

CURRICULUM VITAE

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EDUCATION: B.S. in Biology, Univ. of North Carolina, Chapel Hill 1976
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ACADEMIC EXPERIENCE:

2008-present Regents Professor, Neuroscience Institute and Dept. of Biology, GSU
1995-2008 Professor, Dept. of Biology, GSU
1990-1995 Associate Professor, Dept. Biology, GSU
1984-1990 Assistant Professor, Dept. of Biology, Georgia State University
2002-present Adjunct Faculty, Bermuda Institute of Ocean Sciences
1982-1984 Postdoctoral Fellow, The Whitney Laboratory, Univ. of Florida, St. Augustine, FL
1978-1981 Research Assistant and Teaching Assistant, Boston University Marine Program
1976-1977 Research Technician, Dept. Medicine, University of North Carolina

PUBLICATIONS

Journal Articles

In Preparation

Kamio, M. et al. Isolation and structural elucidation of aplysiolysin and phycoerythrobilin as defensive compounds in the ink secretion of the sea hare *Aplysia californica*
Kamio, M. et al. Aplysiolysin: a synthesized chemical defense in the ink of sea hares
Nusnbaum, M. and C.D. Derby. Ink as a chemical defense against predatory fish.
Kicklighter, C.E., M. Michiya Kamio, L. Nguyen, M.W. Germann, and C.D. Derby. An economy of chemicals: sea hares use sun-screening mycosporine-like amino acids as intraspecific alarm cues.
Wood, J.B., A. Maynard, A. Lawlor, E.K. Sawyer, D. Simmons, K.E. Pennoyer, and C.D. Derby. Ink of Caribbean reef squid, *Sepioteuthis sepioidea*, is a feeding deterrent against predatory French grunts, *Haemulon flavolineatum*

Submitted

Nusnbaum, M. and C.D. Derby. Ink secretion protects sea hares against bluehead wrasse through olfactory and intra-oral chemical defenses. (Submitted to *J. Exp. Biol.*)

Published

107. Shabani, S., M. Kamio, and C.D. Derby. 2009. Spiny lobsters use urine-borne signals to communicate social status. **J. Exp. Biol.** (in press).
106. Matthews, T.R., K.E. Maxwell, R.D. Bertelsen, and C.D. Derby. 2009. Use of neurolipofuscin to determine population structure and growth rates of the Caribbean spiny lobster *Panulirus argus* in Florida, United States. **New Zealand J. Mar. Freshwater Res.** 43: 125-137.
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103. Song, C.K., L. M. Johnstone, D.H. Edwards, C.D. Derby, and M. Schmidt. 2009. Cellular basis of neurogenesis in the brain of crayfish, *Procambarus clarkii*: neurogenic areas in the olfactory midbrain from hatchlings to adults. **Arthrop. Struct. Develop.** 38: 339-360.
102. Kamio, M., K.-C. Ko, S. Zheng, B. Wang, S. Collins, G. Gadda, P.C. Tai, and C.D. Derby. 2009. The chemistry of escapin: identification and quantification of the components in the complex mixture generated by an L-amino acid oxidase in the defensive secretion of the sea snail *Aplysia californica*. **Chem. Eur. J.** 15: 1597-1604.
101. Sheybani, A., M. Nusnbaum, J. Caprio, and C.D. Derby. 2009. Responses of the sea catfish, *Ariopsis felis*, to chemical defenses from the sea hare, *Aplysia californica*. **J. Exp. Mar. Biol. Ecol.** 368: 153-160.
100. Ko, K.-C., B. Wang, P.C. Tai, and C.D. Derby. 2008. Identification of potent bactericidal compounds produced by escapin, an L-amino acid oxidase in the ink of the sea hare *Aplysia californica*. **Antimicrobial Agents and Chemotherapy** 52: 4455-4462.
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96. Kamio, M., M. Reidenbach, and C.D. Derby. 2008. To paddle or not: determinants and consequences of courtship display by male blue crabs, *Callinectes sapidus*. **J. Exp. Biol.** 211: 1243-1248.
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91. Steullet, P., D.H. Edwards, and C.D. Derby. 2007. An electric sense in crayfish? **Biol. Bull.** 213: 16-20.
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88. Song, C.-K., L.M. Johnstone, M. Schmidt, C.D. Derby, and D.H. Edwards. 2007. Social status influences neurogenesis in the brain of juvenile crayfish. **J. Exp. Biol.** 210: 1311-1324.
87. Horner, A.J., S.P. Nickles, M.J. Weissburg, and C.D. Derby. 2006. Source and specificity of chemical cues mediating shelter preference of Caribbean spiny lobsters (*Panulirus argus*). **Biol. Bull.** 211: 128-139.
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85. Kicklighter, C.E. and C.D. Derby. 2006. Multiple components in ink of the sea hare *Aplysia californica* are aversive to the sea anemone *Anthopleura sola*. **J. Exp. Mar. Biol. Ecol.** 334: 256-268.
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71. Derby, C.D., H.S. Cate, P. Steullet, and P.J.H. Harrison. 2003. Comparison of turnover in the olfactory organ of early juvenile stage and adult Caribbean spiny lobsters. **Arthropod Structure & Development** 31: 297-311.
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68. Cate, H.S. and C.D. Derby. 2002. Ultrastructure and physiology of the hooded sensillum, a bimodal chemo-mechanosensillum of lobsters. **J. Comp. Neurol.** 442: 293-307.
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10. Derby, C.D. 1984. Molecular weight fractions of natural foods that stimulate feeding in crustaceans, with data from the lobster *Homarus americanus*. **Mar. Behav. Physiol.** 10: 273-282.
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3. Derby, C.D. and J. Atema. 1981. Selective improvement in responses to odors by the lobster, *Homarus americanus*, following feeding experience. **J. Chem. Ecol.** 7: 1073-1080.
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Review Articles, Book Chapters, Symposium Introductions

