

## Brian Harvey Smith

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### Education

1978 Juniata College, BS Biology  
1985 University of Kansas, PhD Entomology

### Postdoctoral Training

1988-90 ARL Division of Neurobiology, University of Arizona, Tucson "Neuroethological Studies of Memory In a Model System" with Dr. John G. Hildebrand  
1987 Department of Entomology, University of California at Berkeley, "Olfactory conditioning in Honey Bees" with Dr. Wayne M. Getz  
1986 Institute for Neurobiology of the Free University of Berlin, West Germany, "Neurophysiological and behavioral analysis of olfactory learning in *Apis mellifera*." with Dr. Randolph Menzel  
1985 Institute for Developmental Biology, Tübingen, West Germany, "Role of learning and pheromonal communication in primitively social bees." with Dr. Wolf Engels

### Professional Appointments

2011 Director, School of Life Sciences, Arizona State University  
2009 Faculty Leader, Organismal, Integrative and Systems Biology in the School of Life Sciences at Arizona State University  
2008 Director, Interdisciplinary Graduate Program in Neuroscience, Arizona State University  
2007 Research Professor, Barrow Neurological Institute, Phoenix, Arizona  
2005 Professor, School of Life Sciences, Arizona State University  
2002 Professor, Mathematical Biosciences Institute, Ohio State University  
2001 Adjunct Professor, ARL Division of Neurobiology, University of Arizona  
2001 Professor, Department of Entomology, Ohio State University  
1998 Appointment to Department of Evolution, Ecology & Organismal Biology, Ohio State University  
1998 Appointment to Department of Psychology, Ohio State University  
1996 Associate Professor, Department of Entomology, Ohio State University  
1993 Appointment to OSU Neurobiotechnology Center  
1991 Appointment to Neuroscience Graduate Studies Program, Ohio State University  
1990 Assistant Professor, Department of Entomology, Ohio State University

### Language Ability

German - reading and speaking

### Visiting Researcher

2015 Senior Fellow, Zukunftscolleg, University of Konstanz, Germany  
2012-2014 Department of Entomology, King Saud University, Riyadh, Saudi Arabia  
1998/9 Visiting faculty California Institute of Technology  
1993 Guest professor at the Free University of Berlin, Germany  
1984 Department of Genetics, University of Sao Paulo, Riberão Preto, Brazil, "Pheromonal communication in stingless bees."  
1981 Uppsala University Ecological Station, Sweden, "Chemical analysis of volatile compounds used in communication."  
1980 Smithsonian Tropical Research Institute, Republic of Panama, "Interspecific

communication among the highly social stingless bees."

### **Honors**

2003 Fellow, American Association for the Advancement of Science

2002 Fulker Award from the Behavior Genetics Association for the best paper published in the journal of Behavior Genetics Vol. 31, 2001

National Institute of Mental Health National Research Service Award

NATO Fellowship in Science (for research in West Germany)

Deutscher Akademischer Austauschdienst (German Academic Exchange Service)

### **Administration experience**

Arizona State University

*University*

- Promotion & Tenure (2007 – 2010)  
Chair of University P&T 2009 and 2010
- President's Faculty Advisory Committee (2009-present)
- Leadership Fellow in the Office of the Provost (2010)  
Responsibilities include development of online programs and development of a promotion & tenure conflict of interest statement for ASU

*School of Life Sciences*

- Director, School of Life Sciences (July 1, 2011- June 30, 2014)
- Faculty Leader, Organismal, Integrative & Systems Biology (2009-2011)  
21 faculty members (9 Professor, 8 Associate Professor, 4 Assistant Professors)

*Graduate College*

- Chair (interim), Interdisciplinary Graduate Program in Biological Design (2012 – 2013)  
In charge of reorganization of the program
- Chair, Interdisciplinary Graduate Program in Neuroscience (2007 – 2011)  
Proposal to establish the program; received Board of Regents approval Jan 2008  
[neuroscience.asu.edu](http://neuroscience.asu.edu)

Ohio State University

*Department*

- Promotion & Tenure committee (1996-2005)
- Graduate Committee (1994-1998; Chair, 1997/98)
- Seminar Committee (Chair, several years)

*College of Biological Sciences*

- Promotion & Tenure committee (2001-2004)
- Dean's Advisory committee (2001-2003)
- Curriculum committee (1998)
- Chair, ad hoc committee for reorganization of organismal biology in the College of Biological Sciences (1996/97)

This committee concluded by merging and renaming the Department of Zoology and part of the Department of Plant Biology into the Department of Evolution, Ecology and Organismal Biology. Entomology elected to remain separate because of the agricultural mission and affiliations of many of the faculty.

