HEIDI R. KAST-WOELBERN, PH.D.

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PROFESSIONAL EXPERIENCE

POINT LOMA NAZARENE UNIVERSITY, San Diego, CA 2008 - present
Department of Biology
Associate Professor
Lecturer for various undergraduate and graduate courses which include Genetics, Cell Biology & Biochemistry, Microbiology and Biotechnology and Society.

- Served as the instructor for lower division and upper division courses, which included weekly lectures, as well as the design and administration of exams and quizzes.
- Oversaw and instructed multiple laboratory sections for Cell Biology and Biochemistry, Genetics, Microbiology, Developmental Biology, General Chemistry, as well as Ecology and Evolution.

UNIVERSITY OF CALIFORNIA SAN DIEGO 2009-2010
Center for Research on Educational Equity, Assessment and Teaching Excellence (CREATE)
Academic Coordinator I
Project Director for SEASAND, a professional development program targeting science teachers from low performing schools at the middle school and high school level.

- Established an online teacher network community focused on climate change.
- Developed a summer institute for Earth science teachers.

LIGAND PHARMACEUTICALS, San Diego, CA Dec 2002 – 2007
Department of Molecular and Cell Biology
Senior Research Scientist (2005- 2007)
Project leader for an exploratory initiative which identified antagonists of the Hedgehog signaling pathway.

- Coordinated a team of scientists across disciplines (chemistry, pharmacology, molecular biology, and high-throughput screening) to identify a novel drug target, resulting in a rapid implementation of a flow scheme to screen for modulators of the Hedgehog signaling pathway.
- Established the primary screening assay utilizing β-lactamase technology in 384 well format, resulting in increased output of data at a fraction of the cost (75% savings), and measuring multiple endpoints (potency and toxicity) in a single assay.
- Managed a team of scientists to create and optimize a set of assays for secondary and tertiary screening of lead compounds. Some of these assays were ultimately implemented in additional projects to improve cost effectiveness and reliability of data output.
- Invited to be a member of Ligand's Oncology Strategy Group where project plans were refined for optimum productivity and efficiency.

Research Scientist (2002 – 2005)
Contributing scientist for an exploratory project to define the role of PPARs in oncology.

- Designed, executed and analyzed multiple micorarray studies of PPAR modulators in a colorectal cancer cell line that identified target genes associated with growth inhibition, cell differentiation, apoptosis and genes implicated in the inhibition of metastasis.
- Introduced a new technology which facilitated the isolation of RNA in 96 well format, producing high yields of RNA within hours and at a substantial cost savings. Previously established protocol required several days for the same result.
- Optimized and introduced branched DNA technology to Ligand for mRNA analysis. This technology reduced the time to obtain data, improved costs by 66%, and was implemented by Ligand's screening group to assist in high-throughput screening.

Team member in a metabolic disease alliance with Eli Lilly to identify novel PPAR modulators and the mechanism by which they modulate glucose metabolism as well as their negative side effects (such as weight gain and edema).

- Identified a molecular marker for weight gain occurring in type II diabetics treated with insulin sensitizers.
- Determined the mechanism by which PPARγ agonists and SREBP modulate the hepatic expression of INSIG-1 mRNA levels. These studies provided a link between insulin sensitizers and the regulation of lipid homeostasis.

UNIVERSITY OF CALIFORNIA LOS ANGELES 1996-2002
Department of Biological Chemistry
Postdoctoral Fellow (2001-2002)
Advisor: Peter A. Edwards, Ph.D.

- Characterized FXR (the bile acid receptor) null mice by gene expression analysis.
- Identified structural variants of FXR and defined how they affect transcriptional activation.

Doctoral Student (1996-2001)
Advisor: Peter A. Edwards, Ph.D.

- Demonstrated a key role of the bile acid receptor FXR in lipoprotein metabolism in mammalian cell lines, utilizing a candidate gene approach and suppression subtractive hybridization. This work helped define the mechanism by which FXR mediates changes in plasma triglyceride levels.
- Awarded the George Popjak Scholar Award in 2001 for the above contributions.
- Discovered a role for FXR in regulating genes involved in detoxification within the hepatocyte.
- Served as a TA for Nutritional Biochemistry (medical students), Introduction to Genetics (undergraduate students) and Introduction to Molecular Biology (undergraduate students).
- Earned a Department of Education Training Grant, providing two years of full support for TA instruction.

WESTMONT COLLEGE, Santa Barbara, CA 1995-1996
Department of Chemistry
Lecturer (1996) .

- Taught Introduction to General Chemistry to a class of 30 students for a semester. Completed three weekly lectures, wrote and graded all quizzes and exams.

Laboratory Instructor (1995-1996)

- Oversaw and instructed four general chemistry laboratory sections comprising 100 students for an entire year. This work included a weekly lecture, set up of the experiments, facilitating research, and grading laboratory notebooks.

EDUCATION

Postdoctoral Fellow, University of California, Los Angeles
Ph.D., Department of Biological Chemistry, University of California, Los Angeles
Thesis: *The Farnesoid-X-activated Receptor and its Role in Lipid Metabolism*
BS, Chemistry, Westmont College, Santa Barbara, CA
Graduated *Magna Cum Laude*
BA, Religious Studies, Westmont College, Santa Barbara, CA

PUBLICATIONS

1. Shih, D.M., **Kast-Woelbern, H.R.,** Wong, J., Xia, Y.R., Edwards, P.A. and Lusis, A.J. (2006) A role for FXR and human FGF-19 in the repression of paraoxonase-1 gene expression by bile acids. J. Lipid Res. 47: 384-92.

2. Lee, F.Y., **Kast-Woelbern, H.R**., Chang, J., Luo, G., Jones, S.A., Fishbein, M.C., and Edwards P.A. (2005) Alpha-crystallin is a target gene for the farnesoid X-activated receptor in human livers. J. Biol. Chem. 280: 31792-31800.

