# JEFFREY L. STAUDINGER

# **Curriculum Vitae**

December 11, 2017

## **Personal Information**

Basic Sciences Kansas City University

https://scholar.google.com/citations?user=6tDXMOsAAAAJ&hl=en

https://www.researchgate.net/profile/Jeff Staudinger

Email Address: jstaudinger@kcumb.edu

Office Phone: (417) 208-0668 Cell Phone: (417) 434-4791

# **Employment History**

## Academic

# Kansas City University, Joplin Mo

• **Professor & Interim Chair of Basic Sciences- Joplin**, School of Medicine and Biosciences, May 1, 2017-present

## University of Kansas, Lawrence, KS

- Professor, Department of Pharmacology and Toxicology, School of Pharmacy, 2011-2017
- Associate Professor, Department of Pharmacology and Toxicology, School of Pharmacy, 2006
   2011
- Assistant Professor, Department of Pharmacology and Toxicology, School of Pharmacy, 2001
   2006

## **Education**

Ph.D., Biochemistry and Molecular Biology, 1996 University of Texas Graduate School of Biomedical Science, Houston, TX Dr. Eric Olson's laboratory

B.S., Biology, 1987

Nebraska Wesleyan University, Lincoln, NE

#### Research

- University of Kansas Medical Center, Kansas City, KS, Senior Postdoctoral Research Fellow, Department of Pharmacology, Toxicology and Experimental Therapeutics, 2000 2001
- GlaxoSmithKline, Durham, NC, Postdoctoral Research Fellow, Molecular Endocrinology, 1996 2000

# **Professional Memberships**

PRO: School of Pharmacy Vita

Run Date: 8/27/2015

- American Society for Biochemistry and Molecular Biology (ASBMB) (2006 Present)
- American Association for the Advancement of Science (AAAS) (2005 Present)
- American Society for Pharmacology and Experimental Therapeutics (ASPET) (2005 Present)
- International Society for the Study of Xenobiotics (ISSX) (2004 Present)

# Honors/Awards/Honor Societies

#### Individual Honors/Awards

- Leading Light Award, University of Kansas (2012)
- Faculty Scholar Award, KU-K-INBRE (2011)
- Faculty Scholar Award, KU-K-INBRE (2005)

# Kansas City University (KCU) Courses Team Taught, 2017

MED 110- MCM (Molecular and Cellular Mechanisms) - Biochemistry

MED 112- MSK1 (Musculoskeletal System)

MED 113- CP1 (Cardiopulmonary System)

MED 114- GI1 (Gastrointestinal)

Course Director- MED 116- Endo/Repro 1 (Endocrinology and Reproductive Physiology)

# University of Kansas (KU) Courses Taught

```
Spring 2015
   P&TX 640-57610, Toxicology
   P&TX 640-62232, Toxicology
   P&TX 644-63108, Adverse Drug Events
   P&TX 644-63109, Adverse Drug Events
   P&TX 742-66971, Experimental Pharmacology
   P&TX 803-58418, Pharmacolgy Literatur Review I
   P&TX 825-53532, Rsch in Pharmacology&Toxicolgy
Fall 2014
   P&TX 642-22982, Obsty Diab&Metable Syndr:Cr Cn
   P&TX 805-18997, Pharmacley Literatur Review II
   P&TX 825-13842, Rsch in Pharmacology&Toxicolgy
   P&TX 999-13856, Doctoral Dissertation
Summer 2014
   P&TX 698-82003, Library Probs in Pharm&Toxclgy
   P&TX 825-82011, Rsch in Pharmacology&Toxicolgy
   P&TX 999-82027, Doctoral Dissertation
Spring 2014
   P&TX 640-58339, Toxicology
   P&TX 640-63599, Toxicology
   P&TX 644-65057, Adverse Drug Events
   P&TX 644-65058, Adverse Drug Events
   P&TX 747-66386, Molecular Toxicology
   P&TX 803-59256, Pharmacolgy Literatur Review I
   P&TX 825-53836, Rsch in Pharmacology&Toxicolgy
   P&TX 899-53843, Master's Thesis
```

# Fall 2013 P&TX 642-25026, Obsty Diab&Metable Syndr:Cr Cn P&TX 800-14201, Pharmclgy&Toxiclgy Tchng Princ P&TX 805-19871, Pharmaclgy Literatur Review II P&TX 825-14208, Rsch in Pharmacology&Toxicolgy Summer 2013 P&TX 825-82184, Rsch in Pharmacology&Toxicolgy Spring 2013 BIOL 424-50938, Independent Study P&TX 640-59046, Toxicology P&TX 640-65837, Toxicology P&TX 644-69462, Adverse Drug Events P&TX 644-69463, Adverse Drug Events P&TX 742-65849, Experimental Pharmacology P&TX 803-60071, Pharmacolgy Literatur Review I P&TX 825-54147, Rsch in Pharmacology&Toxicolgy Fall 2012 BIOL 424-16689, Independent Study P&TX 642-19328, Obsty Diab&Metable Syndr:Cr Cn P&TX 740-30100, Advanced Biotechnology P&TX 800-14506, Pharmclgy&Toxiclgy Tchng Princ P&TX 805-20741, Pharmaclgy Literatur Review II P&TX 825-14513, Rsch in Pharmacology&Toxicolgy Summer 2012 P&TX 825-82300, Rsch in Pharmacology&Toxicolgy Spring 2012 P&TX 640-59744, Toxicology P&TX 747-68106, Molecular Toxicology P&TX 803-60881, Pharmacolgy Literatur Review I P&TX 825-54468, Rsch in Pharmacology&Toxicolgy Fall 2011 BIOL 424-17142, Independent Study P&TX 633-20055, Pharmacology IV P&TX 642-20056, Obsty Diab&Metable Syndr:Cr Cn P&TX 734-20057, Adv Pharmacolgy V:Endocrinolgy P&TX 805-21638, Pharmacley Literatur Review II P&TX 825-14837, Rsch in Pharmacology&Toxicolgy P&TX 999-14851, Doctoral Dissertation Summer 2011 P&TX 825-82366, Rsch in Pharmacology&Toxicolgy P&TX 999-82382, Doctoral Dissertation

Spring 2011

P&TX 640-60493, Toxicology P&TX 694-54796, Undrgd Lb:Rsh in Pharm&Toxclgy P&TX 803-61820, Pharmacolgy Literatur Review I P&TX 825-54809, Rsch in Pharmacology&Toxicolgy P&TX 999-54822, Doctoral Dissertation

