

**BIOGRAPHIC INFORMATION****Positions**

- 2013 – present Associate Teaching Professor, Neuroscience and Behavioral Biology, Emory University  
 2003 – 2013 Senior Research Associate, Neurobiology and Behavior, Cornell University  
 2005 – 2009 Lecturer, Weill-Cornell Medical College in Qatar (2<sup>nd</sup> half of fall semesters)  
 2000 – 2003 Research Associate, Neurobiology and Behavior, Cornell University  
 1996 – 2000 Postdoctoral Associate, Neurobiology and Behavior, Cornell University

**Education**

- 1995 PhD, Neurobiology and Behavior, Cornell University  
 Thesis, “A psychophysical approach to cricket hearing” (Prof. R. Hoy, advisor)  
 1987 Neural Systems and Behavior course, Marine Biological Laboratory  
 1986 BA, Philosophy and Psychology, Oxford University (Marshall Scholarship)  
 1984 BS, Organismal Biology (with honors and highest distinction), University of Kansas  
 BA, Computer Science (with highest distinction), University of Kansas

**A. SCHOLARSHIP****Extramural funding (with RW as PI)**

- 2008 – 2011 Teaching Mathematical Modeling in the Behavioral Sciences.  
 NSF Directorate for Undergraduate Education 0716592, \$474,919 (of maximum \$500,000 for Phase II award; total \$31 million allocated that year).  
 2004 – 2005 Enhancing the Behavioral Sciences Curriculum with Mathematical Modeling.  
 NSF Directorate for Undergraduate Education 0341410, \$159,937 (of maximum \$160,000 for proof-of-concept award; total \$18 million allocated that year).  
 2001 – 2004 Laboratory Exercises for Cognitive Science and Psychology.  
 NSF Directorate for Undergraduate Education 0088829, \$480,953 (of maximum \$500,000 for full-development award; total \$24 million allocated that year).

**Peer-reviewed publications [citation count from Google Scholar]****Journal articles**

- Wyttenbach RA, Johnson BR (2022). Recording from snail motor nerves to investigate central pattern generation. *J Undergrad Neurosci Educ* 20:A373-A383.  
 Wyttenbach RA (2022). Video microscopy for teaching: Optimizing the field of view. *J Undergrad Neurosci Educ* 20:A111-A114.  
 Wyttenbach RA, Johnson BR, Hoy RR (2018). Reducing the cost of electrophysiology in the teaching laboratory. *J Undergrad Neurosci Educ* 16:A277-A281. [5]  
 McKellar CE, Wyttenbach RA (2017). A protocol demonstrating 60 different *Drosophila* behaviors in one assay. *J Undergrad Neurosci Educ* 15:A110-A116. [8]  
 Wyttenbach RA (2015). Documenting laboratory procedures with video. *J Undergrad Neurosci Educ* 13:A131-A135. [1]  
 Arthur BJ, Emr KS, Wyttenbach RA, Hoy RR (2014). Mosquito (*Aedes aegypti*) flight tones: Frequency, harmonicity, spherical spreading, and phase relationships. *J Acoust Soc Am* 135:933-41. *My role: experiment design, data analysis, co-writing the article with BJA.* [65]  
 Menda G, Uhr JH, Wyttenbach RA, Vermeulen FM, Smith DM, Harrington LC, Hoy RR (2013). Associative learning in the dengue vector mosquito, *Aedes aegypti*: Avoidance of a previously attractive odor or surface color that is paired with an aversive stimulus. *J Exp Biol* 216:218-23. *My role: data analysis, writing the article and designing figures.* [39]

