

# Curriculum Vitae

Notarization. I have read the following and certify that this curriculum vitae is a current and accurate statement of my professional record.

Signature Steven E. Brauth Date 8/20/2015

## I. Personal Information

### A. UID, Last Name, First Name, Contact Information

101268187, Brauth, Steven, sbrauth@umd.edu

### B. Current Academic Employment -

Department of Psychology, University of Maryland, College Park, Professor, appointed 8/89.

### C. Other Academic Appointments while at UMD -

8/80-8/89 - Associate Professor, Department of Psychology, University of Maryland

7/75-8/80 - Assistant Professor, Department of Psychology, University of Maryland

### D. Educational Background-

Martin Van Buren, High School, 6/63

Rensselaer Polytechnic Institute, B. S. 6/67

New York University, Ph.D. 2/73

### E. Employment Background-

8/74-8/75 Research Associate, Department of Psychiatry & Behavioral Science, State Univ. N. Y., Stony Brook, N. Y.

11/72-8/74 Research Fellow, California Institute of Technology, Division of Biology, Pasadena, California

9/67-11/72 Research Assistant and Computer Consultant, New York Univ., Dept. of Psychology, N.Y., N. Y.

## II. Research, Scholarship and Creative Activities

*NOTE: For listing authors of publications, names of individuals with intellectual leadership are **bolded** while current or former faculty research assistants, undergraduate, graduate and postdoctoral students are indicated with an asterick (\*).*

### A. Books

#### 2. Books Edited and Journal Volume Edited

"Plasticity of Development" Edited by **S. E. Brauth**, W. S. Hall and R. J. Dooling, M. I. T. Press, June, 1991.

Brain, Behavior and Evolution, Volume 44 (nos. 4-5):191-286, Nov. 1994 volume entitled "Avian Auditory-Vocal Interfaces", edited by **S. E. Brauth** and W. S. Hall.

#### 3. Book Chapters-

"Evolution of the amniote basal ganglia" by **A. Reiner**, S. E. Brauth and H. J. Karten, In: The Motor System in Neurobiology (E. V. Evarts, S. P. Wise and D. Bousfeld, Eds.), pp. 247-258, 1985 Elsevier Biomedical Press.

"The organization and projections of the paleostriatal complex of Caiman crocodilus" by **S. E. Brauth**, In: The Forebrain of Reptiles: Current Concepts of Structure and Function, W. K. Schwerdtfeger and W. J. A. J. Smeets (Eds.), pp 60-76, Karger, Basel, 1988.

"Auditory-Vocal learning in budgerigars" by **W. S. Hall**, K. K. Cookson\*, J. T. Heaton\*, T. F. Roberts\*, S. D. Shea\* and S. E. Brauth, Ann. N. Y. Acad. Sci., 807:352-367, 1997.

"Functional anatomy of forebrain vocal control pathways in the budgerigar (*Melopsittacus undulatus*)" by **S. E. Brauth**, J. T. Heaton\*, S. D. Shea\*, S. E. Durand\* and W. S. Hall, Ann. N.Y. Acad. Sci., 807:368-385, 1997.

#### B. Articles in Refereed Journals-

"Auditory evoked potentials, motor potentials and reaction time" by **L. Karlin**, M. J. Martz, S. E. Brauth and A. R. Mordkoff, Electroenceph. & Clin. Neuro., 31: 129-136, 1971.

"SIMPLE: Scope Interpreter for Memory, Perception and Learning Experiments" by **S. E. Brauth** & D. Aaronson, Decuscope, 11:2-7, 1972.

"SIMPLE Guidelines for developing a computer-based laboratory" by **D. Aaronson** & S. E. Brauth, Behavior Research Methods and Instrumentation, 4: 257-269, 1972.

"Correlation of overt escape behavior, multi-unit thalamic activity and midbrain lemniscal stimulation in rats" by **S. E. Brauth** & E. E. Coons, J. Comp. Physiol. Psychol., 89: 371-378, 1975.

"Theoretical effects of transmitter persistence on synaptic transfer function" by **S. E. Brauth**, Mathematical Biosciences, 26:79-88, 1975.

"Midbrain unit activity during classical conditioning" by **S. E. Brauth** and J. Olds, Brain Research, 134:73-82, 1977.

"Direct accessory optic projections to the vestibulo- cerebellum: A possible channel for oculomotor control systems" by **S. E. Brauth** and H. J. Karten, Exp. Brain Res., 28:73-84, 1977.

"Prosencephalic pathways related to the paleostriatum of the pigeon, *Columba livia*" by **S. E. Brauth**, J. L. Ferguson\* and C. A. Kitt\*, Brain Research, 147:205-221, 1978.

"Distribution of neurons projecting to the retina of *Caiman crocodilus*" by **J. L. Ferguson\***, P. J. Mulvanny\* and S. E. Brauth, Brain, Behavior and Evolution, 15:294-306, 1978.

"The paleostriatal system of *Caiman crocodilus*" by **S. E. Brauth** and C. A. Kitt\*, J. Comp. Neurol., 189: 437-465, 1980.

"Basal ganglionic pathways to the tectum: Studies in reptiles" by **A. Reiner**, S. E. Brauth, C. A. Kitt\* and H. J. Karten, J. Comp. Neurol., 193:565-598, 1980.

"Projections of the paleostriatum upon the midbrain tegmentum in the pigeon, *Columba livia*" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience, 6:1551-1566, 1981.

"The temporal course of the masking of tinnitus as a basis for inferring its etiology" by **M. J. Penner**, S. E. Brauth and L. Hood, J. Speech & Hearing Res., 24:257-261, 1981.

"A paleostriatal-thalamic-telencephalic path in pigeons" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience, 7:2735-2751, 1982.

"The substance P-containing striato-tegmental path in reptiles: An Immunohistochemical study" by **S. E. Brauth**, A. Reiner, C. A. Kitt\* and H. J. Karten, J. Comp. Neurol., 219:305-327, 1983.

"Enkephalin-like immunoreactivity within the telencephalon of the reptile, *Caiman crocodilus*" by **S. E. Brauth**, Neuroscience, 11:345-327, 1984.

"Retrograde transport of 3H-GABA in the striato-tegmental system of the pigeon" by **K. Hall**, S. E. Brauth and C. A. Kitt\*, Brain Research, 310:157-163, 1984.

"Evolution of the amniote basal ganglia" by **A. Reiner**, S. E. Brauth and H. J. Karten, Trends in Neuroscience, 7:320-325, 1984. (Review article)

"Direction selective single units within the nucleus lentiformis mesencephali of the pigeon" by **B. J. Winterson\*** and S. E. Brauth, Exp. Brain Res., 60: 215-226, 1985.

"Cholinergic neurons in the telencephalon of the reptile, Caiman crocodilus" by **S. E. Brauth**, C. A. Kitt\*, D. L. Price and B. H. Wainer, Neuroscience Letters, 58:235-240, 1985.

"Telencephalic projections from midbrain and isthmal cell groups in the pigeon. I. Locus coeruleus and subcoeruleus" by **C. A. Kitt\*** and S. E. Brauth, J. Comp. Neurol., 247:69-91, 1986.

"Telencephalic projections from midbrain and isthmal cell groups in the pigeon. II. The nigral complex" by **C.A. Kitt\*** and S. E. Brauth, J. Comp. Neurol., 247:92-110, 1986.

"Neurotensin binding sites in the forebrain and midbrain of the pigeon" by **S. E. Brauth**, A. Reiner, C. A. Kitt\* and R. Quirion, J. Comp. Neurol., 253:358-373, 1986.

"Effects of deafening on the contact call of the budgerigar (Melopsittacus undulatus) by **R. Dooling**, B. Gephardt, P. Price, C. M. McHale\* and S. E. Brauth, Animal Behavior, 35:1264- 1266, 1987.

"Auditory pathways in the budgerigar. I. Thalamotelencephalic projections" by **S. E. Brauth**, C. M. McHale\*, C. A. Brasher\* and R. J. Dooling, Brain, Behavior and Evolution, 30:174-199, 1987.

"Catecholamine neurons in the brainstem of the reptile, Caiman crocodilus" by **S. E. Brauth**, J. Comp. Neurol., 270:313-326, 1988.

"Calcium binding protein in the basal ganglia system of a nonmammalian vertebrate: An immunohistochemical study in the reptile Caiman crocodilus" by **S. E. Brauth**, C. A. Kitt\* and C. R. Gerfen, Brain Research, 452:367-372, 1988.

"Auditory pathways in the budgerigar. II. Intratelencephalic pathways" by **S. E. Brauth** and C. M. McHale\*, Brain, Behavior and Evolution, 32:193-207, 1988.

"The distribution of delta, kappa and mu opiate receptors in the forebrain and midbrain of the pigeon, Columba livia" by **A. Reiner**, S. E. Brauth, C. A. Kitt\* and R. Quirion, J. Comp. Neurol., 280:359-382, 1989.

