Scott Manning Rawls, Ph.D.

EDUCATION

- Bachelor of Science, Chemistry, East Carolina University, Greenville, North Carolina (1990)
- Doctor of Philosophy, Neuropharmacology, Department of Cell Biology, East Carolina University School of Medicine, Greenville, North Carolina (1999)
- Postdoctoral Fellow (NIDA Training Grant), Department of Pharmacology, Temple University School of Medicine, Philadelphia, PA 19140 (2000-2002)

PROFESSIONAL POSITIONS

- Assistant Professor of Biology, Department of Biology, Washington College, Chestertown, Maryland (2002-2003)
- Assistant Professor of Pharmacology (tenure-track), Department of Pharmaceutical Sciences, Temple University School of Pharmacy, Philadelphia, Pennsylvania (2003- present)

TEACHING EXPERIENCE

- Doctor of Pharmacy students (Temple University School of Pharmacy)
  - Anatomy and Physiology (2004, 2005, 2006, 2007)
  - Pharmacology (2003, 2004, 2005, 2006)
  - Biochemistry (2003)
  - Topics in Research (2004, 2005, 2006, 2007)
  - Grant Writing Elective (2006)
- Graduate Students (Temple University School of Pharmacy and Medicine)
  - Neuropharmacology (2006)
  - Drugs of Abuse (2005, 2007)
  - Principles of Drug Action (2006, 2007)
- Undergraduate students (Washington College, Chestertown, MD)
  - Animal Physiology (2002) with laboratory
  - Pharmacology (2002)
  - Biochemistry (2002) with laboratory
  - General Biology (2002) with laboratory
- Temple University Physician Scientists Program (Temple University)
  - Supervised 5 high school students in summer research program at Temple: One student, Teresa Gomez, was placed in NIH summer program for summer of 2005.
- High School Students (North Pitt High School, Greenville, NC)
  - Honors and College Preparatory Chemistry (1999)
  - Advanced Placement (AP) Chemistry (1999)
  - Honors Physics (1999)

HONORS

2006	American Association of Colleges of Pharmacy (AACP) Teaching Award
2005	Illustrated Book Award, the top honor for an illustrated medical text from the Association of Medical Illustrators for Published Work
2002	Biological Sciences Teaching Award, Washington College
1986	John Motley Morehead Scholarship nominee, Univ. of North Carolina
1990	B.S. *summa cum laude* with distinction in major field

1990	Analytical Chemical Award
1999	Valentine Graduate Student Award (best overall achievement)
1999	Berbecker Award (excellence in original research)
1999	Sigma Xi Research Award (excellence in published work)
1998-2000	NIH Service Award (Opioid regulation of synaptosomal glutamate)

PROFESSIONAL MEMBERSHIPS, COMMITTEES, AND EXPERIENCES

2005- present	Mid-Atlantic Pharmacological Society
2003-present	Phi Delta Chi Pharmacy Fraternity, Temple University
2006-present	Advisor, Phi Delta Chi Pharmacy Fraternity, Temple University
2005- present	Rho Chi Honor Society Fraternity
2007	Chair, *Marijuana and Cannabinoids; Weeding Out Mechanisms Session*, College on Problems of Drug Dependence Meeting, Quebec City, Canada
2004-present	Journal Reviewer: *Brain Research*; *Journal of Pharmacology and Experimental Therapeutics*; *Trends in Pharmacological Sciences*; *Neurochemistry International; Pharmacology, Biochemistry and Behavior; Physiology and Behavior*
2004-present	Faculty Mentor: Summer High School Student Program, Temple
2004-present	Graduate Committee, Temple University School of Pharmacy
2004-present	Safety Committee, Temple University School of Pharmacy
2003-present	Graduate Faculty, Temple University School of Pharmacy
2003-present	NIDA Training Grant (Temple) Faculty Mentor
2003-present	Phi Delta Chi Pharmacy Fraternity (Advisor), Temple University
2002	Chair, Animal Welfare Committee, Washington College
2003	Chair, Marijuana Research Session, College on Problems of Drug Dependence Meeting, Miami, FL
1996-1999	Member, Society for Neuroscience

