

SHERYL COOMBS

Title: Professor of Hearing Sciences Current as of: 9/30/02

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Loyola University of Chicago
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Place of Birth: Boulder, Colorado

Research Interests: Sensory biology with primary focus on comparative studies of vertebrate hair cell systems. Neurophysiological, behavioral, anatomical and computational modeling techniques are applied to questions of how the nervous system extracts information about various stimulus features (e.g. the size, location and distance of prey) and how complex, natural behaviors (e.g. prey capture behavior) are guided by multiple sensory systems (e.g. auditory and lateral line).

Professional Experience

1997 – Present: Professor of Hearing Sciences, Parmly Hearing Institute
1992 - 1997: Research Professor, Parmly Hearing Institute
1988 - 1991: Research Associate Professor, Parmly Hearing Institute.
1983 - 1988: Research Assistant Professor, Parmly Hearing Institute
1981 - 1983: Postdoctoral Associate, Parmly Hearing Institute.
1975 - 1980: Doctoral Candidate, Department of Zoology, University of Hawaii and
Department of Anatomy, Georgetown University.
1972 - 1975: Research Associate, Kresge Hearing Research Institute, University of
Michigan Medical Center.
1970 - 1972: Research Assistant, Kresge Hearing Research Institute

Education: B.S. (Biology), 1969, University of Michigan, Ann Arbor, Michigan
Ph.D. (Zoology), 1980, University of Hawaii, Honolulu, Hawaii

Teaching Interests: Sensory Physiology, Sensory Ecology, Neurobiology, Neuroethology,
Neuroendocrinology, Biology of Gender Differences

Teaching Experience

University of Illinois

Guest lecturer, The Biology of the Brain, Department of Biological Sciences (1993)

Loyola University of Chicago

Lab in Neuroscience (NS 301, 302)(1998-Present)

Course Coordinator, Interdisciplinary Neuroscience Minor (1998-2000)

Seminar in Neuroscience (NS 300)(1998-2000)

Directed Reading in Neurobiology (Bio 493)(1989, 1995)
Directed Research (Bio 422)(1989, 1996-1997)
Sensory Processing (Psych 421) (1988)
Neuroendocrinology (Bio 395/495)(1985)
Lab in Biopsychology-Neurophysiology (Psych 311), (1983-1984)
Neurobiology (Bio 395/495) (1983)
Animal Behavior (Bio 320/Anth 350)(1983)

Graduate and Postdoctoral Students:

Jia Cuihong, M.S. (2000 - 2002), "Organization of lateral line information in the hindbrain of the clawed frog, *Xenopus laevis*"
Chris Braun, Postdoctoral (1997 - 2001), "Behavioral assessment of lateral line function in ecologically diverse species"
Max Kanter, M.S. (1999 - 2000), "Lateral-line mediated detection of artificial prey in the presence of background flow by Lake Michigan mottled sculpin (*Cottus bairdi*)."
Julie Abboud, M.S. (1996 - 1998), "Mechanosensory control of head posture during prey capture in the mottled sculpin, *Cottus bairdi*."
Ruth Conley, Postdoctoral (1994-1997), "Dipole source localization by mottled sculpin"

Membership in Learned and Professional Societies

Acoustical Society of America
American Association for the Advancement of Science
American Society of Ichthyologists and Herpetologists
Association for Research in Otolaryngology
International Society for Neuroethology
JB Johnston Club
Sigma Xi
Society for Integrative and Comparative Biology
Society for Neuroscience

Grant Support

1985 - 2003: NIH Program Project "Information processing by the auditory system", William Yost, P.I., Sheryl Coombs, Toby Dye, Dick Fay, and William Shofner, Co-PI's. Total Award (last 5-year period): \$5,961,675
1994 - 1997: ONR grant "Localization of low frequency, hydrodynamic sources by Fish", S. Coombs, P.I., Ruth Conley and John Montgomery, Co-P.I.'s. Total Award (3 years): \$247,537
1989 - 1991: NSF Grant "Use of the Lateral Line for Foraging in Antarctic Notothenioid Fishes", John Janssen, P.I. and Sheryl Coombs, Co-PI. Total Award (3 years): \$153,540
1987 - 1988: NSF (\$10,170) and ONR (\$12,344) conference grants for "Neurobiology and Evolution of the Lateral Line System," Sheryl Coombs, P.I.
1984 - 1985: NIH grant "Sensory Processing in a Vertebrate Hair Cell System", Sheryl Coombs, P.I. and John Janssen, Co-PI. (3 year grant refunded after two months as part of the program project grant above) Total Award (3 years): \$151,434
1982 - 1985: NIH grant "Temporal Mechanisms in Acoustic Processing", Sheryl Coombs, P.I. Total Award (3 years): \$49,816

