

S. MICHAEL OWENS, PH.D.

Work: Department of Pharmacology & Toxicology Office: 501-686-5487
College of Medicine Messages: 501-686-8032
University of Arkansas for Medical Sciences Fax: 501-686-5521
4301 West Markham Street, Mail Slot 611 Email: *mowens@uams.edu*
Little Rock, Arkansas 72205

Home: 7 Bradley Lane
Little Rock, Arkansas 72227

EDUCATION

- B.S. Chemistry** 1973 Wofford College, Spartanburg, SC
- Ph.D. Experimental Pathology** 1980 University of North Carolina, Chapel Hill, NC
- Department of Pathology, School of Medicine
 - Dissertation advisor: Arthur J. McBay, Ph.D.
- Postdoctoral Training** 1981–1983 University of Arizona, Tucson, AZ
- Pharmacokinetics and Therapeutics, Department of Pharmaceutical Sciences, College of Pharmacy
 - Postdoctoral advisor: Michael Mayersohn, Ph.D.

PROFESSIONAL EXPERIENCE

- 1973–1976 **Supervisor, Clinical Enzymology Laboratory**, Medical University of South Carolina, Charleston, South Carolina (Employment before going to graduate school)
- 1983–1987 **Research Assistant Professor**, Department of Pharmaceutical Sciences, College of Pharmacy, University of Arizona, Tucson, Arizona
- 1985–1988 **Assistant Professor**, Department of Pharmacology and Interdisciplinary Toxicology, School of Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 1988–1994 **Associate Professor**, Department of Pharmacology and Toxicology, School of Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 1994–present **Full Professor**, Department of Pharmacology and Toxicology, School of Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 1993–1999 **Director, Graduate Studies in Pharmacology**, Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 2001-2002 **Founding Director, Arkansas Biosciences Institute**
- 2004 **Interim Chair**, Department of Pharmacology and Toxicology, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, AR.
- 2000–present **Director, Center for Alcohol & Drug Abuse Studies**, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas
- 2004-present **CSO, InterVexion Therapeutics, LLC**. A University of Arkansas for Medical Sciences Bioventures company for research, development and commercialization of protein therapeutics. The initial medications are based on

the biotechnology of Dr. Owens' monoclonal antibody therapies for the treatment of medical problems associated with drug abuse.

ACADEMIC AND NATIONAL AWARDS/HONORS

- | | |
|------------------|--|
| 1986-1997 | Research Scientist Development Award from the National Institute on Drug Abuse |
| 1986-1987 | Sophomore Basic Science Golden Apple Award for Outstanding Teaching, third runner-up |
| 1987-1988 | Chairman, Special Review Committee for Alcohol, Drug Abuse and Mental Health Administration's Small Business Innovative Research Grants, Rockville, MD |
| 1998, 2000, 2002 | Chairman, Special Emphasis Panel for Minority Institutions Drug Abuse Research Development, National Institute on Drug Abuse, Rockville, MD |
| 2001 | <i>Wilbur D. Mills Endowed Chair in Alcoholism and Drug Abuse Prevention</i> , College of Medicine, University of Arkansas for Medical Sciences, Little Rock, AR |
| 2005-2006 | Chancellor's Distinguished Faculty Teaching Award, University of Arkansas for Medical Sciences, Little Rock, AR |
| 2005-2007 | Chairman, Medication Development Research Subcommittee, NIDA-L, National Institute on Drug Abuse Initial Review Group, NIH/NIDA, Bethesda, MD |

STATE, FEDERAL GOVERNMENT AND NATIONAL PUBLIC ADVISORY COMMITTEES

- | | |
|------------|--|
| 1984–1989 | Member, Special Review Committee for Alcohol, Drug Abuse, and Mental Health Administration's (ADAMHA) Small Business Innovative Research Grant Program, Rockville, MD |
| 1985 | American Society for Engineering Education review panel for the Office of Naval Technology, Postdoctoral Fellowship Program, Washington, DC |
| 1987 | Contract and Concept reviewer for the National Institute on Drug Abuse on "Pharmacokinetics of Psychoactive Drugs", Rockville, MD |
| 1987 | Advisor to Dr. Robert Schuster (Director of the National Institute on Drug Abuse) on the use of immunopharmacological reagents for the treatment and study of drug abuse. One of three invited advisors, Rockville, MD |
| 1987, 1988 | Written Review for Neuroscience Panel of the Small Grant Review Committee, Alcohol, Drug Abuse and Mental Health Administration, Rockville, MD |
| 1987-1988 | Chairman Special Review Committee for Alcohol, Drug Abuse, and Mental Health Administration's (ADAMHA) Small Business Innovative Research Grant Program, Rockville, MD |
| 1989 | Member, Analytical Methods Working Group, Consensus Conference on Technical, Scientific & Procedural Issues of Employee Drug Testing, National Institute on Drug Abuse, Division of Applied Research, Falls Church, VA |

- 1989 Written Review for Physiological Processes Committee of the National Science Foundation, Washington, DC
- 1990 Advisor on drug testing in the workplace for the U.S. House of Representatives, Committee on Energy and Commerce, The Honorable John D. Dingel (Michigan), Chairman, Washington, DC
- 1990 *Ad hoc* Member, Drug Abuse Biochemical Research Review Subcommittee, National Institute on Drug Abuse, Rockville, MD
- 1990–1994 Member, Drug Abuse Biochemical Research Review Subcommittee, National Institute on Drug Abuse, Rockville, MD
- 1994–1998 Member National Institute of Health’s Reviewers Reserve
- 1998, 2000, 2002 Chairman Special Emphasis Panel for Minority Institutions Drug Abuse Research Development, National Institute on Drug Abuse, Rockville, MD
- 1998–Present *Ad hoc* Member, National Institute of Health Research Reviews
- 2002-2004 National Academy of Science, Washington, DC - Committee on Immunotherapies and Sustained Release Formulations for Treating Drug Addiction
- 2001-Present Board of Directors and at Large Member, Arkansas Biotechnology Association
- 2003-2006 College on the Problems of Drug Dependence, Drug Evaluation Liaison Committee
- 2003-2007 Member, Medication Development Research Subcommittee, NIDA-L, National Institute on Drug Abuse Initial Review Group, NIH/NIDA, Bethesda, MD
- 2005-2007 Chair, Medication Development Research Subcommittee, NIDA-L, National Institute on Drug Abuse Initial Review Group, NIH/NIDA, Bethesda, MD
- 2004-2007 College on the Problems of Drug Dependence, Program Committee
- 2004-Present Mentoring Advisory Committee, IDeA Networks of Biomedical Research Excellence
- 2008 US Congressional “Hill” briefing for Friend’s of the National Institute on Drug Abuse – “*Vaccine Development for Treating Drug Abuse*”
- 2010 Member, review committee for 2010 NIH Director's New Innovator Awards

SCIENTIFIC REVIEWS

Biochemical Pharmacology

Drug and Alcohol Dependence

Drug Safety

Fundamental and Applied Toxicology

International Journal of Immunopharmacology

Journal of Drug Targeting

Journal of Pharmaceutical Sciences

Journal of Pharmacology & Experimental Therapeutics

Journal of Pharmacy and Pharmacology
Life Sciences

Molecular Pharmacology

Neurotoxicology and Teratology

Toxicological Sciences

Toxicology and Applied Pharmacology

JOURNAL EDITORIAL POSITIONS

Guest Editor for a journal issue entitled: "Monoclonal Antibodies as Drugs," in *Drug Development Research*, Wiley-Liss Publications, New York, NY. Vol 61 (3), 2004.

Editorial Board. *Toxicological Sciences* (Jan 03-Present).