PUBLISHED TEXTBOOKS

- *Netter's Illustrated Pharmacology.* Icon Learning Systems, Publishers of the Netter Collection, Teterboro, NJ (co-author) (2005). Note: *This book received the Illustrated Book Award, the top honor for an illustrated medical text from the Association of Medical Illustrators.*

SELECTED PEER-REVIEWED PUBLICATIONS (in ascending order)

- Rawls S.M. and McGinty J.F.: L-trans -pyrrolidine-2, 4-dicarboxylic acid-evoked striatal glutamate levels are attenuated by calcium reduction, tetrodotoxin, and glutamate receptor blockade. *J. Neurochem*. **68** 1553-1563 (1998).

- Rawls S.M. and McGinty J.F.: Kappa receptor activation attenuates L-trans-PDC-evoked glutamate levels in the striatum. *J. Neurochem*. **70** 626-634 (1998).

- Rawls S.M. and McGinty J.F.: Muscarinic receptors regulate extracellular glutamate levels in the rat striatum: an *in vivo* microdialysis study. *J. Pharmacol. Exp. Ther*. **286**, 91-98 (1998).

- Rawls S.M., McGinty J.F. and Terrian D.M.: Presynaptic muscarinic and opioid receptors regulate 4-aminopyridine-evoked glutamate release in striatal synaptosomes. *J. Neurochem.* **73** 1058-1065 (1999).

- Gray A.M., Rawls S.M., Shippenberg T.S. and McGinty J.F.: The kappa opioid agonist, U-69593, decreases acute amphetamine-evoked behaviors and dialysate levels of dopamine and glutamate in the nucleus accumbens of awake rats. *J. Neurochem.* **73** 1066-1074 (1999).

- Rawls S.M. and McGinty J.F.: Delta opioid receptors regulate calcium-dependent, amphetamine-evoked glutamate levels in the rat striatum: an *in vivo* microdialysis study. *Brain Res*. **861** 296-304 (2000).

- Rawls S.M., Cabassa J., Geller E.B. and Adler M.W.: CB_1 receptors in the preoptic anterior hypothalamus mediate WIN 55212-2-induced hypothermia. *J. Pharmacol. Exp. Ther*. **301** 963-968 (2002).

- Rawls S.M., Baron D.A., Geller E.B. and Adler M.W.: Sigma sites mediate DTG-induced hypothermia. *Pharmacol. Biochem. Behav*. **73** 779-786 (2002).

- Rawls S.M., Cowan A., Tallarida R.J., Geller E.B. and Adler M.W.: NMDA antagonists and WIN 55212-2, a cannabinoid agonist, interact to produce synergistic hypothermia. *J. Pharmacol. Exp. Ther*. **303** 395-402 (2002).

- Rawls S.M., Baron D.A., Gaughan J.P., Geller E.B., Adler M.W. and Cowan A.: NMDA antagonists attenuate morphine-induced hyperthermia. *Brain Res.* **984** 76-83 (2003).

- Rawls S.M., Tallarida R.J., Geller E.B. and Adler M.W.: L-NAME (N omega-nitro-L-arginine methyl ester), a nitric-oxide synthase inhibitor, and WIN 55212-2 [4,5-dihydro-2-methyl-4(4-morpholinylmethyl)-1-(1-naphthalenyl-carbonyl)-6H-pyrrolo[3,2,1ij]quinolin-6-one], a cannabinoid agonist, interact to evoke synergistic hypothermia. *J. Pharmacol. Exp. Ther*. **308** 780-786 (2004).

- Rawls S.M., Tallarida R.J., Kon D.A., Geller E.B.and Adler M.W.: $GABA_A$ receptors modulate cannabinoid-evoked hypothermia. *Pharmacol. Biochem. Behav.* **78** *83-91* (2004).

- Benamar K., Rawls S.M., Geller E.B. and Adler M.W. Intrahypothalamic injection of deltorphin-II alters body temperature in rats. *Brain Res.* **1019** 22-27 (2004).