3. Anisfeld A.M., **Kast-Woelbern H.R.**, Lee H., Zhang Y., Lee F.Y., and Edwards P.A. (2005) Activation of the nuclear receptor FXR induces fibrinogen expression: a new role for bile acid signaling. J. Lipid Res. 46:458-468.

4. **Kast-Woelbern, H.R.,** Dana, S.L., Cesario, R.M., Sun L., de Grandpre, L.Y., Brooks, M.E., Osburn, D.L., Reifel-Miller, A., Klausing, K., and Leibowitz, M.D. (2004) Rosiglitazone induction of INSIG-1 in white adipose tissue reveals a novel interplay of PPARγ and SREBP in the regulation of adipogenesis. J. Biol. Chem. 279: 23908-23915.

5. Anisfeld, A.M., **Kast-Woelbern, H.R**., Meyer, M.E., Jones, S.A., Zhang, Y., Williams, K.J., Willson, T., Edwards, P.A. (2003) Syndecan-1 expression is regulated in an isoform specific manner by the farnesoid X receptor. J. Biol. Chem. 278: 20420-20428.

6. Downes, M., Verdecia, M., Roecker, A.J., Hughes, R., Hogenesch, J.B., **Kast-Woelbern, H.R.,** Bowman, M.E., Ferrer, J.L., Anisfeld, A.M., Edwards, P.A., Rosenfeld, J.M., Alvarez,

J.G.A., Noel, J.P., Nicolaou, K.C., Evans, R.M. (2003) A chemical and structural analysis of the nuclear bile acid receptor FXR. Molec. Cell 11:1079-1092.

7. Zhang, Y., **Kast-Woelbern, H.R.** and Edwards, P.A. (2003) Natural structural variants of the nuclear receptor farnesoid X receptor affect transcriptional activation. J. Biol. Chem. 278: 104-10.

8. Mak, P.A., **Kast-Woelbern, H.R.**, Anisfeld, A.M., and Edwards, P.A. (2002) Identification of PLTP as an LXR target gene and apoE as an FXR target gene reveals overlapping targets for the two nuclear receptors. J. Lipid Res. 43: 2037-41.

9. Edwards, P.A., **Kast-Woelbern, H.R.**, and Kennedy, M.A. (2002) Cholesterol signaling. Handbook of Cell Signaling (eds. R. Bradshaw and E. Dennis) Volume 2. Pg 287-290.

10. Edwards, P.A., **Kast, H.R.**, and Anisfeld, A.M. (2002) BAREing it all: the adoption of LXR and FXR and their roles in lipid homeostasis. J. Lipid Res. 43: 2-12.

11. **Kast, H.R.**, Goodwin, B., Tarr, P.T., Jones, S.A., Anisfeld, A.M., Stoltz, C. M., Tontonoz, P., Kliewer, S., Willson, T.M., and Edwards, P.A. (2002) Regulation of multidrug resistance-associated protein 2 (ABCC2) by the nuclear receptors pregnane X receptor, farnesoid X-activated receptor, and constitutive androstane receptor. J. Biol. Chem. 277: 2908-2915.

12. **Kast, H.R.**, Nguyen, C. M., Sinal, C. J., Laffitte, B.A., Reue, K., Jones, S.A., Gonzalez, F.J., Willson, T.M., and Edwards, P.A. (2001) Activated FXR induces apoC-II transcription: a molecular mechanism linking plasma triglyceride levels to bile acids. Mol Endo. 15 (10): 1720-1728.

13. **Kast, H.R.**, Nguyen, C.M., Ericsson, J., and Edwards, P.A. (2001) CTP:phosphocholine Cytidylyltransferase; a new sterol- and SREBP- responsive gene controlling phospholipid biosynthesis. J. Lipid Res. 42:1266-1272.

14. Laffitte, B.A., Repa, J.J., Joseph, S.B., Wilpitz, D.C., **Kast, H.R.**, Mangelsdorf, D. J., and Tontonoz, P. (2001) LXRα controls lipid-inducible expression of the apolipoprotein E gene in macrophages and adipocytes. Proc. Natl. Acad. Sci. 98: 507-512.

15. Laffitte, B.A., **Kast, H.R**., Nguyen, C.M., Zavacki, A.M., Moore, D.D., and Edwards, P.A. (2000) Identification of the DNA binding specificity and potential target genes for the farnesoid X-activated receptor. J. Biol. Chem. 275: 10638-10647.

16. Edwards, P.A., Tabor, D., **Kast, H.R.**, and Venkateswaran A. (2000) Regulation of gene expression by SREBP and SCAP. Biochimica et Biophysica Acta 1529: 103-113.

PATENTS:
"Methods and Compositions for Regulating Multi-drug Resistance Associated Protein 2" Inventors: Peter A. Edwards (UCLA), **Heidi Kast** (UCLA) and Bryan Goodwin (GlaxoSmithKline).

AFFILIATIONS
The Endocrine Society (2002-2007)
American Society for Biochemistry and Molecular Biology (2004-2007)

CONFERENCES
Invited Speaker, "FXR Target Genes Identified by Suppression Subtractive Hybridization in Combination with Microarray Analysis." Hot Topics in Endocrinology (2002), New Orleans, Louisiana.

Poster Presentation, "Regulation of multidrug resistance-associated protein 2 (ABCC2) by the nuclear receptors PXR, FXR and CAR." Keystone Symposia (2002), Snowbird, Utah.

Invited Speaker, "The Isolation and Characterization of Genes Regulated by the Farnesoid X-Activated Receptor." Dueul Lipid Conference (2001), Laguna Hills, California