TEACHING EXPERIENCE

1982	Course Director, Industrial Toxicology, Department of Pharmacology and Toxicology, College of Pharmacy, University of Arizona, Tucson, Arizona
1982	Toxicology, Summer Institute Faculty, Occupational and Environmental Health, Arizona Center for Occupational Safety and Health, University of Arizona, Tucson, Arizona
1982–1984	Analytical Toxicology, Department of Pharmacology and Toxicology, College of Pharmacy, University of Arizona, Tucson, Arizona
1983–1984	Pharmaceutical Analysis, Department of Pharmaceutical Sciences, College of Pharmacy, University of Arizona, Tucson, Arizona
1985, 1986, 1994	Course Director, Pharmacology and Toxicology Seminar (5051), Department of Pharmacology and Interdisciplinary Toxicology, University of Arkansas for Medical Sciences
1985– present	Pharmacology for Graduate Students (5033) (Pharmacokinetics, Therapeutics and Immunopharmacology), Department of Pharmacology, University of Arkansas for Medical Sciences
1985– present	Medical School Pharmacology Lectures (Drug Metabolism, Pharmacokinetics, Therapeutics, Immunopharmacology, Antimycobacterials, Antifungals, Antivirals, Stimulant abuse, Sulfonamides, General Principles Laboratory on Pharmacokinetics, Group Discussion Leader for Clinical Case Conferences), Department of Pharmacology and Toxicology, School of Medicine, University of Arkansas for Medical Sciences
1986, 1992	Immunology for Graduate Students (5022) (Immunosuppression, Immunopotential, Anti-idiotypes), Department of Microbiology and Immunology, University of Arkansas for Medical Sciences
1986, 1988	Advanced Immunology (6081) (Idiotypes and the Immune Network Theory, Immunochemistry), Department of Microbiology and Immunology, University of Arkansas for Medical Sciences
Spring, 1989	Course Director for Medical School Pharmacology, Department of Pharmacology, School of Medicine, University of Arkansas for Medical Sciences
1990, 1992, 2003	Course Director for Graduate School Pharmacology (5043), Department of Pharmacology and Toxicology, School of Medicine, University of Arkansas for Medical Sciences

- 1987, 1991, 1997 Course Director and Sole Instructor, Pharmacokinetics and Experimental Therapeutics for Graduate Students (502V), Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences
- 1992–1998 Advanced Toxicology (5093) (Physiologically Based Pharmacokinetic Modeling), Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences
- 1992–2004 Alcohol and Drug Dependency (5143) (Effects of Drugs of Abuse on the Immune System), Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences
- 1995–1996 Course Director (and Course Developer), Scientific Communication and Ethics, a Pharmacology and Toxicology Seminar training course for First and Second Year Graduate Students (5051), Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences
- 1995, 1997, 2001, 2004 Neuropharmacology (5133) (Biochemical and Molecular Techniques for Studying the Nervous System, Receptors Systems), Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences

GRADUATE STUDENT TRAINING

Previous Doctoral Students

- Mark Andrew Zorbas, Ph.D. 1990 Pharmacology
- Current position: Ophthalmic & Dermatology Therapeutic Area Leader for DSRD & Development & Regulatory Strategy Site Lead-La Jolla, Drug Safety Research & Development, Pfizer, Inc., Pfizer, Inc., San Diego, CA.
- John Leland Valentine, Ph.D. 1995 Toxicology
- Current position: Associate Director in Biochemical Toxicology, Merck & Co., West Point, PA
- Susan Shelnutt, Ph.D. 1995 Toxicology
- Current position: Senior Toxicologist, Center for Toxicology and Environmental Health, Little Rock, AR.
- Elizabeth Mary Laurenzana, Ph.D. 1995 Pharmacology
- Current position: Research Associate, Department of Veterinary and Biomedical Sciences, Pennsylvania State University, PA
- J. Shane Hardin, M.D., Ph.D. 1998 Pharmacology
- Physician in private practice. Hot Springs, AR.
- Joel W. Proksch, Ph.D. 1999 Pharmacology
- Current position: Director, Drug Metabolism & Pharmacokinetics, Global Preclinical Development, Bausch & Lomb, Rochester, NY
- Kelly A. Byrnes 2001 Pharmacology
- Current position: Scientist, Preclinical Development/Pharmacokinetics, ZymoGenetics, Inc., Seattle, WA
- Alessandra Milesi-Hallé, M.D., Ph.D. 2005 Pharmacology
- Current position: Medical residency program in Pediatrics at Arkansas Children's Hospital, Little Rock, AR
- Sarah J. White, Ph.D. 2008 Pharmacology
- Current position: Post-doctoral Student in Department of Pharmacology, UAMS

Jonathan Hubbard, /Ph.D. 2008 Pharmacology.
▪ Current position: Completing requirements for last two years of Medical School at UAMS

Previous Post-doctoral Students

▪ Gilles Rivière, Ph.D. Ph.D. in Pharmacology from Pasteur Institute, Paris, France.

Current Position: Director Bioanalytical Group, Drug Metabolism & Pharmacokinetics, Novartis Corporation, Paris, France.

▪ Howard Hendrickson, Ph.D. Ph.D. in Analytical Chemistry
Current Position: Assistant Professor, Department of Pharmaceutical Sciences, College of Pharmacy, UAMS, Little Rock, AR.

▪ Marie Lacy, Ph.D. Ph.D. in Microbiology and Immunology, UAMS
Current Position: Research Assistant Professor, Arkansas Children's Hospital Research Institute, Little Rock, AR.

▪ Eric Peterson, Ph.D. Ph.D. in Molecular Biology, University of Arkansas at Fayetteville, AR
Current Position: Assistant Professor, Department of Pharmacology and Toxicology, College of Medicine, UAMS, Little Rock, AR.

Previous Research Assistant Professors

Howard Hendrickson, Ph.D. Ph.D. in Analytical Chemistry

- Assistant Professor, Department of Pharmaceutical Sciences, College of Pharmacy, UAMS
- Received a NIH K25 award for which Drs. David Wessinger and Michael Owens were mentor.

Elizabeth Laurenzana, Ph.D. Ph.D. in Pharmacology, UAMS

- Research Associate, Department of Veterinary and Biomedical Sciences, Pennsylvania State University, PA

Current Doctoral Students

- William Atchley (M.D./Ph.D. program), IBS.
- Michael Hambuchen (Ph.D. program) Pharmacology

Current Mentoring of Instructors or Assistant Professors

- Eric Peterson, Ph.D. Ph.D. in Molecular Biology, University of Arkansas at Fayetteville, AR
- Daniela Rüedi-Bettschen, Ph.D. Ph.D. in Behavioral Neuroscience. at the Swiss Federal Institute of Technology, Zurich, Switzerland

Medical Student Research Advisor for Honors in Research

- Douglas Blackall, Class of 1988
- Hoang Bui, Class of 1989
- Michael McClurkan, Class of 1992

MEMBERSHIP ON UNIVERSITY COMMITTEES

Previous

1986	LCME Self-Study Task Force Sub-Committee on Clinical Science Departments
1986–1988	Committee for Allocation of Graduate Student Funds
1987	Committee for Development of Alcohol and Drug Abuse Six Year Plan
1989	Principal Investigators Working Group for Grants Accounting System
1989, 1993	Graduate and Medical Student Research Day, Scientific Judge, University of Arkansas for Medical Sciences
1990	Medical School Promotions Committee for Class of 1990
1990–1991	Alcohol and Drug Abuse Committee
1990–1992	Search Committee for Chairperson of Department of Microbiology & Immunology
1991–1992	Human Research Advisory Committee
1991–1994	Dean’s Research Advisory Committee
1996–1997	Search Committee for Chairperson for Department of Dermatology
1995–1998	Executive Committee, Biotechnology Center
1992–2000	Center for Neuroscience Advisory Committee
1997–1998	Search Committee for Chairperson for Department of Molecular Genetics
1998–2002	Arkansas Bioventures Advisory Board
2001-2003	Arkansas Biosciences Building Committee (UAMS Campus)
2002-2003	Internal Advisory Committee, Arkansas Cancer Research Center
2003-2004	College of Medicine Search Committee for Chair of the Department of Internal Medicine
2005-2006	College of Medicine, Search Committee for Director of Bioventures
2004-2006	College of Medicine Space Allocation Committee
2006-2007	College of Medicine, Search Committee for Chair of Microbiology and Immunology
2002-2007	College of Medicine Promotion and Tenure Committee

Current

2002-Present	Dean’s Distinguished Speaker Selection Committee, College of Medicine
2005-Present	Executive Committee for Institutional Clinical and Translational Research
2008-Present	Chair, Dean’s Distinguished Speaker, Faculty Scholar and Distinguished Alumni Selection Committee, College of Medicine
2008-Present	Chair, Subcommittee for rewriting of College of Medicine promotion and tenure document for basic scientist
2009-Present	Cabinet member, Center for Clinical and Translation Research (CCTR), UAMS

2009-Present College of Medicine, Search Committee for Chair of Biochemistry and
Molecular Biology

PROFESSIONAL SOCIETIES

- American Association for the Advancement of Science
- American Association of Pharmaceutical Scientists
- American Society for Clinical Pharmacology and Therapeutics
- American Society for Pharmacology and Experimental Therapeutics
- Arkansas Chapter of the Society for Neuroscience
- College on the Problems of Drug Dependence
- Society for Neuroscience
- Society of Toxicology

MAJOR RESEARCH INTERESTS

Experimental therapeutics, pharmacokinetics, substance abuse, immunopharmacology,
neuroscience, biotechnology.