- Wyttenbach RA (2012). Exploring sensory neuroscience through experience and experiment. *J Undergrad Neurosci Educ* 11:A126-A131. [3]
- Menda G, Bar HY, Arthur BJ, Rivlin PK, Wyttenbach RA, Strawderman RL, Hoy RR (2011). Classical conditioning through auditory stimuli in *Drosophila*: Methods and models. *J Exp Biol* 214:2864-70. *My role: data analysis, writing the article and designing figures.* [19]
- Arthur BJ, Wyttenbach RA, Harrington LC, Hoy RR (2010). Neural responses to one- and two-tone stimuli in the hearing organ of the dengue vector mosquito. *J Exp Biol* 213:1376-85. *My role: experiment design, data analysis, co-writing the article with BJA.* [21]
- Land BR, Johnson BR, Wyttenbach RA, Hoy RR (2004). Tools for physiology labs: Inexpensive equipment for physiological stimulation. *J Undergrad Neurosci Educ* 3:A30-35. *My role: testing equipment, designing printed circuit board, co-writing the article with BRJ.* [26]
- Johnson BR, Wyttenbach RA, Wayne R, Hoy RR (2002). Action potentials in a giant algal cell: A comparative approach to mechanisms and evolution of excitability. *J Undergrad Neurosci Educ* 1:A23-27. *My role: equal coauthor with BRJ.* [31]
- Wyttenbach RA, Eisner T (2001). Use of defensive glands during mating in a cockroach (*Diploptera punctata*). *Chemoecology* 11:25-8. [5]
- Land BR, Wyttenbach RA, Johnson BR (2001). Tools for physiology labs: An inexpensive high-performance amplifier and electrode for extracellular recording. *J Neurosci Meth* 106:47-55. *My role: testing equipment, designing printed circuit board, co-writing the article with BRJ.* [63]
- Engel JE, Wyttenbach RA (2001). An optoelectronic sensor for monitoring small movements in insects. *Florida Entomologist* 84:336-43. [8]
- Wyttenbach RA, Hoy RR (1997). Spatial acuity of ultrasound hearing in flying crickets. *J Exp Biol* 200:1999-2006. [15]
- Wyttenbach RA, May ML, Hoy RR (1996). Categorical perception of sound frequency by crickets. *Science* 273:1542-4. [232]
- Wyttenbach RA, Hoy RR (1993). Demonstration of the precedence effect in an insect. *J Acoust Soc Am* 94:777-84. [90]

### **Chapters in edited volumes**

- Johnson BR, Wyttenbach RA, Hoy RR (2014). Crustaceans as model systems for teaching neuroscience. In: *The Natural History of Crustaceans, Vol. 3: Crustacean Nervous Systems and their Control of Behavior* (ed. Derby C, Thiel M) New York: Oxford Univ Press. *My role: equal coauthor with BRJ.*
- Johnson BR, Wyttenbach RA, Hoy RR (2002). The crawdad project: Crustaceans as model systems for teaching principles of neuroscience. In: *Frontiers in Crustacean Neurobiology* (ed. Wiese K, Schmidt M). Berlin: Springer Verlag. *My role: equal coauthor with BRJ.* [6]
- Wyttenbach RA, Hoy RR (1999). Categorical perception of behaviorally relevant stimuli by crickets. In: *The Design of Animal Communication* (ed Hauser M, Konishi M). New York: MIT, 559-76. [16]

### **Reviews**

- Wyttenbach RA, Farris HE (2004). Psychophysics in insect hearing. *Microsc Res Tech* 63:375-87. [22]

### **Non-peer reviewed publications [citation count from Google Scholar]**

#### **Books and web sites**

- Wyttenbach RA (in progress). *PsyCog: Explorations in Perception and Cognition*. Complete rewrite and expanded coverage. <https://nbb.emory.edu/wyttenbach/psycog/> (for Emory use only)
- Wyttenbach RA, Johnson BR, Hoy RR (2014). *Crawdads: An Online Lab Manual for Neurophysiology*. Sunderland, Mass.: Sinauer Associates. (Revision of 1999 text). <https://crawdads.sinauer.com>, also available (for Emory use only) at <https://nbb.emory.edu/wyttenbach/crawdads/> [9]

- Wyttenbach RA, Reeve HK, Hoy RR (2011). GameBug: Tutorials in Evolutionary Game Theory. <https://nbb.emory.edu/wyttenbach/gamebug/> (online text funded by NSF award 0716592). [5]
- Wyttenbach RA (2006). PsyCog: Explorations in Perception and Cognition. Sunderland, Mass.: Sinauer Associates. (CD-ROM, then download from Sinauer, now being rewritten as a web site.) [7]
- Wyttenbach RA, Johnson BR, Hoy RR (1999). Crawdad: A CD-ROM Lab Manual for Neurophysiology. Sunderland, Mass.: Sinauer Associates. [36]

