

Curriculum Vitae

1. Personal Information

a. UID, Last Name, First Name, Contact Information

100844719, Yager, David, 2123L Biology-Psychology Bldg., Ph: 301-405-7228,
ddyager@umd.edu

b. Current Academic Appointment

Department of Psychology, Associate Professor, 1997

c. Other Academic Appointments while at UMD

Department of Biology, Affiliate Associate Professor, 1997

d. Educational Background

Wesleyan University. B.A. 1972. Biology.

University of Michigan Medical School. 1972-1976. Graduate studies in human anatomy, physiology, pathology, neurobiology.

Cornell University. Ph.D. 1989. Neurobiology and Behavior. Advisors: Robert R. Capranica and Ronald R. Hoy.

2. Research, Scholarly and Creative Activities

a. Books (include full citation information)

i. Book Chapters (include page numbers)

Yager, D.D. (1996) Sound production and acoustic communication in *Xenopus borealis*. In: *The Biology of Xenopus*. Symposia of the Zoological Society of London No. 67. (Tinsley, R.C. and Kobel, H.R., eds.) Oxford: Oxford University Press. pp. 121-142

Yager, D. D. (1999) Sensory processes: Hearing. In: *The Praying Mantids: Research Perspectives*. (Prete, F.R., Wells, H. and Wells, P.H., eds.) Baltimore: Johns Hopkins University Press. 93-113.

Yager, D. D. (1999) Comparative aspects of rearing and breeding mantids. In: *The Praying Mantids: Research Perspectives*. (Prete, F.R., Wells, H. and Wells, P.H., eds.) Baltimore: Johns Hopkins University Press. pp. 311-317.

Yager, D. D. (1999) Histological techniques for mantis research. In: *The Praying Mantids: Research Perspectives*. (Prete, F.R., Wells, H. and Wells, P.H., eds.) Baltimore: Johns Hopkins University Press. pp. 322-326.

Triblehorn, J. D. and Yager, D.D. (2005) Central nervous system specializations in predators

and prey: impacts on the ecological outcomes of predator-prey interactions. In: *Ecology of Predator-Prey Interactions*. (Barbosa, P. and Castellanos, I., eds.) Oxford: Oxford University Press. pp. 77-104.

Yager, D.D. (2010) Predator evasion. In: Breed, M.D. and Moore, J., eds. *Encyclopedia of Animal Behavior*. Volume 2. Oxford: Academic Press. pp. 765-773.

b. Articles in Refereed Journals

Rheinlaender, J., Gerhardt, H.C., Yager, D.D., and Capranica, R.R. (1979) Accuracy of phonotaxis by the green treefrog (*Hyla cinerea*). *J. Comp. Physiol. A* 133: 247-255.

Yager, D.D. and Hoy, R.R. (1986) The cyclopean ear: A new sense for the praying mantis. *Science* 213: 727-729.

Yager, D.D. and Hoy, R.R. (1987) The midline metathoracic ear of the praying mantis, *Mantis religiosa*. *Cell Tissue Res.* 250: 531-541.

Krasnoff, S.B. and Yager, D.D. (1988) Acoustic response to a pheromonal cue in the arctiid moth, *Pyrrharctia isabella*. *Physiol. Entomol.* 13: 433-440.

Yager, D.D. and Hoy, R.R. (1989) Audition in the praying mantis, *Mantis religiosa* L.: Identification of an interneuron mediating ultrasonic hearing. *J. Comp. Physiol. A* 165: 471-493.

Yager, D.D. (1990) Sexual dimorphism of auditory function and structure in praying mantises (Mantodea; Dictyoptera). *J. Zool., Lond.* 221: 517-537.

Yager, D.D. and May, M.L. (1990) Ultrasound-triggered, flight-gated evasive maneuvers in the praying mantis, *Parasphendale agrionina* (Gerst.). II. Tethered flight. *J. Exp. Biol.* 152: 41-58.

Yager, D.D., May, M.L. and Fenton, M.B. (1990) Ultrasound-triggered, flight-gated evasive maneuvers in the praying mantis, *Parasphendale agrionina* (Gerst.). I. Free flight. *J. Exp. Biol.* 152: 17-39.

Yager, D.D. (1992) A unique sound production mechanism in the pipid anuran, *Xenopus borealis*. *Zool. J. Linn. Soc.* 104: 351-375.

Yager, D.D. (1992) Underwater acoustic communication in the African pipid frog, *Xenopus borealis*. *Bioacoustics* 4: 1-24.

Yager, D.D. and Hopkins, C.D. (1993) Directional characteristics of tuberous electroreceptors in the weakly electric fish, *Hypopomus* (Gymnotiformes). *J. Comp. Physiol. A* 173: 401-414.

McKibben, J.R., Hopkins, C.D., and Yager, D.D. (1993) Directional sensitivity of tuberous electroreceptors: polarity preferences and frequency tuning. *J. Comp. Physiol. A* 173: 415-424.