ROYALTIES FOR PRODUCTS DEVELOPED FROM IMMUNOLOGICAL RESEARCH

A non-exclusive license for use of a monoclonal antibody against phencyclidine in a diagnostic
test for drug abuse. Microgenics Corporation, Concord CA (1993).

PATENTS

- US Patent No. 6,669,937, entitled "Monoclonal antibody antagonists for treating medical
problems associated with d-amphetamine-like drugs" issued 12/30/03.
- US Patent No. 7,202,348, with the same title, issued 4/10/07.
- US Patent No. 7,632,929, entitled "Methamphetamine-like hapten compounds, linkers,
carriers and compositions and uses thereof" issued 12/15/09.
- US Patent Application serial no.s 12/611,708, 12/596,765, 11/763,948, and 11/738,789
are currently pending in the US.
- European Regional Patent Application no.s 07798645.3 and 0874624.4 are also currently
pending.
- PCT/US08/60815 is currently pending as a National Stage Application in India.

CURRENT FUNDING

Grants as Principal Investigator

R01 DA07610

7/01/05–6/30/10

NIH/NIDA

Immunotherapy for Drug Abuse

- \$1,512,842 total direct cost
- The goal of this grant is to explore and understand fundamental pharmacological
mechanisms of maternal-fetal effects after exposure to stimulant drugs of abuse and to anti-
drug monoclonal antibodies. The overall hypothesis is that maternally administered anti-
drug monoclonal antibodies can protect both mother and fetus for the harmful effects of (+)-
methamphetamine, ecstasy, and phencyclidine.

R01 DA11560 1/01/04–12/31/11 NIH/NIDA
Antibody-based Therapy for Methamphetamine Abuse

- \$1,563,447 total direct cost.
- The purpose of this grant is to develop antibody-based medications for the treatment of the toxicity and addiction due to stimulants like methamphetamine.
- Currently in a no cost extension. The renewal has been submitted.

U01 DA023900 9/30/07-8/31/12 NIH/NIDA
Active immunization for treating methamphetamine abuse

- \$3,848,043 total direct cost
- The purpose of these preclinical studies is to facilitate the medical discovery and development of new (+)-methamphetamine conjugate vaccines (MCVs) to help patients stop using (+)METH-like drugs by blocking or reducing their effects even under challenges of binge and relapse.

Grants as Mentor or Co-Investigator

F30 DA024522, Period: 9/1/04–6/30/06 9/30/07-9/29/11 NIH/NIDA
Antagonists as Protective Medications for Drug Abuse During Pregnancy

Principal Investigator: Jonathan Hubbard, Ph.D.

Mentor: S. Michael Owens, Ph.D.

- \$144,091 Total direct cost
- This is an individual pre-doctoral MD/PhD fellowship. The research is designed to train a student in research aimed at developing treatments for drug abuse in pregnant users. Dr. Owens is the scientific mentor for this application

R42 DA017596, Period: 9/1/04–6/30/06 9/1/04-6/30/10 NIH/NIDA
Development of Plant Derived Antibodies for Drug Abuse

Principal Investigator: Barry Holtz, Ph.D.

Co-Investigator: S. Michael Owens, Ph.D.

- \$758,369 Current year total cost
- This is Phase I of an STTR small business grant in which InterveXion Therapeutics LLC will produce a chimeric anti-PCP monoclonal antibody in plants. This antibody medication was developed in the laboratory of Dr. Michael Owens. The antibodies will then be tested in human clinical trails on Phase II for safety and efficacy

U54 RR025209-01 (Lowery) 07/01/09-06/30/14 NIH
Arkansas Center for Clinical and Translational Research

Principal Investigator: Curtis Lowery, M.D.

Co-Investigator: S. Michael Owens, Ph.D.

- \$2,778,276 Current year total cost
- The Arkansas Center for Clinical and Translational Research (CCTR) unites all UAMS Colleges and its Graduate School behind a campus-wide translational research endeavor. The overarching goal is to establish an integrative CCTR that transforms the pace, effectiveness, and quality of translational research at UAMS, resulting in better health for all Arkansans. Dr. Owens is a Co-Investigator.

1 RC2 DA028915 (B. Holtz and WB Gentry, PI) 09/30/2009–08/31/2011 NIH/NIDA

- \$1,194,659 Total cost year 1 awarded to InterveXion Therapeutics, LLC
- \$193,687 Total cost year 1 subaward to UAMS component
- *“Chimeric anti-Methamphetamine Monoclonal Antibody for Treating Stimulant Toxicity”*

- The major goals of this project are to develop an anti-methamphetamine antibody into a human medication by developing and completing the manufacturing and purification processes, testing for toxicity in rodents, and preparing the IND application to the FDA.

Role: Co-Investigator

RECENT PREVIOUS FUNDING

PO1 DA14361 9/01/01–7/31/09 NIH/NIDA

Preclinical testing of Antibody therapy for METH abuse

- \$4,187,684 total direct cost, 2nd year no cost extension
- The purpose of this grant is to test new antibody-based medicines for the treatment of the methamphetamine abuse. This program project includes for individual grants, which constitute an NIH program project grant. Dr. Owens is the program director and the principle investigator on Project 1, which has a direct cost budget of \$1,099,808.

Post-doctoral NRSA DA018039 (Eric Peterson, PI) 9/01/04-8/31/07 NIH/NIDA

Single Chain Antibody Medications for (+)METH

Mentor: S. Michael Owens, Ph.D.

- \$133,824 Total direct cost
- This is an individual post-doctoral fellowship. The research will be designed to use molecular engineering to construct a new anti-(+)-methamphetamine single chain antibody. Dr. Owens is the scientific mentor for this application.

PUBLICATIONS

1. Owens, S.M., McBay, A.J., Reisner, H.M. and Perez-Reyes, M.: 125I Radioimmunoassay of delta-9-tetrahydrocannabinol in blood and plasma with a solid-phase second-antibody separation method. *Clin Chem* 27: 619-624, 1981.
2. Perez-Reyes, M., Owens, S.M. and DiGuiseppi, S.: The clinical pharmacology and dynamics of marijuana cigarette smoking. *J Clin. Pharmacol* 21: 201S-207S, 1981.
3. Cocchetto, D.M., Owens, S.M., Perez-Reyes, M., DiGuiseppi, S. and Miller, L.L.: Relationship between delta-9-tetrahydrocannabinol concentration and pharmacologic effects in man. *Psychopharmacol* 75: 158-164, 1981.
4. McBay, A.J. and Owens, S.M.: Marijuana and Driving. In *Problems of Drug Dependence 1980*, L.S. Harris, Ed., National Institute on Drug Abuse Research Monograph Series 34, Supt. of Documents, U.S. Govt. Printing Office, Washington, DC, 1981, 257-263.
5. Owens, S.M., Woodworth, J. and Mayersohn, M.: Radioimmunoassay for phencyclidine (PCP) in serum. *Clin Chem* 28: 1509-1513 (1982).
6. Owens, S.M., McBay, A.J. and Reisner, H.M.: Radioimmunoanalysis of delta-9-THC in blood by means of an 125I-tracer. In *The Analysis of Cannabinoids in Biological Fluids*, R.L. Hawks, Ed., National Institute on Drug Abuse. Research Monograph Series 42, Supt. of Documents, U.S. Govt. Printing Office, Washington, D.C., 1982, 33-43.
7. Barnett, G., Chiang, C-W.N., Perez-Reyes, M. and Owens, S.M.: Kinetic study of smoking marijuana. *J Pharmacokinet Biopharm* 10: 495-506, 1982.
8. Owens, S.M., McBay, A.J. and Cook, C.E.: Marijuana, ethanol and other drug use among drivers killed in single-vehicle crashes. *J Forensic Sci* 28: 372-379, 1983.

