HEIDI R. KAST-WOELBERN, PH.D.

heidiwoelbern@pointloma.edu
(858)245-7825
3900 Lomaland Drive
San Diego, CA 92106

EDUCATION

Postdoctoral Fellow 2001-2002
University of California Los Angeles
Characterization of FXR null mice by gene expression analysis

Ph.D. in Molecular Biology 1996-2001
University of California Los Angeles – Biological Chemistry
Advisor: Professor Peter Edwards
Thesis: *The Farnesoid-X-activated Receptor and its Role in Lipid Metabolism*

B.S. Chemistry and B.A. Religious Studies 1991-1995
Westmont College, Santa Barbara, CA
Graduated *Magna Cum Laude*

PROFESSIONAL EXPERIENCE

Point Loma Nazarene University 2008 –present
Departments of Biology and Chemistry
Associate Professor 2020-present
Assistant Professor 2018-2020
Part-time Professor 2014 - 2018
Adjunct Professor 2008 - 2014

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.

Ligand Pharmaceuticals, San Diego, CA 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 novel Hedgehog pathway targets.
- 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.

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

- Designed and analyzed multiple micorarray studies of PPAR modulators in colorectal cancer cells that identified targets associated with growth inhibition, cell differentiation and apoptosis.
- Optimized and introduced branched DNA technology to Ligand for mRNA analysis. This technology reduced the time to obtain data and improved costs by 66%.

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.
- 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.

Westmont College, Santa Barbara, CA 1995-1996
Department of Chemistry
Lecturer 1996

- Introduction to General Chemistry II

Laboratory Instructor 1995-1996

- General Chemistry Lab I and II – instructor and coordinator

COURSES TAUGHT

Point Loma Nazarene University

Introduction to General, Organic and Biological Chemistry Lab (CHE103L)
General Chemistry I Lab (CHE152L)
General Chemistry II Lab (CHE153L)
Biotechnology and Society (BIO104)
Introduction to Cell Biology and Biochemistry (BIO210)
Introduction to Cell Biology and Biochemistry Lab (BIO210L)
Ecological and Evolutionary Systems Lab (BIO211L)
Microbiology of Infectious Diseases (BIO220)
Microbiology of Infectious Diseases Lab (BIO220L)
Genetics (BIO345)
Genetics Lab (BIO345L)
Research Methodology (BIO3052)
Developmental Biology Lab (BIO400L)
Perspectives on Science (BIO692)

University of California Los Angeles

Nutritional Biochemistry – Teaching Assistant (medical students)
Introduction to Genetics (LS4) – Teaching Assistant (undergraduates)
Introduction to Molecular Biology (LS3) – Teaching Assistant (undergraduates)

Westmont College

General Chemistry II (CHE6)
General Chemistry I Lab (CHE5L)
General Chemistry II Lab (CHE6L)

PUBLICATIONS

1. Dorrell, M.I., **Kast-Woelbern H.R.,** Botts, R.T., Bravo, S.A., Tremblay, J.R., Giles, S., Wada, J.F., Alexander, M.A., Garcia, E., Villegas, G., Booth, C.B., Purington, K.J., Everett, H.M., Siles, E.N., Wheelock, M., Silva, J.A., Fortin, B.M., Lowey, C.A., Hale, A.L., Kurz, T.L., Rusing, J.C., Goral, D.M., Thompson, P., Johnson, A.M., Elson, D.J., Tadros, R., Gillette, C.E., Coopwood, C., Rausch, A.L., and Snowbarger, J.M. (2021) A Novel Method of Screening Combinations of Angiostatics Identifies Bevacizumab and Temsirolimus as Synergistic Inhibitors of Glioma-Induced Angiogenesis. PLoS ONE 16(6):e0252233.

2. 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.

3. 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.

4. 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.

5. **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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. **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.

13. **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.

14. **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.

15. 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.

16. 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.

17. 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.

PRESENTATIONS and CONFERENCES

1. Alonso, A. *, **Woelbern, H.** "Navigation of macrophage polarization by tumors." Oral presentation at PLNU Honors Scholar Program; April 13, 2019.

2. Fortin, B.*, Hale, A.*, Lowey, C., Rausch, A., Snowbarger, J., **Woelbern, H**., and Dorrell, M. "Identification of Avastin and Torisel as a synergistic angiostatic combination to treat cancer." Oral presentation at West Coast Biological Student Undergraduate Research Conference (WCBSURC) held at USD; April 6, 2019.

3. Culpepper, L.*, Lowey, C.*, Rausch, A., Jansma, A., **Woelbern, H**. and Dorrell, M. "Studying the oncogenic effects of HPV viral proteins on Retinoblastoma activity and degradation." Poster presentation at WCBSURC (USD); April 6, 2019.

4. Alonso, A.*, Fortin, B., Dorrell, M. and Woelbern, H. "Understanding macrophage polarization by tumors." Poster presentation at WCBSURC (USD); April 6, 2019.