"Investigation of central auditory nuclei in the budgerigar with cytochrome oxidase histochemistry" by **S. E. Brauth**, Brain Research, 508:142-146, 1990.

"Histochemical strategies in the study of brain evolution" by **S. E. Brauth**, Brain, Behavior and Evolution, 36:100-115, 1990 (Review invited in conjunction with the 1989 Karger Workshop - Satellite Symposium, Society for Neuroscience).

"An experimental study of mate-directed behaviour in the budgerigar" by **D. C. Zocchi\*** and S. E. Brauth, Bird Behaviour, 9:48-56, 1991.

"Calcitonin gene related peptide is an evolutionarily conserved marker within the amniote thalamo-telencephalic auditory pathway" by **S. E. Brauth** and A. Reiner, J. Comp. Neurol., 313:227-239, 1991.

"Effects of yohimbine as a reversal agent for ketamine-xylazine anesthesia in the budgerigar (Melopsittacus undulatus)" by **J. T. Heaton\*** and S. E. Brauth, Lab Animal Care, 42:54-56, 1992.

"Auditory projections to the anterior telencephalon in the budgerigar (Melopsittacus undulatus)" by **W. S. Hall**, P. L. Cohen\* and S. E. Brauth, Brain, Behavior and Evolution, 41:97-116, 1993.

"Comparison of the effects of lesions in nucleus basalis and field "L" on vocal learning and performance in budgerigars" by **W. S. Hall**, S. E. Brauth and J. T. Heaton\*, Brain, Behavior and Evolution, 44:32-47, 1994.

"Covariation of binarual, concurrently-measured spontaneous otoacoustic emissions" by **M. J. Penner**, S. E. Brauth and P. Jastreboff, Hearing Research, 73:190-194, 1994.

"Functional anatomy of forebrain auditory pathways in the budgerigar (*Melopsittacus undulatus*)" by **S. E. Brauth**, J. T. Heaton, S. E. Durand\*, W. Liang\* and W. S. Hall, Brain, Behavior and Evolution, (Review invited in conjunction with the November 1993 Karger Workshop), 44:210-233, 1994.

"Effect of syringeal denervation in the budgerigar (*Melopsittacus undulatus*): The role of the syrinx in call production" by **J. T. Heaton\***, S. E. Brauth and S. M. Farabaugh, Neurobiology of Learning and Memory, 64:68-82, 1995.

"Cholinergic markers in vocal control nuclei of the budgerigar (*Melopsittacus undulatus*)" by **K. K. Cookson\***, W. S. Hall, J. T. Heaton\* and S. E. Brauth, J. Comp. Neur., 369:220-235, 1996.

"Vocal control pathways through the anterior forebrain of a parrot (*Melopsittacus undulatus*) are distributed, not hierarchical" by **S. E. Durand\***, J. T. Heaton\*, S. Amateau\* and S. E. Brauth, J. Comp. Neur., 377:179-206, 1997.

"Methionine enkephalin immunoreactivity in the brain of the budgerigar (*Melopsittacus undulatus*): Similarities and Differences with Respect to Oscine Songbirds" by **S. E. Durand\***, W. Liang\* and S. E. Brauth, J. Comp. Neur., 393:145-168, 1998.

"Cytoarchitecture of vocal control nuclei in nestling budgerigars: Relationships to call development" by **W. S. Hall**, K. K. Cookson, J. T. Heaton\*, T. F. Roberts\*, S. Shea\*, S. K. Amateau\* and S. E. Brauth, Brain, Behavior and Evolution, 53: 198-226, 1999.

"The effects of deafening on the development of nestling and juvenile vocalizations in the budgerigar (*Melopsittacus undulatus*)", by **J. T. Heaton\*** and S. E. Brauth, J. Comp. Psychol., 117:304-320, 1999.

"Telencephalic nuclei control late but not early vocalizations in nestling budgerigars" by **J. T. Heaton\*** and S. E. Brauth, Behavioral Brain Research, 109:127-133, 2000.

"Effects of lesions of the central nucleus of the anterior archistriatum on contact call and warble song production in the budgerigar (*Melopsittacus undulatus*)" by **J. T. Heaton\*** and S. E. Brauth, Neurobiology of Learning and Memory, 73:207-242, 2000.

"The distribution of tyrosine hydroxylase-containing neurons and fibers and in the brain of the budgerigar (*Melopsittacus undulatus*): General patterns and vocal control nuclei" by **T. F. Roberts\***, K. K. Cookson\*, K. J. Heaton\*, W. S. Hall and S. E. Brauth, J. Comp. Neurol., 429:436-454, 2001.

"Projections of the oval nucleus of the hyperstriatum ventrale in the budgerigar (*Melopsittacus undulatus*): Relationships with the Auditory System" by **S. E. Brauth**, W. Liang\* and T. F. Roberts\*, J. Comp. Neurol., 432:481-511, 2001.

"Distribution of iron in the parrot brain: Conserved (pallidal) and derived (nigral) labeling patterns" by **T. F. Roberts\***, S. E. Brauth and W. S. Hall, Brain Res., 921:138-49, 2001.

"Calcitonin gene-related peptide immunoreactive cells and fibers in forebrain vocal and auditory nuclei of the budgerigar (*Melopsittacus undulatus*)" by **S. E. Durand\***, S. E. Brauth and W. Liang\*, Brain, Beh. and Evol., 58:61-79, 2001.

"Contact call driven induction and habituation of zenk protein in telencephalic auditory nuclei in the budgerigar (*Melopsittacus undulatus*): Implications for understanding vocal learning" by **S. E. Brauth**, W. Liang\*, T. F. Roberts\*, L. L. Scott and E. M. Quinlan, Learning and Memory, 9: 76-88, 2002.

"Organization of the avian basal forebrain: Chemical anatomy in the parrot (*Melopsittacus undulatus*)" by **T. F. Roberts\***, William S. Hall and Steven E. Brauth, J. Comp. Neurol., 454:383-408, 2002.

"Contact call driven induction of zenk mRNA in the telencephalon of the budgerigar (*Melopsittacus undulatus*)" by **S. E. Brauth**, Y.-Z. Tang\*, W. Liang\* and T. F. Roberts\*, Mol. Brain Res., 117:97-103, 2003.

“Sexual Dimorphism of Vocal Control Nuclei in Budgerigars (*Melopsittacus undulatus*) Revealed with Nissl and NADPH-d Staining” by **S. E. Brauth**, W. Liang\*, S. K. Amateau\* and T. F. Roberts\*, J. Comp. Neurol., 484:15-27, 2005.

“Feeding and contact call stimulation both induce zenk and cfos expression in a higher order telencephalic area necessary for vocal learning in budgerigars” by **S. E. Brauth**, W. Liang\*, Y. Beru\*, T. F. Roberts\* and W. S. Hall, Beh. Brain Res., 168:331-338, 2006 (Epub 2005).

“Contact-call driven and tone-driven zenk expression in the nucleus ovoidalis of the budgerigar (*Melopsittacus undulatus*)” by **S. E. Brauth**, W. Liang\*, and W. S. Hall, Neuroreport. 17:1407-1410, 2006.

“Rapid contact call-driven induction of NR2A and NR2B NMDA subunit mRNAs in the auditory thalamus of the budgerigar (*Melopsittacus undulatus*).” by **S. E. Brauth**, W. Liang\*, Y.-Z. Tang\*, E. Galdzicka\* and W. S. Hall, Neurobiology of Learning and Memory, 88:33-39, 2007.

“A Novel Female Call Incites Male-Female Interaction and Male-Male Competition in the Music Frog, *Babina daunchina*” by **J. G. Cui**, Y.S. Wang, S. E. Brauth and Y.-Z. Tang\*, Animal Behaviour 80:181-187, 2010.

“An Acoustic Analysis of the Advertisement Calls of the Music Frog, *Babina daunchina*” by **Q. Chen**, J. G. Cui, G. Z. Fang, S. E. Brauth and Y. Z. Tang\*, J. Herpetol., 45:406-416, 2011. DOI:10.1670/10-133.1

“Geographic variation in the advertisement calls of Gekko Gecko in relation to variations in morphological features: Implications for regional population differentiation” by **X. Yu**, Y. Peng, A. L. Aowphol, L. Ding, S. E. Brauth, Y.-Z. Tang\*, Ethology, Ecology and Evolution, 23: 211-228, 2011 DOI: 10.1080/03949370.2011.566581.

“Circadian rhythm of calling behavior in the Emei music frog (*Babina dauchina*) is associated with habitat temperature and relative humidity” by **J. G. Cui**, X. Song, G. Z. Fang, X. Fei, S. E. Brauth and Y. Z. Tang\*. Asian Herp. Res., 2:149-154, 2011 DOI: 10.3724/SP.J.1245.2011.00149.

“Male competition strategies change depending on female receptivity” by **F. Xu**, J. G. Cui, J. Song, S. E. Brauth and Y. Z. Tang\*, Behavioral Ecology, 23:307-312, 2012. DOI:10.1093/beheco/arr187.