9. Woodworth, J., Owens, S.M. and Mayersohn, M.: Phencyclidine (PCP) disposition kinetics in dogs: Preliminary observations. *Res Comm Subst Abuse* 4: 49-57, 1983.
10. Owens, S.M., Mayersohn, M. and Woodworth, J.R.: Phencyclidine blood protein binding: Influence of protein, pH and species. *J Pharmacol Exp Ther* 226: 656-660, 1983.
11. Woodworth, J.R., Owens, S.M. and Mayersohn, M.: Phencyclidine disposition kinetics in dogs: Preliminary findings. In *PCP and Related Arylcyclohexylamines - Present and Future Applications*, J.-M. Kamenka, E.F. Domino and P. Geneste, Eds., NPP Books, Ann Arbor, MI 1983, 411-429.
12. Woodworth, J.R., Mayersohn, M. and Owens, S.M.: Quantitative analysis of phencyclidine and metabolites by capillary column gas chromatography with use of a nitrogen-specific detector. *J Anal Toxicol* 8: 2-6, 1984.
13. Owens, S.M.: Immunoassays for pharmacokinetic studies of psychoactive drugs. In *Pharmacokinetics and Pharmacodynamics of Psychoactive Drugs*. G. Barnett and C.-W.N. Chiang, Eds., Biomedical Publications, Forest City, CA, 1985, 487-502.
14. Mayersohn, M., Woodworth, J.R. and Owens, S.M.: Phencyclidine disposition in animals. In *Pharmacokinetics and Pharmacodynamics of Psychoactive Drugs*, G. Barnett and C.-W.N. Chiang, Eds., Biomedical Publications, Forest City, CA, 1985, 28-47.
15. Mayersohn, M., Owens, S.M., Anaya, A.L., Bliss, M. and Achari, I.: 4-Methylpyrazole disposition in the dog: Evidence for saturable elimination. *J Pharm Sci* 74: 895-896, 1985.
16. Woodworth, J.R., Owens, S.M. and Mayersohn, M.: Phencyclidine (PCP) disposition kinetics in dogs as a function of dose and route of administration. *J Pharmacol Exp Ther* 234: 654-661, 1985.
17. Owens, S.M. and Mayersohn, M.: Phencyclidine-specific Fab fragments alter phencyclidine disposition in dogs. *Drug Metab Dispos* 14: 52-58, 1986.

The above manuscript was featured for review in the *Journal of the American Medical Association* (257:3188, 1987) and as one of the featured articles in the National Institute on Drug Abuse (NIDA) publication, *NIDA Notes* (Vol. 2, Number 3, pp. 12-13, 1987).
18. Levitt, M.A., Sullivan, J.B., Owens, S.M., Burnham, L. and Finley, P.R.: Amitriptyline plasma protein binding: Effect of plasma pH and relevance to clinical overdose. *Am. J. Emer. Med.* 4: 121-124, 1986.
19. Owens, S.M. and Mayersohn, M.: Modulation of phencyclidine (PCP) pharmacokinetics with PCP-specific Fab fragments. In *Phencyclidine: An Update*. D. Clouet, Ed., National Institute on Drug Abuse Research Monograph Series 64, Supt. of Documents, U.S. Govt. Print. Office, Washington, DC, 1986, 112-126.
20. Woodworth, J.R., Mayersohn, M. and Owens, S.M.: Disposition kinetics of the monohydroxy metabolites of phencyclidine (PCP) in the dog. *J Pharmacol Exp Ther.* 238: 900-904, 1986.
21. Owens, S.M., Hardwick, W. and Blackall, D.: Phencyclidine pharmacokinetic scaling among species. *J. Pharmacol. Exp. Ther.* 242: 96-101, 1987.
22. Owens, S.M., Zorbas, M., Gunnell, M., Polk, M. and Lattin, D.L.: Molecular criteria for an immunological model of the PCP receptor. In *Sigma and Phencyclidine-Like Compounds as Molecular Probes in Biology*. E.F. Domino and J.-M. Kamenka, Eds. NPP Books, Ann Arbor, MI., 663-672, 1988.

23. Owens, S.M., Zorbas, M., Lattin, D.L., Gunnell, M., and Polk, M.: Antibodies against arylcyclohexylamines and their similarities in binding specificity with the phencyclidine receptor. *J Pharmacol Exp Ther* 246: 472-478, 1988.
24. Egen, N.B., Bliss, M., Mayersohn, M., Owens, S.M., Arnold, L. and Bier, M.: Isolation of monoclonal antibodies to phencyclidine from ascites fluid by preparative isoelectric focusing in the rotaphor. *Anal Biochem* 172: 488-494, 1988.
25. McMillan, D.E., Evans, E., Wessinger, W.D. and Owens, S.M.: Structure-activity relationships of arylcyclohexylamines as discriminative stimuli in pigeons. *J. Pharmacol. Exp. Ther.* 247: 1086-1092, 1989.
26. Zorbas, M., Owens, S.M., Plunkett, L.M. and Bui, H.: The pharmacokinetics of [3H]1-[1-(2-thienyl)cyclohexyl]piperidine (TCP) in Sprague Dawley rats. *Drug Metab Dispos* 17: 641-645, 1989.
27. Evans, R.E., Owens, S.M., Ruch, S., Kennedy, R.H. and Seifen, E.: The effect of age on digoxin pharmacokinetics in Fisher-344 rats. *Toxicol. Appl. Pharmacol.* 102: 61-67, 1990.
28. Owens, S.M., McMillan, D.E., Hardwick, W.C. and Wessinger, W.D.: Phencyclidine pharmacokinetics and concentration-response relationships in the pigeon. *Pharmacol Biochem Behav* 35: 797-801, 1990.
29. Zorbas, M.A. and Owens, S.M.: Importance of reactive metabolites to the in vivo hepatic clearance of phencyclidine (PCP). In *Problems of Drug Dependence*, L.S. Harris, ed. *Natl. Inst. on Drug Res. Monogr. Ser. 105*, Supt. Documents, U.S. Govt. Print. Office, Washington, DC, pp. 429-430, 1990.
30. Wessinger, W.D. and Owens, S.M.: Influence of phencyclidine (PCP) pharmacokinetics on PCP dependence after i.v. and s.c. routes of administration. In *Problems of Drug Dependence*, L.S. Harris, ed. *National Institute on Drug Abuse Res. Monogr. Ser., Supt. Documents, U.S. Govt. Print. Office, Washington, DC*, pp. 431-432, 1990.
31. Badger, T.M., Millard, W.J., Owens, S.M., LaRovere, J. and O'Sullivan, D.: Effects of gonadal steroids on clearance of growth hormone at steady state in the rat. *Endocrinology* 128: 1065-1072, 1991.
32. Wessinger, W.D. and Owens, S.M.: Chronic administration of phencyclidine: Pharmacokinetic comparison of intravenous and subcutaneous infusions in Sprague-Dawley rats. *Drug Metab Dispos* 19: 719-721, 1991.
33. Wessinger, W.D. and Owens, S.M.: Phencyclidine dependence: The relationship of dose and serum concentrations to operant behavioral effects. *J Pharmacol Exp Ther* 258: 207-215, 1991.
34. Owens, S.M. and Zorbas, M.A.: Immunochemical studies of phencyclidine binding sites. In *Drugs of Abuse and Neurobiology*. R.R. Watson, ed, CRC press, Boca Raton, FL, pp. 233-247, 1992.
35. Zorbas, M.A. and Owens, S.M.: Development of an animal model for studying the pharmacological consequences of in vivo PCP metabolite covalent binding. In *Multiple Sigma and PCP receptor Ligands*. J.-M. Kamenka and E.F. Domino, Eds. NPP Books, Ann Arbor, MI, 817-830, 1992.
36. Owens, S.M. Immunotherapy for Drugs of Abuse. In *Advances in Biosciences*. R.R. Watson, Ed. Pergamon Press, Oxford, England, 86: 663-637, 1993.

