

SUNNY K. BOYD

Professor

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Education

1981 Princeton University, Princeton, NJ - A.B. in Biology

1984 Oregon State University, Corvallis, OR - M.S. (specialty in Behavioral Endocrinology)

1987 Oregon State University, Corvallis, OR - Ph.D. (specialty in Neuroendocrinology)

Academic Positions

1987-94 Assistant Professor, Biological Sciences, University of Notre Dame

1994-2007 Associate Professor, Biological Sciences, University of Notre Dame

2007-Present Professor, Biological Sciences, University of Notre Dame

2008-Present Director of Graduate Studies, Biological Sciences, University of Notre Dame

2009-Present Associate Vice President for Research, University of Notre Dame

Grants Received:

Current:

NSF-IOS: Computational models for neuroendocrine control of social behavior; Co-PI with Matthias Scheutz (Computer Science, IU-Bloomington and Tufts); with 2 REU supplements; 9/15/2007-8/31/2012

Past:

NSF - REU Site: Integrative and comparative biology; Co-PI with M. Whaley, University of Notre Dame; with RET supplements; 3/1/2005-2/29/2011

NSF-IOB: Eleventh and twelfth annual meeting for the Society for Behavioral Neuroendocrinology (conference support); 6/15/2007-6/14/2009

ND Faculty Research Grant. Mechanism of action of neuroactive steroids; 1/1/2008 - 12/31/2010

NSF - IBN: Neuropeptide modulation of a vocal motor pathway; 2003-2008 (With 3 REU supplements and 1 RET supplement)

NSF - IBN: Contemporary approaches to endocrine signaling (conference support); 2003

NSF - IBN: Endocrinology of a viviparous amphibian; 2000-2002

US Forest Service: Amphibian diversity in Gogebic County, Michigan; 2000-2003

NSF - IBN: Steroid control of brain peptide pathways; 1996 - 2000

NSF: New Visions: Advanced optical imaging for the undergraduate; 1995-1997

NIH - NICHD: Sexual dimorphism in neuropeptide systems; 1988 - 1994

J.Jones Grants; 1988, 1994

Refereed Publications: (Downloads of many articles available at <http://www.nd.edu/~sboyd/>)

Boyd, S.K. and Blaustein, A.R. (1985) Familiarity and inbreeding avoidance in the gray-tailed vole (*Microtus canicaudus*). **Journal of Mammalogy** 66: 348-352.

- Boyd, S.K. and Moore, F.L. (1985) Luteinizing hormone-releasing hormone facilitates the display of sexual behavior in male voles (*Microtus canicaudus*). **Hormones and Behavior** 19: 252-264.
- Tripp (Boyd), S.K. and Moore, F.L. (1988) Autoradiographic characterization of binding sites labelled with vasopressin in the brain of a urodele amphibian. **Neuroendocrinology** 48:87-92.
- Boyd, S.K. and Moore, F.L. (1990) Autoradiographic localization of putative arginine vasotocin receptors in the kidney of a urodele amphibian. **General and Comparative Endocrinology** 78:344-350.
- Boyd, S.K. and Moore, F.L. (1990) Evidence for GABA involvement in stress-induced inhibition of male amphibian sexual behavior. **Hormones and Behavior** 24:128-138.
- Boyd, S.K. (1991) Effect of vasotocin on locomotor activity in bullfrogs varies with developmental stage and sex. **Hormones and Behavior** 25:57-69.
- Boyd, S.K. and Moore, F.L. (1991) Gonadectomy reduces the concentrations of putative receptors for arginine vasotocin in the brain of an amphibian. **Brain Research** 541:193-197.
- Taylor, J.A. and Boyd, S.K. (1991) Thyrotropin-releasing hormone facilitates display of reproductive behavior and locomotor behavior in an amphibian. **Hormones and Behavior** 25:128-136
- Boyd, S.K. (1992) Sexual differences in hormonal control of release calls in bullfrogs. **Hormones and Behavior** 26:522-535.
- Boyd, S.K. and Moore, F.L. (1992) Sexually dimorphic concentrations of arginine vasotocin in sensory regions of the amphibian brain. **Brain Research** 588:304-306.
- Boyd, S.K., Tyler, C.J. and De Vries, G.J. (1992) Sexual dimorphism in the vasotocin system of the bullfrog, *Rana catesbeiana*. **Journal of Comparative Neurology** 325:313-325.
- Moore, F.L., Wood, R.E., and Boyd, S.K. (1992) Sex steroids and vasotocin interact in a female amphibian (*Taricha granulosa*) to elicit female-like egg-laying behavior or male-like courtship. **Hormones and Behavior** 26:156-166.
- Boyd, S.K. (1994) Development of vasotocin pathways in the bullfrog brain. **Cell and Tissue Research** 276:593-602.
- Boyd, S.K. (1994) Gonadal steroid modulation of vasotocin concentrations in the bullfrog brain. **Neuroendocrinology** 60:150-156.
- Boyd, S.K. (1994) Arginine vasotocin facilitation of advertisement calling and call phonotaxis in bullfrogs. **Hormones and Behavior** 28:232-240.
- Knox, C.J., Boyd, S.K., and Sower, S.A. (1994) Characterization and localization of gonadotropin-