#### Fall 2010

BIOL 424-25675, Independent Study P&TX 633-32137, Pharmacology IV P&TX 642-32139, Obsty Diab&Metablc Syndr:Cr Cn P&TX 740-32147, Advanced Biotechnology

P&TX 805-35973, Pharmaclgy Literatur Review II P&TX 825-20593, Rsch in Pharmacology&Toxicolgy

P&TX 999-20621, Doctoral Dissertation

## Summer 2010

P&TX 698-85119, Library Probs in Pharm&Toxclgy P&TX 825-85135, Rsch in Pharmacology&Toxicolgy P&TX 999-85167, Doctoral Dissertation

# **Summary List of Courses Taught**

# Kansas City University (KCU) Courses Team Taught, 2017

MED 110- MCM (Molecular and Cellular Mechanisms)- Biochemistry

MED 112- MSK1 (Musculoskeletal System)

MED 113- CP1 (Cardiopulmonary System)

MED 114- GI1 (Gastrointestinal)

**Course Director-** MED 116- Endo/Repro 1 (Endocrinology and Reproductive Physiology)

## **University of Kansas**

Undergraduate Teaching for School of Pharmacy

Course Director: P&TX 640 (Formerly P&Tx 627 in yrs 2003-2006), Toxicology, Spring 2003-Spring 2012, current enrollment 150 students

Instructor: P&TX 601, Biotechnology, Fall 2002- Fall 2009, 105 students

Instructor: P&TX 626 (now P&Tx 631), Pharmacology II, Fall 2005, 105 students

Instructor: P&TX 633, Pharmacology IV, Fall 2007 & 2008, 105 students

Instructor: P&TX 642 (elective), Obesity, Diabetes, and Metabolic Syndrome, Fall 2008-2011, 39 students

# Graduate Teaching for Pharmacology and Toxicology

Course Director: P&Tx 747, Molecular Toxicology, Spring 2003-Spring 2012 (taught every other yr), 3-8 students per course

Course Director: P&TX 803, Pharmacology Literature Review I, 2008-current, 3-8 students per course. Literature review courses are written cumulative exams and are not subject to course evaluation.

Course Director: P&TX 804, Pharmacology Literature Review II, 2008-current, 3-8 students per course.

Literature review courses are written cumulative exams and are not subject to course evaluation.

Instructor, P&TX 740: Advanced Biotechnology, Fall 2002-Fall 2011 (taught every other yr), 3-8 students per course

Instructor, P&TX 742: Experimental Pharmacology, Fall 2002-current (taught every other yr), 3-8 students per course

## Research/Scholarly Work

Note: Publications list is exclusive of abstracts

#### **Publications**

## **Book Chapters**

- Staudinger, J. L. (2016). The Molecular Interface between the SUMO and Ubiquitin Systems. Springer Publishing; 2<sup>nd</sup> edition; SUMO Regulation of Cellular Processes book (originally published in 2009). (Invited) Adv Exp Med Biol. 2017;963:99-110. PMID: 28197908
- Staudinger, J. L., & Lichti, K. (2010). Xenobiotic Metabolizing Enzymes and Xenobiotic Receptors. In *Pharmacological and Toxicological Aspects*. Kerala, India: Transworld Research Network. (Invited)

# **Journal Articles**

- Cui W, Sun M, Zhang S, Shen X, Galeva N, Williams TD, Staudinger JL. A SUMO-acetyl switch in PXR biology. Biochim Biophys Acta. Biochim Biophys Acta. 2016 Sep;1859(9):1170-82. PMID: 26883953
- Cui, W., Sun, M., Galeva, N., Williams, T. D., Azuma, Y., & Staudinger, J. L. (2015). SUMOylation and Ubiquitylation Circuitry Controls Pregnane X Receptor Biology in Hepatocytes. *Drug metabolism and disposition: the biological fate of chemicals, 43*(9), 1316-25. doi:10.1124/dmd.115.065201 ISSN: 0090-9556 PMID: 26063058
- Sun, M., Cui, W., Woody, S. K., & Staudinger, J. L. (2015). Pregnane x receptor modulates the inflammatory response in primary cultures of hepatocytes. *Drug Metab Dispos.*, 43(3), 335-43. PMID: 25527709 (Peer-reviewed/refereed)
- Koen, Y. M., Sarma, D., Hajovsky, H., Galeva, N. A., Williams, T. D., Staudinger, J. L., & Hanzlik, R.
   P. (2013). Protein Targets of Thioacetamide Metabolites in Rat Hepatocytes. *Chem Res Toxicol.*.
   PMID: 23465048 (Peer-reviewed/refereed)
- Staudinger, J. L., Woody, S., Sun, M., & Cui, W. (2013). Nuclear-receptor-mediated regulation of drugand bile-acid-transporter proteins in gut and liver. *Drug metabolism reviews*, 45(1), 48-59. doi:10.3109/03602532.2012.748793 ISSN: 0360-2532 (Peer-reviewed/refereed)
- Hajovsky, H., Hu, G., Koen, Y., Sarma, D., Cui, W., Moore, D. S., Staudinger, J. L., & Hanzlik, R. P. (2012). Metabolism and toxicity of thioacetamide and thioacetamide s-oxide in rat hepatocytes. *Chem Res Toxicol*, *25*(9), 1955-63. PMID: 22867114 (Peer-reviewed/refereed)
- Sarma, D., Hajovsky, H., Koen, Y. M., Galeva, N. A., Williams, T. D., Staudinger, J. L., & Hanzlik, R. P. (2012). Covalent modification of lipids and proteins in rat hepatocytes and in vitro by thioacetamide metabolites. *Chem Res Toxicol.*, *25*(9), 1868-77. PMID: 22667464 (Peer-reviewed/refereed)
- Koen, Y. M., Hajovsky, H., Liu, K., Williams, T. D., Galeva, N. A., Staudinger, J. L., & Hanzlik, R. P. (2012). Liver protein targets of hepatotoxic 4-bromophenol metabolites. *Chem Res Toxicol.*, 25(8),

