

## Scott S. Auerbach

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### **Profile**

- Ph.D. Pharmacologist with training and experience in traditional toxicology, molecular toxicology and toxicogenomics
- Experience with the design and interpretation toxicity and carcinogenicity rodent bioassays
- Working knowledge of machine learning in relation to its use the creation of toxicogenomic models
- Skilled in the application of genome-based technologies used to characterize chemical mechanism of action and genetic determinants of chemical toxicity
- Extensive experience with CYP450 induction studies, primary human hepatocyte studies, nuclear receptor assays
- Working knowledge of ADME study design and interpretation

### **Education**

#### **Doctor of Philosophy in Pharmacology**

University of Washington, School of Medicine, Seattle, WA, USA

GPA: 3.79/4.0

December 2004

Dissertation Topic: "Functional effects of genetic polymorphism and splice variation in human nuclear receptors and their co-activators"

#### **Bachelor of Science in Biochemistry & Molecular Biology & General Science (Life Science Option)**

#### **Recipient of the Senior Evan Pugh Scholar Award**

The Pennsylvania State University, University Park, PA, USA

May 1998

GPA: 3.93/4.0

### **Work Experience**

#### **Intramural Postdoctoral Research Training Associate**

The National Toxicology Program

Research Triangle Park, NC, USA

2007-2009

- Designed and interpreted guideline toxicity and carcinogenicity studies
- Developed gene expression models predictive of chemical carcinogenicity
- Performed extensive gene expression pathway analysis to identify signaling pathways related to toxicity of the liver and heart

#### **Intramural Postdoctoral Research Training Associate**

The National Institute of Environmental Health Sciences and The National Institute of Heart, Lung and Blood

Research Triangle Park, NC, USA

2005-2007

- Developed multiple cell lines that constitutively express distinct shRNA DNA constructs targeted against secreted airway mucins
- Set up air-liquid interface cultures using A549 cells and performed functional genomics (siRNA) to study the role of secreted mucins in air way epithelia integrity
- Performed functional genomic studies using siRNA to identify genes that govern the fibroproliferative phenotype in cultured human lung fibroblasts
- Trained and managed undergraduate student researchers performing siRNA and plasmid-based cell culture studies

#### **Research Assistant**

University of Washington, Department of Pharmacology, Seattle, WA, USA

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1999-2004

- Performed molecular cloning and functional characterization of human Constitutive Androstane Receptor structural variants that are the product of alternative mRNA splicing
- Assessed the functional effect of the human Retinoid X Receptor  $\alpha$  coding polymorphism P261L
- Identified and evaluated the function of naturally occurring NH<sub>2</sub>- truncated human Pregnane X Receptor
- Cloned and described the molecular properties of a PPAR $\gamma$  Coactivator 1  $\alpha$  splice variant and its effect on the transcriptional activation properties of CAR, PXR/SXR, RXR $\alpha/\beta/\gamma$ , HNF4 $\alpha$ , PPAR $\alpha/\beta/\gamma$ , FXR, LXR $\alpha/\beta$ , VDR, RAR $\alpha$  and THR $\alpha/\beta$
- Performed Chromatin Immunoprecipitation studies using rat hepatocytes to determine the mechanism of transcriptional regulation of Phenobarbital-induced gene expression
- Trained and managed multiple graduate students facilitating the development of multiple research projects centered on human nuclear receptor function

### Rotation Student

University of Washington, Department of Pharmacology, Seattle, WA, USA

1999

- Studied the effect of cAMP on the expression of the circadian rhythm gene, Period, in the cultured mouse suprachiasmatic nucleus neurons

### Rotation Student

University of Washington, Department of Pharmacology, Seattle, WA, USA

1998

- Subcloned, expressed and affinity purified TAF(II)250 from a baculovirus expression system for subsequent use in histone acetyltransferase assays

### Undergraduate Researcher

The Pennsylvania State University, University Park, PA, USA

1996-1998

- Maintained drosophila colonies
- Optimized ligation-mediated PCR used in genomic footprinting experiments to characterize promoter proximal pausing on the drosophila hsp70 promoter

### Undergraduate Researcher

The Pennsylvania State University, University Park, PA, USA

1994-1996

- Performed mouse brain necropsy, tyrosine hydroxylase and neurotensin assays as a part of a QTL study focused on alcohol addiction
- Carried out whole brain cocaine metabolite characterization in mice

### Publications

Dekeyser, J. G., Stagliano, M. C., **Auerbach, S. S.**, Prabu, K. S., Jones, A. D., and Omiecinski, C. J. (2009). Di(2-ethylhexyl) phthalate is a highly potent agonist for the human constitutive androstane receptor splice variant, CAR2. *Molecular pharmacology*.