5. Coopwood, C., Campbell, M., **Woelbern, H.R.,** and Dorrell, M. "Isolation and characterization of mutant CPA for use in ADEPT treatment of cancer." Oral presentation at 43rd West Coast Biological Student Undergraduate Research Conference (WCBSURC) held at St. Mary's College; April 14, 2018.

6. Coopwood C.*, Campbell, M.*, Gates, C., Rausch, A., Garcia, E., Silva, J. **Woelbern, H.R.** and Dorrell, M. "Targeted Cancer Therapies: Creating and Purifying a Mutated Version of Carboxypeptidase-A to Activate Capped Methotrexate for use in Antibody Directed Enzyme Pro-Drug Therapy (ADEPT)." Oral presentation at the 42nd Annual West Coast Biological Sciences Undergraduate Research Conference held at Santa Clara University; April 22, 2017.

7. **Kast-Woelbern, H.R.** "FXR Target Genes Identified by Suppression Subtractive Hybridization in Combination with Microarray Analysis." Invited speaker at Hot Topics in Endocrinology (2002), New Orleans, Louisiana.

8. **Kast-Woelbern, H.R.** "Regulation of multidrug resistance-associated protein 2 (ABCC2) by the nuclear receptors PXR, FXR and CAR." Poster presentation at Keystone Symposia (2002), Snowbird, Utah.

9. **Kast, H.R.** "The Isolation and Characterization of Genes Regulated by the Farnesoid X-Activated Receptor." Invited speaker at Dueul Lipid Conference (2001), Laguna Hills, California.

SERVICE

PLNU

2019-2020 Pre-Health Committee, (*conduct pre-med and pre-vet interviews for sophomores and juniors; provide feedback on application materials*)

2019-2022 Commencement Honor Guard

2017- Biology Summer Research Program

- 2022, Naomi Armstead, Ella Carlos, Sam Chang, Madi Dedera, Sebastien Dormoy, Anna Giek, Ava Maeyama, Ethan Morin, Alyssa Wiggins,
- 2021, Alyssa Arnold, Sam Chang, Christina de Jong, Anna Giek, Katherine Johnson, Elizabeth Mills, Ethan Morin, David Ruiz Ovando, Alyssa Wiggins
- 2019, Caleb Bates, Bridget Fortin, Andrew Greer, Allison Hale, Connor Lowey, Caleb Smeraldi, Jeffrey Snowbarger
- 2018, Carley Coopwood, Bridget Fortin, Allison Hale, Connor Lowey, Amy Rausch
- 2017, Carley Coopwood, Eric Garcia, Charisa Gates, Amy Rausch, Jordan Silva

2016- Honors Project Committees (**denotes my advisees*)

- 2021-22, Isabel Garcia and Camryn Marbel *
- 2021-22, Elizabeth Mills and Kate Johnson (advisor Mike Dorrell)
- 2021-22, Abbey Hebert and Shelby Shaw (advisor Walter Cho)
- 2020-21, Caleb Bates *
- 2020-21, Joshua Merrill (advisor David Cummings)
- 2019-20, Madison Malone (advisor Ariane Jansma)
- 2019-20, Madelaine Brown (advisor David Cummings)
- 2019-20, Bridget Fortin and Allison Hale (advisor Mike Dorrell)
- 2019-20, Connor Lowey and Andrew Greer (advisor Mike Dorrell)
- 2018-19, Audrianna Alonso*
- 2018-19, Kimberly Woolery (advisor Mark Perry)
- 2018-19, Shelby Kenney (advisor David Cummings)
- 2018-29, Ryan Orlando (advisor Ariane Jansma)
- 2017-18, Meghan Campbell and Carley Coopwood (advisor Mike Dorrell)
- 2016-17, Ellen Asselin (advisor Mike Mooring)

External

2017 Panelist - Integration of faith and science (Redeemer Presbyterian Church)

2009-11 Science Education Association San Diego SEASAND *(community outreach team for middle school and high school science teachers)*

PROFESSIONAL MEMBERSHIPS

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

AWARDS AND HONORS

PLNU Excellence in Teaching Award 2020
PLNU Alumni Association Faculty Grant and RASP 2020
The elucidation of the molecular mechanisms of the oncogenic protein E7 from high risk HPV.
PLNU Research and Special Project (RASP) Grant 2019
The elucidation of the molecular mechanisms of the oncogenic protein E7 from high risk HPV.
PLNU Alumni Association Faculty Grant and RASP Grant 2018
Combination therapies to inhibit angiogenesis.
PLNU Research and Special Project (RASP) Grant 2017
Expression and purification of wild-type and mutant forms of Carboxypeptidase A.
George Popjak Scholar Award 2001
Department of Education Training Grant 1998-1999
Westmont College Presidential Scholarship 1991-1995
Westmont College – Dean's List 1991-1995

PATENTS:

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