- 1777-86. PMID: 22827705 (Peer-reviewed/refereed)
- Hu, G., Xu, C., & Staudinger, J. L. (2010). Pregnane X receptor is SUMOylated to repress the inflammatory response. *J Pharmacol Exp Ther*, *335*(2), 342-50. PMID: 20719936 (Peer-reviewed/refereed)
- Lichti-Kaiser, K., Brobst, D., Xu, C., & Staudinger, J. L. (2009). A Systematic Analysis of Predicted Phosphorylation Sites within the Human PXR Protein. *J Pharmacol Exp Ther*, *331*, 65-76. PMID: 19617467 (Peer-reviewed/refereed)
- Xu, C., Wang, X., & Staudinger, J. L. (2009). Regulation of tissue-specific carboxylesterase expression by pregnane x receptor and constitutive androstane receptor. *Drug Metab Dispos*, *37*(7), 1539-47. PMID: 19359405 (Peer-reviewed/refereed)
- Singh, R. K., Dai, Y., Staudinger, J. L., & Muma, N. A. (2009). Activation of the JAK-STAT pathway is necessary for desensitization of 5-HT2A receptor-stimulated phospholipase C signalling by olanzapine, clozapine and MDL 100907. *Int J Neuropsychopharmacol, 12*(5), 651-65. PMID: 18976543 (Peer-reviewed/refereed)
- Lichti-Kaiser, K., Xu, C., & Staudinger, J. L. (2009). Cyclic AMP-dependent protein kinase signaling modulates pregnane x receptor activity in a species-specific manner. *J Biol Chem*, 284(11), 6639-49. PMID: 19141612 (Peer-reviewed/refereed)
- Lichti-Kaiser, K., & Staudinger, J. L. (2008). The Traditional Chinese Herbal Remedy Tian Xian Activates Pregnane X Receptor and Induces CYP3A Gene Expression in Hepatocytes. *Drug Metab Dispos*, *36*(8), 1538-45. PMID: 18474680 (Peer-reviewed/refereed)
- Bassan, M., Liu, H., Madsen, K. L., Armsen, W., Zhou, J., Desilva, T., Chen, W., Paradise, A., Brasch, M. A., Staudinger, J. L., Gether, U., Irwin, N., & Rosenberg, P. A. (2008). Interaction between the glutamate transporter GLT1b and the synaptic PDZ domain protein PICK1. *Eur J Neurosci*, 27(1), 66-82. PMID: 18184314 (Peer-reviewed/refereed)
- Wang, H., Huang, H., Li, H., Teotico, D. G., Sinz, M., Baker, S. D., Staudinger, J., Kalpana, G., Redinbo, M. R., & Mani, S. (2007). Activated pregnenolone X-receptor is a target for ketoconazole and its analogs. *Clin Cancer Res*, *13*(8), 2488-95. PMID: 17438109 (Peer-reviewed/refereed)
- Anakk, S., Huang, W., Staudinger, J. L., Tan, K., Cole, T. J., Moore, D. D., & Strobel, H. W. (2007). Gender dictates the nuclear receptor mediated regulation of CYP3A44. *Drug Metab Dispos*, *35*(1), 36-42. PMID: 17020958 (Peer-reviewed/refereed)
- Huang, H., Wang, H., Sinz, M., Zoeckler, M., Staudinger, J. L., Redinbo, M. R., Teotico, D. G., Locker, J., Kalpana, G. V., & Mani, S. (2007). Inhibition of drug metabolism by blocking the activation of nuclear receptors by ketoconazole. *Oncogene*, 26(2), 258-68. PMID: 16819505 (Peer-reviewed/refereed)
- Staudinger, J. L., Ding, X., & Lichti, K. (2006). Pregnane X receptor and natural products: Beyond Drug-drug Interactions. *Expert Opin Drug Metab Toxicol*, *2*(6), 847-857. PMID: 17125405 (Peer-reviewed/refereed)
- Ding, X., Lichti, K., Kim, I., Gonzalez, F. J., & Staudinger, J. L. (2006). Regulation of constitutive androstane receptor and its target genes by fasting, cyclic AMP, HNF-4 and the coactivator PGC-1.

- J Biol Chem, 281, 26540-26551. PMID: 16825189 (Peer-reviewed/refereed)
- Ding, X., Lichti, K., & Staudinger, J. L. (2006). The Mycoestrogen Zearalenone Induces CYP3A through Activation of the Pregnane X Receptor. *Toxicol. Sci*, 91(2), 448-455. PMID: 16547076 (Peer-reviewed/refereed)
- Ding, X., & Staudinger, J. L. (2005). The Ratio of CAR to PXR Determines the Activity of Guggulsterone Against the Cyp2b10 Promoter. *J. Pharmacol. Exp. Ther*, *314*, 120-127. (Peer-reviewed/refereed)
- Ding, X., & Staudinger, J. L. (2005). Repression of PXR-mediated Induction of Hepatic CYP3A Gene Expression by Protein Kinase C. *Biochem. Pharmacol*, 69(5), 867-873. (Peer-reviewed/refereed)
- Ding, X., & Staudinger, J. L. (2005). Induction of Drug Metabolism by Forskolin, the Role of The Pregnane X Receptor and the PKA Signal Transduction Pathway. *J. Pharmacol. Exp. Ther. Feb*, 312, 849-856. (Peer-reviewed/refereed)
- Anakk, S., Kalsotra, A., Kikuta, Y., Huang, W., Zhang, J., Staudinger, J. L., Moore, D. D., & Strobel, H. W. (2004). CAR/PXR Provide Directives for Cyp3a41 Gene Regulation Differently from Cyp3a11. *Pharmacogenomics J*, 4(2), 91-101. (Peer-reviewed/refereed)
- Brobst, D., Ding, X., Creech, K. L., Goodwin, B., Kelley, B., & Staudinger, J. L. (2004). Guggulsterone Activates Multiple Nuclear Receptors and Induces CYP3A Gene Expression through the Pregnane X receptor. *J. Pharmacol. Exp. Ther*, 310(2), 528-35. (Peer-reviewed/refereed)
- Chen, C., Staudinger, J. L., & Klaassen, C. D. (2003). Nuclear Receptor, Pregnane X Receptor, is Required for Induction of UDP-glucuronosyltranferases in Mouse Liver by Pregnenolone-16 Alphacarbonitrile. *Drug Metab Dispos*, 31(7), 908-15. (Peer-reviewed/refereed)
- Anakk, S., Kalsotra, A., Shen, Q., Vu, M. T., Staudinger, J. L., Davies, P. J., & Strobel, H. W. (2003). Genomic Characterization and Regulation of Cyp3a13: Role of Xenobiotics and Nuclear Receptors. *FASEB J*, 17(12), 1736-8. (Peer-reviewed/refereed)
- Staudinger, J. L., Madan, A., & Carol, K. M. (2003). Andrew Parkinson Regulation Of Drug Transporter Gene Expression By Nuclear Receptors. *Drug Metab Dispos*, *31*(5), 523-7. (Peer-reviewed/refereed)
- Guo, G. L., Staudinger, J. L., Ogura, K., & Klaassen, C. D. (2002). Induction of Rat Organic Anion Transporting Polypeptide 2 by Pregnenolone-16 -carbonitrile Is via Interaction with Pregnane X Receptor. *Mol Pharmacol*, *61*, 832-839. (Peer-reviewed/refereed)
- McInvale, A. C., Staudinger, J. L., Harlan, R. E., & Garcia, M. M. (2002). Immunolocalization of PICK1 in the Ascending Auditory Pathways of the Adult Rat. *J Comp Neurol*, 450(4), 382-94. (Peer-reviewed/refereed)
- Torres, G., Yao, W. D., Mohn, A. R., Quan, H., Kim, K. M., Levey, A. I., Staudinger, J. L., & Caron, M. (2001). Functional Interaction Between Monoamine Plasma Membrane Transporters and the Synaptic PDZ Domain-Containing Protein PICK1. *Neuron*, 30, 121-134. (Peer-reviewed/refereed)
- Staudinger, J. L., Liu, Y., Madan, A., Habeebu, S., & Klaassen, C. D. (2001). Coordinate Regulation of Xenobiotic and Bile Acid Homeostasis by PXR. *Drug Metab Dispos*, 29(11), 1467-72.