24. Derby, C.D. 2009. Symposium on 'The Neuroecology of Chemical Senses'. Olfaction & Taste. Ann. N.Y. Acad. Sci. (ed., T. Finger) (in press)
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5. Atema, J. and C. Derby. 1980. Ethological evidence for search images in predatory behavior. **Proc. Internat. Union of Physiol. Sci.** Vol. XIV. 28th International Congress of Physiol. Sciences. Budapest, Hungary: 54-55.
4. Derby, C.D. and J. Atema. 1980. L-Glutamate-specialist chemoreceptors on the legs of the lobster *Homarus americanus*. **Biol. Bull.** 159: 450.
3. Reilly, P., C. Derby, and J. Atema. 1979. Chemoreception in *Homarus americanus*: responses of primary receptors to secondary plant compounds. **Biol. Bull.** 157: 391
2. Derby, C.D. and J. Atema. 1979. Chemical search image: prey exposure improves selective chemical detection by a predator (*Homarus americanus*). **Biol. Bull.** 157: 365-366.
1. Derby, C.D. and J. Atema. 1978. Responses of walking leg chemoreceptors: the role of amino acids, proteins, and live prey body odors as feeding stimuli. **Biol. Bull.** 155: 433-434.

CURRENT EXTRAMURAL GRANTS

2006-2009 National Science Foundation: “Sensory Mechanisms of Chemical Defenses” (PI, Derby) (NSF IBN-0614685 (\$301,311 total costs).

PREVIOUS EXTRAMURAL SUPPORT

2002-2008 National Institutes of Health: (Derby, PI; co-investigators: P.C. Tai and T.S. McClintock): “Olfactory Development: Cell Proliferation and Maturation” NIDCD DC00312. Total 5-Year Amount: \$1,481,500.

2007-2008 Naval Surface Warfare Center – Panama City: “Identification of Molecules that Inhibit Chewing by Blue Crabs” (PI, Derby): Total Costs: \$96,292.

2003-2006 National Science Foundation: “Mechanisms of Chemical Defenses” (PI, Derby) (NSF IBN-0324435). Total award: \$300,000.

2002-2004: National Fish & Wildlife Foundation: “Evaluation of Marine Reserves as Sanctuaries for Caribbean Spiny Lobster (*Panulirus argus*)”: (co-P,I with T. Matthews). Total Award to GSU: \$34,000.

2003-2005 National Marine Fisheries Service/MARFIN: “The Use of Lipofuscin for Aging Caribbean Spiny Lobster (*Panulirus argus*)”: (co-PI, with Thomas Matthews). Total Award to GSU: \$65,780.

2003-2005 Co-sponsor (with Julia Kubanek, Georgia Tech) of Postdoctoral Fellowship to Dr.