37. Owens, S.M., Gunnell, M., Laurenzana, E.M. and Valentine, J.L.: Dose- and time-dependent changes in phencyclidine metabolite covalent binding in rats and the possible role of CYP2D1. *J Pharmacol Exp Ther* 265: 1261-1266, 1993.
38. McClurken, M.B., Valentine, J.L., Arnold, L. and Owens, S.M: Disposition of a monoclonal anti-phencyclidine Fab fragment in rats. *J Pharmacol Exp Ther* 266: 1439-1445, 1993.
39. Valentine, J.L., Arnold, L.W. and Owens, S.M.: Anti-phencyclidine Fab fragments dramatically alter phencyclidine pharmacokinetics in rats. *J Pharmacol Exp Ther* 269: 1079-1085, 1994.
40. Laurenzana, L.M., Sorrels, S.L. and Owens, S.M.: Anti-peptide antibodies targeted against specific regions of rat CYP2D1 and human CYP2D6. *Drug Metab Dispos* 23: 271-278, 1995.
41. McMillan, D.E. and Owens, S.M.: Extrapolating scientific data from animals to man in behavioral pharmacology and behavioral toxicology. In *Methods and Applications in Neurotoxicology*. D. Cora-Slechta and R. MacPhail, Eds. Marcel Dekker, 323-332, 1995.
42. Shelnutt, S.R., Badger, T.M. and Owens S.M.: Phencyclidine metabolite irreversible binding in the rat: gonadal steroid regulation and CYP2C11. *J Pharmacol Exp Ther* 277: 292-298, 1996.
43. Valentine, J.L., Mayersohn, M.M., Wessinger, W.D., Arnold, L.W., M. Mayersohn and Owens, S.M: Anti-phencyclidine monoclonal Fab fragments reverse PCP-induced behavioral effects and ataxia in rats. *J Pharmacol Exp Ther* 278: 709-716, 1996.
44. Valentine, J.L. and Owens, S.M.: Anti-phencyclidine monoclonal antibodies significantly change phencyclidine concentrations in brain and other tissues in rats. *J Pharmacol Exp Ther.* 278: 717-724, 1996.
45. Owens, S.M. Antibody therapy for drug abuse. In *Antibody Engineering: New technologies, applications and commercialization*. IBC Biomedical Library Series Publications, Southborough, MA, 250-264, 1996.
46. Sharma, U., Roberts, E.S., Kent, U.M., Owens, S.M. and Hollenberg, P.F.: Metabolic inactivation of cytochrome P4502B1 by phencyclidine: Immunochemical and radiochemical analyses of the protective effects of glutathione. *Drug Metab Dispos* 25: 243-250, 1997.
47. Shelnutt, S.R., Cornett, L.E. and Owens, S.M.: Phencyclidine continuous dosing produces a treatment time-dependent regulation of rat CYP2C11 function, protein expression and mRNA levels. *J Pharmacol Exp Ther* 281: 574-581, 1997.
48. Laurenzana, E.M. and Owens, S.M.: Brain microsomal metabolism of phencyclidine in male and female rats. *Brain Res* 756: 256-265, 1997.
49. Laurenzana, E.M. and Owens, S.M.: Metabolism of phencyclidine by human liver microsomes. *Drug Metab Dispos* 25: 557-563, 1997.
50. Owens, S.M.: Antibodies as pharmacokinetic and metabolic modifiers of neurotoxicity. In *Pharmacokinetics, Metabolism, and Pharmaceutics of Drugs of Abuse*. Rao S. Rapaka, Nora Chiang and Billy R. Martin, Eds., National Institute on Drug Abuse Research Monograph Series 173, Supt. of Documents, U.S. Govt. Print. Office, Washington, DC, 1997, 259-272.
51. Hardin, J.S., Proksch, J.W., Wessinger, W.D. and Owens, S.M.: Pharmacodynamics of a monoclonal anti-phencyclidine Fab with broad specificity for phencyclidine-like drugs. *J Pharmacol Exp Ther* 285: 1113-1122, 1998.

52. Lim, K., Owens, S.M., Arnold, L., Sacchettini, J.C. and Linthicum, D.S.: Crystal structure of monoclonal 6B5 Fab complexed with phencyclidine. *J Biol Chem* 273: 28576-28582, 1998.
53. Proksch, J.W., Gentry, W.B. and Owens, S.M. Pharmacokinetic mechanisms for favorable renal co-elimination of phencyclidine and a monoclonal anti-phencyclidine Fab in the rat. *J Pharmacol Exp Ther* 287: 616-624, 1998.
54. Owens, S.M., Norman A. and Sparenborg, S.: New Generation of Medications for Drug Abuse: Using antibodies and enzymes to treat cocaine, phencyclidine, and nicotine dependence/abuse. *Pharm News* 5(6): 44, 1998.
55. Shelnutt, S.R., Gunnell, M. and Owens S.M.: Sexual dimorphism in phencyclidine in vitro metabolism and pharmacokinetics in rats. *J Pharmacol Exp Ther* 287: 616-624, 1999.
56. Rivière, G.J., Byrnes, K.A., Gentry, W.B. and Owens, S.M.: Spontaneous locomotor activity and pharmacokinetics of intravenous methamphetamine and its metabolite amphetamine in a rat model of human use. *J Pharmacol Exp Ther* 291: 1220-1226, 1999.
57. Proksch, J.W., Gentry, W.B. and Owens, S.M.: Anti-phencyclidine monoclonal antibodies provide long-term reductions in brain phencyclidine concentrations during chronic phencyclidine administration in rats. *J Pharmacol Exp Ther* 292: 831-837, 2000.
58. Rivière, G.J., Gentry, W.B. and Owens, S.M.: Brain and other tissue distribution of methamphetamine and its metabolite amphetamine after intravenous administration of methamphetamine to rats. *J Pharmacol Exp Ther* 292: 1042-1047, 2000.
59. Proksch, J.W., Gentry, W.B. and Owens, S.M.: The effect of rate of drug administration on the extent and time course of phencyclidine distribution in rat brain, testis and serum. *Drug Metab Dispos* 28: 742-747, 2000
60. Kyosseva, S.V., Owens, S.M., Elbein, A.D., and Karson, C.N.: Differential and region-specific activation of mitogen-activated protein kinases following chronic administration of phencyclidine in rats. *Neuropsychopharmacol* 24(3): 267-277, 2001.
61. Byrnes-Blake, K.A., Carroll, F.I., Abraham, P., and Owens, S.M.: Generation of anti-(+) methamphetamine antibodies is not impeded by (+)-methamphetamine administration during active immunization of rats. *Int Immunopharmacol* 1: 329-338, 2001.
62. Arora, H., Owens, S.M., and Gentry, W.B.: Intravenous (+)-methamphetamine causes complex dose-dependent physiological changes in awake rats. *Eur J Pharmacol* 426: 81-87, 2001.
63. Hardin, J.S., Wessinger, W.D., Wenger, G.R., Proksch J.W. and Owens, S.M.: A Single Dose of Monoclonal Anti-phencyclidine IgG Offers Long-term Reductions in Phencyclidine Behavioral Effects in Rats. *J Pharmacol Exp Ther* 302: 119-126, 2002.
64. McMillan, D.E., Hardwick, W.C., Li, M., and Owens, S.M.: Pharmacokinetic antagonism of (+)-methamphetamine discrimination by a low-affinity monoclonal anti-methamphetamine antibody. *Behav Pharmacol* 13: 465-473, 2002
65. Byrnes-Blake, K.A., Laurenzana, E.M, Carroll, F.I., Abraham, P., Landes, R.D, Gentry, W.B. and Owens, S.M.: Pharmacodynamic mechanisms of monoclonal antibody-based antagonism of high dose (+)-methamphetamine in rats. *Eur J Pharmacol* 461: 119-128. 2003.
66. Laurenzana, E.M, Gunnell, M.G., Gentry, W.B. and Owens: S.M.: Treatment of adverse effects of excessive phencyclidine exposure in rats with a minimal dose of monoclonal antibody. *J Pharmacol Exp Ther* 306: 1092-1098, 2003.