**Conference presentations – teaching**

- Wyttenbach RA, Johnson BR, Hoy RR (2017). Reducing the cost of electrophysiology in the teaching laboratory. Soc Neurosci Abstr 024.13SA
- Johnson BR, Wyttenbach RA, Hoy RR (2015). The crayfish caudal photoreceptor: A non-visual photoreceptor embedded in a central nervous system. Soc Neurosci Abstr 24.19SA
- Johnson BR, Wyttenbach RA, Hoy RR (2011). Grass live demonstration handouts as guides for laboratory exercise development. Soc Neurosci Abstr
- Wyttenbach RA, Reeve HK (2008). Mathematical Modeling in Behavioral Science. NSF-AAAS Conference, Invention and Impact 2: Building Excellence in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education. Poster 54.
- Johnson BR, Selling RE, Rivlin PK, Wyttenbach RA, Hoy RR (2006). Maggot neurobiology: Housefly larvae as a model system for motor pattern generation. Soc Neurosci Abstr 25.5
- Wyttenbach RA, Hoy RR (2004). A hands-on approach to learning about hearing and sound. Soc Neurosci Abstr 30.
- Wyttenbach RA, Hoy RR (2003). From subjective experience to neural mechanism: Interactive demonstrations and experiments for psychology and neuroscience. Soc Neurosci Abstr 29.
- Johnson BR, Vilinsky I, Rivlin PK, Wyttenbach RA, Hoy RR (2002). Mystery mutants: Using mutations at *Drosophila* neuromuscular junctions to teach principles of neuronal communication. Soc Neurosci Abstr 28.
- Land BR, Johnson BR, Wyttenbach RA (2002). Stimscope: A virtual instrument for neurophysiology in the teaching lab. Soc Neurosci Abstr 28.
- Land BR, Wyttenbach RA, Johnson BR, Hoy RR (2001). Inexpensive electronics for the teaching lab. Soc Neurosci Abstr 27.
- Johnson BR, Wyttenbach RA, Hoy RR (2000). Examining neuronal excitability by intracellular recording from the brain of a land snail. Soc Neurosci Abstr 26.
- Wyttenbach RA, Johnson BR, Hoy RR (1999). Introducing electrophysiological recording and passive electrical properties of membranes. Soc Neurosci Abstr 25:264.
- Johnson BR, Wyttenbach RA, Heitler WJ, Hoy RR (1999). The resting potential as a dynamic baseline for neuronal excitability. Soc Neurosci Abstr 25:264.
- Johnson BR, Wyttenbach RA, Wayne R, Hoy RR (1998). Comparative excitability: Action potentials in a giant algal cell. Soc Neurosci Abstr 24:206.
- Wyttenbach RA, Johnson BR, Hoy RR (1997). Project crawdad: Using video to teach dissections in undergraduate neuroscience labs. Soc Neurosci Abstr 23:286.
- Wyttenbach RA, Johnson BR, Hoy RR (1996). Project crawdad: A program to promote use of invertebrates in undergraduate neuroscience courses. Soc Neurosci Abstr 22:254.
- Wyttenbach RA, Johnson BR, Hoy RR (1994). The crayfish abdominal stretch receptor: A model student preparation illustrating principles of sensory neurobiology. Soc Neurosci Abstr 20:205.
- Johnson BR, Wyttenbach RA, Hoy RR, Zottoli SJ (1993). Innervation of a crayfish postural muscle: A student laboratory exercise to examine synaptic plasticity. Soc Neurosci Abstr 19:207.