- Yager, D.D. and Spangler, H.G. (1995) Characterization of auditory afferents in the tiger beetle, *Cicindela marutha* Dow. J. Comp. Physiol. A 176: 587-600.
- Yager, D.D. (1996) Nymphal development of the auditory system of the praying mantis, *Hierodula membranacea* Burmeister (Dictyoptera; Mantidae). J. Comp. Neurol. 364: 199-210.
- Yager, D.D. (1996) Serially homologous ears perform frequency range fractionation in the praying mantis, *Creobroter* (Mantodea, Hymenopodidae). J. Comp. Physiol. A. 178: 463-475.
- Yager, D.D. and Spangler, H.G. (1997) Behavioral response to ultrasound in the tiger beetle, *Cicindela marutha* Dow combines aerodynamic changes and sound production. J. Exp. Biol. 200: 649-659.
- Yager, D.D. (1999) Structure, development, and evolution of insect auditory systems. Microscopy Res. Tech. 47: 380-400.
- Yager, D.D., Cook, A.P., Pearson, D.L., and Spangler, H.G. (2000) A comparative study of ultrasound-triggered behaviour in tiger beetles (Cicindelidae). J. Zool., Lond. 251: 355-368.
- Tribblehorn, J.D. and Yager, D.D. (2001) Broad vs. narrow auditory tuning and corresponding bat-evasive flight behaviors in praying mantids. J. Zool., Lond. 254: 27-40.
- Tribblehorn, J.D. and Yager, D.D. (2002) Implanted electrode recordings from a praying mantis auditory interneuron during flying bat attacks. J. Exp. Biol. 205: 307-320.
- Tribblehorn, J.D. and Yager, D.D. (2005) Timing of praying mantis evasive responses during simulated bat attack sequences. When does the mantis dive? J. Exp. Biol. 208: 1867-1876.
- Yager, D.D. (2005) Cockroach homologues of praying mantis peripheral auditory system components. J. Morphol. 205: 120-139.
- Tribblehorn, J. D. & Yager, D. D. (2006). Wind generated by an attacking bat: anemometric measurements and detection by the praying mantis cercal system. J. Exp. Biol. 209: 1430-1440.
- Tribblehorn, J. D., Ghose, K., Bohn, K., Moss, C. M., and Yager, D. D. (2008) Free-flight encounters between the praying mantis *Parasphendale agrionina* and the bat *Eptesicus fuscus*. J. Exp. Biol. 211: 555-562.
- Yager, D.D. and Svenson, G.J. (2008) A phylogeny of mantis auditory systems based on morphological, molecular, physiological, and behavioral data. Biol. J. Linnean Soc. 94: 541-568.
- Ghose, K., Tribblehorn, J. D., Bohn, K., Yager, D. D. and Moss, C. M. (2009) Behavioral responses of big brown bats (*Eptesicus fuscus*) to dives by praying mantises (*Parasphendale agrionina*). J. Exp. Biol. 212: 693-703.
- Yager, D.D. (2012) Predator detection and evasion by flying insects. Curr. Opinion Neurobiol. 22: 201-207.

e. Conferences and Workshops: Talks, Abstracts and Other Contributions

i. Invited Talks (*at Conferences*)

- Yager, D.D. The ultrasound-detecting ear of the praying mantis - Form and function. Symposium: *Animal Bioacoustics: Session Honoring William E. Schevill*. Annual Meeting of the Acoustical Society of America, 2 May 1991 (Baltimore, MD).
- Yager, D.D. Origins of the cyclopean mantis ear. Symposium: *Sound Production and Hearing Mechanisms*. XIX International Congress of Entomology, 30 June 1992 (Beijing, China).
- Yager, D.D. Sound production and acoustic communication in *Xenopus borealis*.. Symposium: *The Biology of Xenopus*. Zoological Society of London Symposium, 11 September 1992 (London, England).
- Yager, D.D. Ontogeny and phylogeny of the cyclopean mantis ear. Symposium: *Insect Bioacoustics*. Annual Meeting of the Acoustical Society of America, 3 November 1992 (New Orleans, LA).
- Yager, D.D. Of praying mantises, tiger beetles, and the evolution of ultrasound-triggered defensive behaviors. Symposium: *Bats, Insects, and Ultrasound*. Annual Meeting of the American Society of Zoologists, 28 December 1995 (Washington, DC).
- Yager, D.D. Evolutionary patterns of hearing in praying mantises. Symposium: *Comparative View on Hearing in Insects: Ears, Neuronal Processing, and Evolutionary Trends*. Göttingen Conference of the German Neuroscience Society, 28 May 1999 (Göttingen, Germany).
- Yager, D.D. When fierce meet fiercer creatures meet: bug ears foil bat attacks. Symposium: *Cognitive Aspects of Complex Sound Perception in Animals*. Annual Meeting of the Acoustical Society of America, 1 June 2000 (Atlanta, GA).
- Yager, D.D. Neuroethology of audition and bat evasion in praying mantises. Symposium: *Animal Bioacoustics - Electrophysiological Investigations in Animals*. Joint Meeting of Acoustical Society of America, Iberoamerican Federation of Acoustics, and Mexican Institute of Acoustics, 3 December 2002 (Cancun, Mexico).
- Yager, D.D. Listening to Nature's orchestra with peculiar ears. Symposium: *Nature's Orchestra: Acoustics of Singing and Calling Animals*. Annual Meeting of the Acoustical Society of America, 1 May 2003 (Nashville, TN).
- Yager, D.D. When Fierce and Fiercer Creatures Meet: Bug Ears Foil Bat Attacks. Sidney Simpson Symposium on Animal Communication. University of Illinois at Chicago, 2 April, 2010
- Yager, D.D. An Auditory Bicyclops: Two-eared Mantises. Symposium: *Praying Mantises (Mantodea): Diversity of Form, Function, and Biology*. Annual meeting of the Entomological Society of America. 12 December 2010 (San Diego, CA)

Yager, D.D. When fierce and fiercer creatures meet: audition in praying mantises. As keynote speaker for Undergraduate Summer Research Symposium, Delaware State University, 28 July 2011.

i. Posters

Yager, D.D. (1982) Call structure and adaptation in the aquatic frog, *Xenopus borealis*. Animal Behavior Society (Duluth, MN).

Yager, D.D. (1982) Underwater acoustic communication in the anuran, *Xenopus borealis*. Northeastern Regional Animal Behavior Society (Boston, MA).