1981 - 1983: NSF grant "Neural Mechanisms of Directional Hearing", Richard R. Fay, P.I., Sheryl Coombs, Co-PI. Total Award (3 years): \$174,956
1977 - 1980: NIH Predoctoral Fellowship

Extramural Service

Treasurer, International Society for Neuroethology (1998 - Present)
Editorial Board, *Brain, Behavior and Evolution* (1994-present)
Education Committee, Animal Care Committee, Association for Research in Otolaryngology, (1995-1997)
Chair, Long Range Planning Committee, Association for Research in Otolaryngology (1991-1993)
Council Member at Large, Association for Research in Otolaryngology (1990-1993)
Chair, Sponsors and Exhibits Committee, Association for Research in Otolaryngology (1989-1990)
Judge, Outstanding Young Scientist Competition, Museum of Science and Industry (1986-1993)
Scientists and Schools Steering Committee, Museum of Science and Industry (1982-1989)
Ad Hoc Reviewer for: Journal of the Acoustical Society of America, Journal of Experimental Biology, Copeia, Journal of the Marine Biological Association, Journal of Comparative Physiology, NSF and NIH.

Intramural Service

Editorial Board Member, Neuroscience and Aging Institute Newsletter (2002 - present)
Chair, Lab Safety and Animal Care Committee, Parmly Hearing Institute (1993 - present).
Advisory Board Member, Interdisciplinary Neuroscience Minor (1997 - present)
Chair, BioSafety Proposal Committee, Research Services (1999- 2000)
Program Review Committee, Council of Graduate School Programs (1999 - 2000)
Advisory Board Member, Interdisciplinary Neuroscience Minor (1997 - present)
Chair, Lab Safety and Animal Care Committee, Parmly Hearing Institute (1993 - present).
Chair, Faculty-Student Advisory Committee, Parmly Hearing Institute (1997 - 1998)
Institutional Animal Care and Use Committee (1993 - 1999).
Accreditation Review Committee (1994-1995)

Publications

Kanter, M. and Coombs, S. (In Press). Rheotaxis and prey detection in uniform currents by Lake Michigan mottled sculpin (*Cottus bairdi*). *J. Exp. Biol.*
Coombs, S. and Braun, C.B. (2003). Information processing by the lateral line. In: *Sensory Processing of the Aquatic Environment* (S.P. Collin and N.J. Marshall, eds.) Springer-Verlag, N.Y. p. 122-138.
Coombs, S., New, JG, and Nelson, M. (In press). Information-processing demands in electrosensory and mechanosensory lateral line systems. *J. Physiol.*
Coombs, S. and JG New (2002) Multimodal Sensory Guidance of Complex Behaviors. Guest Editors on special issue of *Brain, Behav. Evol.* 59
Braun, CB, Coombs, S. and Fay, RR (2002). What is the nature of multisensory interaction between octavolateralis sub-systems? *Brain, Beh. Evol.* 59: 162-176