67. Laurenzana, E.M., Byrnes-Blake, K.A. Milesi-Hallé, A, and Owens, S.M.: Use of Anti-(+)-Methamphetamine Monoclonal Antibody to Significantly Alter (+)-Methamphetamine and (+)-Amphetamine Disposition in Rats. *Drug Metab Dispos* 31: 1320-1326. 2003.
68. McMillan D.E., Hardwick W.C., Li M., Gunnell M.G., Carroll F.I., Abraham P., and Owens S.M.: Effects of Murine-Derived Anti-Methamphetamine Monoclonal Antibodies on (+)-Methamphetamine Self-Administration in the Rat. *J Pharmacol Exp Ther* 309: 1248-1255, 2004.
69. Hendrickson H.P., Milesi-Hallé A., Laurenzana E.M., and Owens S.M.: Development of a liquid chromatography-tandem mass spectrometric method for the determination of methamphetamine and amphetamine using small volumes of rat serum. *J Chromatog B* 806: 81-87, 2004.
70. Owens, S.M. (Guest Ed). Monoclonal Antibodies as Drugs, Drug Development Research, M. Williams and F. Cattabeni, eds. Wiley-Liss, New York, NY. 2004.
71. Gentry W.B., Ghafoor A.U., Wessinger W.D., Laurenzana E.M. and Owens S.M.: (+)Methamphetamine-induced spontaneous behavior in rats depends on route of (+)methamphetamine administration. *Pharmacol Biochem Behav* 79: 751-760, 2004
72. Hendrickson, HP, Whaley, CE and Owens, SM: A validated liquid chromatography tandem mass spectrometric method for the determination of phencyclidine in microliter Samples of Rat Serum. *J Mass Spectrom* 10: 19-24, 2005.
73. Kosten, T. and Owens, S.M. Immunotherapy for the treatment of drug abuse. In Discovery, Development and Implementation of Novel Pharmacotherapies for Addiction. Pharmacol Ther. T.C. Napier and F.J. Vocci, Ed. 18: 76-85 2005.
74. Milesi-Hallé, A., Hendrickson, H.P., Laurenzana, E.M., Gentry, W.B., and Owens, S.M.: Sex- and dose-dependency in the pharmacokinetics and pharmacodynamics of (+)-methamphetamine and its metabolite (+)-amphetamine in Rats. *Toxicol Appl Pharmacol* 209:302-213, 2005.
75. Byrnes-Blake K.A., Laurenzana E.M., Landes R.D., Gentry W.B. and Owens S.M.: Monoclonal IgG affinity and treatment time alters antagonism of (+)-methamphetamine Effects in Rats. *Eur J Pharmacol* 251:86-94. 2005.
76. Daniels, J.R., Wessinger, W.D., Hardwick, W.C., Li, M., Gunnell, M.G., Hall, C.J., Owens, S.M.: and McMillan, DE: Effects of anti-phencyclidine and anti-(+)-methamphetamine monoclonal antibody alone and in combination on the discrimination of phencyclidine and (+)-methamphetamine. *Psychopharmacol* 185:36-44 2006.
77. Gentry W.B., Laurenzana E.M., Williams D.K., West J.R., Berg R.J., Terlea T., and Owens S.M. Safety and Efficiency of an anti-(+)-methamphetamine monoclonal IgG in the protection against cardiovascular and central nervous system effects of (+)-methamphetamine in rats. *Int Immunopharmacol*, 6:968-977 2006.
78. Pitas G., Laurenzana E.M., Williams D.K., Owens S.M., and Gentry W.B. Anti-PCP monoclonal antibody binding capacity is not the only determinant of effectiveness, disproving the concept that antibody capacity is easily surmounted. *Drug Metab Dispos*, 34:906-912 2006.
79. Peterson, E., Owens, S.M. and Henry, R.L.: Monoclonal antibody form and function: Manufacturing the right antibodies for treating drug abuse. *AAPS J* 8(2): E383-390, 2006.

80. Hendrickson, H.P., Laurenzana, E.M. and S.M. Owens: Quantitative Determination of Total Methamphetamine and Active Metabolites in Rat Tissue by Liquid Chromatography with Tandem Mass Spectrometric Detection. *AAPS*, E709-E717, 2006.
81. Milesi-Hallé, A., McMillan, D.E., Laurenzana, E.M., Byrnes-Blake, K. and Owens, S.M. Sex differences in (+)-amphetamine- and (+)-methamphetamine-induced behavior in male and female Sprague-Dawley rats. *Pharmacol Biochem Behav*, 86:140-149, 2007.
82. Peterson, E.C., Gunnell, M.G., Che, Y., Goforth, R.L. Carroll, F.I., Henry, R., and S.M. Owens: Using hapten design to discover therapeutic monoclonal antibodies for treating methamphetamine abuse. *J Pharmacol Exp Ther*, 322:30-39, 2007.
83. Naef, L., Srivastava, L., Gratton, A., Hendrickson, H., Owens, S.M. and Walker, C.-D.: Maternal high fat diet during the perinatal period alters mesocorticolimbic dopamine in the adult rat offspring: reduction in the behavioral responses to repeated amphetamine administration. *Psychopharmacol*, 197: 83-94, 2008.
84. Lacy, H.M., Gunnell, M.G., Laurenzana, E.M. and Owens S.M.: Engineering and Characterization of a Mouse/Human Chimeric Anti-Phencyclidine Monoclonal Antibody. *Int Immunopharmacol*, 8: 1-11, 2008.
85. Peterson, E.C., Laurenzana, E.M., Hendrickson, H., and Owens, S.M.: Development and Preclinical Testing of a High Affinity Single Chain Antibody against (+)-Methamphetamine, *J Pharmacol Exp Ther*, 325: 124-133, 2008.
86. Hendrickson, H., Hardwick, W.C.; McMillan, D.E., Owens, S.M.: Bioavailability of (+)-methamphetamine in the pigeon following an intramuscular dose. *Pharmacol Biochem Behav*. 90(3):382-386, 2008.
87. Gentry WB, Rüedi-Bettschen D, and Owens SM. Development of Active and Passive Human Vaccines to Treat Methamphetamine Addiction. *Human Vaccines* Vol. 5(4) 2009.
88. White, S.J., Laurenzana, E.M., Gentry, W.B., Hendrickson, H.P., Williams, K., Ward, K.W., Owens, S.M.: Vulnerability to (+)-Methamphetamine Effects and the Relationship to Drug Disposition in Pregnant Rats during Chronic Infusion. *Tox Sci*. 111: 27-36, 2009.
89. Peterson, E.C. and Owens, S.M.: Designing immunotherapies to thwart drug abuse. *Mol Interv*, 9:119-124, 2009.
90. Laurenzana, E.M., Hendrickson, H.P., Carpenter, D., Peterson, E.C., Gentry, W.B., West, M., Carroll, F.I. and Owens, S.M.: Functional and Biological Determinants affecting the Duration of Action and Efficacy of Anti-(+)-Methamphetamine Monoclonal Antibodies in Rats. *Vaccine*. 2009. In press.
91. Celikel R, Peterson EC, Owens SM, Varughese KI. Crystal structures of a therapeutic single chain antibody in complex with two drugs of abuse - methamphetamine and 3,4 methylenedioxy-N-methylamphetamine. *Protein Sci*. 2009. In press.
92. Carroll, FI, Abraham, P, Gong, PK, Ramakrishna, RP, Blough, BE, Che, Y, Hampton, A, Gunnell, M, Lay, JO. The synthesis of haptens and their use for the development of monoclonal antibodies for treating methamphetamine abuse. *J Med Chem*. 2009. In press.

ABSTRACTS AND NOTEWORTHY PRESENTATIONS

1. "Radioimmunoanalysis of Delta-9-THC in Blood by Means of an ¹²⁵I-tracer": S.M. Owens, A.J. McBay and H.M. Reisner, Technical Reviews on the Analysis of Cannabinoids in Biological Fluids, National Institute on Drug Abuse, 1980. (Invited panelist).
2. "A Radioimmunoassay for Delta-9-Tetrahydrocannabinol in Blood using Iodine-125 Labeled Delta-8-Tetrahydrocannabinol": S. Michael Owens, Arthur J. McBay and H.M. Reisner, American Academy of Forensic Sciences, 32, Abstract 211 (1980).
3. "THC Concentrations in Plasma and Their Relationship to Clinical Effects after Smoking Marijuana": S. Michael Owens and Mario Perez-Reyes, Joint Meeting of Canadian Society for Forensic Sciences and Society of Forensic Toxicologist, Toronto, Canada, 1980.
4. "A Forensic Study of Marijuana, Other Drugs, and Driving": S. Michael Owens and Arthur J. McBay, Joint Meeting of Canadian Society for Forensic Sciences and Society of Forensic Toxicologist, Toronto, Canada, 1980.
5. "Marijuana, Ethanol and Other Drug Use Among Drivers Killed in Single Vehicle Crashes": S. Michael Owens, Arthur J. McBay and Clarence E. Cook, American Academy of Forensic Sciences, 32nd Annual Meeting, New Orleans, Louisiana, 1980.
6. "Phencyclidine Analysis in Serum by Radioimmunoassay": S.M. Owens, M. Mayersohn and D. Perrier, American Pharmaceutical Association, 129th Meeting, Las Vegas, Nevada, April 29, 1982.
7. "Phencyclidine Blood Protein Binding: Influence of Protein, pH and Species": S.M. Owens, M. Mayersohn, J.R. Woodworth, Academy of Pharmaceutical Sciences, 33rd National Meeting, San Diego, California, November 16, 1982.
8. "The Simultaneous Quantitative Analysis of Phencyclidine and Metabolites by Gas Chromatography": J. Woodworth, M. Mayersohn and S.M. Owens, Academy of Pharmaceutical Sciences, 33rd Annual Meeting, San Diego, California, November 16, 1982.
9. S.M. Owens: Immunoassays for Pharmacokinetic Studies of Psychoactive Drugs. Presented at Conference on the Pharmacokinetics of Psychoactive Drugs. National Institute on Drug Abuse. February 9-11, 1983. Invited participant.
10. Woodworth, J., Owens, S.M. and Mayersohn, M.: Phencyclidine Disposition in Dogs, Academy of Pharmaceutical Sciences, 34th National Meeting, Miami, Florida, November, 1983.
11. Owens, S.M. and Mayersohn, M.: Anti-Phencyclidine Fab as a Tool for Studying the Toxic Effects of Phencyclidine. NIH Immunotoxicology Workshop, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, October 17 and 18, 1983.
12. S.M. Owens and M. Mayersohn: Anti-Phencyclidine (PCP) Fab Alters PCP Disposition. American Society for Pharmacology and Experimental Therapeutics, Indianapolis, Indiana, August 22, 1983.
13. J. Sullivan, F. Russell, N. Egen and M. Owens: Protection against Crotalus venom lethality by monovalent polyclonal F(ab) fragments: In search of a better snake trap. *Vet. Hum. Toxicol.* 26(5), October, 1984.
14. Owens, S.M.: Manipulation of PCP Pharmacokinetics with PCP-Specific Fab Fragments, Presented at National Institute on Drug Abuse Technical Review on Phencyclidine. National Institute on Drug Abuse, Rockville, MD, May 7, 8 and 9, 1985. Invited participant.
15. Owens, S.M., Hardwick, W. and Blackall, D.: Interspecies scaling of phencyclidine (PCP) pharmacokinetics. *Fed. Proc.* 46(3):3214 (1987).
16. Owens, S.M.: Molecular requirements for an immunological model of the PCP receptor. *Pharmacol. Biochem. and Behav.* 28:117-146 (1987).