“Reduced performance of prey targeting in pit vipers with contralaterally occluded infrared and visual senses” by **Q. Chen**, H. Deng, S. E. Brauth, L. Ding and Y. Z. Tang\*, PLoS ONE 7(5): e34989, 2012. doi:10.1371/journal.pone.0034989.

“Effects of body size and environmental factors on the acoustic structure and temporal rhythm of calls in *Rhacophorus dennysi*” by **J. Wang**, J. G. Cui, H. Shi, S. E. Brauth and Y. Z. Tang\*, Asian Herp. Res., 3:205-212, 2012 doi:10.3724/SP.J.1245.2012.00205.

“Mating Signals Indicating Sexual Receptiveness Induce Unique Spatio-Temporal EEG Theta Patterns in Anuran Species” by **G. Z. Fang**, P. Yang, J. G. Cui, D. Yao, S. E. Brauth and Y. Z. Tang\*, PLoS ONE 7(12): e52364, 2012 doi: 10.1371/journal.pone.0052364.

“Male Vocal Competition is Dynamic and Strongly Affected by Social Contexts in Music Frogs” by **G.Z. Fang**, F. Jiang, P. Yang, J. G. Cui, S. E. Brauth and Y. Z. Tang\*, Animal Cognition, 17: 483-494 2014 (Epub 2013) DOI 10.1007/s10071-013-0680-5.

“Electroencephalographic Signals Synchronize with Behaviors and are Sexually Dimorphic during the Light-Dark Cycle in Reproductive Frogs” by **P. Yang**, G. Z. Fang\*, S. E. Brauth and Y. Z. Tang\*, J. Comp. Physiol. A 200:117-127, 2014 (Epub 2013), DOI: 10.1007/s00359-013-0866-y.

“Right ear advantage for vocal communication in frogs results from both structural asymmetry and attention modulation” by **Guangzhan Fang**, Fei Xue, Ping Yang, Steven E. Brauth and Yezhong Tang\*, Behavioural Brain Research, 266: 77-84, 2014.

"The biological significance of acoustic stimuli determines ear preference in the Emei music frog" by **Fei Xue**, Guangzhan Fang, Ping Yang, Ermi Zhao, Steven E. Brauth and Yezhong Tang\*, J. Exp. Biol. 218:740-747, 2015. 10.1242/jeb.114694

"Gene expression specializations reveal core and unique shell regions of the parrot song system" by **M. Chakraborty**, S. Walloe, S. Nedergaard, E. E. Fridel, T. Dabelsteen, B. Pakkenberg, M. F. Bertelsen, G. M. Dorrestein, S. E. Brauth, S. E. Durand\*, E. D. Jarvis, PLoS ONE, 2015. DOI: 10.1371/journal.pone.0118496

"Parallel coevolution of signal-receiver characteristics in male and female Emei music frogs" by **Jianguo Cui**, Jichao Wang; Guangzhan Fang; Xiaowei Song; Steven E. Brauth; Yezhong Tang\*, Ethology, submitted 2015.

#### D. Book Reviews.

Review of "Lovebirds, Cockatiels, Budgerigars: Behavior and Evolution" by J. Lee Kavanau, Science Software Systems Inc., Los Angeles. Reviewed by **S. E. Brauth** for Brain, Behavior and Evolution, 32:63-64, 1988.

#### E. Conferences and Workshops: Talks, Abstracts, and Other Contributions

##### 1. Invited Talks at Conferences

"Auditory pathways in the budgerigar", invited talk presented by **S. E. Brauth**, International Biopsychology Symposium, Keio University, Tokyo, Japan, August 1986.

"The evolution of the amniote basal ganglia", invited talk presented by **S. E. Brauth**, Institute for Animal Behavior, Rutgers University, Newark, December, 1987.

"Structure and functions of the paleostriatal system of Caiman crocodiles", invited talk presented by **S. E. Brauth** in the International Brain Research Organization (IBRO) satellite symposium on the Structure and Functions of the Reptilian Forebrain (Schwerdtkoff and Lohman, organizers) in Frankfurt, West Germany, August 14-15, 1987.

"Histochemical Strategies in the Study of Brain Evolution", invited talk presented by **S. E. Brauth** talk, Karger Workshop, Satellite Symposium to Society for Neuroscience Meeting, October, 1989.

"Functional Anatomy of Forebrain Auditory Pathways in the Budgerigar", invited talk presented by **S. E. Brauth**, Karger Workshop, Satellite Symposium to Society for Neuroscience Meeting, November 1993.

"Auditory-Vocal Interfaces in the Budgerigar", invited talk presented by **S. E. Brauth**, Institute for Animal Behavior, Rutgers University, Newark, N. J., February, 1995.

"Functional Anatomy of Forebrain Vocal Control Pathways in the Budgerigar", invited talk presented by **S. E. Brauth** for symposium sponsored by the New York Academy of Sciences titled "Integrative Neurobiology of Affiliative Behavior", 1997.

"An Acoustic Analysis of the Advertisement Calls of the Emei Music Frog, *Babina daunchina*" invited talk presented by **S. E. Brauth** with Qin Chen, Jianguo Cui, Guangzhan Fang, and Yezhong Tang\* at the 5<sup>th</sup> Asian Herpetological Conference, Chengdu China, June 2, 2012.

##### 2. Presentations

"Correlation of overt escape behavior, multi-unit thalamic activity and midbrain lemniscal stimulation in rats", presented at the April 1973 meeting of the Eastern Psychological Association, by **S. E. Brauth** and E. E. Coons.

"Midbrain unit activity during classical conditioning", presented at the April 1974 meeting of the Federation of Societies of Experimental Biology, by **S. E. Brauth** and J. Olds.

"Direct accessory optic projections to the vestibulocerebellum" presented at the November 1975 meeting of the Society for Neuroscience, by **S. E. Brauth** and H. J. Karten.

"LM may be NOT", presented at the April 1981 meeting of the Association for Research in Vision and Ophthalmology, by **B. J. Winterson\*** and S. E. Brauth.

"Comparative neurobiology of the basal ganglia", presented at the October 1982 meeting of the J. B. Johnston Club, by **S. E. Brauth**.

"Parallel sensory pathways in the auditory system of the budgerigar", presented at the February 1985 meeting of the Association for Research in Otolaryngology, by **S. E. Brauth**, C. A. Brasher\* and R. J. Dooling.

"Acoustic basis of contact call discrimination in budgerigars", presented at the February 1985 meeting of the Association for Research in Otolaryngology, by T. J. Park, R. J. Dooling and **S. E. Brauth**.

"Cholinergic neurons in the telencephalon of the reptile, Caiman crocodilus", presented at the April 1985 meeting of the American Association of Anatomists, by **S. E. Brauth**, C. A. Kitt\*, D. L. Price and B. H. Wainer.

"The distribution of delta, kappa and mu opiate receptors in the forebrain and midbrain of the pigeon", presented at the April 1986 meeting of the American Association of Anatomists, by **S. E. Brauth**, A. Reiner, C. A. Kitt\* and R. Quirion.

"Neuroanatomical organization of forebrain auditory pathways in the budgerigar", presented at the September 1986 meeting of the First International Congress of Neuroethology by **S. E. Brauth**, C. M. McHale\*, C. A. Brasher\* and R. J. Dooling.

"Computer aided instruction in neuroanatomy", presented at the April 1986 meeting of the Advanced Educational Programming Conference, sponsored by IBM Corporation, San Diego, California, by **S. E. Brauth**.

"Degeneration in the basal ganglia of the caiman disrupts motor functions", presented at the September 1988 MPTP-Sardinia '88 conference - Degeneration and Regeneration Processes in the CNS, by **S. E. Brauth**.

"Mate-specific behavior in the budgerigar", presented at the June 1989 convention of the American Psychological Society by **D. C. Zocchi\*** and S. E. Brauth.

"Evidence for polysensory processing in sensory areas afferent to vocal control nuclei in the budgerigar." by **S. E. Brauth**, W. Liang\*, Y. Beru\*, Y. Z. Tang\*, T. F. Roberts\* and W. S. Hall, presented at the 2005 meeting of the J. B. Johnston Club (satellite symposium of the Society for Neuroscience meeting).

#### 5. Non-Refereed Conference Proceedings-

"Computer aided instruction in Neuroanatomy" by **S. E. Brauth**, Proceedings of the 1986 Advanced Educational Programming Meeting, IBM Corporation, pp. III-16 to III-28, 1986.

"Degeneration in the basal ganglia of the caiman disrupts motor functions" by **S. E. Brauth**, Proceedings of the 1988 Conference MPTP - Sardinia '88 - Degeneration and Regeneration Processes in the CNS, 1989.

#### 6. Abstracts-

"Direct accessory optic projections to the vestibulo-cerebellum" by **S. E. Brauth** and H. J. Karten, Neuroscience Abstracts, 1:217, 1975.

"Prosencephalic pathways related to the avian basal ganglia" by **S. E. Brauth**, J. L. Ferguson\* and C. A. Kitt\*, Neuroscience Abstracts, 3:35, 1977.