**Conference presentations – research**

- Tabatabaie A, Homentcovschi D, Wytttenbach RA, Su Q, Miles CI, Miles RN, Hoy RR (2012). Sound-induced vibration of *Aedes aegypti* antennae measured in three dimensions. Proceedings of the 10th International Congress of Neuroethology.
- Woods VM, Rivlin PK, Land BR, Wytttenbach RA, Hoy RR (2005). Kinematics of larval locomotion in mutant *Drosophila*. Soc Neurosci Abstr 55.1.
- Rosen MJ, Wytttenbach RA, Hoy RR (2005). Responses to temporal pattern vs. sound energy in a parasitoid fly specialized for sound localization. Soc Neurosci Abstr 31.
- Wytttenbach RA, Nelson MC, Buschbeck EK, Hoy RR (2000). Hearing in the Madagascar hissing cockroach. Soc Neurosci Abstr 26.
- Wytttenbach RA, Hoy RR (1999). Laser-vibrometric measurements of the response of cricket ears to ultrasound. Soc Neurosci Abstr 25:621.
- Wytttenbach RA, Hoy RR (1997). The precedence effect in cricket phonotaxis: Discrimination of single pulses from pulse pairs. Soc Neurosci Abstr 23:1070.
- Wytttenbach RA, Hoy RR (1996). Dishabituation of the ultrasound-induced startle response of flying crickets: A test for auditory discrimination. 10th International Meeting on Insect Sound and Vibration. p. 61.
- Wytttenbach RA, Hoy RR (1995). Minimum audible angles in crickets measured by behavioral dishabituation. Proceedings of the 4th International Congress of Neuroethology (ed. Burrows M, Matheson T, Newland PL, Schuppe H). New York: Thieme p 363.
- Wytttenbach RA, Hoy RR (1994). Dishabituation of acoustic startle shows frequency categorization by crickets. Soc Neurosci Abstr 20:1025.
- Vrieslander JD, Skovira JF, Wytttenbach RA, Capranica RR, Bass AH (1994). Microcomputer workstation for neurobiology teaching labs. Soc Neurosci Abstr 20:206.
- Wytttenbach RA, Hoy RR (1993). Prepulse effects on the acoustic startle response of field crickets. Soc Neurosci Abstr 19:166.
- Wytttenbach RA, Hoy RR (1990). The precedence effect and echo suppression in negative phonotaxis of the cricket *Teleogryllus oceanicus*. Soc Neurosci Abstr 16:759.

**B. TEACHING****Undergraduate courses at Emory**

- \* Entirely developed by RW; ‡ Portions of the course developed by RW
- NBB 401W Perspectives in NBB, Fall semesters 2013-present (except 2019)
- \*NBB 370 Neuroethology, Spring 2021, Fall 2021, Fall 2022
- \*NBB 361W Neurophysiology Laboratory, Spring semesters 2014-present (except 2021)
- ‡NBB 300 / Music 309 Musical Brain (with Paul Lennard), Spring semesters 2015, 2016, 2019
- ‡NBB 270 Current Topics in NBB, Spring 2018
- \*NBB 270 Survey of NBB, Spring 2022
- \*NBB 190 Illusions and Reaction Times, Fall semesters 2013-2015, Fall 2020, Spring 2021
- ‡NBB 120 From Botox to Behavior, Fall semesters 2016-2017 (with Kristen Frenzel), Fall 2018, Spring 2020 (with Gillian Hue)
- \*PRECOL P089 Pre-college course on illusions and reaction times, Summer 2016

**Undergraduate courses elsewhere**

- \* Entirely developed by RW; ‡ Portions of the course developed by RW
- ‡Emory-Tibet Science Initiative summer courses in India (2018, 2019).
- \*BioG 400, Neuroscience, Weill-Cornell Medical College in Qatar (2-credit lecture course for premedical students, given in 2<sup>nd</sup> half of the fall semester, 2005, 2006, 2007, 2008, 2009).

‡BioNB 4200, Neurobiology & Behavior of Music, Cornell University (co-taught seminar, 2011).

‡BioNB 420 / Music 240, The Science of Music, Cornell University (co-taught lecture and lab, 2007).

‡BioNB 420, Neurobiology of Animal Behavior, Cornell University (co-taught lecture and lab course at the Cornell/UNH Isles of Shoals Marine Laboratory, Summers 1992-1995).

### Teaching-related awards

2019, Emory University. Winship Award (one-semester teaching release to develop lab exercises).

Annually, one to two awards are given to lecture-track faculty; in 2019, two were given.

2007, Cornell University. Faculty Innovation in Teaching Award (to develop a lab course in the science of music; awarded jointly with Prof. R. Hoy, who taught the course with me). Two awards were given that year; competition was open to all Arts and Sciences faculty.

2006, Faculty for Undergraduate Neuroscience. Educator of the Year Award (for developing PsyCog).

One such award is given annually at the meeting of the Society for Neuroscience.