17. Owens, S.M., Zorbas, M., Gunnell, M., Polk, M. and Lattin, D.L.: An immunological model for the PCP receptor. *The Pharmacologist* 29:297 (1987).
18. McMillan, D.E., Evans, E., Owens, S.M. and Hardwick, W.C.: Generalization of the phencyclidine (PCP) discriminative stimulus to PCP analogs and opioids. *The Pharmacologist* 29:515 (1987).
19. "Antibodies as Drugs", Sponsored by Merrill Dow Pharmaceutical Co. Presented to the Department of Medicine, Hennepin County Hospital and The University of Minnesota, Minneapolis, MN, September 1987.
20. "Reversal of Drug and Chemical Toxicity with Antibodies", Presented to Immunotoxicology Symposium, joint meeting of the American and Canadian Academies of Clinical Toxicology and American Board of Medical Toxicology, Vancouver, BC, Canada, October, 1987. Invited participant.
21. Zorbas, M. and Owens, S.M.: Similarities in binding specificity between rabbit anti-TCHAP antibodies and phencyclidine receptor. *The Pharmacologist*. 30:135.10 (1988).
22. Owens, S.M., Arnold, L.W., Sasser, D. and Gunnell, M.: Anti-PCHAP monoclonal antibodies as models of phencyclidine receptor binding to arylcyclohexylamines. *The Pharmacologist*. 30:135.11 (1988).
23. Zorbas, M., Owens, S.M., Plunkett, L.M. and Bui, H.: [³H]TCP protein binding and pharmacokinetics in Sprague Dawley rats. *The FASEB J.* 2:A4708 (1989).
24. Owens, S.M., Owens, R.B. and Blackall, D.P.: Microbead assay for the detection of phencyclidine by flow cytometric analysis. *The FASEB J.* 2:A4709 (1989).
25. Plunkett, L.M., Owens, S.M., Gunnell, M. and Owens, R.B.: The effect of chronic phencyclidine (PCP) and phenylcyclohexene (PC) dosing on [³H]TCP and [3H]Haloperidol ([3H]HAL) binding in rat brain. *The FASEB J.* 1:A329 (1990).
26. Owens, R.B., Owens, S.M., Gunnell, M. and Plunkett, L.M.: The effect of chronic phencyclidine (PCP) and phenylcyclohexene (PC) dosing on lymphocyte subsets in rats. *The FASEB J.* 1:A337 (1990).
27. "Antibodies as Models of Receptors or Ligands." Presented at symposium on "Antibodies as Drugs: Novel Approaches." American Society for Clinical Pharmacology and Therapeutics, San Francisco, CA (March, 1990) (Invited presentation).
28. Zorbas, M.A. and Owens, S.M.: The importance of phencyclidine (PCP) reactive metabolite(s) to the in vivo hepatic clearance of PCP in Sprague Dawley rats. Committee on Drug Dependence (June, 1990).
29. Wessinger, W.D. and Owens, S.M.: Influence of phencyclidine (PCP) pharmacokinetics on PCP dependence after iv and sc routes of administration. Committee on Drug Dependence (June 1990).
30. Owens, S.M., Gunnell, M., Ronis, M.J.J.: [³H]PCP covalent binding to liver microsomal proteins is significantly affected by the length of chronic dosing. Committee on the Problems of Drug Dependence (June, 1991).
31. Owens, S.M., Gunnell, M., Valentine, J.L. and Laurenzana, E.M.: Development of an animal model for studying the pharmacological consequences of in vivo PCP metabolite binding. Third French-U.S. joint Seminar on Multiple sigma and PCP Receptor Ligands: Mechanisms for Neuromodulation and Protection. Montpellier, France (September, 1991).
32. Owens, S.M., McClurkan, M.B., Badger, T.E., Irby, G.D., Valentine, J.L.: Disposition of anti-PCP Fab in rats. Committee on the Problems of Drug Dependence (June, 1992).
33. Laurenzana, E.M. and Owens, S.M.: Purification of covalently bound phencyclidine (PCP) protein conjugates. *The Pharmacologist*. 34: 263 (1992).
34. Owens, S.M., Gunnell, M.G., Sorrels, S.L., Laurenzana, E.M. and Shelnut, S.R.: Inhibition of phencyclidine metabolism and covalent binding by inhibitors of rat hepatic cytochrome P-450 2D1. *The Toxicologist*. 344: 1342 (1993).

35. Owens, S.M., Gunnell, M.G., and Sorrels, S.L.: Sex is a major determinant of phencyclidine (PCP) metabolism and metabolite covalent binding in rats. College on the Problems of Drug Dependence, Toronto (1993).
36. Shelnutt, S.R., Owens, S.M., Hardwick, W.L., Rodgers, S.E., and McMillan, D.E.: Strain differences in motor activity response to phencyclidine (PCP) in mice: Relationship to PCP receptor binding and pharmacokinetics. College on the Problems of Drug Dependence, Toronto (1993).
37. Valentine, J.L. and Owens, S.M.: Phencyclidine (PCP) pharmacokinetics in the presence of anti-PCP monoclonal Fab fragments. College on the Problems of Drug Dependence, Toronto (1993).
38. Laurenzana, E.M. and Owens, S.M.: Anti-peptide antibodies targeted against specific regions of rat CYP2D1 and human CYP2D6. *The Toxicologist*. 92: 46 (1994).
39. Shelnutt, S.R., Badger, T.M. and Owens, S.M.: Hormonal regulation of phencyclidine (PCP) metabolism in the rat. *The Toxicologist*. 93: 47 (1994).
40. Shelnutt, S.R., Badger, T.M. and Owens S.M.: Sex differences in phencyclidine metabolism in the rat. *International Society for the Study of Xenobiotics. ISSX Proceedings* 6:136 (1994)
41. Valentine, J.L., Wessinger, W.D. and Owens, S.M.: Anti-phencyclidine monoclonal Fab fragments dramatically decrease phencyclidine (PCP) neurotoxicity in Sprague-Dawley rats. *Society for Neuroscience*. Vol. 2: 426.13, 1046: (1994).
42. Laurenzana, E.M. and Owens, S.M.: Brain metabolism of phencyclidine (PCP) in male and female Sprague-Dawley rat microsomes. *International Congress on Toxicology-VII*, Seattle, July 1995.
43. Owens, S.M.: Immunotherapy for drug abuse. Sixth Annual International Business Conference on Antibody Engineering. San Diego, December, 1995. Invited speaker.
44. Shelnutt, S.R., Cornett, L.E. and Owens, S.M.: Phencyclidine causes time-dependent regulation of rat CYP2C11 function, expression and mRNA. College on the Problems of Drug Dependence, San Juan, Puerto Rico (1996).
45. Owens, S.M. and Pentel, P.: Symposium organizers for College on the Problems of Drug Dependence, San Juan, Puerto Rico (1996). Symposium title: Antibody- and Protein-based Therapies for Drug Abuse.
46. Owens, S.M.: Immunotherapy for phencyclidine abuse. Symposium presentation at College on the Problems of Drug Dependence, San Juan, Puerto Rico (1996). Symposium title: Antibody- and Protein-based Therapies for Drug Abuse.
47. Owens, S.M.: Immunotherapy for drugs of abuse. *International Symposium on Hollow Fiber Bioreactor Technology*. Boston, MA (1996). Invited speaker.
48. Gentry, W.B., and Owens, S.M.: Phencyclidine serum pharmacokinetics poorly predict brain equilibration rate in rats. *American Society for Clinical Pharmacology and Therapeutics*, San Diego, CA, PII-95, page 189, 1997.
49. Proksch, J.W. and Owens, S.M.: Antibody-based medications development for phencyclidine (PCP) abuse: Optimization of anti-PCP Fab renal clearance. College on the Problems of Drug Dependence, Nashville, TN (1997).
50. Hardin, J.S., Wessinger, W.D., Owens, S.M.: Medications development for drug abuse: A drug-class specific pharmacokinetic antagonist for phencyclidine (PCP). College on the Problems of Drug Dependence, Nashville, TN (1997).
51. Owens, S.M. Immunotherapy for drug abuse. *FASEB Summer Conference on The Role of Neural and Behavioral Plasticity in Chronic drug Abuse*. Copper Mountain, CO, 1997. Invited speaker.
52. Hardin, J.S. and Owens, S.M.: Monoclonal antibody as a drug class-specific antagonist for the effects of phencyclidine and other arylcyclohexylamines. *Society for Neuroscience*. Vol. 2: 869.4, 2231 (1997).