**Auerbach, S. S.**, Mahler, J., Travlos, G. S., and Irwin, R. D. (2008). A comparative 90-day toxicity study of allyl acetate, allyl alcohol and acrolein. *Toxicology* 253, 79-88.

**Auerbach, S. S.**, Dekeyser, J. G., Stoner, M. A., and Omiecinski, C. J. (2007). CAR2 displays unique ligand binding and RXR $\alpha$  heterodimerization characteristics. *Drug metabolism and disposition: the biological fate of chemicals* 35, 428-39.

Shofer, S., Badea, C., **Auerbach, S.**, Schwartz, D. A., and Johnson, G. A. (2007). A micro-computed tomography-based method for the measurement of pulmonary compliance in healthy and bleomycin-exposed mice. *Experimental lung research* 33, 169-83.

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Stoner, M. A., **Auerbach, S. S.**, Zamule, S. M., Strom, S. C., and Omiecinski, C. J. (2007). Transactivation of a DR-1 PPRE by a human constitutive androstane receptor variant expressed from internal protein translation start sites. *Nucleic acids research* 35, 2177-90.

**Auerbach, S.S.**, Stoner, M.A., Su, S. and Omiecinski, C.J. (2005). RXR-dependent transactivation by a naturally occurring structural variant of human CAR (NR1I3). *Mol Pharmacol.* 68, 1239-1253

**Auerbach, S.S.**, Ramsden, R., Stoner, M.A., Verlinde, C., Hassett, C., and Omiecinski, C.J. (2003). Alternatively spliced isoforms of the human constitutive androstane receptor. *Nucleic Acids Res.* 31, 3194-3207

### **Invited Lectures**

**Auerbach S.S.** Predicting the hepatocarcinogenic potential of alkenylbenzene derivatives using toxicogenomic. Flavoring Extract Manufacturers of America Board of Scientific Counselors Meeting, Miami, FL., February 23, 2009

### **Presentations and Posters**

**Auerbach, S.S.**, Shah, R., Mav, D., Walker, N.J., Vallant, M. Boorman, G.A. and Irwin, R. Independent validation of gene expression-based hepatocarcinogenicity prediction models. SOT 48<sup>th</sup> Annual Meeting, Baltimore, MD., March 15-19, 2009 (poster)

**Auerbach, S.S.** Predicting the hepatocarcinogenic potential of (alkoxy)propenyl benzene derivatives using toxicogenomics. NTP board of Scientific Counselors, RTP, NC, November 21-22, 2008 (presentation)

**Auerbach S.S.**, Shah, R., Mav, D., Walker, N.J., Vallant, M., Boorman, G.A. and Irwin, R. Prediction of hepatocarcinogenic outcomes using gene expression models. Genomics Applications in Safety Studies meeting, Arlington, Virginia, October 27-28, 2008 (poster)

**Auerbach S.S.**, Shah, R., Mav, D., Vallant, M., Boorman, G.A. and Irwin, R. Prediction of hepatocarcinogenic potential using genome-wide expression analysis. NIH Research Festival 2008, Washington, D.C. October 14-17, 2008 (poster)

**Auerbach S.S.**, Shah, R., Mav, D. and Irwin, R. The Use of Gene Expression Data from Multiple Exposure Times for the Development of Genomic Biomarkers of Carcinogenic Potential. SOT 47<sup>th</sup> Annual Meeting, Seattle, WA, March 16-20, 2008 (poster)

Dekeyser, J.G., **Auerbach S.S.**, Stoner, M.A., Omiecinski, C.J. CAR2 displays unique ligand binding and RXR $\alpha$  heterodimerization characteristics. Experimental Biology meeting 2007, Washington, D.C., April 28- May 2, 2007 (presentation)

