

BRUCE SANBORN CUSHING

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CURRENT POSITION

2014 - Chair, Department of Biological Sciences, University of Texas at El Paso

EDUCATION/TRAINING

B.S.: Zoology, Arizona State University, 1977.
M.S.: Wildlife Biology, University of Montana, 1980.
Ph.D.: Zoology/Animal Behavior, Michigan State University, 1984. (John A. King)
Postdoctoral Fellow: University of Hawaii (Ernst Reese)
Postdoctoral Fellow: Indiana University (Polley Ann McClure)
Mentored Career Award NIH - Neuroscience (Gloria Hoffman & Catherine Carr University of Maryland)

GRANTS-IN-AID OF RESEARCH

1989-90 NIH-BRSG Indiana University Grant PHS SO7 RR 7031 L (2,000)
1993 Summer Research Support Grant Middle Tennessee State University (4,250)
1993-94 Academic Year Grant MTSU (2,350)
1993-94 United States Air Force (46,000)
1993-94 Department of Defense (47,000)
1994-95 Department of Defense (18,600)
1994-95 Department of Defense (7,150)
1995-96 Department of Defense (9,000)
2000-05 Postnatal Exposure to Oxytocin and Subsequent Female Reproductive Behavior-NICHD
P01 HD38490-01 (status-PI-332,829 direct)
2000-05 Animal/experimental Core NICHD-P01 HD38490-01 (status-PI-355,888 direct)
2000-05 Social Behavior and Changes in HPA Activity as a Function of Neonatal Oxytocin
Manipulations-NICHD-P01 HD38490-01 (status-co-PI-359,878 direct)
2000-06 Hormones and Behavioral Development- K01 MH01992 (513,763 direct)
2003-06 CNS Estrogen Receptors and Social Behavior – R21 MH68278 (role PI - 200,000 direct)
2008-12 CNS Estrogen Receptors and Social Behavior – R15 MH081262-01A1 (role PI –
220,500)
2008-13 Non-genomic Factors in the Expression of Adult Social Behavior – NSF 0822041 (role PI
320,000) - Neural Modulation Program
2008- Orthopedic Research Cluster of Northeastern Ohio - Third Frontier Ohio Research Scholar
Award (role co-PI 8.5 million).
2013- ERα expression effects on male social and reproductive behavior under ecologically
relevant conditions – R15 HD75222-01A1 (role co-PI 300,000 direct)

2015 - Cocaine Self-administration and Social Bonds R21 DA040042-01 (role PI - 250,000 direct)
(in review)

HONORS & AWARDS

1984 University Wide Excellence-in-Teaching Award - Michigan State University
1995 Nominated for Distinguished Researcher - Middle Tennessee State University
1999 Mentor of the Year - McNair Foundation - University of Maryland
2000 Outstanding Mentor - McNair Foundation - University of Maryland
2012 Alpha Sigma Phi's Student's Choice Award - <http://www.youtube.com/watch?v=InsY9gGLz8E>
2013 IOS (NSF) Distinguished Service During Preliminary Proposals - Program Management

POSITIONS HELD

2014 - Chair, Department of Biological Sciences, University of Texas at El Paso
2014 - 2014 Program Director – NSF IOS Division - Neural Modulation
2012 - 2014 Program Director – NSF IOS Division - Animal Behavior Program
2010- 2013 Faculty Senate – at large Member
2006 - 2014 Professor, Department of Biology, The University of Akron
2006- 2008 Chair and Professor, Department of Biology, The University of Akron
2006- 2008 Director Integrated Bioscience Program, The University of Akron
2001-2006 Associate Research Professor, Psychiatry, University of Illinois at Chicago.
2000- 2002 Associate Research Scientist, Department of Biology, University of Maryland
1996- 1999 Assistant Research Scientist, Department of Biology, University of Maryland
1994- Adjunct Assistant Professor, Department of Physiology and Anatomy,
Meharry Medical College
1992-1996 Assistant Professor, Biology Department, MTSU
1991-92 Curriculum Development Specialist/Assistant Professor, Department of
Biology, Indiana University
1988-91 Post Doctoral Fellow, Department of Biology, Indiana University
1987 Assistant Professor, Department of Zoology, University of Hawaii
1985-86 Postdoctoral Researcher, University of Hawaii
1984-85 Instructor, Biological Science Program, MSU
1984 Laboratory Coordinator, Biological Science Program, MSU
1983 Ombudsman, Biological Science Program, MSU

EDITORIAL BOARD MEMBER

PLoSOne (2009 – current)
BMC Neuroscience / BMC Research (2010 - current)
Developmental Psychobiology (2010 - 2012 2014-)

REVIEWER FOR (continued next page)

Animal Behaviour	Contemporary Topics	Journal of Mammalogy
Acta Theriologica Sinica	Current Zoology	Life Science
Acta Zoologica Sinica	Laboratory Animal Science	Molecular Ecology

REVIEWER FOR (continued....)