Yager, D.D. (1982) A novel mechanism for underwater sound production in *Xenopus borealis*. American Society of Zoologists (Louisville, KY).

Yager, D.D. and Hoy, R.R. (1985) Hearing in the praying mantis. Society for Neuroscience (Miami, FL).

Yager, D.D. and Hoy, R.R. (1986) Neuroethology of audition in the praying mantis, *Creobroter gemmatus*. Society for Neuroscience (Washington, DC).

Yager, D.D. and Hoy, R.R. (1988) Sexual dimorphism in the auditory system of the praying mantis. Society for Neuroscience (Toronto, Canada).

Yager, D.D. (1989) A diversity of mantis ears: Evolutionary implications. Fifth International Meeting of the Orthopterist's Society (Segovia, Spain).

Yager, D.D. and May, M.L. [equal contributions] (1989) Ultrasound-induced flight maneuvers by the praying mantis, *Parasphendale agrionina*. American Society of Zoologists (Boston, MA).

Yager, D.D. (1990) Patterns of auditory structure and function within the suborder Mantodea (praying mantises). J.B. Johnston Club Meeting at Society for Neuroscience Annual Meeting (St. Louis, MO).

Yager, D.D. and Hopkins, C.D. (1990) Directional characteristics of tuberos electroreceptors in the weakly electric fish, *Hypopomus* sp. Society for Neuroscience (St. Louis, MO).

Yager, D.D. (1992) The ontogeny of the praying mantis ear in an evolutionary perspective. Orthopterist's Society, satellite meeting of the Entomological Society of America National Meetings (Baltimore, MD).

Yager, D.D. and Scaffidi, D.J. (1993) Cockroach homolog of the mantis tympanal nerve. Society for Neuroscience (Washington, DC).

Yager, D.D. and Tola, K.C. (1994) Transection of the mantis tympanal nerve homolog in the cockroach alters resting posture, escape turning, and responses to substrate vibration. American Society of Zoologists (St. Louis, MO).

- Yager, D.D. and Tribblehorn, J.D. (1995) Comparative neuroethology of ultra-high frequency hearing in praying mantises. Fourth International Congress of Neuroethology (Cambridge, England).
- Yager, D.D. (1996) Patterns in the multiple evolutions of insect hearing. First Symposium on Evolutionary Perspectives on Audition (College Park, MD).
- Yager, D.D. and Spangler, H.G. (1996) Defensive behaviors of the tiger beetle *Cicindela marutha* triggered by ultrasound. 10th International Meeting on Insect Sound and Vibration (Woods Hole, MA).
- Harron, A.L. and Yager, D.D. (1996) Juvenile hormone affects auditory development in the praying mantis *Taumantia ehrmannii*. First Symposium on Evolutionary Perspectives on Audition (College Park, MD).
- Harron, A.L. and Yager, D.D. (1996) Juvenile hormone reduces auditory sensitivity in the praying mantis, *Taumantia ehrmannii*. Society for Neuroscience (Washington, DC).
- Tribblehorn, J.D., Cook, A., and Yager, D.D. (1996) Interspecific differences in ultrasound-triggered auditory escape behavior in praying mantises. First Symposium on Evolutionary Perspectives on Audition (College Park, MD).
- Tribblehorn, J.D., Cook, A., and Yager, D.D. (1996) Ultrasound-triggered escape behaviors vary among praying mantis species. 10th International Meeting on Insect Sound and Vibration (Woods Hole, MA).
- Yager, D.D. and Spangler, H.G. (1997) Defensive behaviors of the tiger beetle *Cicindela marutha* triggered by ultrasound. 34th Annual Meeting, Animal Behavior Society (College Park, MD).
- Cook, A.P. and Yager, D.D. (1997) Ablation of the head ganglia eliminates ultrasound-triggered escape in the praying mantis, *Parasphendale agrionina*. 34th Annual Meeting, Animal Behavior Society (College Park, MD).
- Tribblehorn, J.D. and Yager, D.D. (1997) Near-field sound reception by particle displacement receptors on the cerci of the praying mantis, *Sphodromantis aurea*. Association for Research on Otolaryngology (St. Petersburg Beach, FL).
- Yager, D.D. (1998) The underwater communication system of a pipid frog, *Xenopus borealis*. Third Symposium on Evolutionary Perspectives on Audition (College Park, MD).
- Tribblehorn, J.D. and Yager, D.D. (1998) Wind-sound integration in the mantis escape response: A preliminary report. Fifth International Congress of Neuroethology (San Diego, CA).
- Tribblehorn, J.D. and Yager, D.D. (2000) Wind-evoked neural responses in the praying mantis *Parasphendale agrionina*. Society for Neuroscience (New Orleans, LA)
- Yager, D.D. and Michelsen, A. [equal contributions] (2001) A traveling wave in the curious ear

of the praying mantis. Sixth International Congress of Neuroethology (Bonn, Germany).

Yager, D.D., Young, A.L., and Donaldson, B. (2001) Temporal processing by an identified auditory interneuron in the praying mantis. Sixth International Congress of Neuroethology (Bonn, Germany).

Triblehorn, J.D. and Yager, D.D. (2001) Implanted electrode recordings of mantis auditory responses to attacks by flying bats. Sixth International Congress of Neuroethology (Bonn, Germany).

Triblehorn, J.D. and Yager, D.D. (2001) Mantis auditory interneuron MR-501-T3 stops responding during the critical period just before capture by a flying bat. Society for Neurosciences (San Diego)

Yager, D.D. (2003) Information transformation by an auditory interneuron in the high-speed bat evasion of a praying mantis. Society of Integrative and Comparative Biology Annual Meeting (Toronto, Canada).