- Michiya Kamio, Center for Behavioral Neuroscience, 2-year total award: \$80,000.
- 2003-2004 Venture fund from Center for Behavioral Neuroscience (M. Schmidt, D.H. Edwards and C.D. Derby, co-PIs) "The Role of Olfaction in Establishing Social Status in Crayfish" (Total Award: \$30,000).
- 2004 NSF IGERT Graduate Fellowship: \$13,750 subcontract from Georgia Institute of Technology, to Amy Horner
- 2000-2004 National Science Foundation: "Functional Organization of a Continuously Growing Compound Nose" (PI, Derby) (NSF IBN 0077474). Total Award: \$309,929.
- 2002-2003 Co-sponsor (with P. Katz) of Postdoctoral Fellowship to Dr. Paul M. Johnson, NSF Center for Behavioral Neuroscience, one-year total award: \$39,000.
- 2000-2001 Venture fund from NSF Center for Behavioral Neuroscience (D.H. Edwards and C.D. Derby, co-PIs) "Aggression, Serotonin, and Neurogenesis in the Crayfish CNS" (Total Award: \$30,000).
- 1997-2002 National Institutes of Health: "Peripheral and Central Processing of Odorant Mixtures" (PI, Derby) (NIH R01 DC00312); Total Award: \$490,000.
- 1997-1998 National Institutes of Health: "Postdoctoral Research supplement for Underrepresented Minorities: Peripheral and Central Processing of Odorant Mixtures" (NIH R01 DC00312): Total Costs for FY 1997-8: \$51,682.
- 1993-1997 National Institutes of Health: "Mixture Interactions in Olfaction;" Total Costs, \$670,000.
- 1992-1995 National Science Foundation: "Effects of Olfactory Mixture Interactions on Coding and Discrimination" (IBN-9109783); Total Costs: \$239,600.
- 1995-1996 National Science Foundation: "Electroreception in Aquatic Invertebrates" (IBN 95-14409; SGER Grant (Co-PIs: C. Derby and D. Edwards). Total Costs: \$50,500
- 1990-1995 National Institutes of Health, Research Career Development Award: "Mixture Interactions in Olfaction: Effects and Mechanisms" (NIH K04 DC00002); Total Costs: \$340,000.
- 1990-1992 Sponsor of NIMH Predoctoral Fellowship to Debbie Wood (Sponsor, C. Derby): "Neurohormonal Control of Sexual Behavior in a Crustacean;" Total Costs: \$23,000.
- 1988-1991 National Institutes of Health: "Mixture Interactions in Olfaction: Discrimination of Binary Mixtures;" Total Costs, \$300,000.
- 1988-1991 The Whitehall Foundation: "Functional Organization and Neural Coding in a Crustacean Olfactory System" (renewal); Total Costs, \$60,000.
- 1985-1988 The Whitehall Foundation: "Functional Organization and Neural Coding in a Crustacean Olfactory System"; Total costs: \$107,000.
- 1985-1988 National Institutes of Health: "Neural Coding of Stimulus Quality in Olfaction"; Total costs: \$170,000.
- 1984-1986 National Science Foundation Grant: "Olfactory Purinoceptors: Their Physiology, Biochemistry and Relationship to Internal Receptor Types" (W.E.S. Carr, PI; B.W. Ache and C.D. Derby, CoPIs); Total costs: \$102,000.
- 1983-1984 Individual Postdoctoral Fellowship (National Research Service Award), National