(Peer-reviewed/refereed)

Staudinger, J. L., Goodwin, B., Jones, S. A., Hawkins-Brown, D., Liu, Y., LaTour, A., Klaassen, C. D., Willson, T. M., Koller, B. H., & Kliewer, S. A. (2001). The Nuclear Receptor PXR Functions as a Hepatic Lithocholic Acid Sensor. *Proc Natl Acad Sci*, *98*(6), 3369-3374. (Peer-reviewed/refereed)

## Editorials

- Staudinger, J. L. (2013). Disease, drug metabolism, and transporter interactions. In *Pharmaceutical research* (9th ed., Vol. 30, pp. 2171-3). doi:10.1007/s11095-013-1129-x ISSN: 0724-8741
- Staudinger, J. L. (2008). Liver-enriched nuclear receptors: therapeutic opportunities. In *Mol Pharm* (1st ed., Vol. 5, pp. 1-2). (Invited)

#### Review Articles, Journals

- Staudinger, J. L., Xu, C., Biswas, A., & Mani, S. (2011). Post-translational modification of pregnane x receptor. *Pharmacol Res*, *64*(1), 4-10. PMID: 21397695 (Peer-reviewed/refereed)
- Staudinger, J. L., Xu, C., Biswas, A., & Mani, S. (2011). Post-translational modification of pregnane x receptor. *Pharmacol Res*, 64(1), 4-10. PMID: 21397695 (Invited) (Peer-reviewed/refereed)
- Staudinger, J. L., Xu, C., Cui, Y. J., & Klaassen, C. D. (2010). Nuclear Receptor-Mediated Regulation of Carboxylesterase Expression and Activity. *Expert Opin Drug Metab Toxicol*, *6*, 261-71. (Invited) (Peer-reviewed/refereed)
- Staudinger, J. L., Xu, C., Cui, Y. J., & Klaassen, C. D. (2010). Nuclear receptor-mediated regulation of carboxylesterase expression and activity. *Expert Opin Drug Metab Toxicol*, *6*(3), 261-71. PMID: 20163318 (Peer-reviewed/refereed)
- Staudinger, J. L., & Lichti, K. (2008). Cell signaling and nuclear receptors: new opportunities for molecular pharmaceuticals in liver disease. *Mol Pharm, 5*(1), 17-34. PMID: 18159925 (Peer-reviewed/refereed)
- Staudinger, J. L., & Lichti, K. (2008). Cell signaling and nuclear receptors: new opportunities for molecular pharmaceuticals in liver disease. *Mol Pharm, 5*(1), 17-34. (Invited) (Peer-reviewed/refereed)

  Review
- Staudinger, J. L., Ding, X., & Lichti, K. (2006). Pregnane X receptor and natural products: Beyond Drug-drug Interactions. *Expert Opin Drug Metab Toxicol*, *2*(6), 847-857. (Invited) (Peer-reviewed/refereed)

#### **Invited Presentations/Lectures**

- Staudinger, J. L. (2015, October 13). *Novel Tools for Characterizing the Stress-Inducible SUMOlome*. Midwest Regional SUMO Symposium, University of Kansas, Lawrence, Kansas.
- Staudinger, J. L. (2015, March 5). *Novel Strategies to Suppress Inflammation and Tumor Progression in Liver*. Mini Symposium: Novel Approaches in the Study of Liver Disease. 1001 Beller, KUMC.

Staudinger, J. L. (2012, December 8). *SUMO-modification of Pregnane X Receptor*. The Second International Symposium for Industrial and Clinical Pharmacy, Sun Yat-Sen University, The First Affiliated Hospital.

- Hosted by Xiao Chen Director of Pharmacy Department
- Staudinger, J. L. (2012, December 5). *SUMO-modification of Pregnane X Receptor*. Shanghai Institute of Materia Medica (SIMM), Chinese Academy of Sciences (CAS), Center for Drug Metabolism and Pharmacokinetics Research.