Triblehorn, J.D. and Yager, D.D. (2003) Mantis auditory interneuron 501-T3 responses and triggering of the evasive response during bat attack sequences. Society for Integrative and Comparative Biology Annual Meeting (Toronto, Ontario Canada).

Yager, D.D. (2004) Structural and functional cockroach homologues of the mantis cyclopean auditory system. Seventh International Congress of Neuroethology (Nyborg, Denmark).

Yager, D.D. (2004) Evolution of praying mantis hearing: cockroach homologues of the cyclopean ear. 52nd Annual Meeting, Entomological Society of America (Salt Lake City, UT).

Cook, A.P., Triplehorn, J.D., Lorscheid, A., Lennon, M., and Yager, D.D. (2005) Praying mantis evasive response: descending control and context gating. Society for Integrative and Comparative Biology Annual Meeting (San Diego, CA).

Yager, D.D. and Svenson, G.J. (2005) An auditory phylogeny of the praying mantids. 53rd Annual Meeting, Entomological Society of America (Ft. Lauderdale, FL).

Huber, A.S. and Yager, D.D. (2006) Inhibition shapes the responses of an auditory interneuron of the praying mantis. Society for Integrative and Comparative Biology Annual Meeting (Orlando, FL).

Smith, E. and Yager, D.D. (2006) Normalized event synchrony; a metric of synchrony applied to neurophysiology. 4th International Summer Program on Pattern Recognition (Plymouth, England).

Yager, D.D., Ottinger, S., and Benedick, M. (2006) Evidence supporting the evolution of aerial bat-evasion maneuvers from the terrestrial deimatic display in praying mantids. 54th Annual Meeting, Entomological Society of America (Indianapolis, IN).

- Yager, D.D., DiGiovanni, P., and Smith, E. (2007) Anti-directional processing of auditory information by an identified interneuron in the praying mantis. Society for Integrative and Comparative Biology Annual Meeting (Phoenix, AZ).
- Yager, D.D., Schlumpf, C, and Koyuncu, I.H. (2008) Why is the cyclopean ear of the praying mantis in a midline chamber. Society for Integrative and Comparative Biology Annual Meeting (San Antonio, TX).
- Lomas, K., Field, L., Yager, D.D., Wild, M., Kubke, F., Parsons, S. (2008) Can tree weta detect terrestrial bats? Eighth International Congress of Neuroethology (Vancouver, Canada).
- Ritter, M., van Hover, C, and Yager, D.D. (2008) Intraspecific visual signaling by praying mantis nymphs. 56th Annual Meeting, Entomological Society of America (Reno, NV).
- Torvund, M. and Yager, D.D. (2009) CNS processing of information from the low-frequency ear of the praying mantis, *Pseudocreobotra ocellata*. . Society for Integrative and Comparative Biology Annual Meeting (Boston, MA).
- Gasser, B., Panessiti, M, and Yager, D.D. (2009) Sudden shadow elicits flight changes in praying mantises. . Society for Integrative and Comparative Biology Annual Meeting (Boston, MA).
- Simpson, M.C. and Yager, D.D. (2010) CNS processing of ultrasound information differs in light and darkness in the praying mantis, *Parasphendale agrionina*. Society for Integrative and Comparative Biology Annual Meeting (Seattle, WA).
- Torvund, M. and Yager, D.D. (2010) Comparing the physiology of two serially homologous, cyclopean auditory systems in the praying mantis, *Pseudocreobotra ocellata*. 58th Annual Meeting, Entomological Society of America (San Diego, CA).
- Jamil, A., Socha, J.J., and Yager, D.D. (2011) 3D reconstruction of tracheal systems in one-eared and two-eared praying mantises. Society for Integrative and Comparative Biology Annual Meeting (Salt Lake City, UT).
- Duque, J.F., Freudenberger, K. and Yager, D.D. (2012) Multimodal integration in praying mantis audition: visual information modulates the descending ultrasound-evoked CNS responses of *Parasphendale agrionina*. Society for Integrative and Comparative Biology Annual Meeting (Charleston, SC).
- Triblehorn, J.D., Paolini, M.L., Yager, D.D., and Frederick-Hudson, K.H. (2012) Comparative study of large axons on the abdominal connectives of mantids (Mantodea) and cockroaches. Society for Integrative and Comparative Biology Annual Meeting (Charleston, SC).
- Miller, L., Waters, J.S., Harrison, J.F., Vandenbrooks, J.M., Yager, D.D., Xiao, X., De Carlo, F, and Socha, J.J. (2012) The use of SR- μ CT for 3D visualization of insect tracheal systems. Society for Integrative and Comparative Biology Annual Meeting (Charleston, SC).

i. Other

- Yager, D.D. (2006) Listening to Nature's orchestra with peculiar ears. Special address to National Hearing Conservation Association, Annual Meeting (Tampa, FL)