releasing hormone receptors in the adult female sea lamprey, *Petromyzon marinus*. **Endocrinology** 134:492-498. (Cover photo).

Conlon, J.M., Hilscher-Conklin, C. and Boyd, S.K. (1995) Purification and structural characterization of insulin from a caecilian, *Typhlonectes natans* (Amphibia: Gymnophiona). **Peptides** 16:1385-1388.

Boyd, S.K. (1997) Brain vasotocin pathways and the control of sexual behaviors in the bullfrog. **Brain Research Bulletin** 44: 345-350.

Hilscher-Conklin, C., Conlon, J.M., and Boyd, S.K. (1998) Identification and localization of neurohypophysial peptides in the brain of a caecilian amphibian, *Typhlonectes natans* (Amphibia: Gymnophiona). **Journal of Comparative Neurology** 394:139-151.

Boyd, S.K., Wissing, K.D., Heinsz, J.E., and Prins, G.S. (1999) Androgen receptors and sexual dimorphisms in the larynx of the bullfrog. **General and Comparative Endocrinology** 113:59-68.

Marler, C.A., Boyd, S.K., and Wilczynski, W. (1999) Forebrain arginine vasotocin correlates of alternative mating strategies in cricket frogs. **Hormones and Behavior** 36:53-61.

Emerson, S.B. and Boyd, S.K. (1999) Mating vocalizations of female frogs: control and evolution mechanisms. **Brain, Behavior and Evolution** 53:187-197.

Tito, M.B., Hoover, M.A., Mingo, A.M., and Boyd, S.K. (1999) Vasotocin maintains multiple call types in the gray treefrog, *Hyla versicolor*. **Hormones and Behavior** 36:166-175.

Ebersole, T.J. and Boyd, S.K. (2000) Immunocytochemical localization of gonadotropin-releasing hormones in the brain of a viviparous caecilian amphibian, *Typhlonectes natans* (Amphibia: Gymnophiona). **Brain, Behavior and Evolution** 55:1-13. (Cover photo).

Ebersole, T.J., Conlon, J.M., Goetz, F.W., and Boyd, S.K. (2001) Characterization and distribution of neuropeptide Y in the brain of a caecilian amphibian. **Peptides** 22:325-334.

Hollis, D.M. and Boyd, S.K. (2003) Characterization of the GABA_A receptor in the brain of the adult male bullfrog, *Rana catesbeiana*. **Brain Research** 992:69-75.

Hollis, D.M., Goetz, F., Roberts, S., and Boyd, S.K. (2004) Acute neurosteroid modulation and subunit isolation of the γ -aminobutyric acid_A receptor in the bullfrog, *Rana catesbeiana*. **Journal of Molecular Endocrinology**, 32:921-934.

Hollis, D.M. and Boyd, S.K. (2005) Distribution of GABA-like immunoreactive cell bodies in the brains of two amphibians, *Rana catesbeiana* and *Xenopus laevis*. **Brain, Behavior, and Evolution**, 65:127-142.

Moore, F.L., Boyd, S.K., and Kelley, DB. (2005) Historical perspective: Hormonal regulation of behaviors in amphibians. **Hormones and Behavior** 48:373-383.

Scheutz, M., Madey, G., and Boyd, S. (2005) tMANS - the Multi-Scale Agent-Based Network System for the study of interactions between neuronal mechanisms and population dynamics. **Proceedings of Agent-Direct Simulation**, Society for Modeling and Simulation International, San Diego, CA.

