CHEMICAL HERITAGE FOUNDATION

MONICA L. VETTER

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview Conducted by

William Van Benschoten

at

University of Utah Salt Lake City, Utah

on

5 and 8 November 2004

From the Original Collection of the University of California, Los Angeles

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1985-1986	Miriam Hills Scholarship, McGill University
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Selected Publications

Steele, M.R., Inman, D.M., Calkins, D.J., Horner, P.J. and Vetter M.L. (2006) Microarray Analysis of Retinal Gene Expression in the DBA/2J Model of Glaucoma. Invest Ophthalmol Vis Sci, 47:977-985.

Logan, M.A., Steele, M.R. and Vetter, M.L. (2005) Expression of Synaptic Vesicle Two-

Related Protein SVOP in the Developing Nervous System of Xenopus laevis. Developmental Dynamics, 234:802-807.

Logan, M.A., Steele, M. Van Raay, T. and Vetter, M.L. (2005) Identification of shared transcriptional targets for Xath5 and NeuroD. Developmental Biology, 285:570-5 83.

- Van Raay, T.J.*, Moore, K.B.*, Iordanova, I., Steele, M., Jamrich, M., Harris, W.A., and Vetter, M.L. (2005) Frizzled 5 signaling governs the neural potential of progenitors in the developing Xenopus retina. Neuron, 46:23-36. (*contributed equally)
- Hutcheson, D.A., Hanson, M.I., Moore, K.B., Le, T.T., Brown, N.B., and Vetter, M.L. (2005) bHLH-dependent and -independent modes of Ath5 gene regulation during retinal development. Development, 132:829-839.
- Sun, Y., Kanekar, S. L., Vetter, M. L., Gorski, S., Jan, Y. N., Glaser, T. and Brown, N. L. (2003). Conserved and divergent functions of Drosophila atonal, amphibian, and mammalian Ath5 genes. Evol. Dev. 5:532-541.
- Burns, C.J. and Vetter, M.L. (2002) Xath5 regulates neurogenesis in the Xenopus olfactory placode. Dev. Dynamics. 225(4): 536-543.
- Moore, K.B., Schneider, M.L. and Vetter, M.L. (2002) Post-translational mechanisms control the timing of bHLH function and regulate retinal cell fate. *Neuron*, 34: 183-195.
- Schneider, M.L., Turner, D.L., and Vetter, M.L. (2001) Xath5 function in the neural plate and retina is sensitive to inhibition by Notch. *Mol. Cell. Neurosci.*, 18:458-472.
- Tucker, P., Laemle, L., Munson, A., Kanekar, S., Schlecht, H., Vetter, M.L., Glaser, T. (2001) Alternative start codon mutation in the Rx/rax homeobox gene in an inbred eyeless mouse strain. *Genesis*, 13:43-53.
- Van Raay, T.J, Wang, Y.-K., Stark, M.R., Rasmussen, J.T., Francke, U., Vetter, M.L., and Rao, M.S. (2001) Frizzled 9 is expressed in neural precursors in the developing neural tube. *Development, Genes and Evolution*, 211:453-457.
- Pozzoli, O., Bosetti, A., Croci, L., Consalez, G.G., and Vetter, M.L. (2001) XEbf3 functions downstream of XNeuroD during neurogenesis. *Dev. Biol.*, 233:495-5 12.
- Rasmussen, J, Deardorff, M., Rao, M.S., Klein, P., and Vetter, M.L. (2001) XFz3 regulates early eye determination in Xenopus. *Proc. Nat. Acad. Sci. (USA)*, 98:3861-3866.
- Hutcheson, D.A. and Vetter, M.L. (2001) The bHLH factors Xath5 and XNeuroD can upregulate the expression of XBrn3d, a POU-homeodomain transcription factor. *Dev. Biol.*, 232:327-338.
- Brown, N.L., Kanekar, S., Vetter, M.L., Tucker, P.K., Gemza, D.L. and Glaser, T. (1998) Math5 encodes a murine basic helix-loop-helix transcription factor expressed during early stages of retinal neurogenesis. *Development*, 125:4821-4833.
- Perron, M., Kanekar, S., Vetter, M.L., and Harris, W.A. (1998) The genetic hierarchy of retinal development in the ciliary margin of the Xenopus eye. *Dev. Biol.*, 199:185-200.
- Kanekar, S., Perron, M., R. Dorsky, Harris, W.A., Jan, L.Y., Jan, Y.N., Vetter, M.L (1997) *Xath5* participates in a network of bHLH genes in the developing *Xenopus* retina. *Neuron*, 19:981-994 (erratum published 1998, vol. 21).
- Vetter, M.L., Bishop, J.M. (1995) PDGF r ceptor mutants defective for mitogenesis promote neurite outgrowth in PC12 cells. *Current Biology*, 5:168-178. (Research Article)

Bishop, J.M., Capobianco, A.J., Doyle, H.J., Finney, R.E., McMahon, M., Robbins, S.M., Samuels, M.L., and Vetter, M. (1994) Proto-oncogenes and plasticity in cell signalling. *Proceedings of the Cold Spring Harbor Symposia on Quantitative Biology*, Vol. 59.