*University*

- Graduate Committee of the Graduate School (1995-1997)
- Honors program advisory committee (1997-1998)

## Teaching Experience

### *Introductory Biology*

Freshman seminar 'The Neuroscience of Magic' (19 students)  
Introductory Biology (Biol 101) for non-majors (ca. 500 students)  
Introductory Honors Biology (Biol 116) for majors  
Introductory Biology (Biol 188) at Arizona State University

### *Advanced Biology*

#### *Arizona State University*

Science Writing seminar (BIO 590) at Arizona State University

- Seminar offered every year to help graduate students learn writing skills, particularly for grant proposals

Neuroscience Journal Club (BIO/NEU 590)  
Animal Physiology lecture and laboratory (BIO 360/361) at Arizona State University  
Neurobiology (BIO 467)  
Annual Behavior Research Techniques (BIO 494/595)  
Workshop "Small Brains, Big Ideas" – Developed a laboratory exercise to train South and Central American graduate students in use of the honey bee as a model for Neuroscience research

#### *Ohio State University*

Neuroethology (Zoology 632)  
Behavioral Neuroscience (Neuroscience 726)\*  
Molecular Neuroscience (Neuroscience 800)\*

- \* Lectures on behavioral and cellular mechanisms of learning in both courses

Seminar on Learning Mechanisms (Neuroscience 797)  
Developmental Neuroscience (Neuroscience 790)

- \* Lectures on cell-cell interactions, neurotrophins and cell death

Honors seminar – The Honey Bee Dance Language Controversy (Honors 597)  
Honey Bee Biology (Entomology 360)

## Research Supervision

### *Undergraduate thesis students*

Cornelia Weller - Zusammenhaenge zwischen Pheromoneabgabe, Groesse und Verhalten bei *Lasioglossum malachurum* - Koeniginnen und Arbeiterinnen (Hymenoptera: Halictidae). University of Tübingen, 1986.

Manfred Ayasse - Wie Beeinflussen Weibchen-Pheromone die Partnerwahl bei Maennlichen Furchenbienen? Paarungs-strategien bei *Lasioglossum malachurum* (Hymenoptera; Halictidae). University of Tuebingen, 1987.

Karin Bohrer - Larvenernaehrung und Kastendifferenzierung bei *Lasioglossum malachurum* (Hymenoptera; Halictidae). University of Tuebingen, 1987.

Ward Hamlet - Behavioral and biochemical analysis of the effects of protein synthesis inhibition on long-term recall in the honey bee. University of Arizona, 1989.

Arthur McNair - Effect of caffeine and forskolin on recall in the honey bee and light-odor interaction during learning in the honey bee. University of Arizona, 1989.

Francine Ganje - Second-order olfactory conditioning in the honey bee: Extinction induced frustration effects. University of Arizona, 1989.

Robert Barlow - The development of GABAergic modulation in the ventral nerve cord of the honey bee. The Ohio State University, 1991.

Gabrielle Lamm - Motoneurons that innervate muscles of the honey bee sting. The Ohio State University, 1992.

Kristi Buxton - The effect of nitric oxide synthase inhibitors on olfactory learning and generalization in the honey bee. Ohio State University, 1997.

Sandeep Singh – Odor discrimination in the fruit fly, *Drosophila melanogaster*. Ohio State University, 2000 \*Denman award for undergraduate research  
Melissa Cousins – The effect of nitric oxide synthase inhibitors on olfactory discrimination in the moth *Manduca sexta*. Ohio state University, 2001 \*Denman award for undergraduate research  
Amy Lutmerding – Discrimination of complex floral odors by the honey bee *Apis mellifera*.