  Hosted by Xiaoyan Chen, Ph.D. Professor
- Staudinger, J. L. (2012, February). University of Kansas, Higuchi Bioscience Center, Science Talks, Hosted by Dr. Eli Michaelis and Dr. John Stobaugh.
- Staudinger, J. L. (2009, October 18). *Regulation of Xenobiotic Enzymes and Transporters*. Presented lecture, Invited Session Speaker: 16th North American Regional ISSX Meeting, Baltimore, MD.
- Staudinger, J. L. (2009, May). University of Maryland School of Pharmacy, Department of Pharmaceutical Sciences. Hosted by Hongbing Wang.
- Staudinger, J. L. (2007, September). *Metabolic Activation of the Constitutive Androstane Receptor*. University of Arizona. Hosted by Dr. Jeanne Wilson-Rawls.
- Staudinger, J. L. (2007, February). *Metabolic Activation of the Constitutive Androstane Receptor*. Pfizer. Hosted by Dr. Susan Buist, Ann Arbor, MI.
- Staudinger, J. L. (2007, February). *Metabolic Activation of the Constitutive Androstane Receptor*. University of Michigan, Department of Pharmaceutical Sciences. Hosted by Dr. David E. Smith, Professor and Chair, Ann Arbor, MI.
- Staudinger, J. L. (2006, December). *Nuclear Receptors and Signal Transduction, an Interlaced Tail of Two Mouse Models*. GlaxoSmithKline. Hosted by Dr. David C. Morris, Durham, NC.
- Staudinger, J. L. (2006, October). *Metabolic Activation of the Constitutive Androstane Receptor*. Kansas State University, Manhattan, KS.
- Staudinger, J. L. (2006, September). *Metabolic Activation of the Constitutive Androstane Receptor*. University of Texas. Hosted by Dr. William Baldwin, El Paso, TX.
- Staudinger, J. L. (2006, April 2). *Metabolic Considerations in the Action of Herbal Medicines*. Invited Session Speaker: American Society for Pharmacology and Experimental Therapeutics, San Francisco, CA.
- Staudinger, J. L. (2005, May). *PXR and CAR: Master Regulators of Xenobiotic and Metabolic Homeostasis*. Stowers Institute for Medical Research. Hosted by Dr. Robert Krumlauf, Kansas City, MO.
- Staudinger, J. L. (2004, May). *The Regulation of Drug Transporter Gene Expression by PXR*. Emporia State University, Emporia, KS.
- Staudinger, J. L. (2004, February). What's Hot? Transgenic and Knockout Mouse Core-Facility and Gene Chips. University of Kansas. Hosted by Dr. Gunda Georg, Lawrence, KS.

Staudinger, J. L. (2003, October 29). Co-Regulation of Drug Metabolizing Enzymes and Drug Transporter Proteins by Orphan Nuclear Receptors. Invited Session Speaker: The American Association of Pharmaceutical Scientists (AAPS), Salt Lake City, UT.

- Staudinger, J. L. (2003, October 15). *Turning ADME On and Off: The Pregnane X Receptor as the Master-Switch*. Invited Session Speaker: International Society for the Study of Xenobiotics, Providence, RI.
- Staudinger, J. L. (2002, May). *Gene Chips and the Study of Drug Inducible Gene Expression*. Lyon College. Hosted by Local Chapter of The American Chemical Society, Batesville, AR.
- Staudinger, J. L. (2002, May). *Pregnane X Receptor Regulates the Uptake, Metabolism and Excretion of Xenobiotics*. University of Texas Health Science Center. Hosted by Dr. A. Firulli, San Antonio, TX.

#### **Poster Presentations**

- Cui, W., Sun, M., Woody, S., & Staudinger, J. L. (2015, October 13). *Biochemical Methods to Detect Post-Translational Modification of Human Pregnane X Receptor*. Poster, Midwest Regional SUMO Symposium, University of Kansas, Lawrence, Kansas.
- Liu, C., Cui, W., & Staudinger, J. L. (2015, October 13). *Pregnane X receptor SUMOylation and De-SUMOylation*. Poster, Midwest Regional SUMO Symposium, University of Kansas, Lawrence, Kansas.
- Sun, M., & Staudinger, J. L. (2015, October 13). *Regulated Ubiquitination and SUMOylation of Pregnane X Receptor*. Poster, Midwest Regional SUMO Symposium, University of Kansas, Lawrence, Kansas.
- Woody, S. K., Sun, M., & Staudinger, J. L. (2015, October 13). *SUMO-Modification of PXR Alters Protein-Cofactor Interactions*. Poster, Midwest Regional SUMO Symposium, University of Kansas, Lawrence, Kansas.
- Cui, W., Gelava, N., Williams, T., & Staudinger, J. L. (2015, February 6). *Detection of a Novel PIAS1 SUMOylation Site in Hepatocytes*. Poster, HBC Science Talks, University of Kansas, Lawrence, Kansas.
- Cui, W., Gelava, N., & Staudinger, J. L. (2015, January 16). *Detection of a Novel Inflammation-Induced Cellular SUMO-target Proteins in Hepatocyte-derived Models of Inflammatory Liver Disease*. Poster, 13th Annual K-INBRE Symposium, Topeka, Kansas. Abstract.
- Cui, W., Sun, M., Woody, S., & Staudinger, J. L. (2014, January 19). *Biochemical Methods to Detect Post-Translational Modifications of Human Pregnane X Receptor*. Poster, 12th Annual K-INBRE SYMPOSIUM, Lawrence, Kansas. Abstract.
- Liu, C., Cui, W., & Staudinger, J. L. (2014, January 19). *Pregnane X receptor SUMOylation and De-SUMOylation*. Poster, 12th Annual K-INBRE SYMPOSIUM, Lawrence, Kansas. Abstract.
- Sun, M., & Staudinger, J. L. (2014, January 19). *Biochemical Characterization of Pregnane X Receptor Ubiquitination and SUMOylation*. Poster, 12th Annual K-INBRE SYMPOSIUM, Lawrence, Kansas. Abstract.

Woody, S. K., Sun, M., & Staudinger, J. L. (2014, January 19). *SUMO-modification Alters PXR Transactivation*. Poster, 12th Annual K-INBRE SYMPOSIUM, Lawrence, Kansas. Abstract.