American J Physiology	Developmental Psychobiology	Neuroscience
Behavioral Brain Research	Endocrinology	Neurosci & Behav Rev
Behavioral Neuroscience	Ethology Physiology & Behavior	Neuropharmacology
Behavioral Processes	Ethology Ecology & Evolution	Neuroscience Letters
Biological Psychiatry	Frontiers in Neuroscience	Peptides
Biology of Reproduction	Genes, Brain, and Behavior	Physiology
BMC Neuroscience	Int. Journal of Women's Health	PloS Computer
BMC Research	J. Comparative Neurology	Plos One
Brain Research	J. Comparative Psychology	PNAS
Canadian Journal of Zoology	Journal of Endocrinology	Psychoneuroendocrinology
		Trends in
Neuroendocrinology		

MEMBERSHIP IN ASSOCIATIONS

Society for Behavioral Neuroendocrinology,
Society for Neuroscience

NIH/NSF PANEL REVIEWER

National Institute Diabetes and Digestive and Kidney Diseases Special Emphasis Panel (10/01)
Center for Scientific Review BRLE (6/02, 2/03, 10/03, 6/04)
Center for Scientific Review Biobehavioral and Behavioral Processes 2 (10/02 special review)
International Bioethics Education and Development ZRG1 ICP-2 (3/25/04)
National Institute Child Health and Development - Developmental Biology Subcommittee (10/12/07)
Center for Scientific Review - Emerging Technologies and Training in Neuroscience (3/09, 7/09, 11/09, 7/10, 11/10, 3/10, 10/11, 10/14)
NIMH – Sensitive Period RFA review panel ZMH1 ERB-L-02 (2/23/10)
NSF – Doctoral Dissertation Improvement Grants – (2009)
NSF – Animal Behavior (2009, 2011)
NIMH – Special Emphasis - ZMH1 ERB-L (07) S - Neural Processes Underlying Sex Differences Related to Risk and Resilience to Mental Illness (2012)

INVITED SPEAKER

Universities

University of Tulsa (1983)	Rutgers (2006)
University of Hawaii (1985)	Kent State University (2007)
University of Illinois (1989)	Oberlin College (2007)
Vanderbilt University (1993)	Cleveland State University (2008)
Meharry Medical College (1995)	Mind Brain Consortium (2008)
University of Tennessee (1995)	University of South Carolina (2008)
University of Maryland (1997)	University of Kiev, Biochemistry (2008)
George Washington University (1998)	University of Kiev, Biology (2008)

Queens University (2000)
Michigan State University, Psychology (2002)
INVITED SPEAKER (continued)

The Ohio State University (2008)
Central Michigan University (2009)

University of Wisconsin, Neuroscience (2002)
Northeastern University, Psychology (2003)
University of Memphis (2005)
Miami University Ohio (2005)
Loyola University, Chicago, (2005)
Northeast Ohio College of Medicine (2006)

University of South Carolina (2012)
Clemson University (2012)
Michigan Technological Univ (2013)
Florida State University (2013)
Texas A&M University (2013)
University of Texas El Paso (2014)

Conferences

The Relationship System and Individual Variation in Functioning - Bowen Center/Georgetown Family Center – April 15-16, 2000
The Relationship System and Individual Variation in Functioning – Bowen Center/Georgetown Family Center – April 4-5, 2003
International Behavioral Neuroscience Society – Symposia “Estrogen Old Hormone New Tricks” – June 16-20th, 2004
19th International Congress of Zoology – Beijing China – August 23 –27th, 2004.
Winter Neuropeptides Conference. Feb 3 – 6th, 2007.
Research Frontiers in Brain Function & Disorders – University of South Dakota – COBRE – September 25-26th, 2009.
1st Asian Pacific – Chinese Conference on Integrated Bioscience Beijing China July 25 – 27th, 2011.