- Rawls S.M., Baron D.A., Gomez T., Jacobs K. and Tallarida R.J. Pronounced hypothermic synergy between systemic baclofen and NOS inhibitor. *Eur. J. Pharm*. **502** 271-272 (2004).

- Rawls S.M., Ding Z., Gray A.M. and Cowan A.: Peripheral kappa-opioid agonist, ICI 204448, evokes hypothermia in cold-exposed rats. *Pharmacology* **74** 79-83 (2005).

- Rawls S.M., Hewson J.M., Inan S. and Cowan A.: Brain delta$_2$ opioid receptors mediate SNC-80-evoked hypothermia in rats. *Brain Res*. **1049** 61-69 (2005).

- Ding Z., Cowan A. and Rawls S.M.: Capsaicin evokes hypothermia independent of cannabinoid CB_1 and CB_2 receptors. *Brain Res.* **1065** 147-51 (2005).

- Rawls S.M., Jacobs K. and Tallarida R.J.: Baclofen and nitric oxide synthase inhibitors interact to cause synergistic hypothermia. *Life Sci.* **78** 669-672 (2006).

- Rawls S.M., Gomez T., Stagliano G.W. and Raffa R.B.: Measurement of glutamate and aspartate in Planaria. *J. Pharmacol. Toxicol. Methods,* **53** 291-295 (2006).

- Werkheiser J.L., Rawls S.M., and Cowan A.: Icilin evokes a dose- and time-dependent increase in glutamate within the dorsal striatum of rats. *Amino Acids,* **30** 307-309 (2006).

- Rawls S.M. and Cowan A.: Modulation of delta opioid-evoked hypothermia in rats by WAY 100635 and fluoxetine. *Neurosci. Lett.,* **398** 319-324 (2006).

- Rawls S.M., Kon D. and Cowan A.: Nitric oxide synthase inhibitor mediates delta opioid-induced hypothermia in rats. *Eur. J. Pharmacol*., **536** 109-112 (2006).

- Rawls S.M., Ding Z. and Cowan A.: Role of TRPV1 and cannabinoid CB(1) receptors in AM 404-evoked hypothermia in rats. *Pharmacol. Biochem. Behav.,* **83** 508-516 (2006).

- Rawls S.M., Rodriguez T., Baron D.A. and Raffa R.B.: A nitric oxide synthase inhibitor (L-NAME) attenuates abstinence-induced withdrawal from both cocaine and a cannabinoid agonist (WIN 55212-2) in Planaria. *Brain Res.,* **1099** 82-87 (2006).

- Werkheiser J., Rawls S.M., and Cowan A.: Mu and kappa opioid receptor agonists antagonize icilin-induced wet-dog shaking in rats. *J. Pharmacol*., **547** 101-105 (2006).

- Rawls S.M., Tallarida R.J. and Zisk J.: Agmatine and a cannabinoid agonist, WIN 55212-2, interact to evoke a hypothermic synergy in rats. *Eur. J. Pharmacol*., **553** 89-98 (2006).

- Ding Z., Cowan A., Tallarida R.J. and Rawls S.M.: Capsaicin and a nitric oxide synthase inhibitor interact to evoke a hypothermic synergy in rats. *Neurosci. Lett.,* **409** 41-46 (2006).

- Rawls S.M., Zisk J. and Amin M.: Agmatine blocks morphine-evoked hyperthermia in rats. *Brain Res.,* **1147** 89-94 (2007).

- Werkheiser J., Rawls S.M. and Cowan A.: Nalfurafine, the kappa opioid agonist, inhibits icilin-induced wet-dog shakes in rats and antagonizes glutamate release in the dorsal striatum. *Neuropharmacology,* **52** 925-930 (2007).

- Rawls S.M., Tallarida R.J., Robinson W. and Amin M.: The beta-lactam antibiotic, ceftriaxone, attenuates morphine-evoked hyperthermia in rats. *Br. J. Pharmacol.,* **151** 1095-1102 (2007).

