issue), D530-5. PMC3531070.
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31. Howe, D.G., Y.M. Bradford, T. Conlin, A.E. Eagle, D. Fashena, K. Frazer, J. Knight, et al. (2013). ZFIN, the Zebrafish Model Organism Database: increased support for mutants and transgenics. *Nucleic Acids Res*, **41**(D1), D854-60. PMC3531097.
32. Howe, K., M.D. Clark, C.F. Torroja, J. Torrance, C. Berthelot, M. Muffato, J.E. Collins, et al. (2013). The zebrafish reference genome sequence and its relationship to the human genome. *Nature*, **496**, 498-503. PMC3703927.
33. Köhler, S., S.C. Doelken, B.J. Ruef, S. Bauer, N. Washington, M. Westerfield, G. Gkoutos, et al. (2013). Construction and accessibility of a cross-species phenotype ontology along with gene annotations for biomedical research. *F1000 Research*, **2**, 30. PMC3799545.
34. Midford, P.E., T.A. Dececchi, J.P. Balhoff, W.M. Dahdul, N. Ibrahim, H. Lapp, J.G. Lundberg, et al. (2013). The vertebrate taxonomy ontology: a framework for reasoning across model organism and species phenotypes. *J Biomed Semantics*, **4**(1), 34. PMC24267744.
35. Phillips, J.B., H. Vastinsalo, J. Wegner, A. Clement, E.M. Sankila, and M. Westerfield. (2013). The cone-dominant retina and the inner ear of zebrafish express the ortholog of CLRN1, the causative gene of human Usher syndrome type 3A. *Gene Expr Patterns*, **13**(8), 473-481. PMC3888827.
36. Smedley, D., A. Oellrich, S. Kohler, B. Ruef, M. Westerfield, P. Robinson, S. Lewis, and C. Mungall. (2013). PhenoDigm: analyzing curated annotations to associate animal models with human diseases. *Database*, **2013**, bat025. PMC3649640.
37. Sullivan, J., K. Karra, S.A. Moxon, A. Vallejos, H. Motenko, J.D. Wong, J. Aleksic, et al. (2013). InterMOD: integrated data and tools for the unification of model organism research. *Sci Rep*, **3**, 1802. PMC3647165.
38. Chen, C.K., C.J. Mungall, G.V. Gkoutos, S.C. Doelken, S. Kohler, B.J. Ruef, C. Smith, et al. (2012). MouseFinder: Candidate disease genes from mouse phenotype data. *Hum Mutat*, **33**(5), 858-66. PMC3327758.
39. Consortium. (2012). The Gene Ontology: enhancements for 2011. *Nuc Acids Res*, **40**(Database issue), D559-64. PMC3245151.
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41. Gao, J., C. Zhang, B. Yang, L. Sun, M. Westerfield, and G. Peng. (2012). Dcc Regulates Asymmetric Outgrowth of Forebrain Neurons in Zebrafish. *PLoS One*, **7**(5), e36516. PMC3351449.

42. Mabee, P., J. Balhoff, W. Dahdul, H. Lapp, P. Midford, T. Vision, and M. Westerfield. (2012). 500,000 fish phenotypes: The new informatics landscape for evolutionary and developmental biology of the vertebrate skeleton. *J Appl Ichthyol*, **28**, 300-305. PMC22736877.
43. Bradford, Y., T. Conlin, N. Dunn, D. Fashena, K. Frazer, D.G. Howe, J. Knight, et al. (2011). ZFIN: enhancements and updates to the Zebrafish Model Organism Database. *Nucleic Acids Res*, **39**(Database issue), D822-9. PMC3013679.
44. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Disease Models and Chemical Screens*. 3 ed. Meth Cell Biol. Vol. 105. 2011, San Diego, CA: Academic Press.
45. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Genetics, Genomics and Informatics*. 3 ed. Meth Cell Biol. Vol. 104. 2011, San Diego CA: Academic Press.
46. Detrich, H.W., 3rd, M. Westerfield, and L.I. Zon, *The Zebrafish: Cellular and Developmental Biology, Part B*. Meth Cell Biol. Vol. 101. 2011, San Diego, CA: Academic Press. 289.
47. Howe, D.G., K. Frazer, D. Fashena, L. Ruzicka, Y. Bradford, S. Ramachandran, B.J. Ruef, et al. (2011). Data Extraction, Transformation, and Dissemination through ZFIN. *Meth Cell Biol*, **104**, 311-25.
48. Murray, K.N., J. Bauer, A. Tallen, J.L. Matthews, M. Westerfield, and Z.M. Varga. (2011). Characterization and management of asymptomatic Mycobacterium infections at the Zebrafish International Resource Center. *Journal of the American Association for Laboratory Animal Science : JAALAS*, **50**(5), 675-9. PMC3189671.
49. Murray, K.N., M. Dreska, A. Nasiadka, M. Rinne, J.L. Matthews, C. Carmichael, J. Bauer, Z.M. Varga, and M. Westerfield. (2011). Transmission, diagnosis, and recommendations for control of Pseudoloma neurophilia infections in laboratory zebrafish (Danio rerio) facilities. *Comp Med*, **61**(4), 322-9. PMC3155398.
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51. Vision, T.J., J. Blake, H. Lapp, P. Mabee, and M. Westerfield, *Similarity between semantic description sets: Addressing needs beyond data integration*, in *1st International Workshop on Linked Science*, T. Kauppinen, L. Pouchard, and C. Kessler, Editors. 2011, CEUR Workshop Proceedings: Bonn.
52. Balhoff, J.P., W. Dahdul, C. Kothari, H. Lapp, J. Lundberg, P. Mabee, P. Midford, M. Westerfield, and T. Vision. (2010). Phenex: Ontological Annotation of Phenotypic Diversity. *PLoS ONE*, **5**(5). PMC286476.
53. Consortium. (2010). The Gene Ontology in 2010: extensions and refinements. *Nucleic Acids Res*, **38**(Database issue), D331-5. PMC2808930.
54. Consortium, R.G.G.o.t.G.O. (2010). The Gene Ontology's Reference Genome Project: a unified framework for functional annotation across species. *PLoS Comput Biol*, **5**(7), e1000431. PMC2699109.
55. Dahdul, W.M., J.P. Balhoff, J. Engeman, T. Grande, E.J. Hilton, C. Kothari, H. Lapp, et al. (2010). Evolutionary characters, phenotypes and ontologies: curating data from the systematic biology literature. *PLoS One*, **5**(5), e10708. PMC2873956.
56. Dahdul, W.M., J.G. Lundberg, P.E. Midford, J.P. Balhoff, H. Lapp, T.J. Vision, M.A. Haendel, M. Westerfield, and P.M. Mabee. (2010). The teleost anatomy ontology: anatomical representation for the genomics age. *Syst Biol*, **59**(4), 369-83. PMC2885267.
57. DeLaurier, A., B.F. Eames, B. Blanco-Sanchez, G. Peng, X. He, M.E. Swartz, B. Ullmann, M. Westerfield, and C.B. Kimmel. (2010). Zebrafish sp7:EGFP: a transgenic for studying otic vesicle formation, skeletogenesis, and bone regeneration. *Genesis*, **48**(8), 505-11. PMC2926247.
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