- Sun, M., & Staudinger, J. L. (2013, January). *PXR regulates the expression of inflammatory mediators in liver: regulation of interleukin 1 receptor antagonist*. Poster. Abstract.
- Woody, S., Cui, W., & Staudinger, J. L. (2012, February). *The Effect of TNF-α on Liver-enriched Nuclear Receptors and their Target Genes*. Poster, HBC Science Talks. (Abstract).
- Sun, M., & Staudinger, J. L. (2012, January). *Biochemical Characterization of PXR-p0071 Interaction*. Poster, Graduate Honors Symposium. (Abstract).
- Brobst, D., & Staudinger, J. L. (2009, October). *Nuclear Receptor Signaling in HepaRG Cells*. Poster, International Society for the Study of Xenobiotics (ISSX), 16th North American Regional Meeting. (Abstract).
- Xu, C., Wang, X., & Staudinger, J. L. (2009, October). *Regulation of Tissue-Specific Carboxylesterase Expression by Pregnane X Receptor and Constitutive Androstane Receptor*. Poster, International Society for the Study of Xenobiotics (ISSX), 16th North American Regional Meeting. (Abstract).
- Lichti, K., & Staudinger, J. L. (2007, October 12). *PXR Activity is Modulated by PKA Signaling in a Species-Specific Manner*. Poster, International Society for the Study of Xenobiotics (ISSX), 8th International ISSX Meeting, Sendai, Japan: (Abstract) October 2007.
- Lichti, K., Brobst, D., & Staudinger, J. L. (2006). Novel Models to Evaluate the Human Xenobioticresponse: Transduced Pregnane X Receptor Knockout Hepatocytes and a 'Humanized' Pregnane X Receptor Mouse. Poster, 14th Annual Meeting of the International Society for the Study of Xenobiotics, (Abstract), Rio Grande, Puerto Rico.
- Hassan, C., Lichti, K., Xunshan, D., & Staudinger, J. L. (2006, October). *PGC1 Regulates Expression of CAR and CAR-target Genes*. Poster, 14th Annual Meeting of the International Society for the Study of Xenobiotics, (Abstract), Rio Grande, Puerto Rico.
- Staudinger, J. L. (2006, October 24). *Metabolic Activation of the Constitutive Androstane Receptor*. Lecture, Symposium Speaker: 14th North American ISSX Meeting, Rio Grande, Puerto Rico.
- Staudinger, J. L. (2006, October 24). Novel Models to Evaluate the Human Xenobiotic-response: Transduced Pregnane X Receptor Knockout Hepatocytes and a 'Humanized' Pregnane X Receptor Mouse. Lecture, Symposium Speaker: 14th North American ISSX Meeting, Rio Grande, Puerto Rico.
- Brobst, D., Parkinson, A., Czerwinski, M., & Staudinger, J. L. (2005, October). *Cytochrome P450 Induction in the Fa2N-4 Immortalized Human Hepatocyte Cell Line and Primary Cultures of Human Hepatocytes*. Poster, International Society for the Study of Xenobiotics (ISSX), 13th North American Meeting, (Abstract), Maui, HI.
- Ding, X., & Staudinger, J. L. (2005, October). *Regulation of CYP2B10 Gene Expression by Guggulsterone*. Poster, International Society for the Study of Xenobiotics (ISSX), 13th North American Meeting, (Abstract), Maui, HI.

Lichti, K., & Staudinger, J. L. (2005, October). *PXR Activity is Modulated by PKA Signaling in a Species-Specific Manner*. Poster, International Society for the Study of Xenobiotics (ISSX), 13th North American Meeting, (Abstract), Maui, HI.

- Ding, X., & Staudinger, J. L. (2004, August). *Differential Modulation of the Xenobiotic Response by PKA Activators*. Poster, International Society for the Study of Xenobiotics (ISSX), 7th International Meeting, (Abstract), Vancouver, Canada.
- Ding, X., Lichti, K., Sweet, D., Hayden, M., & Staudinger, J. L. (2004, August). *Pregnane X Receptor Regulates the Expression of PXR-Target Genes in Choroid Plexus*. Poster, International Society for the Study of Xenobiotics (ISSX), 7th International Meeting, Vancouver, Canada.
- Brobst, D., Ding, X., Goodwin, B., & Staudinger, J. L. (2003, October). *Gugulipid, CYP3A and Herb-Drug Interactions*. Poster, International Society for the Study of Xenobiotics (ISSX), 12th North American Meeting, (Abstract), Providence, Rhode Island.
- Brobst, D., Ding, X., Goodwin, B., & Staudinger, J. L. (2003, May). *Gugulipid, CYP3A and Herb-Drug Interactions*. Poster, American Association for the Study of Liver Diseases, Basic Research Single Topic Conference, (Abstract), Warrenton, VA.

## Research Funding/Fellowships

# **University of Kansas**

## **Externally-Funded Grant/Contract**

## **Funded**

- Staudinger, J. L. (Principal). *Detection of Novel Inflammation-induced Cellular SUMO-target Proteins in Hepatocyte-derived Models of Inflammatory Liver Disease*. Protein Structure & Function CoBRE (2015 2016).
- Staudinger, J. L. (Principal). *Inflammation, PXR Modification and Drug Disposition*. RO1 DK090558, NIH RO-1, National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK) \$996,304 (May 2012 April 2015).
- Hanzlik, R. (Principal), & Staudinger, J. L. (Co-Principal). Reactive Metabolites in Drug Toxicity. 5RO1 GM021784-33, NIH RO-1, NIH-General Medical Sciences (NIGMS) \$990,217 (April 2009 - March 2013).
- Staudinger, J. L. (Principal). *Inflammation, PXR Modification and Drug Disposition*. K-INBRE (2011 2012). \$50,000
- Staudinger, J. L. (Principal). *Cell Signaling, PXR Phosphorylation, and Drug Disposition*. 1 RO1 DK068443, NIH RO-1, National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK) \$922,500 (May 2005 April 2010).
- Hanzlik, R. P. (Principal), & Staudinger, J. L. Structure Activity Relationships Among PXR isoforms. NIH 1-P20-RR017708, Multi-Investigator Grant, COBRE in Protein Structure and Function \$360,000 (September 2002 - August 2005).

Project Leader: Jeff Staudinger

Staudinger, J. L. (Principal). *Novel Strategies to Suppress Inflammation and Tumor Progression in Liver*. Nuclear Receptors in Liver Health & Disease CoBRE, KUMC \$75,000, February 13, 2015 (April 1, 2015 - March 31, 2016).

