CURRICULUM VITAE

Amy L. Brewster, Ph.D.
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Education

Ph.D. Biological Sciences, Anatomy & Neurobiology, University of California, Irvine, 06/2006
B.S. General Biological Sciences, University of Puerto Rico, Cayey, PR-Cum Laude, 06/1999

Professional Experience

Associate Professor, Department of Psychological Sciences, Purdue University, West Lafayette, IN, 08/2019-present; Weldon School of Biomedical Engineering (Courtesy faculty).
Assistant Professor, Department of Psychological Sciences, Purdue University, West Lafayette, IN, 08/2013-08/2019; Weldon School of Biomedical Engineering (Courtesy faculty).
Postdoctoral Fellow, Department of Pediatrics, Baylor College of Medicine, Houston, TX, 09/2007-06/2013.
Postdoctoral Fellow, Department of Anatomy & Neurobiology, University of California, Irvine, CA, 07/2006-06/2007.
Ph.D. Student, Department of Anatomy & Neurobiology, University of California, Irvine, CA, 09/2000-06/2006.

Research Grants Received

Current funding

NIH, R01 NINDS- 1R01NS096234-01A1
A role for the complement system in seizure induced neuronal and dendritic injury
04/01/2019-03/31/2023
$1,335,916
Role, PI

Purdue Research Foundation
Role of microgliosis in hippocampal dendritic instability and memory deficits in experimental epilepsy
5/13/2019-5/12/2020
$30,657
Role, PI

Showalter Trust Research Award
Trem2 dysfunction in epilepsy
07/01/2018-06/30/2020
$75,000
Role, PI

Previous funding

Purdue Institute for Drug Discovery
β-arrestin 1 -a novel target for seizure disorders
07/01/2018-11/01/2019
$75,000; Directly responsible: $20,000
Role, Co-PI [Van Rijn, R. (PI), Lill, M. (Co-PI), and Flaherty, D. Co-PI)]

NIH, R56 NINDS- 1R56NS096234-01A1
A role for the complement system in seizure induced neuronal and dendritic injury
04/01/2018-03/31/2019
$381,805
Role, PI

American Epilepsy Society
The role of C1q of the classical complement pathway in epileptogenesis
07/01/2016-6/30/2017
$50,000
Role, PI

Indiana CTSI; Pilot Funding for Research Use of Core Facilities
Neuronal and glial intracellular signaling cascade dysfunction in acquired epilepsy
09/01/2015-09/30/2018
$9,841
Role, PI

Epilepsy Foundation- Postdoctoral grant
Aberrant mTOR signaling in epilepsy
01/01/2011-12/31/2011
$40,000
Role, PI

NIH, T32 NINDS-43124- Postdoctoral Fellowship
Ion Channel Regulation in Immature Brain
07/01/2008-06/30/2010
$85,656

NIH, T32 NINDS-45540- Postdoctoral Fellowship
Plasticity of HCN channels in epilepsy
07/01/2006-06/30/2007
$38,976

NIH, F31 NINDS-47993- Predoctoral Fellowship
Activity-dependent Regulation of HCN channels expression in hippocampus
04/01/2004-06/30/2006
$66,244

Honors and Awards

1. Keynote speaker. Building Diversity in Biomedical Sciences program, Sackler School of graduate Biomedical Sciences, Tufts University, Boston, MA. August 2019.
2. Keystone Symposia Fellow, Keystone Symposia on Molecular and Cellular Biology-Class of 2018.
3. Award to host a Citizens United for Research in Epilepsy 2017 Frontiers in Research Seminar Series at Purdue University. June 2016.
4. HHS Travel Funds to attend council meetings at the National Institutes of Health. February 2016.
5. Teaching for Tomorrow Fellowship, Office of the Provost, Purdue University. April 2015.
6. Early Career Institute in Neuroscience Fellowship. May 2015.
7. Keystone Symposia Early Career Investigator Travel Award to attend the Keystone Symposia on Neuroinflammation in Diseases of the Central Nervous System. Taos, NM. January 2015.
8. James C. Naylor Award for Teaching Excellence 2014-2015. Department of Psychological Sciences, Purdue University. December 2014.
9. International Travel Grant, Office of the Vice President for Research, Purdue University to attend the International League Against Epilepsy/European Congress in Epileptology. Stockholm, Sweden. July 2014.
10. Fellowship, Summer Program in Neuroscience, Ethics, and Survival (SPINES), Marine Biological Laboratory and National Institute of Mental Health, Woods Hole, MA. June-July 2012.
11. Honorable Mention, Junior Investigator Poster Award at 44th Winter Conference on Brain Research, Keystone, CO. January 2011.
12. Travel Award, Negotiating for Faculty Position Workshop, Rice University, TX. September 2010.
13. Young Investigator Travel Award, American Epilepsy Society 64th Annual Meeting. San Antonio, TX. December 2010.
14. Travel Award, National Institute of General Medical Sciences (NIGMS), Workshop for Postdocs Transitioning to Independent Positions; Bethesda, MD. March 2010.
15. Postdoctoral Scholar: Faculty Institutes for Reforming Science Teaching (First IV), National Science Foundation. 2009-2013.
16. Fellowship, Society for Neuroscience-Neuroscience Scholars Program. 2009-2012.
17. Science Education Leadership Fellow, Howard Hughes Medical Institute and Baylor College of Medicine, Houston, TX. 2009-2010.
18. Carl Storm Underrepresented Minority Travel Fellowship, Mechanisms of Epilepsy & Neuronal Synchronization Gordon Research Conference, Waterville, ME. August 2008.