2002, Faculty for Undergraduate Neuroscience. Certificate of Appreciation (for developing Crawdad).

One such award is given annually at the meeting of the Society for Neuroscience.

### Honors committees

I have served on Honors committees for: Nawoo Kim (2015), Megha Chiruvella (2015), Rohitha Moudgal (2016), Mackenzie Wyatt (2016), Kevin Niu (2019), Lina Du (2019), Aashna Sahni (2021), Rawan Alshehri (2021), Holly Shan (2021), Anshruta Dhanashekar (2022).

### Professional development

Emory College Strategies for Online Teaching (2020)

Emory QEP workshop (2015); I then served as a workshop facilitator (2016)

Southeast Educational Data Symposium (2015)

Science Case Network Conference (2015)

Conferences of the Faculty for Undergraduate Neuroscience (1998, 2001, 2005, 2011, 2014, 2017, 2020). I usually give an invited talk and/or lab workshop at these 3-day conferences (see Service section, below). I also attend sessions on education topics for my own professional development.

## C. SERVICE

### Departmental

2022-present, Director of Undergraduate Studies and chair of the NBB Curriculum Committee.

2022-2023, Head of search committee for an open-rank Lecture-Track appointment.

2015-2022, in charge of producing NBB's assessment reports (see documents appended to my service portfolio).

2018-2022, member of the NBB Curriculum Committee.

2017, received Hightower funding and organized a college-wide public talk and Frontiers in Neuroscience seminar by vision scientist Margaret Livingstone of Harvard.

### College

2022-2024, member of the Lecture-Track Faculty group Executive Committee.

2015-present, faculty adviser to the College Honor Council. I participate in investigations, full hearings, and administrative hearings.

2019, Faculty Advisor of the Year, selected by student members of the College Honor Council.

2014-present, worked with the National Scholarships & Fellowships Program, as needed, on committees to select Emory's candidates for Marshall and Rhodes scholarships and give practice interviews to those who are selected to compete at the national level.

2015, Emory Scholars award committee (two days of reading and ranking applications).

**Profession**

Most of my scholarship activity involves developing laboratory exercises. Much of my service to the profession involves teaching faculty how to implement lab exercises at their home institutions. Most recently, I have done the latter with the sponsorship of ADInstruments (ADI). I have also taught lab exercises at Faculty for Undergraduate Neuroscience (FUN) and Project Kaleidescope (PKAL) conferences. Since arriving at Emory, I have given 20 lab workshops and 3 invited talks on neuroscience education. A complete list follows:

*Workshops and conferences in which I was a sole or primary instructor*

- 2011-2022, Lab workshops at Cornell University, 1-2 workshops per year, 14 total (ADI)
- 2022, Lab workshop at University of the Incarnate Word, San Antonio TX (ADI)
- 2021, Two online lab workshops in neurophysiology, presented from my Emory teaching lab (ADI)
- 2020, Lab workshop at University of the Incarnate Word, San Antonio TX (ADI)
- 2020, Invited talk at FUN-PKAL online workshop (originally scheduled for Davidson College)
- 2015-2018, Lab workshops at Emory University, 1-2 per year, 4 total (ADI)
- 2017, Invited talk at FUN-PKAL workshop at Dominican University, Chicago
- 2016, Lab workshop at Eckerd College, Tampa FL (ADI)
- 2014, Lab instruction and invited talk at FUN-PKAL workshop at Ithaca College
- 2011, Lab instruction and invited talk at FUN-PKAL workshop at Pomona College
- 2005, Lab instruction and invited talk at FUN-PKAL workshop at Macalester College
- 2001, Lab instruction and invited talk at PKAL workshop at Trinity College, Hartford CT
- 1999, Lab instruction at Chautauqua Workshop at Northern Illinois University
- 1998, Lab instruction at PKAL workshop at Oberlin College
- 1996-1999, Week-long summer workshops in neurophysiology, Cornell University (NSF)

*Other professional service*

- 2003-present, member of the editorial board of the Journal of Undergraduate Neuroscience Education (published the Faculty for Undergraduate Neuroscience, indexed on PubMed).
- 2015, external reviewer for Macalester College Neuroscience Studies program.
- 2007-2013, NSF-DUE review panelist for SBIR, CCLI, UBM, and TUES awards.