#### ASU

Gregory Deleo (2008) “Peak shift in perception of odor mixtures”  
Nicole Rennell (2008) “Peak shift in perception of odor mixtures”  
Francis Villarreal (2009) “Experience-related changes in the salience of conditioning stimuli in honey bees”

#### *Honors thesis main advisor*

Parisa Allveri (2009) “Competition Between Components of Odor Mixtures: Blocking”  
Kimberly Dickens (2009) “Prevalence of EEG Abnormalities in Female Anorexia and Bulimia Nervosa Patients”  
Rebecca Bramble (2009) “Experience-based changes in the salience of conditioning cues”

#### *Graduate students*

##### Ohio State University

Brian Burrell — The modulation of stinging behavior by biogenic amines in the honey bee. Ph.D. (1996) main advisor, The Ohio State University. Present position: Associate Professor, University of South Dakota..  
Seetha Bhagavan — An ethological and biochemical analysis of individual differences in learning performance in honey bee workers. Ph.D. (1996) main advisor, The Ohio State University. Present position; Scientific Review Administrator, NIH. .  
Shirly Benatar — A genetic analysis of discrimination conditioning in the honey bee. M.S. (1993), The Ohio State University.  
Diana Sammataro — Behavioral studies of tracheal mites on honey bees. Ph.D. (1996) co-advisor, The Ohio State University. Present position: USDA Honeybee Research Laboratory, Tucson, AZ.  
Kellie Robinson — Toward a molecular analysis of associative learning in the honey bee, *Apis mellifera*, via massed conditioning and genetic transformation. Ph.D. (December 1999) main advisor, The Ohio State University. Present position; Postdoctoral researcher, Lawrence Livermore Laboratories.  
Young soo Kim — Taste processing of mixtures of sugars and amino acids in the honey bee. Ph.D. (March 2000) main advisor.  
Sathees Chandra — Mapping quantitative trait loci involved in honey bee reversal learning. Ph.D. (June 2000) main advisor. Associate Professor Roosevelt University, Chicago IL  
Heather Dean – Non-associative and associative mechanisms of olfactory learning in the locust, *Schistocerca americana*. M.S. (June 2000 - California Institute of Technology). Present position: Ph.D. program Duke University.  
Stephanie Christine – Dopaminergic regulation of motor control in the honeybee. M.S. (2003) main advisor.  
Cynthia Ford – Odor discrimination in fruit flies. M.S. (2006) main advisor.  
Laurie Vroman – Role of salience in attention to odors. M.S. (2006) main advisor.

##### Arizona State University

Joseph Latshaw — Colony-level effects on differences in learning performance. M.S. (OSU 2003) and Ph.D. (ASU 2008) program main advisor. Private honey bee breeding business  
Danielle Protas – – Mechanisms of calcium-mediated excitation and plasticity in primary olfactory pathways of the honey bee (Ph.D. August 2014). Postdoctoral researcher Neuroscience, University of New Mexico.  
Christina Burden - current PhD program Chair  
Christopher Jernigan - current PhD program Chair  
Meghan Duell - current PhD program co-Chair

Ryan Brackney – current PhD program co-Chair

*Post Doctoral*

George Yocum (Ph.D., Ohio State University, 1993)— Developmental expression of protein biosynthesis in ventral nerve cords of queen and worker honey bees. Present position: Research Scientist with the USDA.

Holly Ferguson — Genetic transformation of honey bees. Present position: Researcher with the USDA

Robert S. Thorn (Ph.D. University of Washington, 1994) —Patterns of neuroblast division in developing antennal lobes of worker honey bees. Present position since 1997: Unknown.

Sharoni Shafir (Ph.D. Stanford University, 1995) — Cognitive mechanisms involved in honey bee-plant relationships. Present position since 1998: Professor, Hebrew University, Israel.

Jay Hosler (Ph.D. Notre Dame University, 1995) — Synaptic plasticity in the honey bee olfactory system. Present position since 2000: Associate Professor, Juniata College, Huntingdon, PA.

Sathees Chandra (Ph.D. Ohio State University, 2000) Mapping quantitative trait loci involved in honey bee reversal learning. Present position: Associate Professor, Department of Biology, Roosevelt University, Chicago

Bradley Worden (Ph.D., Ohio State University, 1999) Quantitative trait loci for learning traits in honey bees. Present position: Postdoctoral Researcher, University of Arizona.