Scientific and Professional Societies

Member, Society for Neuroscience (SFN) (active), 2001-present
Member, American Epilepsy Society (AES) (active), 2008-present
Member, Faculty for Undergraduate Neuroscience (FUN), 2014-2017
Member, Engineering in Medicine and Biology Society (EMBS), 2015-2016
Member, American Society for Cell Biology (ASCB), 2012-2013

Editorial Board member

Epilepsy Currents (IF 9.3), contributing editor (January 1, 2019 to December 31, 2021)
Neuropharmacology (IF 4.2), October 2016-present

Grant Reviewer (*ad hoc*)

Clinical Neuroplasticity and Neurotransmitters (CNNT) study section, NIH
Brain Disorders and Clinical Neuroscience (BDCN) Integrated Review Group, NIH
American Epilepsy Society
Indiana Brain and Spinal Cord Injury Research Fund
Medical Research Council, United Kingdom
The University of Washington Alzheimer's Disease Research Center

Manuscript Reviewer (*ad hoc*)

Brain Structure and Function ● *Epilepsia* ● *Epilepsy Research* ● *Experimental Neurology* ● *Journal of Neuroinflammation* ● *Journal of Neuroscience* ● *Journal of Neuroscience Research* ●*Neural Plasticity* ● *Neurobiology of Disease* ● *Neurochemical Research* ● *Neurochemistry International* ● *Neuropathology and Applied Neurobiology* ●*Neuropharmacology* ● *Physiology and Behavior* ● *PLOS ONE* ● *Scientific Reports* ● *Transactions on Biomedical Engineering*

Publications

My research program seeks to identify novel therapeutic targets for drug-resistant epilepsy and its cognitive comorbidities. Currently, 20-30% of epileptic patients suffer from drug-resistant seizures, which is often comorbid with learning and memory dysfunctions as well as a high risk for sudden and unexplained death in epilepsy. Specifically, my research focuses on elucidating the role of microglial cells and their phagocytic signaling cascades in the pathological remodeling of neuronal connectivity that is associated with seizures and memory deficits in epilepsy.

My published work focuses on the identification and evaluation of mechanisms that may contribute to the generation of unprovoked seizures, cognitive and behavioral impairments in rodent models of pediatric and adult epilepsy. I have contributed to 33 peer-reviewed publications which have been cited 2390 times. According to Google Scholar my h-index is 23, and iH_{10} index is 28.

Peer-reviewed work [* indicates primary author(s); superscript indicate co-author(s) mentored by Amy L. Brewster; ^{UG} undergraduate student, ^{G} graduate student]