**Auerbach, S.S.**, Stoner, M.A. and Omiecinski, C.J. RXR-dependent transactivation by a naturally occurring structural variant of human CAR (NR1I3). American Society for Pharmacology and Experimental Therapeutics Annual Meeting 2005 (poster)

**Auerbach, S.S.**, Stoner, M.A. and Omiecinski, C.J. Functional assessment of a putative phosphorylation site in a variant isoform of human CAR. Society of Toxicology 44<sup>th</sup> Annual meeting 2004 (poster)

Stoner, M.A., **Auerbach, S.S.** and Omiecinski, C.J. Amino terminus-deleted constitutive androstane receptor variants are expressed from downstream AUG and CUG start codons. Society of Toxicology 44<sup>th</sup> Annual meeting 2004 (poster)

**Auerbach, S.S.** Isoforms of the human constitutive androstane receptor. Fall 2004 EPT Training Grant Semiannual Seminar (presentation)

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Hassett C.M., **Auerbach, S.S.**, and Omiecinski, C.J. Characterization of the Human Constitutive Androstane Receptor Gene (NR1I3). American Society for Pharmacology and Experimental Therapeutics Annual Meeting 2002 (poster)

**Auerbach, S.S.** Identification of alternatively spliced forms of hCAR in liver. Spring 2002 EPT Training Grant Semiannual Seminar (presentation)

**Auerbach, S.S.**, Lu, F. and Omiecinski, C.J. Alterations in histone acetylation are associated with phenobarbital induction of the rat CYP2B2 gene. Society of Toxicology 42<sup>nd</sup> Annual meeting 2002 (poster and presentation)

**Auerbach, S.S.** Effects of Dexamethasone on Histone Acetylation in the Rat CYP2B2 Promoter. 1999 UW Pharmacology Annual Retreat (presentation)

### **Awards and Grants**

- 2009 SOT Perry J. Gehring Postdoctoral Fellow Abstract Award
  - Independent validation of gene expression-based hepatocarcinogenicity prediction models.
- 2008 NCSOT PARC Award – 2<sup>nd</sup> place
  - Prediction of hepatocarcinogenic potential using machine learning methods informed by genome-wide expression analysis
- 1999-2004 - Environmental Health, Toxicology and Pathology Training Grant, University of Washington
- 2002 – 1<sup>st</sup> Prize in the Molecular Biology Specialty Section, Society of Toxicology
- 1998 – Evan Pugh Scholar (upper 0.5% of graduating class), The Pennsylvania State University
- 1992 – Edward Copeland Scholarship, Central Bucks East High School

### **Teaching/Mentoring Experience**

- 2003-2005 - Laboratory mentor to multiple early stage graduate students
- 1999-2000 - Teaching assistant for Pharmacology I, II and III
- 1998 - Teaching assistant for Cold Spring Harbor Euk. Gene Expression Short Course
- 1996-1998 – Academic Tutor to Penn State Student Athletes

### **Society and Association Memberships**

- Society of Toxicology
- Golden Key National Honor Society
- University of Washington Alumni Association

### **Additional Training**

#### **NIH Course: Introduction to the Principles and Practice of Clinical Research**

NIEHS, RTP, NC

Completion Date: 03/13/2007

#### **NIH Course: Principles of Clinical Pharmacology**

NIEHS, RTP, NC

09/07/2006-present

#### **Clinical Pharmacology and Drug Development Course**

HST Center for Experimental Pharmacology and Therapeutics

<http://hstcept.mit.edu/clinpharm/>

2006

#### **Introduction to the Regulatory Process for Clinical Investigators**

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Online Course assembled by the FDA and NIAID and used as a part of the Clinical Research Training Program at NIH.

Completion date: 09/06/2006

**Short Course: OmniViz v. 4.0 Overview and Numerical Analysis**

NEIHS, RTP, NC

06/08/2006, repeated 02/21/07

**Short Course: Introduction to GeneSpring GX**

NIEHS, RTP, NC

05/17/2006

**Short Course: Chemical Genomics 101**

NIEHS, RTP, NC

04/20/2006

**Good Laboratory Practices: Quality Assurance in Government & Industry**

EPA, RTP, NC

04/05/2006