INVITED PRESENTATIONS SINCE 1985

Invited Seminars at Universities

45. "Escape by Inking: Marine Molluscs Avoid Predators Using Diverse Chemicals and Mechanisms", 2009 Edmund A. Arbas Memorial Lecture, Arizona Research Laboratories Division of Neurobiology, University of Arizona, January 23, 2009.
44. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": University of Lund, Zoology Dept., Sweden, October 16, 2008.
43. "Chemical communication in affiliation, aggression, and mating of decapod crustacean", George D. Grice, Jr. Lecture, at the College of Charleston, September 19, 2008.
42. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": University of Maryland College Park, April 18, 2008.
41. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": University of Maryland Baltimore County, April 17, 2008.
40. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": University of Hawaii, Coconut Island Marine Laboratory, March 2008.
39. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": UCLA, February 6, 2008.
38. "Antimicrobials and other bioactive chemicals in sea slug ink", Georgia State University. December 7, 2007.
37. "Escape by inking: marine molluscs avoid predators with diverse chemicals and mechanisms": Wake Forest University. November 7, 2007.
36. "Chemical defenses and communication in sea hares and other inking animals": University of Florida, The Whitney Laboratory. January 19, 2007.
35. "Chemical defenses of sea hares: novel and adaptive strategies for escape and defense via inking", Georgia State University. September 9, 2005.
34. "Life-long proliferation and turnover in the olfactory system of lobsters", Medical College of Georgia, Augusta. February 14, 2005.
33. "Life-long proliferation and turnover in the olfactory system of lobsters", University of South Carolina, Columbia. January 24, 2005.
32. "Chemical Defenses of Sea Hares: How to Manipulate Predators, Kill Microbes, and Warn Friends", University of Copenhagen, Denmark, October 21, 2004.
31. "Chemical Defenses", Assumption College, MA, March 1, 2004
30. "Postembryonic Development of Olfactory Systems", Univ. Virginia, Feb. 27, 2004.
29. "Tales of a Lobster's Nose", at Georgia Tech, May 2, 2002.
28. "Crustacean Chemoreception", at Kagoshima University, Japan, August 20, 2000.
27. "The Continuously Changing Olfactory System of the Spiny Lobster: Multiple Mechanisms for Growth, Turnover, and Response to Injury", at Fukuoka University, Japan, August 14, 2000.
26. "A Compound Nose: Functional Development, Odotopic Mapping, and Behavioral Role of Aesthetasc and Other Sensilla in the Crustacean Antennule", at the Marine Biological Laboratory, Woods Hole, MA, Oct. 6, 1999.

25. "A Compound Nose: Functional Development, Odotopic Mapping, and Behavioral Role of Aesthetasc and Other Sensilla in the Crustacean Antennule", at the Dept. of Biology, University of North Carolina, Chapel Hill, Oct. 4, 1999.
24. "Functional organization of crustacean noses: multiple pathways, multiple functions? The Whitney Laboratory, University of Florida, Dec. 11, 1998.
23. "Functional organization of crustacean noses: multiple pathways, multiple functions? Bowling Green State University, Dec. 4, 1998.
22. "Peripheral processing of odorant mixtures by the spiny lobster", University of Kentucky School of Medicine, March 12, 1997.
21. "Crustacean sensation", Bermuda Biological Station for Research, Aug. 14, 1996.
20. "Crustacean sensation: processing of sensory information", at Spelman College, December 4, 1995.
19. "Processing of odorant mixture information by the Caribbean spiny lobster: discriminating parts from the whole", at University of Arizona, Nov. 20, 1995.
18. "Three tales of crustacean sensation", at University of North Carolina at Charlotte, July 28, 1995.
17. "Transduction and discrimination of odorant mixtures by the Georgia spiny lobster," at University of North Carolina at Greensboro, February 3, 1995.
16. "Understanding responses to mixtures in the Georgia spiny lobster," at Marine Biological Laboratory, Woods Hole, MA, May 4, 1994.
15. "The role of peripheral chemosensory systems in the control of food-related behaviors of crustacean," at the Dept. of Biology, Fukuoka University, Fukuoka, Japan, July 19, 1993.
14. "Neurobiology of chemoreception in aquatic crustaceans," at University of North Carolina at Charlotte, April 24, 1992.
13. "Chemical sensing in feeding and reproduction," at Georgia Tech, April 17, 1992.
12. "Transduction and quality coding by the peripheral olfactory system of spiny lobsters," at University of Toronto, Scarborough College, on April 3, 1992.
11. "Coding of complex stimuli in the peripheral nervous system," at Emory University (Frontiers in Neuroscience; Mini-Series on Neuronal Signaling), January 17, 1992.
10. "Chemical sensing of odorant mixtures by the Georgia spiny lobster," at Hopkins Marine Station, Stanford University, CA, October 10, 1991.
9. "Chemoreception in sex and feeding behavior of crustaceans," at Dauphin Island Sea Lab, Dauphin Island, Alabama, on January 30, 1989.
8. "Neural and hormonal control of chemosensory behavior in crustaceans," at Boston University Marine Program, Marine Biological Laboratory, Woods Hole, MA, on December 7, 1988.
7. "Chemoreception in sex and feeding behavior of crustaceans," at Skidaway Institute of Oceanography, Savannah, GA, on August 26, 1988.
6. "Chemical sensing by crustaceans," at Duke University Marine Laboratory, Beaufort, NC, on March 23, 1988.
5. "Discrimination of quality of single chemicals and chemical mixtures in aquatic crustaceans," at Monell Chemical Senses Center, Philadelphia, PA, on December 9, 1986.
4. "Chemoreception in lobsters," at the Dept. of Chemistry, Georgia State University, Atlanta, GA, on November 17, 1986.