"The crocodilian midbrain tegmentum: A key to understanding the avian diencephalon" by **S. E. Brauth**, C. A. Kitt\* and J. L. Ferguson\*, Neuroscience Abstracts, 4:98, 1978.

"Neural connections of the lateral corticoid areas in the pigeon, *Columba livia*" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience Abstracts, 4:45, 1978.

"Demonstration of reciprocal connections between the paleostriatum and the midbrain tegmentum in the pigeon" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience Abstracts, 5:74, 1979.

"Telencephalic projections from catecholamine cell groups in the pigeon" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience Abstracts, 6:630, 1980.

"LM may be NOT" by **B. J. Winterson\*** and S. E. Brauth, Investigative Ophthalmology and Visual Science, 20: 56, 1981.

"A basal ganglia-thalamic-telencephalic path in pigeons" by **C. A. Kitt\*** and S. E. Brauth, Neuroscience Abstracts, 7: 194, 1981.

"A pretectal-tectal enkephalin connection: Immunohisto-chemical studies of homologous systems in reptiles" by S. E. Brauth and A. Reiner, Neuroscience Abstracts, 8:116, 1982.

"Evidence for a GABA-containing striato-tegmental path in pigeons" by **K. Hall\***, S. E. Brauth and C. A. Kitt\*, Neuroscience Abstracts, 9:1065, 1983.

"Auditory nuclei in the budgerigar" by **S. E. Brauth** and R. J. Dooling, Neuroscience Abstracts, 10:401, 1984.

"Parallel sensory pathways in the auditory system of the budgerigar" by **S. E. Brauth**, C. A. Brasher\* and R. J. Dooling, Association for Research in Otolaryngology, p.141, 1985.

"Acoustic basis of contact call discrimination in budgerigars" by **T. Park**, R. J. Dooling and S. E. Brauth, Association for Research in Otolaryngology, p. 47, 1985.

"Cholinergic neurons in the telencephalon of the reptile, Caiman crocodilus" by **S. E. Brauth**, C. A. Kitt\*, D. L. Price and B. H. Wainer, Anatomical Record, 1985.

"Neurotensin receptors within the forebrain and midbrain of the pigeon" by **S. E. Brauth**, C. A. Kitt\*, A. Reiner and R. Quirion, Neuroscience Abstracts, 11:413, 1985.

"Intratelencephalic pathways related to the auditory system of the budgerigar" by **C. M. McHale\*** and S. E. Brauth, Neuroscience Abstracts, 11:546, 1985.

"The distribution of delta, kappa and mu opiate receptors in the forebrain and midbrain of the pigeon" by **S. E. Brauth**, A. Reiner, C. A. Kitt\* and R. Quirion, Anatomical Record, 1986.

"Neuroanatomical organization of forebrain auditory pathways in the budgerigar" by **S. E. Brauth**, C. M. McHale\* and R. J. Dooling, First International Congress of Neuroethology, p. 94, 1986.

"Catecholamine neurons in the brain of Caiman crocodilus" by **S. E. Brauth**, Neurosci. Abstracts, 12:110, 1986.

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"Auditory projections to the anterior telencephalon in the budgerigar (Melopsittacus undulatus) by **S. E. Brauth**, W. S. Hall and P. Cohen\*, Neuroscience Abstracts, 16:246, 1990.

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"Effect of lesions in forebrain auditory structures in the budgerigar" by **W. S. Hall**, J. T. Heaton\*, P. L. Cohen\* and S. E. Brauth, Neuroscience Abstracts, 18:530, 1992.

"Vocalizations following tracheosynringial nerve sectioning in the budgerigar" by **J. T. Heaton\***, S. Farabaugh and S. E. Brauth, Neuroscience Abstracts, 18:530, 1992.

"Thalamic auditory input to vocal control nuclei in the budgerigar" by **S. E. Durand\***, W. S. Hall and S. E. Brauth, Neuroscience Abstracts, 19:1018, 1993.

"Lesions of telencephalic vocal control nuclei in the budgerigar (*Melopsittacus undulatus*) disrupt both calls and warble song" by **J. T. Heaton\***, S. E. Brauth and W. Liang\*, Neuroscience Abstracts, 20:164, 1994.

"Connections and vocal functions of nucleus dorsomedialis posterior in the budgerigar" by **W. S. Hall**, J. T. Heaton\*, S. E. Durand\*, S. Amateau\* and S. E. Brauth, Neuroscience Abstracts, 20:164, 1994.

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"Vocal control nuclei receive cholinergic inputs from the basal forebrain in the budgerigar" by **W. S. Hall**, K. K. Cookson\*, J. T. Heaton\*, S. E. Durand\*, W. Liang\* and S. E. Brauth, Neuroscience Abstracts, 21:963, 1995.

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"Early vocal and neural development in the budgerigar" by **W. S. Hall**, K. K. Cookson\*, J. T. Heaton\*, T. F. Roberts\*, S. Shea\* and S. E. Brauth, Neuroscience Abstracts, 22:694, 1996.

"Effects of vocal archistriatal lesions and early deafening on vocal development in the budgerigar" by **J. T. Heaton\*** and S. E. Brauth, Neuroscience Abstracts, 22:694, 1996.

"Common organizational features in budgerigar and oscine forebrain vocal control systems" by **S. E. Durand\***, J. T. Heaton\* and S. E. Brauth, Neuroscience Abstracts, 22:1402, 1996.

"Transient expression and developmental changes in staining for acetylcholinesterase and choline acetyltransferase in the budgerigar" by **T. F. Roberts\***, K. K. Cookson\*, W. S. Hall and S. E. Brauth, Neuroscience Abstracts, 23: 1307, 1997.

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"Colocalization of Vocalization-Driven Zenk Protein Expression and NADPH-d in Vocal Control Nuclei of Nestling and Adult Budgerigars" by **T. Roberts\***, W. Liang\*, S. E. Brauth and W. S. Hall, Neuroscience Abstracts, 24: 700, 1998.

"Tyrosine Hydroxylase in Telencephalic Vocal Control Nuclei of the Budgerigar" by **W. S. Hall**, K. J. Heaton\*, K. K. Cookson\*, T. F. Roberts\* and S. E. Brauth, Neuroscience Abstracts, 24: 701, 1998.

"Vocal and Accessory Auditory Pathways of the Budgerigar (*Melopsittacus undulatus*) Exhibit Calcitonin Gene Related Peptide Immunoreactivity" by N. F. Vatcha\*, **S. E. Durand\***, C. A. Kitt and S. E. Brauth, Neuroscience Abstracts, 24: 190, 1998.

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“Shell neurons of the auditory nucleus ovoidalis terminate in the subhabenular posterior thalamus” by **S.E. Durand\***, S.E. Brauth and M.F. Cheng, Neuroscience Abstracts, 27:855.20, 2001.

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“C-Fos expression in the secondary auditory forebrain in budgerigars by **T. F. Roberts\***, S. E. Brauth and W. Liang\*, Soc. Neurosci. Abs. 27:261.7, 2002.

“The distribution of calcitonin gene-related peptide (CGRP) receptor in pigeon brain.” by **K. Yamamoto**, S. E. Brauth, S. E. Durand\*, Y. Dumon, R. Quirion and A. Reiner, Soc. Neurosci. Abs. 27:877.14, 2002.

“Perinucleolar zenk binding in parrots” by **S. E. Brauth**, W. Liang\*, T. Roberts\* and Y.-Z. Tang\*, Soc. Neurosci. Abs. 28:897.11, 2003. (This abstract was selected for inclusion in press book #13162 associated with the meeting).

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“Feeding and contact call stimulation both induce zenk and cfos expression in a higher order telencephalic area necessary for vocal learning in budgerigars” by **W. Liang\***, Y. Beru\*, T. F. Roberts\*, W. S. Hall and S. E. Brauth, Soc. Neurosci. Abs. 30: 204.3, 2005.

“Evidence for polysensory processing in sensory areas afferent to vocal control nuclei in the budgerigar.” by **S. E. Brauth**, W. Liang\*, Y.T. Beru\*, Y.-Z. Tang\*, T. F. Roberts\* and W. S. Hall, *Brain Behav. Evol.*, 2005.

“Comparison of contact call and tone-driven zenk expression in nucleus ovoidalis in budgerigars” by **S. E. Brauth**, W. Liang\* and W. S. Hall, Soc. Neurosci. Abs. 31:579, 2006.

“Auditory and Vocal Functions of the Magnocellular Nucleus of the Dorsomedial Thalamus in the Budgerigar” by **S. E. Brauth** and W. Liang\*, Soc. Neurosci. Abs., 2007.

“Advertisement calls drive IEG mRNA expression in auditory system of lizards” by **Y.-Z. Tang\***, W. Liang\*, K. Yan, Toby Matthews, S. E. Brauth and C. E. Carr, Soc. Neurosci. Abs. 2008. Also presented at UMCP on Bioscience Day 2008 (Poster Location 172).