Project Leader: Jeff Staudinger

## **Internal Grant Awards:**

#### General Research Fund

- Staudinger, J. L. (Principal). *Identification of PXR-target Genes in Kidney Using Gene-Chips*. University of Kansas \$18,000 (July 2003 June 2004).
- Staudinger, J. L. (Principal). Faculty Start Up Funds University of Kansas and Department of Pharmacology and Toxicology \$250,000 (August 2001 Present).
- Muma, N. A. (Principal), & Staudinger, J. L. Consortium Targeting SUMO for the Treatment of Inflammatory-related Diseases. Strategic Initiative Grant (2015 2018).
- Staudinger, J. L. *KU Kansas IDeA Network of Biomedical Research Excellence Faculty Scholar Award (KINBRE)*. RR016475, K-INBRE Program of the National Center for Research Resources \$50,000 (February 2012).
- Staudinger, J. L. *KU Kansas IDeA Network of Biomedical Research Excellence Faculty Scholar Award* (*KINBRE*). RR016475, K-INBRE Program of the National Center for Research Resources \$10,000 (2005).
  - \$10,000.00 with an additional \$10,000.00 in matching funds from KU Center for Research (KUCR)
- Staudinger, J. L. (Principal). *Transgenic Mouse Core Facility*. Research Development Fund University of Kansas \$90,000 (December 2002 November 2004).
- Staudinger, J. L. (Principal). *Transgenic Mouse Core Facility*. Research Development Fund University of Kansas \$125,000 (December 2001 November 2003).

## **New Faculty General Research Fund**

Staudinger, J. L. (Principal). *Identification and Characterization of Drug-Inducible Genes Using Gene-array and DNA Gene Chip Platforms*. University of Kansas \$10,000 (December 2001 - June 2002).

#### **External Grants**

#### Not Funded:

Staudinger, J. L. *Cell Signaling, PGC-1 Proteins, and Drug Disposition.* R01DK068443, NIH - National Institute of Health \$1,250,000, Submitted March 5, 2009.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Cell Signaling, PXR Phosphorylation & Drug Disposition*. R01DK068443-01A2, NIH - National Institute of Health \$1,250,000, Submitted March 1, 2005.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Genome-wide analysis of PGC-1 Proteins*. RC1DK086714, NIH - National Institute of Health \$682,594, Submitted April 27, 2009.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Identification and characterization of drug-inducible genes*. American Liver Foundation \$150,000, Submitted January 3, 2002.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Identification and Characterization of Drug-Inducible Genes*. PHRMA Foundation \$60,000, Submitted September 14, 2001.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Inflammation, PXR Modification and Drug Disposition*. R01DK090558, NIH - National Institute of Health \$1,250,000, Submitted February 19, 2010.

Project Leader: Jeff Staudinger

Staudinger, J. L. *Molecular Mechanisms of Resistance to Weight Loss*. R01DK073579-01, NIH - National Institute of Health \$750,000, Submitted February 1, 2005.

Project Leader: Jeff Staudinger

Staudinger, J. L. *PXR Expression and Activity in Aging Choroid Plexus*. NURSA - Nuclear Receptor Signaling Atlas \$150,000, Submitted April 15, 2004.

Project Leader: Jeff Staudinger

Staudinger, J. L. Studies of PXR-target Genes in Extra-Hepatic Tissues. F32GM070316-01, NIH - National Institute of Health \$123,403, Submitted April 7, 2003.

Post-Doc fellowship for Obe Omoike, Project Leader: Jeff Staudinger

Staudinger, J. L. *Cell Signaling, PXR Phosphorylation & Drug Disposition*. R01DK068443-01, NIH - National Institute of Health \$1,250,000 (September 30, 2003).

Project Leader: Jeff Staudinger

## Dissertation/Thesis/Postdoctoral/Other Supervision

# University of Kansas

#### Dissertation Committee Chair

Wenqi Cui, Ph.D., Status: completed. 2013 - 2017 Mengxi Sun, Status: completed. 2009 - January 2015

Chenshu Xu, Status: completed. 2007 - 2011 Kristin Lichti, Status: completed. 2004 - 2009 Xunshan Ding, Status: completed. 2001 - 2005

#### Dissertation Committee Member

Pan Pan, Status: in progress. 2009 - 2015
Liang Zhang, Status: in progress. 2009 - 2015
Rakesh Sing, Status: completed. 2008 - 2010
Melinda Toumi, Status: completed. 2005 - 2010
Sunny Peizhen Song, Status: completed. 2004 - 2010
Jamie Cunningham, Status: completed. 2003 - 2008
Nanteetip Limpeanchob, Status: completed. 2002 - 2006
Kathleen Seyb, Status: completed. 2002 - 2006
Xiaodong Bao, Status: completed. 2002 - 2005
Kristin Barkus, Status: completed. 2002 - 2005
Jon Maher, Status: completed. 2002 - 2005
Rong Chen, Status: completed. 2002 - 2003
Andreas Gille, Status: completed. 2002 - 2003

# Master's Thesis Committee Chair

Xunan Shen, M.S., Status: Completed, 2017 Chang Liu, M.S., Status: completed. 2014 Robert Baker, Status: completed. 2006 - 2008 Hongsheng Zhang, Status: completed. 2005 - 2008 Dan Brobst, Status: completed. 2003 - 2005

Brenda Birckenstrand, Status: completed. 2002

#### Postdoctoral Research Advisor

Gang Hu, Status: completed. 2009 - 2011 Dan Papa, Status: completed. 2005 - 2007 Kathleen Davis, Status: completed. 2003 - 2004 Obe Omoike, Status: completed. 2002 - 2003

# Undergraduate Student Research Advisor

Margeret Stuckey, Status: in progress. January 2015 - Present Scott Ogan, Pre-med, Status: in progress. 2010 - Present Alex Balmaceda, Pre-med, Status: in progress. 2009 - Present Emre Agbas, summer undergraduate fellow, Status: in progress. Erica Crandon, Status: completed. 2013 - 2015 Emre Aghbas, Student Hourly, Status: completed. 2011 - 2012 WanTo Poon, Student Hourly, Status: completed. 2008 - 2010 Andrea Steen, Pre-med, Status: completed. 2008 - 2010 Hassan Chebaro, Student Hourly, Status: completed. 2007 - 2009 Alex Stearns, Pharmacy Elective, Status: completed. 2008

Chris Bell, Student Hourly, Status: completed. 2005

Ray Perrenoud, Pharmacy Internship, Status: completed. 2005

Mary Hayden, Student Hourly, Status: completed. 2003 - 2005

Dave Swafford, Student Hourly, Status: completed. 2002 - 2005

Alison Eastwood, Pharmacy Internship, Status: completed. 2004

Joan Thompson, Pharmacy Internship, Status: completed. 2004

My Luu, KU Honors Program, Status: completed. 2002 - 2004

Alison Mezger, Student Hourly, Status: completed. 2003

Edlira Bashari, REU Program, Status: completed. Summer 2003

Karel Capek, REU Program, Status: completed. Summer 2003

Kristin Lichti, Nebraska Wesleyan University, Howard Hughes Fellow, Status: completed. Summer 2003