3. "Detection and discrimination of complex mixtures by the lobster," at Dept. of Biology, Georgia State University, Atlanta, GA, on April 25, 1986.
2. "Neural coding of complex odorants by crustaceans," at Dept. of Anatomy and Cell Biology, Emory University, Atlanta, GA, on April 17, 1985.
1. "Chemoreception in lobsters: neural codes of natural mixtures," at Dept. of Zoology and Physiology, Louisiana State University, Baton Rouge, LA, on March 22, 1985.

Invited Presentations at Symposia or Meetings since 1985

28. "Mechanisms of Chemical defense by inking molluscs against crustaceans: diverse chemicals and mechanisms." 5th Brazilian Crustacean Congress, Nov 12 2008, Gramado, Brasil.
27. Chemical communication in affiliation, aggression, and mating of decapod crustaceans. 5th Brazilian Crustacean Congress, Nov 11 2008, Gramado, Brasil.
26. "Chemical signals in the aquatic environment, and how they are detected", lecture in International Course in Sensory Ecology, Lund, Sweden, October 13, 2008.
25. "Chemoreception in love, affiliation, and arms races of decapod crustaceans: 2007 Mid-Year Meeting of The Crustacean Society, Coquimbo, Chile, October 15, 2007.
24. "Why Have a Diversity of Chemosensory Pathways in Noses?" National Evolutionary Synthesis Center Symposium on Origins and Evolution of Chemoreception, Durham, NC, June 4-6, 2007.
23. "Antimicrobials and Other Bioactive Chemicals in Sea Slug Ink", 3rd Annual Molecular Basis of Disease Symposium, May 18, 2007, Atlanta.
22. "Chemical signals in the aquatic environment, and how they are detected", lecture in International Course in Sensory Ecology, Lund, Sweden, October, 2006.
21. "Yuk, yum, and yikes: chemical defenses of inking animals", SouthEast Nerve Net, Atlanta, GA, March 31-April 1, 2006.
20. "Physiological genomics of lobster olfaction", T.S. McClintock, C.D. Derby, and B.W. Ache. At the 2006 Annual Meeting of the Society for Integrative and Comparative Biology, Orlando, FL, Jan. 8, 2006.
19. "All-in-one chemical defenses of sea hares: novel and adaptive strategies for escape and defense via inking", at the Harold Nations Annual Symposium, hosted by the School of Chemistry & Biochemistry, Georgia Institute of Technology, Oct. 14, 2005.
18. "Why do crustaceans have two parallel antennular chemosensory pathways", 9th European Symposium for Insect Taste and Olfaction, Villasimius, Italy, Sept. 27, 2005.
17. "Novel and adaptive strategies in chemical defense and chemical signaling in sea hares", at the conference on Biological and Computation Perspectives on Intelligent Systems", Friday Harbor Laboratories, Washington, June 7-10, 2005.
16. "Chemical signals in the aquatic environment, and how they are detected by crustaceans", lecture in International Course in Sensory Ecology, Lund, Sweden, October 20, 2004.
15. "Continuous turnover of neurons in the peripheral and central olfactory systems of lobsters", Keynote Talk at the SouthEast Nerve Net, Atlanta, GA, March 3, 2002.
14. "Continuous turnover of neurons in the peripheral and central olfactory systems of lobsters: mechanisms, regulation, and implications for functional organization", at the 7th European Symposium for Insect Taste and Olfaction, Villasimius, Italy, Sept. 22-28, 2001.