“Anatomical Differences in Reptilian Auditory and Vestibular Brainstem Nuclei Reflect Adaptation: A Comparative Study of Parvalbumin-ir in Squamata and Chelonians” by J. Xu, J. Song, S. E. Brauth, C. E. Carr, B. Young and **Y.-Z. Tang\***, Society for Neuroscience Abstract, 2010.

"Synergistic Interaction Between Visual and Infrared Senses During Prey Targeting in Pit Vipers" by **Q. Chen**, H. Deng, L. Ding, S. E. Brauth and Y. Z. Tang\*, Society for Neuroscience Abstract, 2010.

"Changes in electroencephalographic power spectra associated with vigilance and reproductive status in an anuran species" by **J. Cui**, Q. Chen, G. Fang, Y.-Z. Tang\*, S. E. Brauth, Society for Neuroscience Abstract, 286.04, 2011.

"The Spectral Characteristics and Temporal Rhythm of Male Calls are Affected by Body Size and Environmental Factors in the Large Treefrog, *Rhacophorus dennysi*" by **J. Wang**, J. Cui, H. Shi, S. E. Brauth and Y.-Z. Tang\*, 5<sup>th</sup> Asian Herpetological Conference, Chengdu China, A010, 2012.

"Preliminary Study of Pit Vipers' Infrared and Visual Senses" by **Q. Chen**, H. Deng, S. E. Brauth, L. Ding and Y.-Z. Tang\*. 5<sup>th</sup> Asian Herpetological Conference, Chengdu China, A003, 2012.

"An Acoustic Analysis of the Advertisement Calls of the Emei Music Frog, *Babina daunchina*", by **Q. Chen**, J. Cui, G. Fang, S. E. Brauth and Y.-Z. Tang\*, 5<sup>th</sup> Asian Herpetological Conference, Chengdu China, A144, 2012

"Mating Signals Indicating Sexual Receptiveness Induce Unique Spatio-Temporal EEG Theta Patterns in Frogs" by **G. Fang**, P. Yang, J. Cui, D. Yao, S. E. Brauth and Y.-Z. Tang\*, 5<sup>th</sup> Asian Herpetological Conference, Chengdu China, A087, 2012.

"Mating Signals Indicating Sexual Receptiveness Induce Unique Spatio-Temporal EEG Theta Patterns in Frog" by **G. Fang**, J. Cui, D. Yao, S. E. Brauth and Y.-Z. Tang\*. Front. Behav. Neurosci. Conference Abstract: Tenth International Congress of Neuroethology. doi: 10.3389/conf.fnbeh.2012.27.00447, 2012.

"Gene expression specializations reveal core and unique shell regions of the parrot song system" by **M. Chakraborty**, S. Walloe, S. Nedergaard, E. E. Fridel, T. Dabelsteen, B. Pakkenberg, M. F. Bertelsen, G. M. Dorrestein, S. E. Brauth, S. E. Durand\*, E. D. Jarvis, Neuroscience Abstracts, 196.07, 2013.

## 7. Posters

"Prosencephalic pathways related to the avian basal ganglia", presented at the 1977 meeting of the Society for Neuroscience by **S. E. Brauth**, J. L. Ferguson\* and C. A. Kitt\*.

"The crocodylian midbrain tegmentum: A key to understanding the avian diencephalon", presented at the November 1978 meeting of the Society for Neuroscience, by **S. E. Brauth**, C. A. Kitt\* and J. L. Ferguson\*.

"Neural connections of the lateral corticoid areas in the pigeon, *Columba livia*", presented at the November 1978 meeting of the Society for Neuroscience, by **C. A. Kitt\*** and S. E. Brauth.

"Demonstration of reciprocal connections between the paleostriatum and the midbrain tegmentum in the pigeon", presented at the November 1979 meeting of the Society for Neuroscience, by **C. A. Kitt\*** and S. E. Brauth.

"Telencephalic projections from catecholamine cell groups in the pigeon", presented at the November 1980 meeting of the Society for Neuroscience, by **C. A. Kitt\*** and S. E. Brauth.

"A basal ganglia-thalamic-telencephalic path in pigeons", presented at the October 1981 meeting of the Society for Neuroscience, by **C. A. Kitt\*** and S. E. Brauth.

"A pretectal-tectal enkephalin connection: Immunohisto-chemical studies in reptiles", presented at the October 1982 meeting of the Society for Neuroscience by **S. E. Brauth** and A. Reiner.

"Evidence for a GABA-containing striato-tegmental path in pigeons, presented at the November 1983 meeting of the Society for Neuroscience by **K. Hall\***, S. E. Brauth and C. A. Kitt\*.

"Auditory nuclei in the budgerigar", presented at the October 1984 meeting of the Society for Neuroscience, by **S. E. Brauth** and R. J. Dooling.

"Neurotensin receptors in the forebrain and midbrain of the pigeon", presented at the October 1985 meeting of the Society for Neuroscience, by **S. E. Brauth**, C. A. Kitt\*, A. Reiner and R. Quirion.

"Intratelencephalic pathways in the auditory system of the budgerigar", presented at the October 1985 meeting of the Society for Neuroscience, by **C. M. McHale\*** and S. E. Brauth.

"Catecholamine neurons in the brain of Caiman crocodilus", presented at the November 1986 meeting of the Society for Neuroscience by **S. E. Brauth**.

"Motor functions of the caiman basal ganglia", presented at the November 1987 meeting of the Society for Neuroscience by **S. E. Brauth**.

"Serotonin neurons in the brain of the reptile, Caiman crocodilus, presented at the November 1988 meeting of the Society for Neuroscience by **S. E. Brauth**.

"Effect of Field "L" lesions on auditory discrimination in the budgerigar (Melopsittacus undulatus), presented at the Oct. 1989 meeting of the Society for Neuroscience by **S. E. Brauth**, S. D. Brown, T. Park, K. Okanoya and R. J. Dooling.

"CGRP is an evolutionarily conserved marker for thalamic auditory relay neurons", presented at the October 1989 meeting of the Society for Neuroscience by **A. Reiner** and S. E. Brauth.

"Auditory projections to the anterior telencephalon in the budgerigar", presented at the 1990 meeting of the Society for Neuroscience by **S. E. Brauth**, W. S. Hall and P. Cohen\*.

"Neural and vocal development in the budgerigar", presented at the 1991 meeting of the Society for Neuroscience by **S. E. Brauth**, D. C. Zocchi\*, P. L. Cohen\*, W. Liang\* and W. S. Hall.

"Effect of forebrain auditory lesions on call development in the budgerigar", presented at the 1992 meeting of the Society for Neuroscience by W. S. Hall, J. T. Heaton\*, P. L. Cohen\* and S. E. Brauth.

"Vocalizations after tracheosyringeal nerve sectioning in the budgerigar", presented at the 1992 meeting of the Society for Neuroscience by **J. T. Heaton\***, S. Farabaugh and S. E. Brauth.

"Thalamic auditory input to vocal control nuclei in the budgerigar", presented at the 1993 meeting of the Society for Neuroscience by **S. E. Durand\***, W. S. Hall and S. E. Brauth".

"Lesions of telencephalic vocal control nuclei in the budgerigar (Melopsittacus undulatus) disrupt both calls and warble song" presented at the 1994 meeting of the Society for Neuroscience by **J. T. Heaton\***, S. E. Brauth and W. Liang\*.

"Connections and vocal functions of nucleus dorsomedialis posterior in the budgerigar" presented at the 1994 meeting of the Society for Neuroscience by **W. S. Hall**, J. T. Heaton\*, S. E. Durand\*, S.K. Amateau\* and S. E. Brauth.

"Lesions of a vocal control nucleus in the budgerigar disrupt production but not perception of contact calls" presented at the 1995 meeting of the Society for Neuroscience by **J. T. Heaton\***, M. L. Dent, R. J. Dooling and S. E. Brauth,

"Organizational features of budgerigar vocal circuitry relative to songbirds: A distributed versus a hierarchical system" presented at the 1995 meeting of the Society for Neuroscience by **S. E. Durand\***, J. T. Heaton\* and S. E. Brauth.

"Vocal control nuclei receive cholinergic inputs from the basal forebrain in the budgerigar" presented at the 1995 Society for Neuroscience meeting by **W. S. Hall**, K. K. Cookson\*, J. T. Heaton\*, S. E. Durand\*, W. Liang\* and S. E. Brauth.

"NADPH-d neurons in vocal control nuclei of the budgerigar" by **S. E. Brauth**, W. Liang\* and S. K. Amateau\*, presented at the November, 1996 meeting of the Society for Neuroscience.

"Early vocal and neural development in the budgerigar" by **W. S. Hall**, K. K. Cookson\*, J. T. Heaton\*, T. F. Roberts\*, S. Shea\* and S. E. Brauth, presented at the November, 1996 meeting of the Society for Neuroscience.