f. Colloquia and Research Presentations

- 1980: Department of Zoology, University of Nairobi (Kenya)
- 1983: Department of Biology, Utica College of Syracuse University (NY)
Department of Biology, State University of New York at Binghamton
- 1989: Department of Biology, Hartwick College (NY)
Department of Biology, Siena College (NY)
- 1990: Department of Organismal Biology, University of Chicago (IL)
Department of Psychology, University of Maryland, College Park
- 1991: Department of Biology, Andrews University (MI)
Center for Insect Sciences, University of Arizona
Department of Psychology, University of Pennsylvania
- 1992: Program in Neurosciences, University of Pennsylvania
Department of Entomology, Rutgers University (NJ)
Laboratory of Neurophysiology, NIH, Poolesville (MD)
Department of Biology, University of Maryland, Baltimore County
Department of Zoology, University of Toronto
- 1993: Department of Entomology, University of Delaware
- 1994: Program in Neurosciences, University of Pennsylvania
Department of Biology, Wake Forest University (NC)
- 1995: Departments of Zoology and Entomology, Ohio State University
- 1997: Department of Zoological Research, National Zoo (Washington, DC)
- 1998: Department of Biology, Villanova University (PA)
- 1999: Biology Institute, Odense University (Denmark)
- 2001: Department of Biology, Morehouse University (GA)
- 2002: Department of Biology, Indiana University
- 2003: NIH, National Institute for Deafness and Other Communication Disorders
Departments of Acoustics and Entomology, Pennsylvania State University
- 2006: American Entomological Society
Department of Biology, Georgetown University (DC)
Department of Biology, Bowling Green University (OH)
- 2008: Department of Entomology, University of Maryland
- 2009: Department of Biology, Virginia Tech
- 2011: Department of Biology, Delaware State University

g. Completed Creative Works

v. Films.

1994-1995 - Consultant for a six-part PBS series on insect biology titled "Alien Empire"

produced by the BBC Natural History Unit, Bristol, England.

1996 - Consultant and commentator for a segment on praying mantis biology on the television program "The Straight Dope" broadcast on the Arts and Entertainment Network.

1995-1997 - Consultant for National Geographic "Explorer" television program episode "Savage Garden."

1999-2001 - Consultant for BBC television documentary on bat/insect interactions, "Enter the Mantis".

2002-2003 - Consultant for IMAX feature-length documentary on praying mantis natural history, for Principal Films, London, England.

2002-2003 - Consultant and commentator, Maryland Public Television, for show on the natural history of praying mantises in Maryland.

2004 - Consultant and commentator for television segment on mantis ultrasonic hearing, Canadian *Discover* channel

x. Photographs

1998 - Photographs selected as the cover art for the Harvard University Press reissue of the classic book *Nerve Cells and Insect Behavior* by Kenneth Roeder.

2005 - Photographs selected as cover art for the Oxford University Press book *Ecology of Predator-Prey Interactions*. (Barbosa, P. and Castellanos, I., eds.)

2006 - Photograph won second prize in the Photography Division of the Annual Science and Engineering Visualization Challenge sponsored by the National Science Foundation and *Science* magazine

h. Sponsored Research

i. Grants

1 July 1979 - 30 June 1981 - As Principal Investigator. "Underwater Sound Communication in the African Clawed Frog (*Xenopus*)."
Funded by the National Science Foundation as an Improvement of Doctoral Dissertation Grant. \$6,833.

10 January 1988 - 30 June 1989 - As co-Principal Investigator. "The Cyclopean Ear: A New Taxonomic Character for the Mantodea."
Funded by The Eppley Foundation for Research. \$6,650.

August 1991 - As co-Principal Investigator. "Audition in Tiger Beetles (Cicindelidae)."
Funded by the Center for Insect Science, University of Arizona. \$1,000.

1 January 1992 - 31 December 1998 - NIH 'First Award' for young investigators. "Ontogeny and Phylogeny of an Insect Auditory System,"
Funded by National Institutes of Health,

National Institute on Deafness and Other Communication Disorders. \$486,995.

- 1 July 1994 - 30 June 2008 - As a core faculty member. "Comparative and Evolutionary Biology of Hearing." A training grant funded by National Institutes of Health, National Institute on Deafness and Other Communication Disorders. average \$200,000 per year
- 1 July 1995 - 30 June 1996 - As Principal Investigator. "Auditory Clusters and the 'Hot Spot' Hypothesis for the Evolution of Insect Auditory Systems." University of Maryland GRB Research Award. \$6,500.
- 1 September 1998 - 31 August 2003 - As Principal Investigator. "Integration of Wind and Sound Cues in the Bat Evasion System of Praying Mantises." Funded by the National Science Foundation, Behavioral Neuroscience/Sensory Systems. \$300,324.
- 1 September 1999 - 31 August 2000 - As Principal Investigator. "Bioacoustics of the Praying Mantis Auditory System." Funded by the Center for Neuroscience, University of Maryland. \$6,500.
- 1 September 1999 - 31 August 2006 - As Principal Investigator. "Ontogeny and Phylogeny of an Insect Auditory System." Funded by National Institutes of Health, National Institute on Deafness and Other Communication Disorders. \$942,812.
- 1 July 2001 - 30 June 2006 - As a core faculty member. "Neuroethology: Neurobiology, Evolution, and Behavior." A training grant funded by National Institutes of Health. \$769,445.
- 1 July 2007 – 30 June 2008 – As Principal Investigator. "Neural Processing to Yield Bat Evasion Behavior in the Cyclopean Auditory System of Praying Mantises." University of Maryland GRB Research Award. \$3,500.
- 1 March 2008 – 31 August 2012 – As Principal Investigator. "Sensory System Innovation for Hearing in Multiple Frequency Channels." Funded by the National Science Foundation. \$413,961.
- 1 April 2008 – 31 March, 2011 – As Principal Investigator. "Anatomical and Functional Bioacoustics of Praying Mantis Ear Evolution." Funded by Argonne National Laboratory (DOE), Advanced Photon Source Division. For 200 hours of synchrotron beam time to do x-ray tomography.

3. Teaching, Mentoring and Advising.

a. Courses Taught (last five years)

PSYC 301 Biological Basis of Behavior. (3 credits) This is our 'gateway' course for all biopsychology students, and a required course for many psychology majors. Average enrollment: 125.

PSYC 401 Biological Basis of Behavior Laboratory. (4 credits) Intensive, hands-on laboratory experience in neuroscience for psychology and biology upper class students and first-year graduate students. Average enrollment: 25.