- Linstedt, A.D., Vetter, M.L., Bishop, J.M., Kelly, R.B. (1992) Specific association of the protooncogene product pp60 ^{c-src} with an intracellular organelle, the PC1 2 synaptic vesicle. *J. Cell Biol.*, 117(5): 1077-84.
- Vetter, M.L., Martin-Zanca, D., Parada, L.F., Bishop, J.M., Kaplan, D.R. (1991) Nerve growth factor rapidly stimulates tyrosine phosphorylation of phospholipase C-gamma 1 by a kinase activity associated with the product of the trk proto-oncogene. *Proc.Natl. Acad. Sci. (USA)*, 88(13): 5650-5654.
- Logan, M.A. and Vetter, M.L. (2004) Do-it-yourself tiling: dendritic growth in the absence of homotypic contacts. Neuron, 43:439-440.
- Van Raay T.J. and Vetter M.L., (2004) Wnt/frizzled signaling during vertebrate retinal development. Dev Neurosci., 26:352-358.
- Vetter, M.L. (2003) Methylation gets SMRT: Functional insights into Rett Syndrome. Dev. Cell. 5:359-360.
- Hutcheson, D.A. and Vetter, M.L. (2002) Transgenic approaches to retinal development and function in Xenopus laevis. Methods, vol. 28(4), 402-4 10.
- Vetter, M.L. and Brown, N.L. (2001) The role of basic helix-loop-helix genes in vertebrate retinogenesis, *Seminars in Cell and Developmental Biology*, 12: 491-498.
- Vetter, M.L. (2001) A turn of the helix: preventing the glial fate. Neuron, 29:559-562.
- Vetter, M.L. and Moore, K.B. (2001) Becoming glial in the neural retina. *Dev. Dynamics*, 221: 146-153.
- Vetter, Monica and Harris, William (1998) Neural development: bHLH genes. *Encyclopedia of Life Sciences*, Macmillan Reference Ltd.
- Vetter, M.L. Development of the retina. in: Principles of Developmental Genetics. Ed. Sally A. Moody. Elsevier Press. In preparation for 2006.
- Vetter, M.L. and Dorsky, R. (2005) Neural differentiation, in: <u>Developmental Neurobiology</u>, 4th Edition. Eds. Mahendra Rao and Marcus Jacobson. Plenum Press.
- Vetter, M.L. and Levine E. (2004) Adult retinal stem cells. In: Adult Stem Cells (ed: Turksen, K.) Humana Press, Totowa, NJ.

ABSTRACT

Monica L. Vetter grew up in Markham, Ontario, Canada, the eldest of three siblings. Vetter's father worked for Honeywell and in the computer industry generally—and was gifted musically—and her mother was a nurse who, later in life, founded the Head Injury Association of Toronto, in part in response to a family tragedy. Vetter's parents provided her with access to all the things typical of childhood: gymnastics, swimming, and piano lessons; she loved reading, spending much time in the library, playing soccer, and having fun with her brothers outdoors.

She entered McGill University, deciding to major in biosciences. Her interest in science led to several summers spent in various academic labs working on muscle contraction at the University of Ottawa, motor cortex and motor control in primates at the University of Toronto, and eye movements and the neural control of eye movements at McGill. Wanting to experience the academic world beyond the confines of the traditional Canadian/American school systems, Vetter spent a year abroad at the Free University in Berlin, Germany. During her time there, she applied to and was accepted at the University of California, San Francisco (UCSF), where she conducted research in the lab of J. Michael Bishop on molecular genetics and signaling pathways in neuronal cells. She remained at UCSF to undertake a postdoctoral position in Yuh Nung Jan's laboratory focusing on *ath5* transcription factor and the regulation of the initial events in vertebrate retinal neural development. From there she accepted a faculty appointment at the University of Utah, developing her research on retinal neurogenesis.

At the end of the interview, Vetter talks about the biomedical revolution and her decision to pursue academic research rather than work in industry; the issue of patents; her interest in the history of science; and the role of the scientist in scientific public policy and literacy. She concludes with thoughts about the impact of the Pew Scholars Program in the Biomedical Sciences award on her work and the process of conducting scientific research.

UCLA INTERVIEW HISTORY

INTERVIEWER:

William Van Benschoten, Interviewer, UCLA Oral History Program; B.A., History, University of California, Riverside, 1990; M.A., History, University of California, Riverside, 1991; C.Phil., History, University of California, Los Angeles, 1995.

TIME AND SETTING OF INTERVIEW:

Place: Vetter's office at the University of Utah.

Dates of sessions: November 5 and 8, 2004.

Total number of recorded hours: 4.5.

Persons present during interview: Vetter and Van Benschoten.

CONDUCT OF INTERVIEW:

This interview is one in a series with Pew Scholars in the Biomedical Sciences conducted by the UCLA Oral History Program in conjunction with the Pew Charitable Trusts's Pew Scholars in the Biomedical Sciences Oral History and Archives Project. The project has been designed to document the backgrounds, education, and research of biomedical scientists awarded four-year Pew scholarships since 1988.

To provide an overall framework for project interviews, the director of the UCLA Oral History Program and three UCLA faculty project consultants developed a topic outline. In preparing for this interview, Van Benschoten held a telephone preinterview conversation with Vetter to obtain written background information (curriculum vitae, copies of published articles, etc.) and agree on an interviewing schedule. He also reviewed documentation in Vetter's file at the Pew Scholars Program office in San Francisco, including Vetter's proposal application, letters of recommendation, and reviews by Pew Scholars Program national advisory committee members.

ORIGINAL EDITING:

Carol Squires edited the interview. She checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Vetter reviewed the transcript. She verified proper names and made minor corrections and additions.

Carol Squires prepared the table of contents and TechniType Transcripts compiled the guide to proper names.

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