- Nelson, MA, MacIver, ME. and Coombs, S (2002). Modeling electrosensory and mechanosensory images during the predatory behavior of weakly electric fish. *Brain, Beh. Evol.* 59: 199 - 210.
- Coombs, S. (2002). Imaging of the hydrodynamic environment by the peripheral lateral line system. *Bioacoustics* 12: 148 - 151.
- Coombs, S. (2001). Smart Skins: Information processing by the lateral line system. *Autonomous Robots* 11: 255-261
- Coombs, S, Braun, C.B. and Donovan, B. (2001). Orienting response of Lake Michigan mottled sculpin is mediated by canal neuromasts. *J. Exp. Biol.* 204: 337-348
- Montgomery, J.C., S. Coombs and C.F. Baker (2001). The mechanosensory lateral line of hypogean fish. *Biology of Hypogean Fishes Special Issue, Guest Editor Dr. Aldemaro Romero Environ. Biol. Fishes* 62: 87-96
- Abbound, J.A. and S. Coombs (2000). Mechanosensory based orientation to elevated prey by a benthic fish. *Mar. Freshwater Behav. Physiol.* 33: 261-279
- Braun, C.B. & Coombs, S. (2000). The overlapping roles of the inner ear and lateral line: the active space of dipole source detection. *Phil. Trans. Roy. Soc. Lond.* 355: 1115-1119
- Coombs, S, J. Finneran and R.A. Conley (2000). Hydrodynamic imaging by the lateral line system of the Lake Michigan mottled sculpin. *Phil. Trans. Roy. Soc. Lond.* 355: 1111-1114
- Coombs, S. (1999) Signal detection theory, lateral line excitation patterns and prey capture behavior of the mottled sculpin. *Anim. Behav.* 58(2), 421-430.
- Coombs, S. and J.C. Montgomery (1999). The enigmatic lateral line system. In: *Comparative Hearing: Fishes and Amphibians*. (A.N. Popper and R.R. Fay, eds.) *Springer Handbook of Auditory Research*, V. 11: 319-362, Springer-Verlag, N.Y.
- Conley, R.A. and S. Coombs (1998). Dipole source localization by mottled sculpin. III. Orientation after site-specific, unilateral blockage of the lateral line system. *J. Comp. Physiol.* 183: 335-344
- Coombs, S, J. Mogdans, M. Halstead and J. Montgomery (1998). Transformations of peripheral inputs by the first order brainstem nucleus of the lateral line system. *J. Comp. Physiol.* 182: 609-626
- Montgomery, J.C. and S. Coombs (1998). Peripheral encoding of moving sources by the lateral line system of a sit-and-wait predator. *J. Exp. Biol.* 201(1): 91-102.
- Coombs, S. and R.A. Conley (1997). Dipole source localization by mottled sculpin. I. Approach strategies. *J. Comp. Physiol.* 180:387-399.
- Coombs, S. and R.A. Conley (1997). Dipole source localization by mottled sculpin. II. The role of lateral line excitation patterns. *J. Comp. Physiol.* 180:401-415.
- New, J.G., Coombs, S, McCormick, C.A. and Oshel, P. (1996) The cytoarchitecture and internal organization of the medial octavolateralis nucleus in the goldfish, *Carassius auratus*. *J. Comp. Neurol.* 364: 1-13.
- Coombs, S., M. Hastings and J. Finneran (1996). Measuring and modeling lateral line excitation patterns to changing dipole source locations. *J. Comp. Physiol.* 178: 359-371.
- Montgomery, J., Coombs, S. and M. Halstead (1995). Biology of the Mechanosensory Lateral Line in Fishes. *Rev. Fish Biol. & Fisheries* 5: 399-416
- Coombs, S. (1995). Natural orienting behaviors for measuring lateral line function. In: *Methods in Comparative Psychoacoustics* (R. Dooling, R.R. Fay, G. Klump and W.C. Stebbins, eds). Birkhauser. 237-248.
- Montgomery, J., Coombs, S., Conley, R.A. and Bodznick, D. (1995). Hindbrain sensory processing in lateral line, electrosensory and auditory systems: A comparative overview