Kevin Daly (Ph.D. University of Arizona, 1998) — Synaptic plasticity in the olfactory system of the moth *Manduca sexta*. Present position: Associate Professor, West Virginia University.

Dhruba Naug (Ph.D., Indian Institute of Science, Bangalore, India, 1998) Socially mediated patterns of nutrient flow in honey bee colonies. Present position: Associate Professor, Colorado State University.

Geraldine Wright (Ph.D. Oxford University, 1998) — The relationship between floral odors and the nutritional ecology of pollinators. Present position: Lecturer, University of Newcastle, UK.

Tahira Farooqui (Ph.D., Ohio State University, 1994) Biogenic amines as neuromodulators of behavioral plasticity in the honey bee.

Mathieu Dacher (Ph.D., University of Toulouse, 2005) Inhibitory transmission in the insect antennal lobes. Present position: Tenure-track faculty University of Caen, France

Fernando Locatelli (Ph.D., University of Buenos Aires, Argentina) Neural plasticity in the antennal lobes of the honey bee. Present position: Tenure-track faculty University of Buenos Aires, Argentina.

Patricia Fernandez (Ph.D., University of Buenos Aires, Argentina) The role of temporal information in odor discrimination in the honey bee. Present position: Tenure-track faculty University of Buenos Aires, Argentina.

Martin Strube-Bloss (Ph.D. Free University of Berlin, Germany, 2008) Transformation of the read-out of olfactory processing in higher-order processing in the honey bee brain. Present position: Researcher Max Planck

Julie Mustard (Ph.D. University of Arizona, 1999) Dopamine modulation in the honey bee brain. Present position: Assistant Professor University of Texas Brownsville.

*Current*

Irina Sinakevitch (Ph.D. Univ of Paris, France) Octopamine receptor distribution in the honey bee brain.

Richard Gerkin (Ph.D. Stanford University) Olfactory coding and plasticity in the mouse olfactory bulb.

**Researcher Assistant Professors/Visiting Researchers**

Paul Szyszka (Ph.D. Free University of Berlin, Germany) Fast odor processing in the honey bee peripheral and central nervous system. Currently Assistant Professor University of Konstanz, Germany.

Hong Le (Ph.D. University of Lund Sweden) Calcium imaging of local interneurons in the honey bee antennal lobes. Currently Research Assistant Professor University of Arizona.

**Research Techniques and Courses**

“The Cell and Molecular Biology of Learning and Memory” (1991), Cold Spring Harbor Laboratory

“Methods In Computational Neuroscience” (1988), Woods Hole Marine Biological Laboratories  
“Neural Systems and Behavior”, course participant (1987), Woods Hole Marine Biological Laboratory

### **Organizational Memberships**

American Association for the Advancement of Science  
Society for Neuroscience  
Animal Behavior Society  
Association for Chemoreception Sciences

### **Research Support**

*Pending*

(Smith,Brian) 4/1/2015-3/31/2019

HHS-NIH \$2,577,798.00

Multiscale model of exploration-exploitation tradeoff: from genes to collectives

We propose to integrate a new model animal, the honey bee, with a new modeling approach, multiscale modeling, to understand the proximate and ultimate causes of how complex, adaptive collective behaviors emerge from a collection of individuals who vary in their behavioral rules.

(Smith,Brian) 1/1/2015-12/31/2017

HFSP \$337,500.00

Odor-background segregation and source localization using fast olfactory processing

We propose to investigate the problem of odor-background segregation. Sensory systems have evolved to function within the statistical structure (scenes) of their environments. We understand these adaptations quite well in visual, auditory and somatosensory processing but lack a similar understanding in olfaction, which poses two particular challenges: Odors occur in turbulent plumes that break them into thin filaments so that receptors encounter odors only a few milliseconds at a time; and ‘background’ odors, emitted from different sources, arrive intermingled with any target odor.