Teaching Experience (postgraduate)

University of Hawaii

MICRO 130 -General Microbiology (3-hr)- Role of microorganisms; how they affect people, property, and the environment. A basic survey course covering broad aspects of biochemistry, genetics, molecular biology, and physiology; host-parasite relationships, public health, bacterial, mycotic and viral diseases; epidemiology; ecology of soils and water; environmental pollution; food microbiology; industrial applications at an introductory level.

BIOL 171 - Introduction to Biology I (3-hr) -Introductory biology for all life science majors. Cell structure and chemistry; growth, reproduction, genetics, evolution, viruses, bacteria, and simple eukaryotes.

BIOL 171L - Introduction to Biology I Lab (1 3-hr Lab) Laboratory to accompany 171.

ZOOL 320 -Vertebrate Zoology- Introduction to the evolution and systematics of vertebrates, with emphasis on comparative morphology, physiology and ecology.

ZOOL 321- Vertebrate Zoology Lab (2 3-hour labs per week) - Laboratory to accompany ZOOL 320.

Indiana University

BIOL- L340 - Biological Sex Roles (3-hr) - Biological mechanisms underlying sex differences in physiology, behavior, and evolution of sex roles. Emphasis is on the origin, implications, or general patterns of sex-related function across a variety of types of organisms, with special attention to the higher vertebrates; especially humans.

BIOL-L111 – Introduction to Biology: Evolution and Diversity (3-hr) - For biology and other science majors. Preference will be given to freshmen and sophomores. Processes of evolution (selection, speciation, macroevolution, origin and early history of life) and organismal function (morphology, physiology, and behavior).

Middle Tennessee State University

BIOL 1030 - Exploring Life (4-hr)- Designed for non-majors. Offers understanding, experiences, and skills related to common biological issues.

BIOL 1031 - Exploring Life Lab – lab required with course.

BIOL 1110 - General Biology (4 hr)- Biological principles and processes, including introduction to the nature of science, cells (structure, function, metabolism, division), genetics, evolution, viruses, bacteria, protists, and fungi. Three hours lecture and one three-hour laboratory.

BIOL 1111 - General Biology Lab – lab required with course.

BIOL 1120 - General Biology (4 hr) -Survey of plants and animals emphasizing evolution, structure, function, reproduction, growth, and ecology. Three hours lecture and one three-hour laboratory.

BIOL 1121 - General Biology Lab - lab required with course.

BIOL 2010 - Human Anatomy and Physiology I (4 hr)-Structure and function of the cell, integumentary, skeletal, muscle, and nervous systems. Three hours lecture and one three-hour laboratory.

BIOL 2011 - Human Anatomy and Physiology I Lab– lab required with course.

BIOL 2020 - Human Anatomy and Physiology II (4-hr) Structure and function of endocrine, circulatory, respiratory, urinary, digestive, and reproductive systems.

BIOL 2021 - Human Anatomy and Physiology II Lab – lab required with course.

BIOL 6180 -Mammalogy (graduate course) (3 hr)- Morphology, physiology, systematics, and the development of mammals. Two lectures and one three-hour laboratory.

BIOL 6160 Animal Behavior (graduate course) (3hr)- Principles of animal behavior from an evolutionary perspective.

BIOL 6650 Graduate Seminar

BIOL 6660 Graduate Seminar

University of Maryland

BSCI 342/WMST 326 -Biology of Reproduction - (3-hr)The biology of the reproductive system with emphasis on mammals and, in particular, on human reproduction. Hormone actions, sperm production, ovulation, sexual differentiation, sexual behavior, contraception, pregnancy, lactation, maternal behavior, and menopause.

BSCI 201 - Anatomy and Physiology I (3-hr)-Anatomy and physiology of the skeletal, muscular, neural, endocrine, and sensory systems.

CLFS 609B - Human Reproduction (graduate level WebCT) (3-hr) - All living organisms are capable of reproducing. This course will take a comprehensive look at this interesting and

relevant process by examining the role of hormones, developmental and genetic sex, the process of puberty, and the production of offspring. While a variety of species will be used to help you understand the reproductive process, this course will concentrate on sexual reproduction by emphasizing mammalian, especially human, reproduction. While there are no specific prerequisites to take this course, reproduction either directly or indirectly involves all systems and functions of the body and therefore you should have a basic knowledge of biology.