- Rawls S.M., Gomez T., and Raffa R.B.: An NMDA antagonist (LY 235959) attenuates abstinence-induced withdrawal of planarians following acute exposure to a cannabinoid agonist (WIN 55212-2). *Pharmacol. Biochem. Behav.,* **86** 499-504 (2007).

- Rodriguez T., Aggarwal S., Schroeder J.A., Naveri N. and Rawls S.M.: NOP receptor antagonist, JTC-801, blocks cannabinoid-evoked hypothermia in rats. *Neuropeptides,* **41** 239-247 (2007).

- Rawls S.M., Gomez T., Ding Z., Raffa R.B.: Differential behavioral effect of the TRPM8/TRPA1 channel agonist icilin (AG-3-5). *Eur J Pharmacol*., **575** 103-4. (2007).

- Ding Z., Gomez T. Werkheiser J., Cowan A. and Rawls S.M.: Icilin induces a hyperthermia in rats that is dependent on nitric oxide production and NMDA receptor activation. *Eur J Pharmacol*., in press (2007).

- Ding Z., Cowan A. and Rawls S.M.: 5-HT reuptake and 5-HT2 receptors modulate capsaicin-evoked hypothermia in rats. *Neurosci Lett.,* in press (2007).

- Rawls S.M., Cavallo F., Ding Z., and Raffa R.B.: A beta-lactam antibiotic (ceftriaxone) inhibits physical dependence and abstinence-induced withdrawal in planarians. *Eur J Pharmacol.,* submitted.

- Raffa R.B., Stagliano G., Ross G., Powell J.A., Phillips A.G., Ding Z., and Rawls S.M.: Cocaine and amphetamine, but not cannabinoid (WIN 52212-2), abstinence-induced withdrawal/physical-dependence is mediated via a kappa-opioid receptor-like pathway in planarians: 'pharmacologic congruence', *Brain Res*., submitted.

- Rawls S.M., Tallarida R.J., and Kim E.: A cannabinoid agonist (WIN 55212-2) and agmatine interact to evoke an antinociceptive synergy in rats. *Pharmacology, Biochemistry and Behavior,* submitted.

- Yulin W., Chen Y., Xu W., Lee D., Rawls S.M., Cowan A., and Liu-Chen L. 2-methoxymethyl-salvinorin B is a potent kappa opioid receptor agonist with longer-lasting action *in vivo* than Salvinorin A. *J. Pharmacol. Exp. Ther.,* accepted with revision.

- Rawls S.M., Baron A., Ding Z., Roth C. and Raffa R.B.: Nociceptin (N/OFQ) attenuates the development and expression of methamphetamine physical dependence in an *in vivo* model. *Neuropeptides*, submitted.

PAPERS IN PREPARATION

- Rawls S.M. and Baron A.: The beta-lactam antibiotic and GLT-1 activator, ceftriaxone, decreases extracellular glutamate in the striatum and nucleus accumbens of conscious rats: an *in vivo* microdialysis study.

- Rasmussen B., Unterwald E.M., and Rawls S.M.: Anandamide, an endogenous cannabinoid, blocks amphetamine-induced sensitization.

- Rasmussen B. and Rawls S.M.: Rimonabant (SR 141716A), a cannabinoid CB_1 receptor antagonist, does not alter the acute hyperactivity caused by cocaine.

- Ding Z., Cowan A., and Rawls S.M.: Effects of vanilloid agonists on glutamate and dopamine levels in the rat striatum: an *in vivo* microdialysis study.

- Ding Z., Cowan A., and Rawls S.M.: Vanilloid agonists attenuate the increase in hyperactivity and extracellular dopamine caused by amphetamine.

- Rawls S.M., Baron A., Unterwald EM and Kim E.: The beta-lactam antibiotic and GLT-1 activator, ceftriaxone, reduces cocaine conditioned place preference in rats.

- Rawls S.M., Gerber K., Baron A., Ding Z., Roth C. and Raffa R.B.: Agmatine inhibits methamphetamine, cannabinoid and opioid withdrawal in a planarian model of physical dependence.