(Smith,Brian) 6/1/2015-5/31/2019

NSF \$480,000.00

RI: Medium: Collaborative Research: On the role inhibitory circuits for robust classification of multisensory inputs

This project focuses on the understanding of computational principles of multisensory integration in the MBs of insects. The focus is divided into three goals: i) the investigation of the role played by the closed-loop inhibitory circuits to control activity levels in the MBs to improve robustness in pattern recognition tasks, ii) disentangle the neural code under odor/tactile/visual stimulation in the MB and understanding the limits of pattern recognition for multimodal information; and iii) embed the algorithms into low-power Cortex ARM processors and use them to solve multimodal tasks using our electronic nose and other sensory modalities.

(Smith,Brian) 7/1/2015-6/30/2020

UNIV CA - SAN DIEGO \$1,004,250.00

Dynamic and Distributed Memory in Olfaction

This project will develop dsRNA probes for knockdowns of octopamine receptors in the honey bee and investigate how this pathway is involved in driving the formation of olfactory memories.

(Smith,Brian) 7/1/2014-6/30/2016

HHS-NIH \$406,019.00

## Plasticity of odor coding in the mouse olfactory bulb

The proposed research will evaluate hypotheses about how plasticity changes the code in ways that are important for odor detection and discrimination.

### *Current*

5-000554 (Smith,Brian) 4/15/2012-4/14/2015  
UC RIVERSIDE \$55,000.00

Contaminant Accumulation in Plants and Biotransfer to the Honey Bee (*Apis mellifera* L.): Implications for Insect Behavior, Honey Bee Survival and P E

Our objectives are to 1) document plant responses that can affect honey bees (accumulation in nectar and pollen, effect on floral traits), 2) determine if a primary pollinator can detect or will respond to key pollutants, 3) document sublethal (learning responses, foraging behavior) and lethal effects (forager and larval survival, whole colony fitness) and, 4) use a common garden experiment to document field effects of contaminant uptake on pollinator visitation, floral traits, and plant reproduction.

PO 10312411 (Smith,Brian) 7/1/2010-6/30/2015  
UNIV CA - SAN DIEGO \$663,111.00

Collaborative Research: Dynamic and Distributed Memory in Olfaction

The goals of this project are to investigate the changes or the spatiotemporal encoding at the AL and MB output after unsupervised olfactory learning in honey bees. We are also investigating the spatio-temporal changes of the odor representations after reinforcement learning to determine if the octopamine receptors are concentrated on inhibitory neurons in the AL and the MB.

ADHS14-052688 (Smith,Brian) 7/1/2014-6/30/2015  
AADC \$24,154.00

FY15: Arizona Alzheimer's Consortium

The goal is to study olfactory processing in the mouse, and in particular it evaluates how behavioral conditioning and long-term plasticity affect the neural representations of odors in the olfactory bulb.

1446290 (Smith,Brian) 9/1/2014-8/31/2015  
NSF-CISE-IIS \$29,813.00  
2014 CRCNS PI Conference

The meeting will bring together PIs from grants funded under the Collaborative Research in Computational Neuroscience (CRCNS) program to discuss research progress and the future directions of the field.

### *Previous*

Office of Naval Research – “Chemical Discrimination and Localization using Biologically Based Olfactory Processing” \$80,000 (subcontract through UC San Diego) (May 1, 2010 – April 30, 2012 no cost extension through April 2013).

National Institutes of Health/NCRR (PI: Duch co-PI: BHS) 5/1/2011-4/30/2012 “Acquisition of a Leica TCS SP5 laser scanning confocal microscope” \$470,658 (October 1, 2011 - September 30, 2012).

National Institutes of Health – “SUPPLEMENT: Behavioral and Physiological Mechanisms of Olfaction” \$352,640 (October 1, 2009 – September 30, 2011).

National Institutes of Health – “Behavioral and Physiological Mechanisms of Olfaction” \$1,794,000 (competitive renewal; August 1, 2004 – July 31, 2010).

National Institutes of Health – “Prairie Technologies 2-Photon Microscope” \$450,000 (July 1, 2009- June 30, 2010).

National Institutes of Health/National Science Foundation – “The Importance of Temporal Information for Olfactory Coding” \$999,709 (July 1, 2005 – June 30, 2009)

National Institutes of Health – “D1-like dopamine receptors in learning and behavior” \$147,500 (co-PI with Dr. Julie Mustard; April 1, 2004 – March 31 2007).