PSYC 407 Behavioral Neurobiology Laboratory. (4 credits) Designed for psychology students with an interest in neuroscience, but little background in biology. Exercises emphasize human neuroscience, but also includes several animal systems. Students learn microdissection, simple neurophysiological techniques, and data analysis. Enrollment: 20.

PSYC 606 Human Biopsychology. (3 credits) A graduate course aimed at clinical and counseling students. Basic neuroanatomy, neurophysiology, neuropharmacology and their roles in behavior with an emphasis on clinical applications. Enrollment: 26.

HONR 2090 Science of Biological Rhythms and Sleep. (3 credits) A detailed examination of biological rhythms and sleep geared for very bright non-science students. Included some basic neuroanatomy and neurophysiology. Students presented/discussed papers from the primary literature each week. Enrollment: 20.

PSYC 414 Biological Rhythms and Sleep. (3 credits) This is a senior-level follow-up to the Honors seminar. It covers similar material in considerably more depth and with more emphasis on the primary literature. Enrollment: 25.

b. Course or Curriculum Development

PSYC 301 - completely redesigned including entirely new lectures, extensive new classroom audiovisuals, and new catalog description and prerequisites. I have recently been implementing a range of teaching technologies to enhance student engagement and learning.

PSYC 401 - I designed this new laboratory course under the auspices of my Lilly Teaching Fellowship; besides curriculum development, this included: the market research and purchasing of all equipment and furniture; design of the new laboratory room and coordination of the necessary renovations; creation of a 'course-within-a-course' structure by teaching Undergraduate Teaching Assistants who are themselves part of the staff for the course in addition to the Graduate Teaching Assistants. The course is under constant revision, and I rewrite the laboratory manual every year.

PSYC 407 - I designed this new laboratory course for PSYC majors who want to explore neuroscience, but do not have an extensive biology background. Students learn basic techniques of microdissection, recording neuron activity, quantifying simple behaviors, and staining neural tissue. Most exercises use animals to teach concepts, but there is an overall emphasis on human neurobiology. I designed renovations for a new laboratory room. As with PSYC 401, the course is under constant revision, and I rewrite the laboratory manual every year.

PSYC 606 - In response to the special needs of clinical, counseling, and education/counseling graduate students, I redesigned a graduate level 'brain and behavior' course emphasizing neural processes underlying human behavior. This is a department graduate core course. I have been introducing more new teaching technologies like note-taking wikis.

HONR 2090/PSYC 414 - These reflect the continuing evolution of a course on biological rhythms and sleep that I created over 10 years ago. Despite its substantial scientific and social significance, this subject had not previously been part of the University's curriculum. I recently created PSYC 414 as a senior-level counterpart to HONR2090 that goes deeper into the subject with more time in the primary literature.

CAPSTONE course – I recently designed a course for seniors in the Neuroscience Minor. The course gives the students the opportunity to study the real-world applications of the theoretical material they have learned while in the Minor. It does this through intensive writing and projects coupled with classroom discussion modules led by researchers in a broad range of neuroscience sub-disciplines. The course will be taught for the first time in the 2015-2016 school year.

d. Advising: Research Direction

i. Undergraduate (**These students all have had their own individual research projects and collect their own data. Sixteen have been authors on professional presentations.**)

Darryl Bartow, 1991-1992	David Scaffidi, 1992-1994
Catherine McClintock, 1992-1995	Cory Lebson, 1993-1994
Kevin Johnson, 1996 -1997	Brian Donaldson, 1997-1998
Ashley Huber (Biology), 2004-2006	Hannah DeGroot (Biology), 2006-2008
Daniel Berman, 2008-2010	Juan Duque, 2010-2011
Semret Seyoum (Biology), 2010-2012	Saikrishna Gurishetti, (Biology), 2011-2013
Cheryl Feldman, 1990-1992	Alicia Feddor, 1991-1992
Mary Schultheis, 1992-1994	Emmanuel Defaux, 1993
Kenneth Tola, 1993-1994	Kerri Irvine, 1993-1994
Daniel Weiss, 1994	Gregory Robison, 1994
Michael Yankus, 1994	Ulrich Stegmann (Zoology), 1994-1995
Tarra Gupta (Zoology), 1995	Jessica Nelson, 1998
Liz Lee (Biology) - 1999	Andrea Young, 1999
Lucina Uddin, 2000	Ryan Williams, 2000
Hassana Ibrahim, 2001	Brynnen Sandoval, 2001
Kate Jones, 2002	Katie Bukrinsky, 2002
Alexandria Wise, 2003	Ashly Hindle, 2003
Alireza Mofrad, 2003	Aaron Lorsong (Biology), 2003-2005
Annalissa Vicencio, 2004	Ashley Sacramo (Biology), 2004-2005
Marc Lennon, 2004-2005	Amanda Metheny (Biology). 2004-2006
Silvia Lara (Biology), 2004-2006	Steven Ottinger, 2005-2006
Matthew Benedick, 2005-2006	William Barth, 2005-2006
Emily Uphoff, 2005-2007	Patrick DiGiovanni, 2005-2007
Swapnil Swarna (Biology), 2006	Zachary Binder (Biology), 2006
Marjorie Clemens (Biology), 2006-2007	Craig Schlimpf, 2006 -2007
Christine van Hover, 2007-2009	Maryam Rabei (Biology), 2007

Iclal Hilal Koyuncu (Biology), 2007
Meaghan Torvund (Biology), 2008-2010
Bradley Gasser, 2008
Marlena Simpson (Biology), 2008-2010
Nick Gammon, 2009-2010
Theresa Chea (Biology), 2009
Adam Brockett, 2010-2011
Kelley Freudenberg (Biology), 2011-2012
Mang Pa, 2011
Caroline Gomes, 2012
Adam Zhao, 2012-2013
Anna Patnaik, 2013