- Rawls S.M., Patel H., Zielinski M., Sacavage S., and Patel D.: The beta-lactam antibiotic and GLT-1 activator, ceftriaxone, attenuates tolerance to morphine angalgesia in rats.

- Werkheiser J., Gomez T., Cowan A., and Rawls S.M.: Icilin, a cold channel agonist, induces we-dog shaking through a NMDA receptor- and nitric oxide-sensitive pathway.

PRESENTATIONS

- Rawls S.M., Whitlow C.T., Church W.H. and McGinty J.F.: Kappa opioid receptor agonist blocks potassium-stimulated increase in extracellular glutamate levels in rat striatum. Society for Neuroscience Abstract, San Diego, California (1995).

- Rawls S.M. and McGinty J.F.: L-trans -pyrrolidine-2,4-dicarboxylic acid-evoked striatal glutamate levels are attenuated by calcium reduction, tetrodotoxin, and glutamate receptor blockade. Society for Neuroscience Abstract, Washington, DC (1996).

- Rawls S.M. and McGinty J.F.: Delta opioid receptors regulate amphetamine-evoked glutamate and dopamine levels in the rat striatum: an *in vivo* microdialysis study. Society for Neuroscience Abstract, New Orleans, Louisiana (1997).

- Rawls S.M. and McGinty J.F.: Muscarinic receptors regulate extracellular glutamate levels in the rat striatum: an *in vivo* microdialysis study. Society for Neuroscience Abstract, Los Angeles, California (1998).

- Rawls S.M., Geller E.B. and Adler M.W.: WIN 55212-2 produces hypothermia via CB_1 receptor activation. Temple University Neuroscience Day Abstract, Philadelphia, PA (2001).

- Rawls S.M., Geller E.B. and Adler M.W.: Cannabinoids and opioids regulate body temperature in rats. Temple University NIDA Training Grant Retreat Abstract, Philadelphia, PA, (2001).

- Rawls S.M., Geller E.B. and Adler M.W.: Intra-hypothalamic delta opioid receptors produce hyperthermia in the rat. International Narcotics Meeting Abstract, Helsinki, Finland (2001).

- Rawls S.M., Geller E.B. and Adler M.W.: Cannabinoid CB_1 receptors in the preoptic anterior hypothalamus regulate WIN 55212-2-induced hypothermia. College on Problems of Drug Dependence Abstract, Scottsdale, Arizona (2001).

- Rawls S.M., Cowan A., Tallarida R.J., Geller E.B. and Adler M.W.: NMDA antagonists and WIN 55212-2, a cannabinoid agonist, interact to produce synergistic hypothermia. Society for Neuroscience Abstract, Orlando, Florida (2002).

- Rawls S.M., Tallarida R.J., Geller E.B. and Adler M.W.: U-50, 488H, a kappa opioid agonist, and WIN 55212-2, a cannabinoid agonist, interact to produce synergistic hypothermia. International Narcotics Meeting Abstract, Anaheim, California (2002).

- Rawls S.M., Geller E.B. and Adler M.W.: Cannabinoid receptors play a modulatory role in morphine-evoked hyperthermia. College on Problems of Drug Dependence Abstract, Quebec, Canada (2002).

- Rawls S.M., Baron A., Gaughan J.P., Geller E.B., Adler M.W. and Cowan A.: NMDA antagonists attenuate morphine-induced hyperthermia. College on Problems of Drug Dependence Abstract, Miami, FL (2003).

- Hewson J.M., Cowan A. and Rawls S.M.: Regulation of Delta-opioid-evoked hypothermia in rats. Society for Neuroscience Abstract, New Orleans, LA (2003).

- Inan S., Baron D.A. and Rawls S.M.: Cannabinoid Regulation of Striatal Glutamate. Society for Neuroscience Abstract, San Diego, CA (2004).

- Ding Z., Gomez T., Werkheiser J., Kehner G.B., Cowan A. and Rawls S.M.: Icilin induces hyperthermia by a nitric oxide mechanism. College on Problems of Drug Dependence Meeting Abstract, San Juan, Puerto Rico (2004).