National Science Foundation – “How Social Organization Influences an Infectious Process: The Honey Bee Colony As a Model” \$272,000 (co-PI with Dr. Dhruva Naug; September 1, 2003 – August 31, 2006).

National Institutes of Health – “Plasticity of Odor Coding in a Model System” \$150,000 (co-PI with K.S. Daly; April 1, 2002 –March 31, 2005).

United States-Israel Binational Science Foundation – Mechanisms Underlying Choice behavior in Response to Resource Variability Co-PI with Dr. Sharoni Shafir, \$114,000 (September 1, 1999 - March 31, 2004).

National Institutes of Health – “Behavioral and Physiological Mechanisms of Olfaction” \$1,019,573 (competitive renewal; September 30, 1998 –September 29, 2004).

Defense Advance Research Projects Agency (DARPA) “Plasticity of odor-guided behavior in moths” \$398,029

National Institutes of Health – NIDCD: “Cyclic nucleotides and memory in olfactory glomeruli”. Co-PI with Dr. Robert S. Thorn. \$52,500 (1.Sept.1997-31.August.2000)

National Institutes of Health – NIDCD: “An Analysis of Blocking in Odor Mixtures” Sponsor for NRSA to Dr. Jay Hosler.

National Institutes of Health – General Medicine: "A Behavior Genetic Analysis of Learning Performance" \$279,470 (1.May.95 – 30.April.99)

National Institute of Mental Health – Behavioral Physiology: “Behavioral and Physiological Mechanisms of Olfaction” \$502,812 (1.Apr.1993 – 31.Mar.1999)

California Apiary Board and California Almond Board: “Breeding Honey Bees for Resistance to Mite Infestations” \$25,000 (1.August.1995 – 31.July.1996). In collaboration with Dr. Marla Spivak, University of Minnesota.

The Ohio State University Seed Grant Program “Genetic Transformation of Honey Bees” \$54,000 (1.Apr.1993 – 30.Sept.1994)

California Department of Food and Agriculture “An Integrated Pest Management Approach to the Control of Honey Bee Tracheal Mites ” \$29, 660 (1.Apr.1993 – 31.Mar.1995)

California Department of Food and Agriculture “Control of Honey Bee Tracheal Mites With Natural Products: Testing of Vegetable Oil Formulations” \$6,000 (1.Feb.1992 – 31.Jan.1993)

Whitehall Foundation and The Ohio State University Seed Grant Program “Environmentally Induced Differences In the Central Nervous System: The Terminal Ganglion In Different Castes of Honey Bees” \$15,000 and \$17,000

National Science Foundation and the Hasselblad Foundation "Computational Models of Olfactory and Spatial Cognition" \$60,000 (with Drs. JG Hildebrand and L Nadel) University of Arizona Small Grants Program

National Institute of Mental Health National Research Service Award \$95,000 to study olfactory learning in honey bees

### **Invited presentations on Original Research and Organization of Symposia (2000 - present)**

- 2014      Second Annual Winter q-bio [Quantitative Biology] Meeting. Kona Hawaii  
             12th Asian Apicultural Association Conference in Antalya, Turkey  
             Janelia Farm symposium on Structure and Function of the Insect Mushroom Body  
             Janelia Farm symposium on Learning and Memory – Comparing Fruit Flies and Honey Bees  
             Workshop “Small Brains, Big Ideas” Santiago and Valparaiso Chile
- 2013      Workshop on honey bee behavior at King Saud University, Riyadh Saudi Arabia  
             Bernstein program in Computational Neuroscience, Berlin Germany