13. "Structural and functional plasticity in the postembryonic olfactory system", at the Atlanta Chapter of the Society for Neuroscience Spring Symposium, at Emory University, Atlanta. May 5, 2001.
12. "What is the Role of Parallel Pathways in Chemical Sensing?", at the Workshop on Invertebrate Sensory Information Processing: Implications for Biological Inspired Autonomous Systems, Woods Hole, MA, April 15-17, 2000.
11. "A Compound Nose: Functional Development, Odotopic Mapping, and Behavioral Role of Aesthetasc and Other Sensilla in the Crustacean Antennule", at the Frontiers in Crustacean Neurobiology, Hamburg, Germany, July 9, 1999.
10. Chair and Discussant in Symposium on "How Shall We Measure Stimulus Quality in the Chemical Senses", at the Gordon Research Conference on Chemical Senses, August 18-23, 1996, Newport, Rhode Island.
9. "Mechanisms of detection and discrimination of mixtures in the olfactory system of spiny lobsters," in Session on Chemoreception in Aquatic Organisms, at the 11th International Symposium on Olfaction & Taste, Sapporo, Japan, July 12-16, 1993.
8. "Sensory Coding by Peripheral Olfactory Cells of Invertebrates and Vertebrates", at the 'Workshop on Neurobiology of Vertebrate and Invertebrate Olfactory Systems: A Comparative Analysis', at the 13th Annual Meeting of the Association for Chemoreception Sciences, April 17-21, 1991.
7. "Simple and Complex Odorant Mixtures and the Spiny Lobster", at the 1990 Gordon Conference on Chemical Senses, Plymouth, NH, July 16-20, 1990.
6. "Olfactory processing in the crustacean brain," at the International
5. "Tuning of peripheral and central neurons of crustaceans," at the Symposium on New Directions in Chemoreception in Aquatic Organisms, at the 2nd International Congress of Comparative Physiology and Biochemistry, Baton Rouge, LA, on August 1-4, 1988.
4. "Summary of the International Symposium on Olfaction and Taste: Mixtures and olfactory physiology," at the 9th Annual Meeting of the Association of Chemoreception Sciences, Sarasota, FL, on April 29 - May 3, 1987.
3. "Olfactory discrimination of mixtures: behavioral, electrophysiological, and theoretical studies using the spiny lobster," at the International Symposium, Perception of Complex Smells and Tastes, Sarasota, FL, April 27-29, 1987.
2. "Physiology and functional organization of crustacean sensilla," at the Symposium on Feeding and Grooming Mechanisms in Selected Crustaceans, at the Annual Meeting of the American Society of Zoologists, Baltimore, MD, on December 27-30, 1985.
1. "Chemoreceptor cells in aquatic invertebrates: peripheral mechanisms of chemical signal processing," at the International Conference on Sensory Biology of Aquatic Animals, Sarasota, FL, on June 24-28, 1985.

PROFESSIONAL SOCIETIES

American Association for the Advancement of Sciences

Association for Chemoreception Sciences

The Crustacean Society

Society for Integrative and Comparative Biology

Society for Neuroscience

AWARDS

2000 GSU College of Arts & Sciences Outstanding Faculty Scholarship Award
1994 Georgia State University Outstanding Faculty Achievement Award
1988 Outstanding Paper Award, Journal of Crustacean Biology
1987 Kenji Nakanishi Research Award (for outstanding research in olfaction)
1984 European Chemoreception Res. Organization Travel Award
1982 Postdoctoral Fellowship, Whitney Lab, Univ. of Florida
1982 Outstanding Paper Award, Journal of Crustacean Biology
1982 Belamarich Award (outstanding graduate work in the Dept. of Biology, Boston University)
1979 Sigma Xi Research Fund Award, Boston Univ. Chapter
1979 Boston University Graduate Scholarship Award

PATENTS

1. "Synergistic antimicrobial molecules". Provisional patent # 61/083,790. Filed July 28, 2008
2. "Escapin protein, a broadly antimicrobial compound from ink of the sea hare *Aplysia californica*, and uses thereof." Patent No. US 7,329,517. Issued Feb 12, 2008 (Application No. 11/100,328, filed Apr 6 2005, and Provisional application No. 60/561,115, filed on April 9, 2004)

TEACHING

Courses Taught

Bio 111: Human Anatomy and Physiology I
Bio 112: Human Anatomy and Physiology II
Bio 142: Introductory Biology II (Organisms in their Environment)
Bio 403/603: Neurobiology & Behavior
Bio 493: Undergraduate Topics in Neurobiology
Bio 455/655: Neurobiology I: Cellular & Systems Neurobiology
Bio 3840/7840: Animal Biology
Bio 3850/7850: Animal Biology Laboratory
Bio 4910: Undergraduate Research
Bio 4999/6999: Directed Readings
Bio 4970: Undergraduate Biology Seminar
Bio 8110: Concepts in Neurobiology & Behavior
Bio 8700: Graduate Biology Seminar
Bio 8910: Topics in Biology
Bio 8950: Topics in Neurobiology & Behavior
Bio 8800 Graduate Research
Bio 8999/9999: Dissertation Research
Summer 1996, 1998, 2000, 2002, 2004: "Chemosensory Neurobiology in the Marine Environment". 3-week course at The Bermuda Biological Station for Research. Co-Director with Dr. Hank Trapido-Rosenthal and Tim McClintock.
Fall 2004, 2006, 2008: Lecturer in "Sensory Ecology: An International Course for Postgraduates", at Lund University, Sweden.