Asay, M.J. and Boyd, S.K. (2006) Pharmacological characterization of the binding of [³H]CGP54626 to GABA_B receptors in the male bullfrog (*Rana catesbeiana*). **Brain Research** 1094:76-85.

Huynh, P. and Boyd, S.K. (2007) Nitric oxide synthase and NADPH diaphorase distribution in the bullfrog (*Rana catesbeiana*) CNS: pathways and functional implications. **Brain, Behavior, and Evolution** 70:145-163.

Scheutz, M., Harris, J., and Boyd, S.K. (2010) How to pick the right one: investigating tradeoffs among female mate choice strategies in treefrogs. **FROM ANIMALS TO ANIMATS 11**; Book Series: Lecture Notes in Artificial Intelligence. Editor(s): Doncieux S; Girard B; Guillot A; Hallam J; Meyer JA; Mouret JB. Volume: 6226 Pages: 618-627.

Book Chapters:

Moore, F.L., Boyd, S.K., Chu, J., and Hyde, G. (2005) Hormonal regulation of behaviour. Chapter 3 (pp. 2178-2207) in: **Amphibian Biology, Endocrinology** (vol. 6), ed by H. Heatwole. Surrey Beatty & Sons, Chipping Norton.

Boyd, S.K. (2006) Amphibian neurohypophysial peptides. Chapter 49 in: **The Handbook of Biologically Active Peptides**, edited by A. Kastin, Elsevier. (Second edition forthcoming in 2012.)

Boyd, S.K. (2012) Vasotocin modulation of social behaviors in amphibians. Chapter 7 in: **Oxytocin, Vasopressin and Related Peptides in the Regulation of Behavior**, edited by E. Choleris, D. Pfaff and M. Kavaliers, Cambridge University Press.

Professional Service, Awards and Distinctions

Current:

Editorial Review Board for the following journals:

General and Comparative Endocrinology, 2000-present (Associate Editor)

Hormones and Behavior, 2000-present

NSF Review Panel member (3 different programs)

Society for Behavioral Neuroendocrinology Advisory Board, 2011-2013

Past:

Editorial board member *Brain, Behavior and Evolution*, 1999-2010

American Midland Naturalist (Associate Editor), 2005 - 2009

Member of the Education Committee, Society for Behavioral Neuroendocrinology; 1999-2009

Chair of the Education Committee, Society for Behavioral Neuroendocrinology; 2005-2007

Chair of Public Policy Committee of the American Institute of Biological Sciences, 2005-2008

Secretary, Society for Integrative and Comparative Biology, 2003-2006

Program officer, Society for Integrative and Comparative Biology, Comp. Endo., 1999-2002

Review panel member for NIH: 1997; 1999; 2009
Site visit team for NSF Science and Technology Centers grant program, 1999
Review panel co-chair, American Heart Association — Midwest Consortium 1998
Member, Allocations Committee, American Heart Association-Indiana Affiliate 1998
Review panel member, American Heart Association — Midwest Consortium 1996, 1997
Ad-hoc review of grants for NIH, NSF, American Heart Association, UND Faculty Research Grant Program and Experimental Program to Stimulate Competitive Research (EPSCoR; joint program of NSF, NASA, DOE, EPA).

Co-organizer of conferences:

Society for Integrative and Comparative Biology, annual national meeting symposium, 2003;
Midwestern Conference on Comparative Endocrinology, University of Notre Dame, 1994; Western Regional Conference on Comparative Endocrinology, Oregon State University, 1985; Oregon State University Biology Colloquium on Molecular Endocrinology, 1985

Invited lectures:

Duquesne University, Pittsburgh, PA, September 2008
University of Missouri, Columbia, Division of Biological Sciences, April 2006
University of Oklahoma, Department of Zoology, Norman, OK, 2003
Irving J. Geschwind Memorial Lecturer in Comparative Endocrinology, Western Regional Conference on Comparative Endocrinology, Boulder, CO, 2003
Winter Conference on Brain Research, Steamboat Springs, CO, 2001
University of Arkansas School of Medicine, Little Rock, 1998
Fifth International Conference on Hormones, Brain and Behavior, Torino, Italy, 1996
International Symposium on Amphibian Endocrinology, Boulder, Colorado, 1996
Distinguished Scholar Lecturer, College of Science, University of Notre Dame, 1995
University of New Hampshire, 1992; University of Massachusetts, 1990

Manuscript review for: American Naturalist, American Midland Naturalist, American Zoologist; Animal Behaviour; Behaviour; Biology of Reproduction; Brain, Behavior and Evolution; Brain Research; Cell and Tissue Research; Endocrinology; General and Comparative Endocrinology; Hormones and Behavior; Journal of Chemical Neuroanatomy; Journal of Comparative Neurology; Journal of Experimental Biology; Journal of Experimental Zoology; Journal of Herpetology; Journal of Molecular Endocrinology; Journal of Neurobiology; Journal of Neuroendocrinology; Journal of Neuroscience; Peptides; Proceedings of the National Academy of Sciences, Quarterly Review of Biology.