"Effects of vocal archistriatal lesions and early deafening on vocal development in the budgerigar" by **J. T. Heaton\*** and S. E. Brauth, presented at the November, 1996 meeting of the Society for Neuroscience.

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"Colocalization of Vocalization-Driven Zenk Protein Expression and NADPH-d in Vocal Control Nuclei of Nestling and Adult Budgerigars" by **T. F. Roberts\***, W. Liang\*, S. E. Brauth and W. S. Hall, presented at the 1998 meeting of the Society for Neuroscience.

"Tyrosine Hydroxylase in Telencephalic Vocal Control Nuclei of the Budgerigar" by **W. S. Hall**, K. J. Heaton\*, K. K. Cookson\*, T. F. Roberts\* and S. E. Brauth, presented at the 1998 Society for Neuroscience meeting.

"Vocal and Accessory Auditory Pathways of the Budgerigar (*Melopsittacus undulatus*) Exhibit Calcitonin Gene Related Peptide Immunoreactivity" by N. F. Vatcha\*, **S. E. Durand\***, C. A. Kitt\* and S. E. Brauth, presented at the 1998 meeting of the Society for Neuroscience.

"Complex Responses to Auditory Stimuli in the Budgerigar Oval Nucleus of the Hyperstriatum Ventrale (HV0)", by **S. E. Durand\*** and S. E. Brauth, presented at the 1998 meeting of the Society for Neuroscience.

"Investigation of Functional Pathways of the Oval Nucleus of the Hyperstriatum Ventrale in the Budgerigar" by **S. E. Brauth**, W. Liang\*, T. Benaderet\* and T. F. Roberts\*, presented at the 1999 Society for Neuroscience meeting.

"Vocalization-driven zenk responses in budgerigar vocal control nuclei" by **S. E. Brauth**, W. Liang\* and T. F. Roberts\*, presented at the 2000 meeting of the Society for Neuroscience.

"Chemical anatomy of the avian basal forebrain: an immunohistochemical, histochemical, and cytoarchitectural study in a parrot (*Melopsittacus undulatus*)" by **T. F. Roberts\***, W. S. Hall, and S. E. Brauth, presented at the 2000 meeting of the Society for Neuroscience.

"Rapid induction and habituation of auditory-driven zenk expression in auditory-vocal pathways of the budgerigar (*Melopsittacus undulatus*)" by **S. E. Brauth**, W. Liang\* and T. F. Roberts\*, presented at the 2001 Society for Neuroscience meeting.

"Shell neurons of the auditory nucleus ovoidalis terminate in the subhabenular posterior thalamus" by **S.E. Durand\***, S.E. Brauth and M.F. Cheng, presented at the 2001 meeting of the Society for Neuroscience.

"The distribution of iron in the brain of the budgerigar" by **T. F. Roberts\***, S. E. Brauth and W. S. Hall, presented at the 2001 meeting of the Society for Neuroscience.

"C-Fos expression in the secondary auditory forebrain in budgerigars by **T. F. Roberts\***, S. E. Brauth and W. Liang\*. Presented at the Nov. 2002 meeting of the Society for Neuroscience Meeting.

"The distribution of calcitonin gene-related peptide (CGRP) receptor in pigeon brain." by **K. Yamamoto**, S. E. Brauth, S. E. Durand\*, Y. Dumon, R. Quirion and A. Reiner. Presented at the Nov. 2002 meeting of the Society for Neuroscience.

"Perinucleolar zenk binding in parrots" by **S. E. Brauth**, W. Liang\*, Y.-Z. Tang\* and T. F. Roberts\*. Presented at the Nov. 2003 of the Society for Neuroscience.

"Feeding and contact call stimulation both induce zenk and cfos expression in a higher order telencephalic area necessary for vocal learning in budgerigars" by **W. Liang\***, Y. Beru\*, T. F. Roberts\*, W. S. Hall and S. E. Brauth, presented at the Nov. 2005 meeting of the Society for Neuroscience.

"Contact call induced expression of NR2A and NR2B mRNAs in auditory-vocal pathways of the budgerigar" by **S. E. Brauth**, W. Liang\*, Y.-Z Tang\* and W. S. Hall, presented at the Nov. 2005 meeting of the Society for Neuroscience.

"Comparison of contact call and tone-driven zenk expression in nucleus ovoidalis in budgerigars" by **S. E. Brauth**, W. Liang\* and W. S. Hall, presented at the Oct. 2006 meeting of the Society for Neuroscience.

"Auditory and Vocal Functions of the Magnocellular Nucleus of the Dorsomedial Thalamus in the Budgerigar" by **S. E. Brauth** and W. Liang\*, presented at the Nov. 2007 meeting of the Society for Neuroscience.

"Advertisement calls drive IEG mRNA expression in auditory system of lizards" by **Y.-Z.Tang\***, W. Liang\*, K. Yan, T. Matthews, S. E. Brauth and C. E. Carr, presented at the Nov. 2008 meeting of the Society for Neuroscience (also presented at the UMCP Biosciences Day, 11/12/2008, poster location 172).

"Anatomical Differences in Reptilian Auditory and Vestibular Brainstem Nuclei Reflect Adaptation: A Comparative Study of Parvalbumin-ir in Squamata and Chelonians" by **J. Xu**, J. Song, S. E. Brauth, C. E. Carr, B. Young and Y.-Z. Tang\*, presented at the 11/2010 Society for Neuroscience meeting, Nov. 2010, session 791.

"Synergistic Interaction Between Visual and Infrared Senses During Prey Targeting in Pit Vipers" by **Q. Chen**, H. Deng, L. Ding, S. E. Brauth and Y.-Z. Tang\*, Society for Neuroscience Abstract; presented at the Society for Neuroscience meeting, Nov. 2010, Tuesday Nov. 16, session 579.

"Changes in electroencephalographic power spectra associated with vigilance and reproductive status in an anuran species" by **J. Cui**, Q.Chen, G. Fang, Y.-Z. Tang\*, S. E. Brauth, presented at the Nov. 2011, meeting of the Society for Neuroscience, Sunday Nov. 13, poster RR36.

"Mating Signals Indicating Sexual Receptiveness Induce Unique Spatio-Temporal EEG Theta Patterns in Frog" by **G. Fang**, J. Cui, D. Yao, S. E. Brauth S and Y.-Z. Tang\*, presented at the Tenth International Congress of Neuroethology. Poster PO223, Wednesday August 8, 2012.

"Gene expression specializations reveal core and unique shell regions of the parrot song system" to be presented by **M. Chakraborty**, S. Walloe, S. Nedergaard, E. E. Fridel, T. Dabelsteen, B. Pakkenberg, M. F. Bertelsen, G. M. Dorrestein, S. E. Brauth, S. E. Durand\*, E. D. Jarvis, Society for Neuroscience Meeting, 2013.

#### F. Colloquia and Research Presentations

"Reptile Ventral Paleostriatum", by **S. E. Brauth**, invited lecture to Reptile Interest Group, Society for Neuroscience, October 1984.

"Seminar on Amniote Brain Evolution", by **S. E. Brauth**, invited lecture to faculty and graduate students, Univ. of Pennsylvania, Department of Psychology, October 1984.

"Parallel pathways in the budgerigar auditory system", by **S. E. Brauth**, invited lecture to faculty and graduate students, Department of Anatomy, Georgetown University, November 1984.

"Evolution of the basal ganglia", by **S. E. Brauth**, invited lecture, Institute for Neuroscience, University of Pennsylvania, January, 1985.

"Vertebrate brain evolution", by **S. E. Brauth**, invited lecture to undergraduate students, Department of Psychology, University of Pennsylvania, March 1985.

"Evolution of the basal ganglia: Neuroethological studies in the Caiman", by **S. E. Brauth**, invited departmental colloquium, Department of Psychology, University of Pennsylvania, November 1986.

"Studies of brain and behavior in the reptile Caiman crocodilus", by **S. E. Brauth**, invited colloquium, Rockefeller University Field Center, Milbrook, N. Y., January, 1989.

“Audio-vocal pathways in budgerigars: Perspectives on the evolution of vocal learning”, by **S. E. Brauth**, Rudolfo Rivas memorial lecture, Neural and Cognitive Sciences Program, University of Maryland, College Park, January 2003.

“The Role of the Thalamus in “Acoustic Communication” by **S. E. Brauth**, presented by Steven E. Brauth at ChengChing Normal University on March 14, 2010.

“The Role of the Thalamus in Acoustic Communication”, by **S. E. Brauth**, presented to graduate students, postdoctoral fellows and faculty at the Chengdu Institute of Biology, Chinese Academy of Sciences on March 21, 2010.

## H. Sponsored Research

### I. Grants

7/1976 - 6/1979 NIH Grant (NS13018-01,02,03) - Comparative Neurobiology of the Basal Ganglia - \$67,827 direct costs approved, Principal Investigator, **S. E. Brauth**.

7/1979 - 8/1983 NIH Grant (NS13018-04,05,06) - Comparative Neurobiology of the Basal Ganglia - \$90,222 direct costs approved, Principal Investigator, **S. E. Brauth**.