1. Wyatt-Johnson^{G}, S.K., Brewster*, A.L. (2019) Emerging Roles for Microglial Phagocytic Signaling in Epilepsy. *Epilepsy currents, 3:1535759719890336. doi: 10.1177/1535759719890336.*
2. Schartz*^{G}, N.D., Sommer, A.L., Colin^{UG}, S.A., Mendez-Torres, L.B., **Brewster*, A.L**. (2019). Early treatment with C1 esterase inhibitor improves weight but not memory deficits in a rat model of status epilepticus. *Physiology & Behavior*, 212:112705.
3. **Brewster, A.L.** (2019). Human Microglia Seize the Chance to be Different. *Epilepsy currents* 19 (3), 190-192.
4. Robins*, M.T., Blaine, A.T., Ha, E., **Brewster, A.L.,** Van Rijn*, R.M. (2019). Repeated Use of the Psychoactive Substance Ethylphenidate Impacts Neurochemistry and Reward Learning in Adolescent Male and Female Mice. *Frontiers in Neuroscience*, doi: 10.3389/fnins.2019.00124.
5. Schartz*^{G}, N.D., Wyatt-Johnson^{G}, S.K., Price^{UG}, L.R., Colin^{UG}, S.A., **Brewster*, A.L.** (2018). Status epilepticus triggers long-lasting activation of complement C1q-C3 signaling in the hippocampus that correlates with seizure frequency in experimental epilepsy. *Neurobiology of Disease,* 109:163-173.
6. Wyatt-Johnson*^{G}, S.K, Herr^{UG}, S.A., **Brewster*, A.L.** (2017). Status epilepticus triggers time-dependent alterations in microglia abundance and morphological phenotypes in the hippocampus. *Frontiers in Neurology,* 8:700.

7. Wyatt*[G], S.K., Witt, T., Barbaro, N.M. Cohen-Gadol, A.A., **Brewster*, A.L.** (2017). Enhanced classical complement pathway activation and altered phagocytosis signaling molecules in human epilepsy. *Experimental Neurology* 295:184-193.
8. **Brewster*, A.L.,** Marzec[UG], K., Hairston [UG], A., Ho, M., Anderson, A.E., Lai, Y.C. (2016). Early electrographic and molecular remodeling in a model of status epilepticus and acquired epilepsy. *Epilepsia 7(11):1907-1915.*
9. Schartz*[G], N.D., Herr, [UG] S.A., Madsen,[UG] L., Butts, [UG] S. J., Torres, C., Mendez, L.B., **Brewster*, A.L. (**2016). Spatiotemporal profile of Map2 and microglial changes in the hippocampus following pilocarpine-induced status epilepticus. *Scientific Reports, srep24988.*
10. Abiega*, O., Becari, S., Diaz-Aparicio, I., Nadjarm, A., Layé, S., Leyrolle, Q., Gomez-Nicola, D., Domercq, M., Pérez, A., Sánchez-Zafra, V., Paris, I., Deudero, J.J.P., **Brewster, A.L.,** Anderson, A.E., Zaldumbide, L., Galbarriatu, L., Marinas, A., Vivanco, M.dM., Matute, C., Maletic-Savatic, M., Encinas, J.M., Sierra, A. (2016). Neuronal hyperactivity disturbs ATP microgradients, impairs microglial motility, and reduces phagocytic receptor expression triggering apoptosis/microglial phagocytosis uncoupling. *PLOS Biology* 14(5): e1002466.
11. Erramuzpe*, A., Encinas, J.M., Sierra, A., Maletic-Savatic, M., **Brewster, A.L**., Anderson, A.E., Stramaglia, S., Cortes, J.M. (2015). Longitudinal variations of brain functional connectivity: A case report study based on a mouse model of epilepsy. F1000Res. 4:144.
12. Sierra, A., S, Valcarcel-Martin, R., Pascual-Brazo, J., Aelvoet, S.A., Abiega, O., Deudero, J.J.P, **Brewster, A.L.,** Bernales, A., Anderson, A.E., Baeckelandt, V., Maletic-Savatic, M., Encinas, J.M. (2015). Induction of reactive neural stem cells and impairment of hippocampal neurogenesis due to neuronal hyperactivity. *Cell Stem Cell*. 16(5):488-503.
13. Nguyen*, L.H., **Brewster, A.L.,** Clark, M., Regnier-Golanov, A., Sunnen, N.C., Patil, V.V., Anderson, A.E. (2015). mTOR inhibition suppresses established epilepsy in the NS-Pten knockout mouse model of cortical dysplasia. *Epilepsia.* 56(4):636-46.
14. **Brewster*, A.L.,** Lugo, J.N., Patil, V.V., Lee, W.L., Qian, Y., Vanegas, F., Anderson, A.E. (2013). Rapamycin reverses status epilepticus-induced memory deficits and dendritic damage. *PLoS ONE 8,* e57808.
15. Marcelin*, B., Lugo, J.N., **Brewster, A.L.,** Liu Z, Lewis AS, McClelland S, Chetkovich DM, Baram TZ, Anderson AE, Becker A, Esclapez M, Bernard C. (2012). Differential dorso-ventral distributions of Kv4.2 and hyperpolarization-activated cyclic adenosine monophosphate gated channel (HCN) proteins confer distinct integrative properties to hippocampal CA1 pyramidal cell distal dendrites. *Journal of Biological Chemistry, 287*, 17656-17661.
16. Surges*, R., Kukley, M., **Brewster, A.,** Rüschenschmidt, C., Schramm, J., Baram, T.Z., Beck, H., Dietrich, D. (2012). Hyperpolarization-activated cation current Ih of dentate gyrus granule cells is upregulated in human and rat temporal lobe epilepsy. *Biochemical and Biophysical Research Communications, 420*, 156-160.
17. Lugo*, J.N., **Brewster, A.L.,** Spencer, C.M., Anderson, A.E. (2012). Kv4.2 knockout mice have hippocampal-dependent learning and memory deficits. *Learning and Memory, 19*,182-189.
18. Sunnen*, C.N., **Brewster, A.L.,** Lugo, J.N., Vanegas, F., Turcios, E., Mukhi, S., Parghi, D., D'Arcangelo, G., Anderson, A.E. (2011). mTORC1 inhibition prevents epileptogenesis and reverses mossy fiber sprouting in NS-Pten knockout mice. *Epilepsia, 52*, 2065-2075.
19. Dubé*, C.M., McClelland, S., Choy, M.K., **Brewster, A.L.,** Noam, Y., Baram, T.Z. (2010). Fever, febrile seizures, and epileptogenesis. *Epilepsia, 51 (s5),* 33-33.
20. Bealer*, S.L., Little, J.G., Metcalf, C.S., **Brewster, A.L.,** Anderson, A.E. (2010). Autonomic and Cellular mechanisms mediating detrimental cardiac effects of status epilepticus. *Epilepsy Research, 91*, 66-73.
21. Dubé*, C.M., **Brewster, A.L.,** Baram, T.Z. (2009). Febrile seizures: Mechanisms and relationship to epilepsy. *Brain and Development, 31*, 366-371.