Megan Ritter, 2007-2009
Mithun Suresh, 2008
Micaela Panacitti, 2008
Yike Jiang (Biology), 2009-2010
Juan Duque, 2009-2012
Asif Jamal (Biology), 2010-2011
Mustafa Rouzi (Biology), 2010-2011
William Aisenberg, 2011-2012
Saikrishna Gourishetti (Biology), 2011-2013
Michael Zimberg (Biology), 2012-2013
Ashwin Reddi, 2013

ii. Master's

Amy Harron, 1994 - 1997
Aaron Cook, 1995 – 2000

Andrew Scherrer (Zoology), 1991
Susan Davidson (Zoology), 1999

iii. Doctoral – as mentor

Jeffrey Triplehorn (PSYC, advisor), 1995 – 2003 (now Associate Professor at College of Charleston, SC)

Kyle Vick (NACS, co-advisor), 2002-2005 (now Professor at Shawnee State, Ohio)

iv. Doctoral – committee member

Maura Kurkjian, 1991-1994	Jeanette Boughman (Zoology), 1993 – 1997
Shih-Min Cheng (Zoology), 1993 – 1998	Kelly Cookson, 1993 - 1999
Elizabeth Powell, 1994 – 2001	James Heaton, 1994 -1997
Micheal Dent, 1996 – 2001	James Carpenter (Zoology), 1997 – 1999
Ignacio Castellanos (Entomology), 1998 – 2003	Murat Aytakin (NACS), 1999 -2007
Virginie van Wasenhove (NACS), 1999 – 2001	Beth Stevens (NACS), 1999 – 2003
Kala Laksmanarayanan (NACS), 2000 – 2002	Kisi Bohn (Biology), 2000 - 2005
Stacey Brown, 2001 – 2003	Shiva Sinha (NACS), 2001– 2004
Amanda Lauer, 2001-2005	Michaela Meyer (Biology), 2001 -2008
Michael Osmanski, 2001 -2007	Joujun Wang (NACS), 2002 -2007

Dan Fergus (Biology), 2003 -2007
Andrew Sensenig (Entomology), 2005-2008
Heather Mallory (Georgetown Univ.), 2005-2011
Genni Spanjer (BEES), 2006-2012
Adam Smith (Biology), 2007-2011
Xiaohong Deng (NACS), 2008-2009
Vanessa Medley, 2008-2011
Adam Jones (NACS), 2009-2013
Ben Falk (NACS), 2011-2014

Jaime Grace (Biology), 2004-2007
Bryan Arnold (Biology), 2005-2011
Marina Bornavalova, 2006-2007
Kathryn Lomas (Univ. Auckland), 2006-2011
Vicky Tu, 2007-2009
Mohit Chadha (NACS), 2009-2012
Matthew Swierbinski (NACS), 2009-2016
Graham Marquart (NACS), 2010-2013
Sara Erickson, 2013-2015

Served as External Examiner for York University (Toronto, Canada) on the doctoral thesis committee of Dr. Lalita Acharya, 1995.

Served as External Examiner for Odense University (Denmark) on the doctoral thesis Committee of Dr. Niels Skals, 1998.

Served as External Reviewer for Karl-Franzen University (Austria) on the Habilitation thesis Committee of Dr. Manfred Hartbauer, 2012.

e. Advising (Other than Research Direction)

Indicate approximate numbers of students per year.

- i. Undergraduate
Approximately 20 per year

4. Service and Outreach

a. Editorships, Editorial Boards and Reviewing Activities

iii. Reviewing Activities for Journals and Books

Copeia

Behavioral Ecology and Sociobiology (multiple)

Springer-Verlag symposium volume on evolution of hearing

Zoological Society of London symposium volume on frog biology

Orthopterists' Society Proceedings

Brain, Behavior and Evolution (multiple)

Journal of Neurobiology (multiple)

Journal of Comparative Physiology A (multiple)

US Department of Agriculture internal publications

Animal Behavior (multiple)

Journal of Comparative Neurology (multiple)

Biological Journal of the Linnean Society (multiple)

Journal of Experimental Biology (multiple)

Naturwissenschaften (multiple)

Invertebrate Neurobiology
Physiological Entomology (multiple)
Bioacoustics (multiple)
Annals of the Entomological Society of America (multiple)
Proceedings of the Royal Society of London, B (multiple)
Journal of the Acoustical Society of America (multiple)
Zoology
Journal of Ethology (multiple)
Studies on Neotropical Fauna and Environment
Environmental Entomology (multiple)
Behaviour (multiple)
Science
Current Zoology
Royal Society Open Science Journal
Frontiers in Neuroscience
PlosOne
Biology Letters

iv. Reviewing Activities for Agencies

National Science Foundation - as external grant reviewer, 1991 - present
National Institute of Mental Health - as *ad hoc* panel member, 1994, 2004
NSF Review Panel: Databases Activities in Neuroscience - as panel member, 1995
Förderung der wissenschaftlichen Forschung (Austrian counterpart to NSF), reviewer, 1997
National Institutes of Health - as member of site visit team, 1998
National Geographic Society, grant reviewer, 2002
Volkswagen Foundation (Germany), grant reviewer, 2003
Guggenheim Foundation, grant reviewer, 2004
National Institutes of Health, NIDCD, grant reviewer, 2004
National Science and Engineering Research Counsel (Canada), grant reviewer, 2005, 2006
NSF Review Panel: Sensory and Sensorimotor Systems - as panel member, 2007
Air Force Office of Scientific Research, grant reviewer, 2007, 2009
NSF Review Panel: Integrative and Organismal Biology-Activation, 2008
Biotechnology and Biological Sciences Research Council (UK), 2011, 2012
Leverhulme Foundation (UK), 2012

b. Professional Service

- i. Offices and committee memberships held in professional organizations (*include dates*).
Annual Meeting Organizing Committee, Animal Behavior Society, 1996 - 1997
Organizing Committee, International Conference on Acoustic Communication by Animals,