Tony Podany, Nebraska Wesleyan University, Howard Hughes Fellow, Status: completed. Summer 2003

Claire Binci, Student Volunteer, Status: completed. 2002

Brian Kelley, Student Volunteer, Status: completed. 2002

Kyle Kanipe, REU Program, Status: completed. Summer 2002

#### Academic Advisees

## Undergraduate

Emre Aghbas, Erica Crandon, Xin Jin, Shenyu Qian, Margaret Stuckey, Qi Wang

# **University Service**

## **University of Kansas**

## Director

Transgenic and Knockout Mouse Core Facility (TAKOM). (2004 - 2008)

#### **Faculty Senator**

Faculty Senate. (2008 - 2011) University Senate. (2008 - 2011)

#### Member

Internal advisory committee (IAC), CoBRE in Protein Structure and Function.

Promotions and Tenure Committee, Higuchi Bioscience Center. (2012 - Present)

COBRE in Protein structure and Function Internal Advisory Board. (2005 - Present)

Recombinant DNA Committee. (2005 - Present)

Faculty Appointments Committee. (2005 - 2007)

University Graduate Council. (2004 - 2007)

Institutional Animal Care and Use Committee (IACUC). (2003 - 2004)

#### **School Service**

# **Kansas City University (KCU)**

Member, Institutional Review/Privacy Board Member, Rank and Promotions Member, Admissions Committee

# **University of Kansas**

## Chair

Deans 5 yr Review Committee.

Standards for Students Sub-Committee. (2008)

#### Director

Pharmacology and Toxicology Departmental Course Scheduling. (2002 - Present)

## Member

Admissions Committee (2001-2016).

Ronald T. Borchardt Ph.D. Scholorship Selection Committee (2009-2016).

Faculty executive committee. (2008 - Present)

PharmD Program Admissions Committee. (2005 - Present)

Non-Traditional PharmD Program Admissions Committee. (2002 - 2009)

Standards for Students Committee. (2008)

Assessments Committee. (2005 - 2006)

#### Officer

International Pharmaceutical Students Federation (IPSF) Student Exchange Program (SEP). (2005 - Present)

# Preceptor

Pharmacy Practice Rotation Program. (2004 - Present)

# **Department Service**

## University of Kansas

## Pharmacology & Toxicology

#### Chair

Faculty Search Committee. (2008) Faculty Search Committee. (2005)

## Director

Departmental Seminar Program. (2008 - 2009)

Graduate Studies. (2004 - 2007)

## Host

Dr Angela Slitt, Pharmacology and Toxicology Department Seminar. (2007)

Dr. Bryan Goodwin for Departmental Seminar. (2004)

Dr. Steve Kliewer for Departmental Seminar. (2004)

Dr. Anthony Firulli for Departmental Seminar. (2003)

#### Member

Faculty Search Committee. (2005) Faculty Search Committee. (2004) Faculty Search Committee. (2003)

Safety Officer (2002 - Present)

#### **Professional Service**

# **Editorial Responsibilities**

## International

#### Editorial Board Member

Drug Metabolism and Disposition, Editorial Advisory Board. (20012-Present) Molecular Pharmaceutics, Editorial Advisory Board. (2008 - Present)

## Associate Editor

Naunyn-Schmiedeberg's Archives of Pharmacology. (2015-Present)

#### National

#### Editorial Board Member

*Molecular Pharmaceutics*, Editorial Advisory Board. *Nuclear Receptors*, Editorial Advisory Board.

#### Other Professional Service

## International

#### Co-Chair

Symposium, 8th International ISSX Meeting, Lipid Homeostasis and Metabolic Regulation.

Presented Lecture on Nuclear Receptors, Cell Signaling, and Drug Metabolism, Sendai, Japan. (October 9, 2007)

Plenary Session, 14th North American ISSX Meeting, International Society for the Study of Xenobiotics, Nuclear Receptors and Obesity, Rio Grande, Puerto Rico. (October 24, 2006)

Symposium, 14th North American ISSX Meeting, Modulation of Xenobiotic Response by Nutritional and Inflammatory Factors, Rio Grande, Puerto Rico. (October 24, 2006)

## **Guest Editor**

*Pharmaceutical Research*, Theme Issue - Disease-drug Metabolism/drug Transporter Interactions. (2012)

*Molecular Pharmaceutics*, Theme Issue - Liver-enriched Nuclear Receptors - Volume 5, number 1. (February 2008)

## Reviewer, Ad Hoc Journal

Biochemical Journal.

Cancer Biology & Therapy.

Developmental Biology.

Drug Metabolism and Disposition (DMD).

Expert Opinion on Drug Metabolism and Toxicology (EMT).

Journal of Biological Chemistry (JBC).

Journal of Pharmaceutical Sciences.

Journal of Pharmacology and Experimental Therapeutics (JPET).

Journal of Pharmacy and Pharmacology.

Molecular Pharmacology.

Nuclear Receptor Signaling Atlas (NURSA).

Nucleic Acids Research.

Pharmaceutical Research.

Pharmaceutical Reviews.

Toxicological Sciences.

Toxicology Letters.

## Session Chair and Organizer

Genetically Modified Animals in ADME Research', 12th Annual North American Meeting International Society for the Study of Xenobiotics (ISSX), Providence, RI. (October 21, 2003)

# Session Chair and Organizer

*Inflammation and Drug Metabolism*, 14th Annual North American Meeting International Society for the Study of Xenobiotics (ISSX), Puerto Rico. (October 1, 2006)

## **National**

## Ad Hoc Member

ZAT1 HS-18 Training, Education, and AREA Grants Study Section. (2015)

XNDA-NIH Study Section. (2011)

XNDA-NIH Study Section. (2010)

## Reviewer, Ad Hoc

National Institutes of Health (NIH), Xenobiotic and Nutrient Disposition and ActionStudy Section (XNDA). (2011)

National Institutes of Health (NIH), Xenobiotic and Nutrient Disposition and ActionStudy Section (XNDA). (2009)