- Werkheiser J.M., Rawls S.M. and Cowan A.: Effects of mu, delta, and kappa opioid agonists on icilin-induced wet dog shakes (WDS) in rats. Society of Biological Psychiatry Abstract. New York, New York (2004).

- Ding Z., Cowan A. and Rawls S.M.: Capsaicin blocks amphetamine-evoked stereotypy. Philadelphia Society for Neuroscience Meeting Abstract, Philadelphia, PA (2005).

- Werkheiser J.M., Rawls S.M. and Cowan A.: Perfusion of the kappa antagonist, nor-binaltorphimine, into the striatum reverses kappa mediated inhibition of icilin-induced wet dog shakes in rats. Society for Neuroscience Meeting Abstract, Washington, DC (2005).

- Ding Z., Cowan A., Schroeder J.A. and Rawls S.M.: Vanilloid agonists block amphetamine-evoked stereotypy. Society for Neuroscience Meeting Abstract, Washington, DC (2005).

- Rawls S.M., Rodriguez T., Schroeder J.A., and Zaveri N.: NOP receptor antagonist, JTC-801, blocks cannabinoid-evoked hypothermia in rats. College on Problems of Drug Dependence Meeting Abstract, Quebec City, Canada (2007).

PAST RESEARCH SUPPORT

(1) NIH National Research Service Award (NRSA/ F31) (1998-2000)
Opioid regulation of rat striatal glutamate efflux
1998-2000
Principal Investigator: Scott Rawls
East Carolina University School of Medicine
*This study used a continuous fluorometric assay to investigate the role of glutamate, opioid, and acetylcholine systems in the regulation of glutamate release from rat striatal synaptosomes.

CURRENT RESEARCH SUPPORT

(1) R15 NIH Area Research Enhancement Award (August, 2007- 2010)
Cannabinoid regulation of basal ganglia glutamate and GABA
Direct Costs: $150,000
Total Costs: $ 225,000
Principal Investigator: Scott Rawls
Consultant: Billy Martin (Virginia Commonwealth University School of Medicine)
*This grant uses the techniques of *in vivo* microdialysis and HPLC to investigate the functional impact of cannabinoid agonists and antagonists on glutamate and GABA release in the basal ganglia and reward centers of the brain. A role for cannabinoid-glutamate interactions in the behavioral and neurochemical effects of psychostimulants (e.g. cocaine, amphetamine, methamphetamine) is also investigated. Another goal of this proposal is to expose professional students (e.g. Pharmacy students) to basic science research to prepare them for a career in academics, industry, or government.

(2) Pennsylvania Department of Health (PADOH) (2007-2009)
Chemokine interactions with dopamine systems in the brain ***(*2007-2009)**
Total Amount: $100,000

Investigators: Scott Rawls, Lynn Kirby (Temple), Ellen Unterwald (Temple)
*This grant investigates the functional impact of the central chemokine system on dopamine and dopamine-mediated behaviors. Specific goals are to determine the effects of chemokines on dopamine and glutamate release in reward centers of the brain (e.g., nucleus accumbens, prefrontal cortex, amygdale, ventral tegmental area) and to elucidate the effects of chemokines on psychostimulant-evoked behaviors and neurotransmitter release.

(3) Purdue Pharma support
Approximate Total: $200,000
*My collaboration with Don Kyle, Ph.D., Vice President of Research at Purdue Pharma, on a cannabinoid and vanilloid project has resulted in a donation of equipment, chemicals and supplies to support my laboratory at Temple.

(4) T32 DA 07237: NIDA Training Grant (2005-2010)
Training Grant: Drugs of abuse and related neuropeptides
Principal Investigator: Ellen Unterwald (Temple)
Faculty mentor: Scott Rawls
Temple University School of Medicine and School of Pharmacy
*This training program funds graduate student and post-doctoral fellowships at Temple University School of Medicine and provides laboratory resources and travel money for the students and post-doctoral fellows.