CLFS 609J- Evolution (graduate level WebCT) (3-hr)- The goal of this course is to provide a basic understanding of the concepts and effects of evolution, the unifying theme of biology. Following completion of the course you should be able to effectively discuss the scientific foundations of evolution within a secondary classroom environment or an introductory science course at the college level. Basic ideas to be addressed include understanding what a scientific theory is, and how this applies to evolution, genetics, and mutations. Mechanisms of evolution that will be discussed include natural selection, individual and group selection, sexual selection, the role of non-genomic influences in gene expression, and speciation. While the concepts of evolution are straightforward and logical, evolution can be a controversial topic within society and secondary education programs. Finally, misrepresentation of evolutionary concepts will be presented and discussed to better enable you to address these issues as a teacher.

George Washington University

BISC 2452 - Animal Behavior (3-hr) -An evolutionary approach to the study of animal behavior, emphasizing behavioral ecology and sociobiology.

The University of Akron

3100:111 Principles of Biology (3-hr) - In this course we will discuss the major biological problems experienced by all living organisms with an emphasis on the understanding how life works and our current best explanation of biological phenomena. The course is designed for *majors in biology* and others who require a broad but rigorous training in general biology.

3100:468 - Physiology of Reproduction (3-hr) - This course will explore in depth the physiologic and behavioral mechanisms that regulate sexual reproduction. Special emphasis will be placed on neuroendocrine regulation and the cellular action and metabolism of sex steroids.

While many of the examples while emphasis human reproduction other animal will also be considered and the course will. A combination of formal lectures, informal discussions, and assigned readings will introduce the student to the area of reproductive neuroendocrinology.

3100:495 - Endocrinology (3-hr) - This course will explore in depth the endocrine system, including the major endocrine glands and other sights of hormone production, hormones, including structure and function, and signal transduction. In addition we will discuss some conditions produced by endocrine disorders.

University of Texas at El Paso

BIOL 5308 – Research Funding & Professional Development (graduate MS) - This course aims at providing instruction and guidance in the construction and submission of competitive grant proposals and fellowship applications, as well as the development of other professional tools needed by graduate students in the biological sciences.

BIOL 6308 - Research Funding & Professional Development (graduate PhD) - This course aims at providing instruction and guidance in the construction and submission of competitive grant

proposals and fellowship applications, as well as the development of other professional tools needed by graduate students in the biological sciences.

PUBLICATIONS

1980. Gore, J.A., Cushing, B.S. Observations on temporary foraging areas and burrows of the sun-spider, *Ammotrechula penninsulana*. **Southwestern Naturalist** 25:95-102.
1980. Cushing, B.S., Matherne, A. Stinger utilization and predation in the scorpion *Paruroctonus oreus*. **Great Basin Naturalist** 40:193-195.
1983. Cushing, B.S. Responses of polar bears to human menstrual odors. **International Conference on Bear Research and Management** 5:204-207.
1984. Cushing, B.S. A selective preference by least weasels for oestrous versus dioestrous urine of prairie deer mice. **Animal Behaviour** 32:1263-1265.
1985. Cushing, B.S. A comparison of activity patterns of estrous and diestrous prairie deer mice, *Peromyscus maniculatus bairdi*. **Journal of Mammalogy** 66:136-139.
1985. Cushing, B.S. Estrous mice and vulnerability to weasel predation. **Ecology** 66:1976-1978.
1987. Dodson, K.M., Dawson, W., VanOoteghem, S.O., Cushing, B.S., Haigh, G.R. The platinum coat color locus in the deer mouse (*Peromyscus maniculatus*). **Journal of Heredity** 78:183-186.
1988. Haigh, G.R., Cushing, B.S., Bronson, F.H. A novel postcopulatory reproductive block in White-footed mice. **Biology of Reproduction** 38:623-626.
1988. Cushing, B.S., Cushing, N.L., Jonkel, C. Polar bear response to ringed seal underwater vocalizations. **Polar Biology** 9:123-124.
1991. Cushing, B.S., Knight, F. Range extension and the first reported female least weasel in Tennessee. **Journal of Tennessee Academy of Science** 66:12.
1994. Cushing, B.S., Lebeck, L. Foraging in cockroach sticky traps by the spider *Nesticodes rufipes*: A super food resource. **ACTA Arachnological** 41:49-56.
1995. Cushing, B.S. When a hawk can damage a dove: An extension of game theory. **Journal of Theoretical Biology** 175:173-176.
1995. Cushing, B.S., Marhenke, S., McClure, P. A. Estradiol concentration and the regulation of locomotor activity. **Physiology and Behavior** 58:953-957.
1996. Cushing, B.S., Cawthorn, J.M. Species differences in activity patterns during oestrus. **Canadian Journal of Zoology** 74:473-479.
1996. Cushing, B.S., Hite, R. Effects of estradiol on sexual receptivity, wheel-running behavior, and vaginal estrus in virgin prairie voles. **Physiology and Behavior** 60:829-832.