- of anatomical and functional similarities. *Audit. Neurosci.* 1: 207-231.
- Coombs, S. and Montgomery, J. (1994). Structural diversity in the lateral line system of antarctic fish: Adaptive or non-adaptive? *Sensory Systems* 8: 150-155.
- Coombs, S. and Montgomery, J. (1994). Evolution and function of superficial neuromasts in the antarctic notothenioid, *Trematomus bernacchii*. *Brain, Behavior & Evolution* 44: 287-298.
- Montgomery, J., S. Coombs and J. Janssen (1994). Form and function relationships in the lateral line system: Comparative data from six species of antarctic notothenioid fish. *Brain, Behavior & Evolution* 44: 299-306.
- Coombs, S. (1994). Nearfield detection of dipole sources by the goldfish, *Carassius auratus*, and mottled sculpin, *Cottus bairdi*. *J. Exp. Biol.* 190: 109-129
- Coombs, S., J. Montgomery and R. Conley (1994). Brainstem organization and function in the lateral line, electrosensory and auditory systems. In: *Contributions of electrosensory systems to neurobiology and neuroethology: Proceedings of a conference in honor of the scientific career of Thomas Szabo*. *J. Comp. Physiol.* 173(6): 682-683
- Coombs, S. and R.R. Fay (1993). Source level discrimination by the lateral line system of the mottled sculpin. *J. Acous. Soc. Am.* 93: 2116-2123.
- Fay, R. and Coombs, S. (1992). Psychometric functions for intensity discrimination in the goldfish (*Carassius auratus*): Psychophysics and Neurophysiology. *J. Acoust. Soc. Am.* 92: 189-201
- Coombs, S. and J. Montgomery (1992). Fibers innervating different parts of the lateral line system of the Antarctic fish, *Trematomus bernacchii*, have similar neural responses despite large variations in peripheral morphology. *Brain, Behavior & Evolution* 40:217-233.
- Montgomery, J. and S. Coombs (1992). Physiological characterization of lateral line function in the Antarctic fish, *Trematomus bernacchii*. *Brain, Behavior & Evolution* 40: -216.
- Coombs, S., J. Janssen and J. Montgomery (1991). Functional and evolutionary implications of peripheral diversity in lateral line systems. In: *The Evolution of Hearing* (D. Webster, A.N. Popper and R.R. Fay, eds.) Springer-Verlag, N.Y.
- Coombs, S. and J. Janssen (1990). Behavioral and neurophysiological assessment of lateral line sensitivity in the mottled sculpin, *Cottus bairdi*. *J. Comp. Physiol. A.* 167: 557-567
- Janssen, J., Coombs, S. and Pride, S. (1990). Feeding and orientation of mottled sculpin, *Cottus bairdi*, to water jets. *Environmental Biology of Fishes* 29: 43-50.
- Coombs, S. and J. Janssen (1990). Water Flow Detection by the Mechanosensory Lateral Line. In: *Comparative Perception*. (W.C. Stebbins and M. Berkley, eds). John Wiley and Sons.
- Coombs, S. and R.R. Fay (1989). The temporal evolution of masking and frequency selectivity in the goldfish (*Carassius auratus*). *J. Acous. Soc. Am.* 86: 925-933
- Coombs, S., R.R. Fay and J. Janssen (1989). Hot film anemometry for measuring lateral line stimuli. *J. Acoust. Soc. Am.* 85: 2185-2193.
- Coombs, S., P. Görner and H. Münz (eds) (1989). *The Mechanosensory Lateral Line: Neurobiology and Evolution*. Springer-Verlag, N.Y.
- Coombs, S. and J. Janssen (1989). Peripheral processing by the lateral line system of the mottled sculpin, *Cottus bairdi*. In: *The Mechanosensory Lateral Line: Neurobiology and Evolution*. (S. Coombs, P. Görner, H. Münz, eds). Springer Verlag, N.Y.
- Fay, R.R. and Coombs, S. (1988). Psychophysics and neurophysiology of frequency selectivity and masking in the goldfish. In: *Basic Issues in Hearing*. (H. Duifhuis, W. Horst, and H. Wit, eds). Groningen University Press: Groningen, The Netherlands