- Odor Spaces workshop Hannover, Germany (Sept)  
 Neuroethology congress Argentina (Oct)  
 Workshop on Olfactory Coding Valparaiso, Chile (Oct)
- 2012 King Saud University, Riyadh Saudi Arabia; 3 lectures  
 Workshop on Biogenic Amines in the Insect Brain, Free University of Berlin, Germany  
 Invited lecture Max Planck Institute München  
 Special symposium on Insect Olfaction. University of Würzburg, Germany.  
 International Congress of Entomology, Daegu South Korea  
 Workshop “Small Brains, Big Ideas” Santiago and Valparaiso Chile (included outreach talk to  
 200+ 7<sup>th</sup> through 12<sup>th</sup> graders in Valparaiso Chile).
- 2011 Chemical Ecology workshop, Beijing China  
 European Symposium on Insect Taste and Olfaction, St Petersburg, Russia  
 Janelia Farm symposium on Learning and Memory – Comparing Fruit Flies and Honey Bees
- 2010 University of California Riverside, Neuroscience Program  
 University of Sussex, UK, Department of Biology  
 Association for Chemoreception Sciences, organized symposium “Transient Dynamics,  
 Metastable States and the Importance of Temporal Codes for Chemosensory Processing”,  
 Tampa FL  
 Free University of Berlin, Germany, International Symposium on Neurobiology “Honeybee  
 Neuroscience – a New, Old Model System, Bridging Genomics, Physiology and Behavior.  
 Where To in The Next 50 Years?”  
 Zukunftskolleg Annual meeting, University of Konstanz, Germany  
 University of Sussex, UK, “International Workshop on Dynamical Olfaction”  
 Symposium “Genetics and Evolutionary Biology of Bees”, Riberao Preto, Brazil  
 Plenary lecture “Honey Bee Learning and Memory” symposium EurBee 2010, Ankara, Turkey
- 2009 COSYNE conference, Snow Bird, UT  
 Workshop on Neuromorphic Engineering, Telluride CO  
 Insect Learning & Memory, France (declined)  
 Olfactory Coding in Insects, Free University of Berlin Germany  
 Behavioral Physiology & Sociobiology, University of Wuerzburg, Germany  
 Pavlovian Society, Burlington VT
- 2008 Janelia Farm (HHMI) conference on “Learning and Memory: A Synthesis of Flies and Honey  
 Bees”, Session Chair, Washington, DC  
 University of Virginia Neuroscience Graduate Program, Charlottesville, VA  
 College of Medicine ASU/University of Arizona, Phoenix, AZ  
 International Congress of Entomology, session organizer, Durban, South Africa  
 Workshop on Neuromorphic Engineering, Telluride CO  
 University of Illinois, Department of Entomology, Urbana-Champaign, IL  
 2<sup>nd</sup> Annual ASU-BNI Neuroscience Symposium, Phoenix, AZ
- 2007 Cold Spring Harbor Laboratory conference on the Honey Bee Genome  
 PI meeting Collaborative Research Computational Neuroscience, Washington, DC  
 Workshop on Neuromorphic Engineering, Telluride CO  
 Animal Behavior Society, Burlington VT  
 Institute for Nonlinear Science, San Diego CA  
 Annual Meeting of the Entomological Society of Canada, Saskatoon Saskatchewan, CA
- 2006 Session organizer and keynote speaker Gordon Research Conference on ‘Genes & Behavior’,  
 Ventura, CA  
 1<sup>st</sup> Annual ASU-BNI Neuroscience Symposium, Phoenix, AZ  
 Poster Association for Chemoreception Sciences meeting, Sarasopta, FL  
 Invited seminar ‘Insect CNS-MMX’ meeting, Bäckaskog Castle, Sweden  
 Presentation on sponsored research at NSF Collaborative Research on Computational  
 Neuroscience meeting, Washington, DC  
 Symposium speaker Society for Mathematical Biology, Raleigh-Durham, NC