1997. Morgan, L.R., Hite, R., Cushing, B.S. Exposure to male siblings facilitates the response to estradiol in sexually naive female prairie voles. **Physiology and Behavior** 61:955-956.
1998. Roberts, R.L., Cushing, B.S., Carter, C.S. Intraspecific variation in the induction of female sexual receptivity in prairie voles. **Physiology and Behavior** 64:209-212.
1998. Cushing, B.S., Reese, E. Hawk-like aggression in the Hawaiian red lobster, *Enoplometopus occidentalis*. **Behaviour** 135:963-877.
1999. Cushing, B.S., Carter, C.S. Prior exposure to oxytocin mimics social contact and
2002 facilitates sexual behaviour in females. **Journal of Neuroendocrinology** 11:765-769.
Reprinted IN: J.T. Cacioppo, G.G. Bernston, R. Adolphs, et al. (Eds.). Foundations in Social Neuroscience. pp. 901-908, MIT Press, Cambridge, MA
2000. Cushing, B.S., Carter, C.S. Peripheral pulses of oxytocin increase pair bonding in female, but not male prairie voles. **Hormones and Behavior** 37:49-56.
2001. Cushing, B.S., Martin, J.O., Young, L., Carter, C.S. The effects of peptides on partner preference formation are predicted by habitat and mating system in prairie voles. **Hormones and Behavior** 39:48-58.
2002. Bowler, C., Cushing, B.S., Carter, C.S. Social factors regulate female-female aggression and affiliation in prairie voles. **Physiology and Behavior** 76:559-566.
- 2003 Cushing, B.S., Mogeckwu, N., Le, W.W., Hoffman, G.E., Carter, C.S. Cohabitation and Fos immunoreactivity in prairie voles. **Brain Research** 965:203-211.
2003. Cushing, B.S., Yamamoto, Y., Carter, C.S., Hoffman, G.E. Central c-Fos expression in neonatal male and female prairie voles in response to treatment with oxytocin. **Developmental Brain Research** 143:129-136.
2003. Razzoli. M., Cushing B.S., Carter, C.S., Valsecchi. P. Hormonal regulation of agonistic and affiliative behavior in female Mongolian gerbils (*Meriones unguiculatus*). **Hormones and Behavior** 43:549-553.
2003. Kramer, K.M., Cushing, B.S., Carter, C.S. Developmental effects of oxytocin on stress response: acute versus repeated exposure. **Physiology and Behavior** 79:775-782.
2003. Cushing, B.S., Okorie, U., Young, L.J. Neonatal castration inhibits adult male response to centrally-administered vasopressin but does not alter expression of V_{1a} receptors. **Journal of Neuroendocrinology** 15:1021-1026.
2003. Withuhn, T., Kramer, K.M., Cushing, B.S. Early exposure to oxytocin affects the age of vaginal opening and first estrus in female rats. **Physiology and Behavior** 8:135-138.