This research was included in a national news conference on medication development for drug abuse at the annual meeting of the Society for Neuroscience in New Orleans, October 26, 1997.

53. Owens, S.M.: Rational design and development of protein-based therapies for drug abuse. Presentations at: Peripheral Blockers as Treatments for Substance Abuse and Dependence. National Institute on Drug Abuse. April, 1998. Keynote address.
54. Owens, S.M.: Use of a drug class-specific monoclonal Fab to treat phencyclidine abuse and overdose in a rat model. Presentation at: Peripheral Blockers as Treatments for Substance Abuse and Dependence. National Institute on Drug Abuse. April, 1998.
55. Owens, S.M.: Evaluation of protein binding parameters for kinetic modeling. Presented at a continuing education course titled: "In vitro Methods for Evaluating Biokinetic Parameters for Risk Assessment" (J. Frazier, course director). Society for Toxicology, March 1999. Invited speaker.
56. Hardin, J.S., Wenger, G.R., Wessinger, W.D. and Owens, S.M.: Monoclonal antibodies as long-term antagonist of phencyclidine (PCP). American Society for Clinical Pharmacology and Therapeutics. Vol. 100, PII-25 (1999).
57. Gentry, W.B. Proksch, J.W. and Owens, S.M.: Phencyclidine (PCP) distribution in rats: Unique time profiles of brain and testis accumulation. American Society for Clinical Pharmacology and Therapeutics. Vol. 100, PII-35 (1999).
58. Owens, S.M.: Monoclonal antibody-based pharmacokinetic antagonists for the treatment of drug abuse. American Society for Clinical Pharmacology and Therapeutics, March 1999. Featured speaker.
59. Owens, S.M.: Rational design of short- and long-acting monoclonal antibody-based antagonists for the treatment of drug abuse. Center for Biologicals Evaluation. Division of Monoclonal Antibodies, U.S. Food and Drug Administration, April 1999. Invited presentation.
60. Owens, S.M.: Monoclonal antibody-based pharmacokinetic antagonists for the treatment of drug abuse. American Chemical Society, August 1999. Invited presentation.

This research was included in a national press release and news conference on medication development for drug addiction at the annual meeting of the American Chemical Society in New Orleans, August 23, 1999. As a result, it received international news coverage in the lay and scientific press.

61. Kiosseva, S.V., Karson, C.N., Owens, S.M. and Elbein, A.D.: Phencyclidine-induced activation of MAP kinase in rat cerebellum. Society for Neuroscience. Vol. 2: 831.4, 2076 (1999).
62. Gentry WB, Proksch JW and Owens SM. The effect of anti-phencyclidine antibodies on the distribution of phencyclidine (PCP), a ketamine analogue, in rats. Anesthesiology 91(3A): A446, 1999.
63. McMillan, D.E., Hardwick, W.C., Gunnell, M., Li, M., Carroll, F.I., Abraham, P., Byrnes, K.A., Owens, S.M.: An anti-methamphetamine monoclonal antibody blocks methamphetamine (METH) discrimination but not self-administration. The FASEB Journal 14(8), A1552, no. 1377, 2000.
64. Owens, S.M.: "Antibody-based therapy for stimulant abuse." Presentation and symposium organizer for joint meeting of the American Society for Biochemistry and Molecular Biology/American Society for Pharmacology and Experimental Therapeutics. Symposium title: "Protein-based pharmacokinetic antagonist for the treatment of drug abuse." Boston, MA, June 2000.

65. E.L. Laurenzana, Wood, S.L., Gentry, W.B., Owens, S.M.: Dose-response relationships for anti-phencyclidine (PCP) monoclonal antibodies. *The FASEB Journal* 15(4), 207.16, 2001.
66. McMillan, D.E., Hardwick, W.C. Li, M., Byrnes-Blake, K.A., Carroll, F.I., Abraham, P., and Owens, S.M.: An anti-methamphetamine monoclonal antibody shifts the (+)-methamphetamine (METH) dose-response curve for drug discrimination, but not for cocaine or (+)-amphetamine. *The FASEB Journal* 15(4), 709.2, 2001.
67. Laurenzana, E.M., Ali, S.F., Gentry W.B. and Owens, S.M.: Monoclonal Anti-Phencyclidine PCP (IgG) Produces Long Term Protection Against Adverse Effects of PCP. Society of Toxicology, Nashville, TN, March 2002
68. Owens, S.M. Byrnes-Blake, K.A., Laurenzana, E.M., Gentry, W.B., Carroll, F.I. and Abraham, P.: Pharmacokinetic and Behavioral Mechanisms of Antibody-based Antagonism of (+)-Methamphetamine Overdose in Rats. *American Society of Pharmacology and Experimental Therapeutics*, New Orleans, LA, April 2002.
69. Owens, S.M. Byrnes-Blake, K.A., Laurenzana, E.M., Gentry, W.B., Carroll, F.I. and Abraham, P. Pharmacokinetic and behavioral mechanisms of antibody-based antagonism in a model of chronic (+)-methamphetamine use in rats. *College on the Problems of Drug Dependence*, Quebec, Canada, June 2002.
70. Pitas G., Laurenzana E.M., Owens S.M., and Gentry W.B. Single Dose anti-PCP IgG Alters Tissue Distribution of Bolus PCP doses During a Continuous, High-Dose PCP Infusion in Rats. *Clinical Pharmacology and Therapeutics* 2003; 73(2):P78.
71. Milesi-Hallé, A., Henderson, H.P., and Owens S.M.: Sex-related difference in the pharmacokinetics of (+)-methamphetamine (METH) and (+)-amphetamine (AMP). *College on the Problems of Drug Dependence* 2003.
72. Henderson, H.P., Milesi-Hallé, A., Laurenzana, E.M. and Owens S.M.: Sex-related difference in the pharmacokinetics of (+)-methamphetamine (METH) and (+)-amphetamine (AMP). *College on the Problems of Drug Dependence* 2003.
73. Owens, S.M.: Monoclonal antibody based medications for (+)-methamphetamine and phencyclidine. Symposium presentation at *College on the Problems of Drug Dependence* 2003.
74. Owens, S.M: Preclinical trials of monoclonal antibody based medications for drug abuse. *Behavioral Pharmacology*. 14: Supplement 1, S9. 2003.
75. Peterson, E and Owens S.M.: Engineering of a single chain antibody for treatment of methamphetamine abuse. Accepted for presentation at *Experimental Biology* 2004, Washington. DC.

This abstract (along with 14 other abstracts) was selected from over 600 submitted abstracts by the American Society of Pharmacology and Experimental Therapeutics (ASPET) for inclusion in their annual press briefings.

76. Lacy, M. and Owens, S.M.: Molecular engineering an anti-PCP chimeric (mouse/human) monoclonal antibody for treatment of human drug abuse. *Experimental Biology* 2004, Washington, DC.
77. Gentry, W.B., Laurenzana, E.M., Terlea, T., Berg, R.J., West J.R., and Owens S.M.: Monoclonal anti-(+) methamphetamine ((+)-METH) IgG reduces hemodynamic effects of subsequent (+)METH intravenous (IV) bolus doses in rats. *College on the Problems of Drug Dependence* 2004, San Juan, Puerto Rico.
78. Owens, S.M. Invited presentation on "Antibody and vaccine approaches against small-molecule toxins" at the AAPS National Biotechnology Conference in Seattle, WA, June 2009.

Abstracts for 2005-2009 have not been included.