2003

Organizing Committee, International Congress of Neuroethology, 2010-2012

c.. Campus Service

i. Departmental

Promotions and Tenure Committee, 1991-1992, 1999-2002

Undergraduate Committee, 1992-1994, 2006-present

Policy Review Committee, 1994-1995, 1995-1996

Psi Chi Committee, 1994-1995

Psi Chi mentor, 1996-present

Salary Committee, 1997, 2000, 2004, 2007, 2008

Graduate Committee, 1997-2006

Honors Committee as Associate Chair, 1997-2006

Director, Undergraduate Summer Neuroscience Intern Program, 1999-2004

Search Committees, 1995-1996, 2001-2002 (2), 2004-2005, 2006-2007

Department Climate Study Group, 2006-2007

Department Faculty and Staff Development Committee, 2008-2014

Department committee for review of statistics and lab courses, 2009

Tenure Review Committee, 2010

Lecturer Review Committee, 2013

Chair, Grade Appeal Committee, 2013

Associate Chair and Director of Graduate Studies (Interim), 2013

Established monthly faculty lunches to discuss undergraduate education, 2014-present

Chair, Search Committee for Director of Undergraduate Studies, 2015

Chair, Undergraduate Committee, 2015-

Executive Committee, 2015-

Associate Chair for Undergraduate Studies, 2015-

Chair, Human Subjects Committee, 2015-

Developed, coordinated, and participated in peer teaching review system, 2016-

Chair, Lecturer Review Committee, 2016, 2017

i. College

BSOS Teaching Evaluation Focus Group, 1992

BSOS Teaching Committee, 1997-1998

Presentation for BSOS at Maryland Day, 2007

BSOS Excellence in Teaching Award Nomination Committee, 2011

BSOS Directors of Graduate Studies, 2013

BSOS Banneker-Key recruiting day representative, 2015

BSOS New Faculty Teaching Panel, 2015

BSOS Search Committee for Director of OACS, 2016

ii. University

Research Experience for Undergraduates Program Steering Committee, 1990-1993
Center for Neural and Cognitive Sciences Seminar Committee, 1991-1992, 1992-1993
Senior Summer Scholarship Selection Committee, 1992, 1993, 1994
Howard Hughes Undergraduate Research Fellowship Selection Committee, 1992, 1993, 1994, 1999, 2002, 2005, 2009, 2012
Center for Neural and Cognitive Sciences Steering Committee, 1994
CORE/Honors Course Review Working Group, 1996-2004
Graduate Director, Neuroscience and Cognitive Science Program, 1997-2000
Director, Undergraduate Summer Neuroscience Intern Program, 2004 – 2008
NACS Graduate Committee, 2000 – 2004
NACS Minority Recruiting Committee (Chair), 2000-2001
NACS Strategic Planning Committee (co-chair), 2001 -2002
Goldwater Scholarship Nominee Selection Committee, 2001
Biological and Chemical Hygiene Committee, 2001 – 2008
Compliance Officer for Department of Environmental Safety, 2001-present
Search Committee, Honors Program Director, 2003-2004
NACS Membership Committee (chairman), 2003-2006
NACS Executive Committee, 2003 –2005, 2006-2008
Search Committee, Biology Department, 2004-2005
Maryland English Institute ‘English for Teaching Seminar’ mentor, 2006
HHMI lecturer / advisor, 2006-2013
Institutional Animal Care and Use Committee, 2006, 2008-2015
Search Committee, Director of Lab Animal Care/University Attending Veterinarian, 2007
BEES Graduate Admissions Committee, 2010
Faculty evaluator, search for Honors College Director, 2015
Banneker/Key Scholarship Selection Committee, 2012, 2013, 2014, 2015, 2016, 2017
TLTC Classroom Group Strategies Panel, 2015
IRB Liason for the PSYC Department, 2015 -
GEMSTONE Program, project reviewer, 2014, 2015, 2017
Provost’s Committee for development of a neuroscience major, 2016 -

v. Other

Montgomery Blair High School, speaker for AP biology class, 1997
Sidwell Friends School, speaker and project advisor, 1998, 2000
Holy Trinity Episcopal Day School, speaker for science classes, 2007
Montgomery Blair High School student project advisor, 2009, 2011
Consultant for new Invertebrate House displays, National Zoological Park, 1998

5. Awards and Honors

a. Research Fellowships, Prizes and Awards

Phi Beta Kappa, 1972

NIMH Traineeship in Integrative Neurobiology, 1980-1981 and 1981-1982

D. Dwight Davis Award, American Society of Zoologists (Division of Vertebrate Morphology) for best student paper at the national meetings, December, 1982

Elected to Full Membership in Sigma Xi, 1989

b. Teaching Awards

Lilly Endowment Teaching Fellow, 1991-1992

Award for Teaching Excellence, Department of Psychology, University of Maryland, 1994

Ph.D. advisee Jeffrey Triplehorn won Bartlett Award for best Ph.D. thesis, Dept. of Psychology, 2003

College of Behavioral and Social Sciences Excellence in Teaching Award, 2010

CTE Summer Teaching with Technology Institute Fellow, 2013

Elected to Omicron Delta Kappa national honor society, 2017