2004. Cushing, B.S., Razzoli, M., Murphy, A.Z., Epperson, P.D., Le, W.W., Hoffman, G.E. Intraspecific variation in estrogen receptor alpha and the expression of male sociosexual behavior in two populations of prairie voles. **Brain Research** 1016:247-254.
2004. Bales, K.L., Abdelnabi, M., Cushing, B.S., Ottinger, M.A., Carter, C.S. Effects of neonatal oxytocin manipulations on male reproduction in prairie voles. **Physiology and Behavior** 81:519-526.
2004. Yamamoto, Y., Cushing, B.S., Kramer, K.M., Epperson, P., Hoffman, G.E., Carter, C.S. Neonatal manipulations of oxytocin alter expression of oxytocin and vasopressin immunoreactive cells in the paraventricular nucleus of the hypothalamus in a gender specific manner. **Neuroscience** 125:947-955.
2004. Kramer, K.M., Cushing, B.S., Carter, C.S., Wu, J., Ottinger, M.A. Species differences in plasma oxytocin levels using an enzyme immunoassay. **Canadian Journal of Zoology** 82:1187-1193.
2005. Cushing, B.S., Levine, K., Cushing, N.L. Neonatal manipulations of oxytocin affect reproductive behavior and reproductive success of adult female prairie voles (*Microtus ochrogaster*). **Hormones and Behavior** 47:22-28.
2005. Kramer, K.M., Yamamoto, Y., Hoffman, G.E., Cushing, B.S. Vasopressin and estrogen receptor α in the paraventricular nucleus of the hypothalamus in *Peromyscus*. **Brain Research** 1032:154-161.
2005. Cushing, B.S., Kramer, K.M. Mechanisms underlying epigenetic effects of early social experience: the role of neuropeptides and steroids. **Neuroscience and Biobehavioral Reviews** 29:1089-1115.
2005. Young, E., Carter, C.S., Cushing, B.S., Caldwell, J.D. Neonatal manipulation of oxytocin alters oxytocin levels in the pituitary of adult rats. **Hormone and Metabolic Research** 37:397-401.
2005. Cushing, B.S., Kramer, K.M. Microtines: A model system for studying the evolution and regulation of social monogamy. **Acta Theriologica Sinica** 25:182-199.
2006. Yamamoto, Y., Carter, C.S., Cushing, B.S. Neonatal manipulation of oxytocin effects expression of estrogen receptor alpha. **Neuroscience** 137:157-164.
2006. Kramer, K.M., Choe, C., Carter, C.S., Cushing, B.S. Developmental effects of oxytocin on neural activation and neuropeptide release in response to social stimuli. **Hormones and Behavior** 49:206-214.
2006. Cushing, B.S., Wynne-Edwards, K.E. Estrogen receptor alpha distribution in male rodents is associated with social organization. **Journal of Comparative Neurology** 494:595-605.

2006. Kramer, K.M., Carr, M., Schmidt, J.V., Cushing, B.S. Parental regulation of central patterns of estrogen receptor α . **Neuroscience** 142:165-173.
2007. Pournajafi-Nazarloo, H., Carr, M.S., Papademetriou, E., Schmidt, J.V., Cushing, B.S. Oxytocin selectively increases ER α mRNA in the neonatal hypothalamus and hippocampus of female prairie voles. **Neuropeptides** 41:39-44.
2007. Grippo, A.J., Cushing, B.S., Carter, C.S. Social isolation induces depression- and anxiety-like behaviors and neuroendocrine dysfunction in prairie voles. **Psychosomatic Medicine** 69:149-157.
2007. Pournajafi-Nazarloo, H., Perry, A.N., Papademetriou, E., Carter, C.S., Cushing, B.S. Neonatal oxytocin treatment modulates oxytocin receptor, atrial natriuretic peptide, nitric oxide synthase and estrogen receptor mRNAs expression in rat heart. **Peptides** 28:1170-1177.
2007. Pournajafi-Nazarloo, H., Papademetriou, E., Partoo, L., Saadat, H., Cushing, B.S. Modulation of cardiac oxytocin receptor and estrogen receptor alpha mRNAs expression following neonatal oxytocin treatment. **Endocrine** 31:154-160.
2007. Kramer, K.M., Yoshida, S., Cushing, B.S. The effects of neonatal manipulation on the organization of estrogen receptor alpha and the production of oxytocin in adults. **BMC Neuroscience** 8:71 (e-journal).
2008. Cushing, B.S., Perry, A., Musatov, S., Ogawa, S., Papademetriou, E. Estrogen receptors in the medial amygdala inhibit the expression of male prosocial behavior. **Journal of Neuroscience** 28:10386-10403.
2008. Timinon, M, Cushing BS, Wynne-Edwards, K. In three brain regions central to maternal behaviour, neither male nor female *Phodopus* dwarf hamsters show changes in oestrogen receptor- α distribution with mating or parenthood. **Journal of Neuroendocrinology** 20:1301-1309.
2009. Kramer, K.M., Perry, A.N., Golbin, D., Cushing, B.S. Sex steroids are necessary in the second postnatal week for the expression of male alloparental behavior in prairie voles. **Behavioral Neuroscience** 123:958-963.
2009. Perry, A.N., Paramadilok, A. Cushing, B.S. Neonatal oxytocin alters subsequent estrogen receptor alpha protein expression and estrogen sensitivity in the female rat. **Behavioral Brain Research** 205:154-161.
2010. Lei, K, Cushing BS, Musatov S, Ogawa S, Kramer KM. Estrogen receptor- α in the bed nucleus of the stria terminalis regulates social affiliation in male prairie voles (*Microtus ochrogaster*). **PLoS One** online January 27, 2010.
2011. Eaton, JL, Roache, L, Nguyen, KN, Troyer, E, Papademetriou, E, Cushing, BS, Raghanti, MA. Organizational effects of oxytocin on serotonin innervation. **Developmental Psychobiology** (published on line 18 May 2011, DOI: 10.1002/dev.20566).