3/1984 - 8/1987 NSF Grant (BNS83-12571) - Comparative Organization of Motor Pathways - \$145,533 total direct+indirect costs, Principal Investigator, **S. E. Brauth**.

6/1984- 5/1985 NIMH Small Grant (MH39424) - Anatomical Basis of Facilitated Learning - \$15,000, Principal Investigator, **S. E. Brauth**

7/1985 - 6/1988 NIMH Grant (MH40698-01,02,03) - Neural Basis of Associative Learning - \$125,997 direct costs approved, Principal Investigator, **S. E. Brauth** (R. J. Dooling, CO-PI).

7/1987 - 6/1990 NIH Grant (NS24992-01,02,03) - Comparative Neuroethology of Motor Systems - \$106,521 direct costs approved, Principal Investigator, **S. E. Brauth**.

7/1988 - 6/1992 NIMH Grant (MH40698-04,05,06,07) - Neural Basis of Associative Learning (This proposal received an NIMH Merit Award) - \$266,482 direct costs approved, Principal Investigator, **S. E. Brauth** (R. J. Dooling, CO-PI).

7/1992 - 6/1998 NIMH Grant (MH40698-08,09,10,11) - Neural Basis of Associative Learning (MERIT Extension approved 5/91 for an additional 4 year project period) - \$379,900 direct costs approved, Principal Investigator, **S. E. Brauth**. Later extended for 2 years at no cost.

2/1999-1/2003 NSF Grant (IBN9816061) - Neural Pathways for Auditory-Vocal Learning - \$257,785 total costs approved for period 2/1/99 to 1/31/02 plus one year extension, Principal Investigator, **S. E. Brauth**.

7/2007-8/2009 NIGMS Grant (T36GM08640-01S1)– “Minority Biomedical Research Talent in Psychology” – Subaward from APA to **S. E. Brauth** as Eastern Regional Team Leader - \$43,324.92.

## III. **Teaching and Advisement**

### A. Courses Taught During the last 10 Years-

#### 1. Undergraduate (Normally 2-3 courses per semester):

Introductory Psychology (PSYC 100, enrollment of 30-35).

Honors Introductory Psychology (PSYC 100H, enrollment of 20-30).

Development Biopsychology (PSYC 206, enrollment of 10-30)

Neural Systems and Behavior (PSYC 402, enrollment of 35-45)

Sensory and Perceptual Processes (PSYC310 enrollment of from 40-150)

Honors Seminar in Biological Basis of Mental Illness (HONR 279G, enrollment of 20-25)

Psychology Honors Seminar in the Biopsychology of Aggression (PSYC 498H, enrollment of 6).

Biological Basis of Mental Disorders (PSYC289I, enrollment of 80)  
 Psychology Senior Seminar (PSYC489B, enrollment of 10-15)  
 Advanced Topics: Evolution of the Forebrain (PSYC489N, enrollment of 6)

2. Graduate Courses (Normally 0-1 course per academic year):

Historical Viewpoints and Current Theories in Psychology (PSYC 608, enrollment of 10-35)  
 Neural Basis of Sensory Processes (PSYC 605, enrollment of 5-10)  
 Fundamentals of Neuroscience (NACS641, enrollment of 12-15)  
 Seminar on Evolution of the Forebrain (NACS728E, enrollment of 5-10)

B. Course or Curriculum Development

Fall 2010 - Developed an I-series course, PSYC289I (Biological Basis of Mental Disorders) including *Blackboard* website taught in the Fall 2010 semester. The website includes the course syllabus, powerpoint presentations, course packet, online quiz, study guide with practice questions, glossary of scientific terms and *Brain Browse* tool for studying human neuroanatomy.

Fall 2011 - Developed a new graduate course "Evolution of the Forebrain" for the NACS program. Topics included: (a) Overview of vertebrate brain development and organization (b) historical perspectives on cytoarchitecture of the forebrain, theories of homology and convergence, outgroup comparisons and the equivalent circuit hypothesis of Karten, (c) comparison of pallial organization in mammals, sauropsids and amphibian, (d) patterns and processes in neocortical development (e) parallel sensory pathways in land vertebrates (f) evolution of the basal ganglia (g) olfactory systems and evolution of the limbic system (h) behavioral and physiological studies of telencephalic functions in nonmammals (i) theoretical treatment of how a new neurobehavioral system can evolve – review of my own research on vocal learning in budgerigars.

Fall 2014 – Developed undergraduate advanced topics course "Evolution of the Forebrain" for PSYC489N including powerpoint presentations, lecture outlines, online quizzes and other assignments.

C. Teaching Innovations

1. Software, Web Pages, Online Education

1985 – 1989 - Developed computer aided instruction materials for undergraduate and graduate biopsychology courses including a software model of the human brain for use as an interactive computer graphics learning tool. Pilot tested these materials in both graduate and undergraduate courses and presented the results both within the University (Nov. 1985 Computer Science Spring Fair) and for a national conference of educators receiving grants of computer equipment from the IBM Corporation (Advanced Educational Programming Conference, San Diego, April 1986).

1990 – 2000 - Modified software to be used as a supplemental or required text and continued to use and develop this software in PSYC 606 (Human Biopsychology) a graduate course emphasizing human brain functional anatomy and clinical correlations. This software was also modified for PSYC206 (Developmental Biopsychology), an undergraduate course concerning the biological basis of developmental processes.

2000 – 2013 - Developed Powerpoint lecture slides (more than 5000) for use with video computer display technology for Introductory Psychology (PSYC100 and PSYC100H), Developmental Biopsychology (PSYC206), Honors Seminar in Biological Basis of Mental Disorders (HONR 279G), Neural Systems and Behavior (PSYC402), Sensory and Perceptual Processes (PSYC310), Biological Basis of Mental Disorders (PSYC289I), Fundamentals of Neuroscience (NACS641) and Evolution of the Forebrain (NACS728E).

2000 – 2012 - Developed a set of web based tools originally using **WebCT** and subsequently made available for **Blackboard** for NACS 641, PSYC 605, PSYC 606, PSYC 206, PSYC 498H, PSYC 402 (Physiological Psychology now Neural Systems and Behavior) and PSYC310 (Perception) including an HTML version of the brain model program, interactive quizzes and other material including course-based glossaries and notes. These websites include the Brain Browse as well as physiology simulations, review notes, study guides and practice exams. The websites for PSYC206 and all seminars include original course packets as well. Websites also include simulations of neurophysiological processes and tools for studying neural anatomy and functioning.



2009 - Received certificate for participating in an online Sloan-C course during 2/09 – 3/09 concerning “Delivering Content, Fostering Student Interactivity, and Assessing Learning In Blended Courses”. Using this technology, developed online live classroom sessions based on Wimba Live Classroom for PSYC 100H and PSYC 402.

2012 – present - Revised all previously developed original web-based tools for all courses I teach to work under the **Canvas** platform including all study materials, simulations and course packets.

#### 4. Instructional Workshops and Seminars Established

2010 - At the Chengdu Institute of Biology, China, developed a new graduate seminar “Seminar on the Evolution of the Forebrain”. The seminar was taught twice weekly from 3/5/10 – 5/24/10 for graduate students at the Chengdu Institute of Biology, Chinese Academy of Sciences including development of PowerPoint slides and lecture notes.

### D. Advising, Research Direction

#### 1. Undergraduate

1992 - Mentor for Ronald E. McNair Program for recruiting undergraduate minority scholars into science (summer of 1992).

1991 - Served as mentor for REU (Research Experience for Undergraduate) Program, an NSF-sponsored program administered by the Zoology department aimed at recruiting undergraduate scholars into neuroscience (1991).

1990 – 2013 - Mentor for undergraduate honors students in Psychology: Paul Cohen (5/90), Steve Cayelli (5/91), David Airey (5/92), Stewart Amateau (12/95), Mark Flasar (5/96), Steven Shea (5/95), Latrice Scott, Tova Benaderet (5/2000) - including one (Airey) who won an NSF predoctoral fellowship and one (Amateau) who received a Howard Hughes Undergraduate Research Fellowship under my mentorship and Ms. Ginevra Frank (2013), Independent Studies Major.

1994 - Mentor for Zoology Honors student (Micah Sickel, 5/94) who won a Hughes Undergraduate Fellowship and later was admitted to the MD/PhD program at Univ. of Md.

2007-2009 - Eastern Regional Team Leader in an APA/NIGMS project to increase recruitment of minority undergraduate and graduate students into biologically based behavioral sciences. Students mentored have included Serena McCann, Senovia .Smith Yodit Beru, Omair Janjua and Colleen Frasier.

#### 2. Masters

Committees Served On: Jace Glowa (12/1976); Maureen McCall (8/1977); Susan Weiss (6/1978); Tom Park (6/1984); Cynthia Kline (10/1984); Ccatherine Burrows (5/1989), Sagheed Ragahvan (11/2008), Andrew. Herst (7/2009), Remi. Hicks (8/2011).