Doctoral Students

- Jacqueline Fine-Levy: "Behavioral Discrimination and Neural Coding of the Quality and Intensity of Odorant Mixtures by the Spiny Lobster *Panulirus argus*." Graduated Summer 1991. Current Position: Associate Director of Outlicensing, External Scientific Affairs, Merck Research Laboratories.
- Debbie Wood: "Neural and Hormonal Control of Courtship Display Behavior in the Blue Crab." Graduated Winter 1993. 1st Position: Postdoctoral Fellow with Dr. Ed Arbas, Division of Neurobiology, University of Arizona (with Individual NIH National Research Service Award Postdoctoral Fellowship). Current Position: Assistant Professor at Case Western University.
- David Blaustein: "Neuroanatomy of the Olfactory Pathway of Crustaceans." Graduated Winter 1993. Present Position: Academic Professional, Dept. of Biology, Georgia State University.
- Michele Burgess: "The Biochemical and Physiological Characterization of Olfactory L-Glutamate Receptors in the Olfactory Organ of the Spiny Lobster." Graduate Summer 1996. 1st Position: Post-doctoral Fellow with Dr. Steve Traynelis, Dept. of Pharmacology, Emory University.
- Min Zhang Levine: "Molecular Cloning and Characterization of Proteins in the Olfactory Organ of the Spiny Lobster". Graduated Fall 2000. 1st Position: Postdoc at CDC.
- Holly Cate: "Parallel Chemosensory Pathways in the Antennules of the Caribbean Spiny Lobster *Panulirus argus*: Structure and Function of Chemosensilla". Graduated Spring 2001. Current Position: Research Scientist, Howard Florey Institute, Sydney, Australia.
- P. M. Johnson (joint student with University of Washington): "Multi-Component Chemical Defense in Seahares (Gastropods: Opisthobranchia): Antipredator Compounds Act as Both Honest and Deceptive Signals to Multiple Predator Species". Graduated Summer 2002. Current Position: Special Agent, FBI
- Amy Horner: "Dual Antennular Chemosensory Pathways in Caribbean Spiny Lobster, *Panulirus argus*." Graduated Fall 2006. Current Position: Lecturer, GSU
- Shkelzen Shabani: "The Role of Chemical Senses in Predation, Risk Assessment, and Social Behavior of Spiny Lobsters". Graduated Fall 2008. 1st Position: Postdoc at Oregon Health & Science University.
- Ko-Chun Ko: Started in program in Fall 2004: "Characterization of bactericidal mechanisms of escapin, a protein in the ink of sea hares"
- Tizeta Tadesse: Started in program in Summer 2005: "Molecular and Cellular Control of Neurogenesis and Regeneration in Adult Nervous Systems"
- Matthew Nusnbaum: Started in Fall 2005: "Identification of chemical defenses of *Aplysia californica* and sensory processing by predatory fishes"

Masters Students

- Dae-Yong Sung: "Identification and Partial Characterization of Putative Taurine Receptor Proteins From the Olfactory Organ of the Spiny Lobster." Graduated Summer 1995.
- Sandra Levitt: "Electroreception in Crayfish". Graduated 1995.
- Lisa Gentilcore: "Neural Coding of Complex Odorant Mixtures in the Spiny Lobster, *Panulirus*

argus." Graduated Spring 1997.
Huijie Liu: Thesis Title: "Molecular Cloning of Genes from the Olfactory Organ of the Spiny Lobster *Panulirus argus*: Homologs of *hairy*, *atonal*, *cytochrome P450*, and *cyclophilin A*. Graduated Fall 2003.
Malcolm Johns: "Proteases in the olfactory organ: serine- and other proteases are functionally expressed and have a developmental axis in the spiny lobster *Panulirus argus*". Graduated Summer 2005.
Kerry Maxwell: "The Use of Lipofuscin for Aging Caribbean Spiny lobsters, *Panulirus argus*". Graduated Spring 2006. Current Position: Scientist, Florida Fish and Wildlife Commission