2014. Sullivan, A.W., Beach, E. C., Stetzik, L. L., D'Addezio, A. S., Cushing, B. S., Patisaul, H. B. (2014). A novel model for neuroendocrine toxicology: Neurobehavioral effects of BPA exposure in a prosocial species, the prairie vole (*Microtus ochrogaster*). **Endocrinology** (DOI: <http://dx.doi.org/10.1210/en.2014-1379>).

BOOK CHAPTERS:

2004. Carter, C.S., Cushing, B.S. Proximate mechanisms regulating sociality and social monogamy, in the context of evolution. In Sussman, R. W., Chapman, A. R. (eds.) *Origins and Nature of Sociality*. Pp. 99-121. Aldine de Gruyter, New York.
2011. Cushing, B.S. Neonatal Effects of Oxytocin: Development and Organizational. In Jastron, H., Feuerbach, D. (eds) *Handbook of Oxytocin: Synthesis, Storage and Release, Actions and Drug Forms*. Pp. 87-107. Nova Science Publishers, Hauppauge New York.
2013. Cushing, B.S. The organizational effects of oxytocin and vasopressin: behavioral implications. In Choleris, E., Pfaff, D., Kavaliers, M. (eds) *Oxytocin, Vasopressin and Related Peptides in the Regulation of Behavior*. Cambridge Press, London, United Kingdom.

PAPERS PRESENTED:

2014. Stetzik, L, Payne, R, Roache, L, Beasley, W, Perry, AN, Cushing, BS Organizational and Behavioral Effects of the Early Cultural Environment in Highly Social Prairie Vole. Society for Neuroscience, Washington DC.
2012. Ganshevsky, D, Stetzik, L, Lende, M, Roache, L, Cushing, BS. ER α in MeA regulates aspects of male prosocial behavior. Society for Neuroscience, New Orleans, LA.
2012. Stetzik, L, Payne, Rex, Roache, L, Ickes, J, Cushing, BS. Non-genomic Factors in the Expression of Adult Social Behavior. Society for Neuroscience, New Orleans, LA.
2012. Peloquin, MJ, Caldwell, H, Cushing, BS. The vasopressin 1b receptor (avpr1b): Sequencing and localization in the prairie vole. Society for Neuroscience, New Orleans, LA.
2011. Sullivan, AW, Beach EC, et al. Social behavior, anxiety and activity of subadult rats and prairie voles are altered by low dose BPA exposure during critical windows of hypothalamic organization. Society for Neuroscience Washington DC.
2009. Eaton, JL, Roache, LE, Troyer, EA, Cushing, BS, Raghanti, M. Neonatal oxytocin manipulations affect adult serotonergic innervation in prairie voles. Society for Neuroscience, Chicago, IL.

2009. Perry AN, Carter CS, Cushing BS. The effects of social isolation on reproductive behavior in the prairie vole (*Microtus ochrogaster*). Society for Behavioral Neuroendocrinology, East Lansing, MI.
2008. Zito SD, Eaton JL, Cushing BS. CNS estrogen receptor β expression in prairie voles (*Microtus ochrogaster*). Society for Neuroscience Washington DC.
2008. Zushin PJH, Eaton JL, Bertani A, Cushing BS. The selective effect of estrogen receptor alpha and beta on activity and social behavior in neonatal male prairie voles. Society for Neuroscience Washington DC.
2008. Lei K, Kramer KM, Musatov S, Ogawa S, Cushing BS, Kramer KM. Increased ER α expression in the bed nucleus of the stria terminalis alters social behavior. Society for Neuroscience Washington DC.
2007. Perry, A.N., Paramadilok, A., Carter, C.S., Cushing, B.S. The effects of neonatal oxytocin treatment on adult ER α expression and estrogen sensitivity in female rats. Society for Behavioral Neuroendocrinology, Monterey, CA.
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