Committees Chaired and Research Directed: Cheryl. A. Kitt (5/1978); John. L. Ferguson (11/1979); Colleen. M. McHale (11/1986); David C. Zocchi (2/1990), James T. Heaton (2/1992), Todd F. Roberts completed research competency, MA substitute in Spring (1999), Shannon Bentz (2005).

#### 3. Doctoral:

Committees Served On: Barbara. J. Kirshner (6/1976); David. I. Sommers (6/1976); George. M. Samaras (7/1976 - Zoology); Barbara. J. Winterson (1/1977); Morris Waxler (3/1978); Katherine. Macko (1/1979); Nellie. Bugbee (3/1979); Jonathan Peck (4/1979 - Zoology); Jace Glowa (6/1979); Terry. Helbick (12/1980); Brenda Spiegler (12/1984); John. L. Ferguson (12/1984); A. Baker-Dittus (12/1985 - Zoology); Toru. Shimizu (12/1986); Carrie. Kertzman (12/1986); Tom. Park (11/1988); Susan. Brown (11/1990); Zygmunt. Pislo (5/1991), Linn Chaves (5/1994), Julie Epelboim (7/1995), Daphne Soares (Biology, 2002), Kelly K. Cookson

(2000), Sally Bogacz (2000), Beth Goldman (NACS, 2006), Youjun Wang (completed 5/2007), Bonnie Jacques (9/08), John Keagy (8/2010).

Committees Chaired: Cheryl A. Kitt (12/1981), Hilleary D. Everist (12/1984), Colleen M. McHale (5/1991), James T. Heaton (12/1997), Todd F. Roberts (5/2003).

#### 4. Postdoctoral Students

Sarah E. Durand (1/1993-2000). Dr. Durand applied for and received an NRSA postdoctoral fellowship from NIDCD (approved 7/1994-6/1997) and is now on the faculty at Queens College, N.Y.

Yezhong Tang (in lab of C.E. Carr, however Dr. Tang collaborated and published papers with me 2/2002-2/2007). Dr. Tang is now a Professor in the Chengdu Institute of Biology, Chinese Academy of Sciences and Chair of the Department of Herpetology.

I have also advised Drs. Jianguo Cui and Guangzhan Fang, postdoctoral associates at the Chengdu Institute of Biology (3/2010-present), both of which are now Assistant Professors.

### E. Advising, Other than Research Direction

#### 1. Undergraduate

In 2007-2009 Eastern Regional Team Leader in an APA/NIGMS project to increase recruitment of minority undergraduate and graduate students into biologically based behavioral sciences. Participated in meetings with other team leaders under the auspices of the program.

#### 2. Graduate

Comprehensive Examinations Chaired for: Cheryl A. Kitt (12/1978); Colleen M. McHale (4/1989), David C. Zocchi (8/1991), James T. Heaton (3/1995), Todd F. Roberts (2000), Shannon Bentz (2001).

Comprehensive and Qualifying Examination Committees Served on: Nellie Bugbee; John L. Ferguson; L. Kittler; Katherine Macko; Brenda Spiegel; J. D. Morris; C. Duchala (Animal Science); C. Kertzman; W. Burghardt; T. Shimizu; T. Park; S. Brown; M. Kurkjian; K. K. Cookson, Daphne Soars (NACS program), Beth Goldman (NACS), John Keagy (Biology), Sharon Atkins (NACS/Psychology)

### IV. **Service and Outreach**

#### A. Editorships, Editorial Boards and Reviewing Activities

##### 2. Editorial Boards

8/1989-12/1998 Appointed to Editorial Board of *Brain, Behavior and Evolution*.

##### 3. Reviewing Activities for Journals and Books

1980 – present - Reviewed papers for journals on an ad hoc basis - Brain, Behavior and Evolution; British Journal of Experimental Psychology; Brain Research; Brain, Behavior and Evolution; Journal of Comparative Neurology; Visual Neuroscience; Journal of Chemical Neuroanatomy; European Journal of Neuroscience; Behavioral Brain Research; Ethology, Ecology and Evolution, PLoS ONE.

##### 4. Reviewing Activities for Agencies

Ad Hoc Member, NIMH Neuropsychology Review Panel, Nov. 1981

Ad Hoc Reviewer, NSF, 2000-

Ad Hoc Reviewer, NIMH Special Study Section, 1995-1996

Ad Hoc Reviewer, NINDS, NSPA Study Section, 1995-1996

Reviewer for B/START Grant Proposals (1994)

Member, NIMH Special Review Committee, July, 1994.

Member, NINDS Program Project Review, 1997.

5. Other Review and Service Activities-

Member of ICANN (1998, International Congress of Avian Anatomical Nomenclature)

Participant and adviser for APA/NIGMS-sponsored program for "Developing Minority Research Talent in Psychology" (1996- 2007)

Eastern Regional Team Leader (2007- 2009) for APA/NIGMS Program .

C. Campus Service

1. Departmental:

Promotion and Tenure Committee (1993-1994, Chair)  
Graduate Committee (1990)  
Undergraduate Honors Committee (1980 – 2006, including Acting Chair in 1984)  
Director of the Honors Program for Psychology 2006-2008)  
Graduate Committee; Computer Committee (Chair during 1994-1995)  
Teaching Committee (Chair during 1994-1995, 2003-2007)  
Biopsychology Area Head (1989-1991)  
Policy Review Committee (1989, 1997)  
Faculty Animal Facilities Supervisor (1995 – present)  
Compliance Officer for Hazardous Waste (1997-2000)  
Developmental Sciences Steering Committee (1995)  
Cognitive Psychology Search Committee  
Computer Committee (1994, Chair), IT Committee (2010).

2. College:

1983 - Dean's (then called Provost's) Internal Review Committee for Psychology Department (1983)  
1985 - Programs, Curricula and Courses Committee (1985)  
1992 - Cognitive Studies Committee (1992)  
1992 – 1994, 1998 – 2000 – BSOS Academic Collegiate Council (elected for term 9/1992-6/1994 and for term 9/1998-6/2000).

3. University:

2013 – present - Representative from Psychology to the University Senate (2013 - current)  
2014 – present – Elected member of Senate Committee on Committees  
2014 – present – Faculty Senate Representative to Committee for the Review of Student Fees  
1990 – 2007 – Animal Care and Use Committee (1990-93 and 1998-2007, including Chair in 'Fall 1996-Spring 1998)  
1990 2001 -Biological and Chemical Hygiene Committee (BACH, Fall 1999 - 2001)  
1995 -Safety Committee, Developmental Science Steering Committee (1995)  
1992 – 1994 -Neuroscience Curriculum Committee (1992-1994), Neuroscience Steering Committee (1992-1994)  
1994 and 2002 – Neural and Cognitive Studies (NAC) Graduate Committee (1994, 2002)  
1994 - College Park Scholars Steering Committee (1994) - Responsibilities during the first two years the program was started included phone interviews and recruiting of potential undergraduate students, advising students in the program and design of a colloquium series).  
1992 – 1995 - Graduate Research Board (1992-1995)

D. Consulting and External Engagements

3. Community Engagements

1986-1993 - Invited to provide lectures to medical students at the Uniformed Services University of the Health Sciences (USUHS) during the Spring coursework in Medical Psychology on "The role of the psychologist in

assessing human brain function", April, 1986, 1987, 1988, 1989 and May, 1990, 1991, 1992, 1993.

1994 - Judged Science Fair, Roosevelt H.S., April, 1994.

2007 - Participated in a workshop for high school teachers of psychology under the auspices of the APA/NIGMS grant in the Fall of 2007 which was designed to familiarize these teachers with advances in neuroscience and techniques for incorporating these into their curricula.

## V. Honors and Awards-

### A. Research Fellowships, Prizes and Awards

6/1967	Dean's List, Rensselaer Polytechnic Inst.
9/1970	NIMH Predoctoral Fellowship (MH43775)
6/1975	National Research Service Award - Postdoctoral Fellowship (NS05175, never activated)
7/1976	Univ. of Md. Graduate Research Board Award
7/1975 - 5/1979	Univ. of Md. Biomedical Support Grants
7/1988	NIMH Merit Award (for MH40698)
8/1993	Elected Fellow, American Psychological Society (APS)
12/2009	Fellowship from Chinese Academy of Sciences for Sabbatical work Spring 2010
3/2010	Senior International Scientist Award, Chinese Academy of Sciences
3/2010-6/2010	Appointed Visiting Professor at the Chengdu Institute of Biology.

### B. Teaching Awards

1986 - Departmental Recognition in 1986 for outstanding course evaluations in PSYC 402.

1988- Finalist (1988) in EDUCOM competition- for computer aided instructional software in teaching neuroanatomy.

1997 - Ph.D. advisee, J. T.Heaton (1997) received a Jack Bartlett dissertation award from the Psychology department.

2010 - I-series Fellow awarded March 2010 by the Provost for Fall 2010 semester for developing and teaching a new course, "The Biological Basis of Mental Disorders" (PSYC289I).