Departmental Committees

Director of graduate studies and admissions (2008 - present)
Director of graduate admissions (2004-2008)
Graduate admissions and studies committee member (2001- present)
Genomics facility committee (2007-2009)
Graduate curriculum committee (2004-2010)
Committee on appointments and promotions (1995-2000; 2001-2002)
Undergraduate curriculum committee (chair 1995-96)
Biocomputing committee (1987-2010)
Optical facility committee (1987-2002)

Graduate admissions and recruitment committees (1989-1993)

Library committee (1987-1990)

Search Committees: UND Environmental Research Center director, Physiologist (multiple times), Cell Biologist, Developmental Biologist and multiple searches for Neuroscientists (chair or co-chair for several)

Undergraduate research committee

College and University Committees

Multi-disciplinary research committee (2011-12)

Review of the dean of the Graduate School (2011-12)

Academic and faculty affairs committee of the Board of Trustees (2008-2011)

Graduate council (2008-2014 (chair attrition subcommittee 2008-2009); 2004-2005; 1998-1999)

Graduate council executive committee (2009-2011)

University committee on research & sponsored programs/Strategic research committee (2009-pres)

Limited submissions committee (2009-present)

University research development committee (2010-present)

Institutional animal care and use committee (2007-2009)

College of Science faculty council (2007-2010)

Undergraduate education vision statement steering committee (2008)

Provost search committee (2005)

Academic council (member executive committee, chair graduate affairs subcommittee: 2004-05)

College of Science dean search committee (2001-2002)

Shilts/Leonard teaching award selection committee (2000-2003; 2007; 2008; 2010; 2011)

Kaneb teaching award selection committee (2000-2002)

Faculty senate (1992-1993)

Society Memberships

Society for Neuroscience

Society for Integrative and Comparative Biology

Society for Behavioral Neuroendocrinology

J.B. Johnston Club (a comparative neurobiology society)

American Institute of Biological Sciences

Teaching Dossier (abbreviated; all at Notre Dame)

Undergraduate Education:

General Biology (BIOS 20202 and 10162; team taught second term)

Vertebrate Physiology (BIOS 30344)

Physiology Laboratory (BIOS 41344L)

UND Environmental Research Center Undergraduate Teaching (BIOS 568 & 569, with others)

Teaching Practicum in Life Sciences (BIOS 495)

Undergraduate Research (BIOS 499)

Faculty advisor for Presidential Scholars (class of 2006)

Teaching honors: 1995 Distinguished Scholar Lecturer, College of Science, UND
Kaneb Teaching Award, 1999

Shilts/Leonard College of Science Teaching Award, 2000
Kaneb Faculty Fellow, 2003-2004
Joyce Award for Excellence in Undergraduate Teaching, 2007

Graduate Education:

Brain and Cognitive Science (BIOS 77672)
Foundations of Neuroscience (BIOS 60571)
Comparative Endocrinology (BIOS 535)
Scientific Writing (BIOS 578)
Graduate Seminars (BIOS 580)
Graduate Research (BIOS 699)

Educational Outreach:

Master of ceremonies for Siemens Competition in Math, Science and Technology Regional Semi-Finals, 2010
Judge for the Siemens-Westinghouse Regional Semi-Final Science Competition, 1999, 2007.
Supervised research projects of Marion High School teacher and students, 2005-2007.
Developed the Cognitive Science Initiative with M. Scheutz, S. Boker and D. Howard, 2005-6.
Led a workshop on teaching for new ND faculty "Rookie Mistakes," August 2003.
Led workshop on teaching for the Society for Integrative and Comparative Biology, 1999.
Textbook Review: Average of 2 textbooks/year for 4 different publishers (1987-present) in the fields of general biology, physiology and endocrinology.
Grade school science presentations: 1st grade and 4th grade, twice each.
Neuroscience presentation, Trinity High School, May 2006.