22. Kanyshkova*, T., Pawlowski, M., Meuth, P., Bender, R., **Brewster, A.L.,** Baumann, A., Dubé C.M., Baram, T.Z., Pape, H.C., Budde, T. (2009). Postnatal expression patterns of HCN channel isoforms in thalamic neurons: relationship to maturation of thalamocortical oscillations. *Journal of Neuroscience, 29*, 8847-8857.
23. Zha*, Q.Q., **Brewster, A.L.,** Richichi, C., Baram, T.Z. (2008). Activity-dependent heteromerization of the Hyperpolarization-activated, cyclic nucleotide gated (HCN) channels: role of N-linked glycosylation. *Journal of Neurochemistry, 105*, 68-77.
24. Richichi*, C., **Brewster, A.L.,** Bender, R.A., Simeone, T.A., Zha, Q.Q., Yin, H.Z., Weiss, J.H., Baram, T.Z. (2008). Mechanisms of seizure-induced 'transcriptional channelopathy' of hyperpolarization-activated cyclic nucleotide gated (HCN) channels. *Neurobiology of Disease, 29*, 297-305.
25. Bender*, R.A., Kirschstein, T., Kretz, O., **Brewster, A.L.,** Richichi, C., Rüschenschmidt, C., Shigemoto, R., Beck, H., Frotscher, M., Baram, T.Z. (2007). Localization of HCN1 channels to presynaptic compartments: novel plasticity that may contribute to hippocampal maturation. *Journal of Neuroscience, 27*, 4697-4706.
26. **Brewster*, A.L.,** Chen*, Y., Bender, R.A., Yeh, A., Shigemoto, R., Baram, T.Z. (2007). Quantitative analysis and subcellular distribution of mRNA and protein expression of the hyperpolarization-activated cyclic nucleotide-gated (HCN) channels throughout development in rat hippocampus. *Cerebral Cortex, 17*, 702-712.
27. Dubé*, C.M., **Brewster, A.L.,** Richichi, C., Zha, Q., Baram, T.Z. (2007). Fever, febrile seizures and epilepsy. *Trends in Neuroscience, 30*, 490-496.
28. Kuisle*, M., Wanaverbecq*, N.J., **Brewster*, A.L.,** Frere, S.A., Pinault, D., Baram, T.Z., Lüthi, A. (2006). Functional stabilization of weakened thalamic pacemaker channel regulation in absence epilepsy. *Journal of Physiology, 575*, 83-100. Authors contributed equally
29. Surges*, R., **Brewster, A.L.,** Bender, R.A., Beck, H., Feuerstein, T.J., Baram, T.Z. (2006). Regulated expression of HCN channels and cAMP levels shape the properties of the h current in developing rat hippocampus. *European Journal of Neuroscience, 24*, 94-104.
30. **Brewster*, A.L.,** Bernard, J.A., Gall, C.M., Baram, T.Z. (2005). Formation of heteromeric hyperpolarization-activated cyclic nucleotide-gated (HCN) channels in the hippocampus is regulated by developmental seizures. *Neurobiology of Disease, 19*, 200-207.
31. Bender*, R.A., Soleymani, S.V., **Brewster, A.L.,** Nguyen, S.T., Beck, H., Mathern, G.W., Baram, T.Z. (2003). Enhanced expression of a specific hyperpolarization-activated cyclic nucleotide-gated cation channel (HCN) in surviving dentate gyrus granule cells of human and experimental epileptic hippocampus. *Journal of Neuroscience, 23*, 6826-6836.
32. **Brewster*, A.L.,** Bender, R.A., Chen, Y., Dubé, C., Eghbal-Ahmadi, M., Baram, T.Z. (2002). Developmental febrile seizures modulate hippocampal gene expression of hyperpolarization-activated channels in an isoform and cell-specific manner. *Journal of Neuroscience, 22*, 4591-4599.
33. Bender*, R.A., **Brewster*, A.L.,** Santoro, B., Ludwig, A., Hofmann, F., Biel, M., Baram, T.Z. (2001). Differential and age-dependent expression of hyperpolarization-activated, cyclic nucleotide-gated cation channel isoforms 1-4 suggest evolving roles in the developing rat hippocampus. *Neuroscience, 106*, 689-698. Authors contributed equally