- Coombs, S., J. Janssen and J. Webb (1988). Diversity of lateral line systems: evolutionary and functional considerations. In: *Sensory Biology of Aquatic Animals* (J. Atema, R.R. Fay, A.N. Popper and W. N. Tavolga, eds.) pp. 553-594, Springer Verlag, N.Y.
- Janssen, J. Coombs, S., Hoekstra, D. and Platt, C. (1987) Postembryonic growth and anatomy of the lateral line system in the mottled sculpin, *Cottus bairdi* (Scorpaeniformes: Cottidae). *Brain, Behav. Evol.* 30: 210-229.
- Coombs, S. and R.R. Fay (1987). Response dynamics of goldfish saccular fibers: Effects of stimulus frequency and intensity on fibers with different tuning, sensitivity and spontaneous activity. *J. Acous. So. Am.* 81:1025-1035.
- Coombs, S. and R. Fay (1985). Adaptation effects on the detection of amplitude modulation: Neurophysiological and behavioral assessment in the goldfish auditory system. *Hear. Res.* 19: 57-71
- Stebbins, W.C., Coombs, S. and Prosen, C. (1984) Comparative Psychoacoustics: New directions. In: *Recent Advances: Hearing Sciences* (C. Berlin, ed.) College Hill Press, San Diego
- Fay, R.R., Yost, W.A. and Coombs, S. (1983) Psychophysics and neurophysiology of repetition noise processing in a vertebrate auditory system. *Hear. Res.* 12: 31-55
- Fay, R.R. and Coombs, S. (1983). Neural mechanisms in sound detection and temporal summation. *Hear. Res.* 10: 69-92
- Coombs, S. and Popper, A.N. (1982). Structure and function of the auditory system in the clown knifefish, *Notopterus chitala*. *J. Exp. Biol.* 97: 225-239
- Coombs, S. and Popper, A.N. (1982) Comparative frequency selectivity in fishes: Simultaneous and forward masked psychophysical tuning curves. *J. Acoust. Soc. Am.* 71(1): 133-141
- Popper, A.N. and Coombs, S. (1982). The morphology and evolution of the ear in Actinopterygian fishes. *Am. Zool.* 22: 311-328
- Coombs, S. (1981). Interspecific differences in hearing capabilities for select teleost species. In: *Hearing and Sound Communication in Fishes*. (Tavolga, W.N.; Popper, A.N.; and Fay, R.R.; eds.) Springer-Verlag, New York.
- Popper, A.N., and Coombs, S. (1980) Acoustic detection in fish. In *Environmental Physiology of Fishes*. (M. Ali, ed.) Plenum Press, New York.
- Popper, A.N. and Coombs, S. (1980). Auditory mechanisms in teleost fishes. *Am. Sci.* 68(4): 429-440.
- Coombs, S. and Popper, A.N. (1979). Hearing differences among Hawaiian squirrelfish (family Holocentridae) related to differences in the peripheral auditory system. *J. Comp. Physiol.* 132A: 203-207.
- Hawkins, J.E. Jr., Johnsson, L-G., Stebbins, W.C., Moody, D.B., and Coombs, S. (1976) Hearing loss and cochlear pathology in monkeys after noise exposure. *Acta Otolaryngol.* 81: 337-343.
- Stebbins, W.C., and Coombs, S. (1975). Behavioral assessment of ototoxicity in nonhuman primates. In *Behavioral Toxicology* (B. Weiss and V.G. Laties, eds.) Plenum Press, New York.

Conferences and Symposia Organized

- Symposium on “*Multimodal sensory guidance of complex behaviors*”, August 2001, International Society for Neuroethology Congress, Bonn, Germany (with J. New).
- Symposium on “*A comparative approach to understanding brainstem processing in*

octavolateralis systems", Association for Otorhinolaryngology, February 1994, Sarasota, Fla.

Conference on "*The neurobiology and evolution of the lateral line system*", September 1987, Bielefeld, Germany (with P. Görner and H. Münz).

Invited Presentations

- Coombs, S. Information processing by electrosensory and mechanosensory lateral line systems. Neurobiology of Electrosensory Organisms, Bonn Germany, July 2001
- Coombs, S. Imaging of the hydrodynamic environment by the peripheral lateral line system. Fish Bioacoustics: Sensory Biology, Behavior and Practical Applications, Evanston, Il., May 2001
- Coombs, S. Smart skins: Information processing by the lateral line system of fish. NASA Workshop on Biomorph Robotics, Jet Propulsion Lab, NASA, Pasadena, Ca., August 2000.
- Coombs, S. Touch at a distance: How fish use their lateral line sensory system, Warnell School of Forest Resources, University of Georgia, Athens, GA, June 2000
- Coombs, S. Hydrodynamic imaging by the lateral line system, Tenth International Conference on Perception and Action, Edinburgh University, Scotland, August 1999
- Coombs, S. The ebb and flow of lateral line research (1988-1998). First International Conference on Sensory Biology of the Aquatic Environment, Heron Island, The Great Barrier Reef, Australia, March 1999
- Coombs, S. The lateral line and free neuromast system: Structure and Function. Workshop on *Using sound to modify fish behavior at power-production and water-control facilities*. Portland State University, Portland, Or. Dec. 1995
- Coombs, S. Behavior and neurobiology of the lateral line system. School of Biological Sciences, University of Kentucky, Lexington, Ky. April 1995
- Coombs, S. The neurobiology of the lateral line system: Anatomy, physiology and behavior. University of Maryland, College Park, Maryland. March 1995
- Coombs, S. Anatomy, function and evolution of the lateral line system. Marine Biological Laboratory, Boston University Marine Program, Woods Hole, Massachusetts. April 1994
- Coombs, S. Recent physiological and behavioral studies of lateral line function in Antarctic and North American fishes. U.S. - Russian Meeting on Sensory Biology. University of Maryland, College Park, Maryland. September 1993
- Coombs, S. Lateral line function in a monophyletic radiation of antarctic fish. Oberlin College, Oberlin, Ohio. April 1993
- Coombs, S. Structure and function in the lateral line system of fish. Kresge Hearing Institute, University of Michigan, Ann Arbor, Jan. 1993
- Coombs, S. Understanding brainstem organization and function in the lateral line system: Lessons from electrosensory systems. Conference on Contributions of Electrosensory Systems to Neurobiology and Neuroethology. Montreal, Canada. Aug. 1992
- Coombs, S. The neurobiology of the lateral line system in antarctic fish. Department of Cell Biology, Neurobiology and Anatomy, Medical School. Loyola University of Chicago. April 1991
- Coombs, S, J. Janssen and J. Montgomery. Functional and evolutionary implications of peripheral diversity in lateral line systems. Conference on The Evolutionary Biology of Hearing. Mote Marine Lab, Sarasota, Fla. May 1990.