Postdoctoral Fellows and Research Scientists

Dr. Marie-Nadia Girardot 1986-1988.
Present Position: Director of Research, Biomedical Research Inc., Atlanta, GA
Dr. Peter Daniel 1986-1990.
Present Position: Associate Professor, Dept. of Biology, Hofstra University
Dr. Ted Simon 1991-1992.
Present Position: Toxicologist at U.S. Environmental Protection Agency.
Dr. Kirby Olson 1991-1993.
1st Position: Specialist at Georgia Environment Protection Division
Dr. Andrew Livermore 1993-1995.
1st Position: Assistant Professor, Charles Sturt University, Bathurst, Australia.
Current Position: North American Region Manager, Sensory & Consumer Insights, International Flavors & Fragrances Inc.
Dr. Marc Weissburg 1992-1996.
Present Position: Associate Professor, Georgia Institute of Technology.
Dr. Stuart Cromarty 1995-1997.
Present Position: Associate Professor, Assumption College, MA
Dr. Marion McClary 1997-1998.
Present Position: Associate Professor, Fairleigh-Dickinson University.
Dr. Pascal Steullet: 1994-2000.
Present Position: Research Scientist, Center for Research in Psychiatric Neuroscience, University of Lausanne, Switzerland.
Dr. Paul Harrison: 1998-2001.
Present Position: Managing Director and R&D Manager, Mainstream Aquaculture Pty Ltd, Sydney, Australia
Dr. Holly Cate: 2001.
Present Position: Research Scientist, Howard Florey Institute, Sydney, Australia.
Dr. P.M. Johnson: 2002-2003.
Present Position: Special Agent, FBI
Dr. Cynthia Kicklighter: 2003-2006
Present Position: Assistant Professor, Goucher College, Maryland
Dr. Hsin Chien: 2003-2007

Present Position: Postdoctoral Fellow with Dr. Richard Dix, Biology, GSU
Dr. Manfred Schmidt: 2002-present
Dr. Michiya Kamio: 2003-present
Dr. Juan Aggio: 2006-present

SERVICE

Department of Biology, GSU

1985-1991, 1993, 1998-2000 Executive Committee
1985-1998 Graduate Committee
1985-1988 Curriculum Committee
1991-1993 Graduate Director
1993-1998 Program Advisor, Neurobiology Program
1998-2000 Associate Chair

College of Arts & Sciences, GSU

1987-1989 Pre-Medical Advisory Committee
1994-1996 Chair, Pre-Medical Advisory Committee
1988-1991 Graduate Council
2000-present Associate Dean of Natural & Computational Sciences, College of Arts & Sciences

University

1993-2008 University Faculty Senate
1993-1994 Vice-Chair of the Committee for Research, University Senate
1993-1994 Chair of Subcommittee for Review of Centers, Committee for Research, Univ Senate
1994-1998 Chair of Committee for Research, University Senate
1996 Ad hoc Committee to Review the VP for Research
1996 Committee for Re-accreditation by the Southern Assoc. Colleges & Schools
1995-1996 Chair of Ad Hoc Committee to Review the Research Office and Search Committee
for Associate Vice-President for Research and Technology
1998-1999 Member of the Fiscal Advisory Committee to the President
1999-2000 Member of Search Committee for Vice-Pres for Research & Sponsored Programs

Journal Editing

2006-present Member of the Advisory Board of *Arthropod Structure & Development*
1996-present Associate Editor of *The Biological Bulletin*

NIH Study Sections

2006-2009 Member of NIH CDRC Study Section (Oct 2007, June 2008, Feb 2009)
2000- 2002 Member of NIH R03 Study Section (Council ZDC1 SRB-030S)
2002 Member of NIH R21 Study Section (Council ZDC1 SRB-S07)

NSF Study Sections

Member of the NSF Panel: IOS/BIO Neural Systems Cluster, Activation Panel, Oct. 22-24, 2007

Scientific Societies and Conferences

- 2008 Organizer and Chair of Symposium on “Neuroecology of Chemoreception”, at the 2008 International Symposium on Olfaction & Taste, July 21-26, 2008, San Francisco, CA
- 2004-7 President-Elect, President, Past President, and Senior Advisor of the Association for Chemoreception Sciences
- 2003 Chair of the 25th Annual Meeting of the Association for Chemoreception Sciences
- 1990, 2001-2007 Organizing Committee for the Annual Meeting of the Association for Chemoreception Sciences
- 1991 Organizing Committee for Annual Meeting of the American Society of Zoologists
- 1993-1996 Secretary of the Association of Chemoreception Sciences
- 1999 Local Organizing Committee for the Annual Meeting of the Society for Integrative & Comparative Biology

Other

- 1997-2000 Advisory Committee for Spelman College’s Research Infrastructure for Minority Institutions Program