- Symposium speaker Conference on Mathematical Neuroscience, Andorra  
 Symposium speaker International Entomology Congress, Izmir, Turkey  
 2005 Invited seminar, Conference on Chemosensory Modulation, Jackson, WY  
 Invited seminar, Joint Mathematics Meetings, Atlanta, GA  
 2004 Invited seminar, Hebrew University, Israel  
 Workshop on “Coherence and Coordination in the Brain: Perspectives From Olfaction And  
 Birdsong” at the Aspen Center for Physics, Colorado.  
 Invited seminar International Congress of Entomology, Brisbane, Australia.  
 Invited seminar, “Insect Sensors and Robotics” meeting, Brisbane, Australia.  
 2003 Invited seminar, University of Florida Center for Smell and Taste, Gainesville, FL  
 Invited seminar, Winter Conference on Learning & Memory, Park City, UT.  
 Invited seminar Washington State University, Pullman, WA.  
 Invited seminar symposium Entomological Society of America  
 Invited seminar Case Western Reserve IGERT program  
 2002 Purdue University, Department of Horticulture and Crop Science, Lafayette, IN  
 Virginia Commonwealth University, Department of Biology, Richmond, VA  
 Chair, symposium on Neuroscience, Gordon Conference on Floral Chemistry, Ventura, CA  
 Invited symposium presentation, Association for Chemical Senses, Sarasota, FL  
 Invited symposium presentation, IUSSE meetings, Japan  
 Invited symposium presentation, Gordon Conference on Neuroethology, Oxford, UK  
 Department of Biology, Vanderbilt University, Nashville, TN  
 Department of Biology, Indiana University, Bloomington, IN  
 Symposium presentation, Association for the Study of Animal Behaviour, London, UK  
 Seminar Rothamsted Agricultural Research Station, UK.  
 2001 Invited symposium presentations Entomological Society of America, San Diego, CA  
 Invited symposium presentation “Minibrain Symposium”, Tsukuba, Japan October  
 Invited symposium presentation, European IUSSE meetings, Berlin, Germany  
 Invited symposium presentation 7th European Symposium for Insect Taste and Olfaction Grass  
 Foundation lecture Eastern Nerve Net meetings, Woods Hole MA  
 Invited seminars Department of Neurobiology & Behavior, Cornell University  
 Invited seminars The Hebrew University of Jerusalem, Rehovot, Israel  
 2000 Invited seminar North Carolina State University  
 XXI International Congress of Entomology, Iguassu Falls, Brasil  
 Building a Community to Foster New approaches to Study Genes Brain and Behavior with the  
 Honey Bee, Bellagio, Italy  
 Progress In Invertebrate Neurobiology, Berlin, Germany  
 NASA Center for Advanced Studies in the Space Life Sciences symposium on Invertebrate  
 Sensory Information Processing

#### **Ad hoc reviews**

Journal of Chemical Ecology	Behavioral Ecology and Sociobiology
Animal Behaviour	Journal of Insect Behavior
Behavioral Genetics	Quarterly Review of Biology
Behavioral and Brain Sciences	Journal of Neuroscience
Behavioral Research Methods, Instrumentation, and Computers	Nature Neuroscience
American Midland Naturalist	Journal of Insect Physiology
Current Genetics	Journal of the Kansas Entomological Society
Journal of Comparative Physiology	Journal of Comparative Neurology
Journal of Experimental Psychology:	Journal of Experimental Biology
Animal Behavior Processes	Journal of Comparative Psychology
	Proceedings National Academy of Sciences

#### **Reviewer for granting agencies**

Zukunftskolleg, University of Konstanz Germany  
Several panels at NSF  
National Environment Research Council (UK)  
Molecular, Cellular, & Developmental Neurobiology study section at NIH (ad hoc reviews)  
Biobehavioral Regulation, Learning and Ethology study section at NIH (reviewer 1999-2005)  
Ad hoc reviewer for several other NIH study sections  
Site visits for evaluation of intramural NIH-NICHD research program (2006 and 2008)

### Review Articles

- 1) Michener CD, Smith BH. (1987) Kin recognition in social wasps and bees. In *Kin Recognition in Animals* (D. Fletcher & C.D. Michener, eds.), pp. 209–242. John Wiley and Sons..
- 2) Smith BH (1988) Ethological aspects of olfactory learning and memory in the honey bee, pp. 97-104. In *10th Biosciences Colloquium On Africanized Honey Bees and Mites* (M. Delfino-Baker, et. al. eds.), pp. 97–104. Ellis Horwood Ltd., Chichester, England.
- 3) Smith BH, Abramson CI (1992) Insect learning: Case studies in comparative psychology. In *Encyclopedia of Learning and Memory* (L.I. Nadel & J. Byrne, eds.), pp. 276–283. Macmillan.
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### **Published abstracts**

3-4 published abstracts for poster presentations per year through, for example, the Association for Chemoreception Sciences (*Chemical Senses*) and the Society for Neuroscience (meeting abstracts).

### **Books Reviewed**

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