- Coombs, S. Comparative neurobiology of fish lateral line systems. Department of Biology, Colorado State University. January 1990.
- Coombs, S. The octavolateralis system of fishes. Symposium on New Perspectives on Animal Psychophysics. Association for Research in Otolaryngology. St. Petersburg, Fla. Feb., 1989
- Janssen, J. and S. Coombs. Functional changes in the lateral line during development. Functional Development of Sensory Systems and Acquisition of Behavior in Larval Fishes. American Society of Ichthyologists and Herpetologists, June 1988.
- Coombs, S. Lateral Line Function in the Lake Michigan Mottled Sculpin. Department of Biological Sciences, University of Illinois. January 1988
- Coombs, S. Sensory Adaptation in the Peripheral Auditory System of the Goldfish: Possible Mechanisms and Functions. Biology Department, Boston University. March 1986
- Coombs, S., Janssen, J. and Webb, J. Diversity of lateral line systems: phylogenetic, ecological and functional considerations. International conference on Sensory Biology of Aquatic Animals. Mote Marine Laboratory, Sarasota, Florida. June 1985
- Coombs, S. What the fish ear tells us about vertebrate auditory processing. Symposium on Comparative Hearing. Association for Research in Otolaryngology. Clearwater, Fla., Feb., 1985
- Coombs, S. Acoustic processing by water-logged ears: a fishy tale. Department of Psychology, University of Michigan. April 1984
- Coombs, S. Sensory ecology of fishes: "Herring Aids". Department of Ecology, Ethology and Evolutionary Biology University of Illinois. March 1984
- Coombs, S. Neurobiology of fish hearing. Dept. of Psychology, State University of New York at Stony Brook. March 1984.
- Coombs, S. Neurobiology of fish hearing. Communicative Disorders Research Conference. Loyola University Medical Center. Maywood, Il. June 1983
- Coombs, S. Comparative neurobiology of fish auditory systems and its implications for acoustic behaviors. Symposium on Physiological Basis of Behavior. Fourth Biennial Conference on Ethology & Behavioral Ecology of Fishes. May, 1983.
- Coombs, S. Comparative neurobiology of fish auditory systems. Biology Department Seminars, Bowdoin College, Brunswick, ME. March, 1983.
- Coombs, S. Comparative studies of fish hearing. Biology Departmental Seminars, Loyola University of Chicago, Sept. 1982.
- Coombs, S. Comparative studies of fish hearing. Psychology Departmental Seminars, Cornell University, Ithaca, NY. Feb., 1982.
- Coombs, S. A comparative look at water-logged ears: a fishy sounding story. University of Chicago's Evolutionary Morphology Group Seminar Series. Dec, 1981.
- Popper, A.N., and Coombs, S. The morphology and evolution of the ear in Actinopterygian fishes. American Society of Zoologists Symposium on Evolutionary Morphology of Actinopterygian Fishes. Dec., 1980.
- Popper, A.N., and Coombs, S. Acoustic detection in fish. NATO Symposium on Environmental Physiology. Lennoxville, Quebec, Aug., 1979.
- Coombs, S. C.. Acoustic processing in some water-logged vertebrates. Eaton Peabody Laboratory at Massachusetts Eye and Ear Infirmary. M.I.T., Cambridge, Massachusetts. April, 1979