RESEARCH GRANTS UNDER REVIEW

(1) R01 NIH Investigator Grant (Priority Score - 229; Percentile - 44.3) (5-year proposal)
Synthesis and Screening of Salvinorin-A Bases kappa opioid receptor ligands
Direct Costs: $1,160,000
Principal Investigator: Yui-Wei Lee (Harvard)
Co-investigator: Scott Rawls
Co-investigator: Lee-Yuan Liu-Chen (Temple)
*This is a new application proposing to design and evaluate novel salvinorin A and B analogs based on the identification of two interesting lead compounds in preliminary studies. These compounds act as agonists and antagonists at kappa opioid receptors and may be useful in managing clinical conditions such as pain, tolerance, dependence and depression.

(2) R01 NIH Investigator Grant (priority score of 203) (3-year proposal)
Cannabinoid interactions with glutamate systems in the brain
Direct Costs: $ 525,000
Principal Investigator: Scott Rawls
Consultant: Jacqueline F. McGinty (Medical University of South Carolina)
* Experiments proposed at the neurochemical (microdialysis, synaptosomes, HPLC) and behavioral (locomotor, place preference, sensitization) levels will investigate the functional impact of the endogenous cannabinoid system on glutamate release in the reward centers of the brain and determine if endocannabinoid-glutamate interactions mediate the behavioral and neurochemical effects of psychostimulants (e.g. cocaine, amphetamine, methamphetamine). Novel compounds such as cannabinoid CB_1

antagonists, endocannabinoid uptake blockers, and inhibitors of endocannabinoid metabolism will be tested.

(3) R15 NIH Investigator Grant (submitted, 10-25-07) (3-year proposal)
Can beta-lactam antibiotics decrease morphine physical dependence?
Direct Costs: $150,000
Principal Investigator: Scott Rawls
Consultant: Ellen Unterwald (Temple)
*Beta-lactam antibiotics (e.g. ceftriaxone, penicillin) do more than just kill bacteria. In a process distinct from their antibacterial mechanism, these miraculous drugs increase glutamate reuptake in the brain by increasing the expression and functional activity of GLT-1, the major glutamate transporter protein in the mammalian brain (Rothstein et al., 2005). This proposal will test hypothesis that beta-lactam antibiotics decrease extracellular glutamate levels in the basal ganglia and limbic system of rats by increasing the expression and activity of the GLT-1 transporter.

(4) R15 NIH Area Research Enhancement Award (under review) (3-year proposal)
Agmatine Interactions with Glutamate Systems in the Brain
Direct Costs: $150,000
Principal Investigator: Scott Rawls
Consultant: Ellen Unterwald (Temple)
* Experiments proposed at the neurochemical and behavioral levels will test the hypothesis that agmatine (a biogenic amine formed via arginine decarboxylation) inhibits glutamate release in the reward centers of the brain and blocks two glutamate-mediated effects: the behavioral sensitization and conditioned place preference caused by cocaine.

NEW RESEARCH GRANTS TO BE SUBMITTED IN 2008

(1) R01 NIH Investigator Grant (3-year proposal)
Role of beta-lactam antibiotics and GLT-1 activators on glutamate systems in the brain
Investigators: Scott Rawls, Ellen Unterwald (Temple), and Jacqueline McGinty (Medical University of South Carolina)
*This proposal will test the hypothesis that beta-lactam antibiotics reduce extracellular glutamate in limbic regions of the brain and inhibit glutamate-mediated processes such as stimulant-induced behavioral sensitization and conditioned place preference.

(2) R01 NIH Investigator Grant (3-year proposal)
Chemokine interactions with dopamine and glutamate systems in the brain
Investigators: Scott Rawls, Lynn Kirby (Temple), Ellen Unterwald (Temple)
* Experiments conducted at the neurochemical, electrophysiological, behavioral, and molecular levels will investigate the role of chemokines on dopamine and glutamate systems in the reward centers of the limbic system. Because dopamine and glutamate mediate the behavioral effects of psychostimulants, we will determine if chemokines regulate the neurochemical and behavioral effects of cocaine and amphetamine.