Abstracts and Contributed Presentations

- Cuihong, J., Braun C.B. and Coombs, S. (2002). Hindbrain termination sites of lateral line nerve fibers from oppositely oriented hair cells in the clawed frog, *Xenopus laevis*. Neurosci. Abst.
- Coombs, S. and Grossman, G.D. (2001). Mechanosensory-based rheotactic behaviors in fluvial and lacustrine populations of mottled sculpin (*Cottus bairdi*). *Proceedings of the 6th International Congress of Neuroethology*, Bonn, Germany, August 2001
- Fay, R.R., S. Coombs and A. Elepfandt (2001). Response of Goldfish Otolithic Afferents to a Moving Dipole Sound Source. *Bioacoustics*
- Coombs, S., Anderson, E.J., Braun, C.B. and Grosenbaugh, M.A. (2001). How fish body parts alter local hydrodynamic stimuli to the lateral line. *SICB Abstracts*, p. 149.
- Kanter, M. and Coombs, S. (2000). Lateral-line mediated detection of artificial prey in the presence of background flow by Lake Michigan mottled sculpin (*Cottus bairdi*). Neurosci. Abst. (Program 55.7) 26: 146
- Coombs, S. and Braun, C.B. (2000). Canal neuromasts mediate orientation to prey in Lake Michigan mottled sculpin. Neurosci. Abst.
- Coombs, S. and Finneran, J. A. (2000). 3-D models of lateral line excitation patterns during prey acquisition by Lake Michigan mottled sculpin. *J. Acoust. Soc. Am. Suppl.* 107(5): 2786.
- Simmons, A.M. and Coombs, S. (2000). Pressure and pressure-gradient sensitivity of the tadpole medulla. *J. Acoust. Soc. Am. Suppl.* 107(5): 2835
- Abboud, J. A. and S. Coombs (1999) The role of the lateral line system in controlling vertical head posture during prey capture behavior by mottled sculpin. 79th Annual Meeting of the American Society of Ichthyologists and Herpetologists, Pennsylvania State University State College, June 1999.
- Braun, C.B. and S. Coombs (1999) The distance range of inner ear and lateral line function in mottled sculpin. Neurosci. Abst. 25: 131.
- Coombs, S., Braun, C.B. and Donovan, B. (1998) The role of lateral line canal neuromasts in prey capture behavior by the mottled sculpin. *Proceedings of the 5th International Congress of Neuroethology*. San Diego, Ca. Aug. 1998
- Abboud, J. and Coombs, S. (1998) Mechanosensory control of vertical head posture during prey capture behavior by mottled sculpin. *Proceedings of the 5th International Congress of Neuroethology*. San Diego, Ca. Aug. 1998
- Braun, C.B. and Coombs, S. (1998) A comparison of ethological and psychological approaches to the study of lateral line function. *Proceedings of the 5th International Congress of Neuroethology*. San Diego, Ca. Aug. 1998
- Conley, R.A. and Coombs, S. (1998). Unilateral denervation of the lateral line system alters angular striking accuracy and distance determination in the prey strike behavior of mottled sculpin. *Proceedings of the 5th International Congress of Neuroethology*. San Diego, Ca. Aug. 1998
- Coombs, S. (1998). Distance Range of Mottled Sculpin Lateral Line System. Association for Research in Otolaryngology, St. Petersburg Beach, Fla. Feb. 1998
- Coombs, S. and R.R.Fay (1997). Encoding of dipole near fields by the goldfish auditory system. Neurosci. Abst. 23(1): 179.
- Coombs, S., J. Mogdans, M. Halstead, and J. Montgomery (1997). Responses of cells in the first-order lateral line brainstem nucleus suggest rudimentary amplitude and phase-encoding pathways. Association for Research in Otolaryngology, St. Petersburg Beach, Fla. Feb. 1997
- Conley, R. and S. Coombs (1997). Spatial excitation patterns, not bilateral computations, are

- important for source localization by the lateral line system. Association for Research in Otolaryngology, St. Petersburg Beach, Fla. Feb. 1997
- Alborg, L. , S. Coombs and J.G. New (1996). Strike behavior in the muskellunge, *Esox masquinongy*: Relative contributions of lateral line and visual sensory systems. Neurosci. Abstr. 22: 446
- Coombs, S. (1996). Interpore spacings on canals may determine distance range of lateral line system. Soc. Neurosci. Abstr. 22: 1819
- Conley, R.A. and Coombs, S. (1996). The use and misuse of lateral line excitation patterns in determining source location by the mottled sculpin. Association for Research in Otolaryngology, St. Petersburg Beach, Fla. Feb. 1996
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