In revision/Submitted/Unpublished work

1. Schartz*[G], N.D., Sommer*, A.L., **Brewster*, A.L**. Increased C3 activation contributes to memory deficits in rodent models of epilepsy. *In preparation*.

2. Wyatt-Johnson*[G], S.K., Sommer, A.L., Shim[UG], K.Y., Lam, S., **Brewster*, A.L.** Suppression of microgliosis with the colony stimulating factor 1 receptor inhibitor PLX3397 does not attenuate memory deficits during epileptogenesis in the rat. *In preparation*.

Book chapters

1. Bealer, S.L., Metcalf, C.S., Little, J.G, Vatta, M., **Brewster, A.L.,** and Anderson, A.E. (2015). Cardiac myocyte damage, electrocardiographic dysfunction, and ion channel remodeling in rodent models of seizure disorders. Lathers, C. M., Schraeder, P. L., Leestma, J. E., Wannamaker, B. B., Verrier, R. L., & Schachter, S. C. (Eds.), Sudden unexpected death in epilepsy: Mechanisms and new methods for analyzing risks (pp. 234-240). Boca Raton, FL: Taylor and Francis Group.
2. Dubé, C.M., McClelland, S., Choy, M., **Brewster, A.L.,** Noam, Y., and Baram, T.Z. (2011). Fever, febrile seizures and epileptogenesis. Noebels, J.L., Avoli, M., Rogawski M.A., Olsen, R.W., and Delgado-Escueta, A.V. (Eds.), Jasper's Basic Mechanisms of the Epilepsies, 4th edition (pp. 497-512). Bethesda, MD: National Center for Biotechnology Information (US).
3. Bealer, S.L., Metcalf, C.S., Little, J.G, Vatta, M., **Brewster, A.L.,** and Anderson, A.E. (2010). Sympathetic nervous system dysregulation of cardiac function and myocyte potassium channel remodeling in rodent seizure disorders: Candidate mechanisms for SUDEP. Lathers, C.M., Schraeder, P.L., Bungo, M.W. and Leestma, J.E. (Eds.), Sudden Death in Epilepsy: Forensic and Clinical Issues (pp. 613-624). Boca Raton, FL: Taylor and Francis Group.

Invited colloquium/seminar series presentations

Invited addresses at regional and national conferences:

1. *Immune Cells of the Brain and Treatment-Resistant Epilepsy.* President's Council Back-to-Class. Purdue Research Foundation, Naples, FL, February 2019.
2. *Neuropathological roles for C1q-C3 and Trem2 phagocytic signaling in epilepsy.* GRC Mechanisms of Epilepsy and Neuronal Synchronization, West Dover, VT, August 2018.
3. *The classical complement pathway and its role in seizure-induced brain injury.* Brain and Spinal Cord Injury Symposium. Stark institute of Neuroscience at IU Med and PIIN at Purdue University. Indianapolis, IN, December 2017.
4. *Non-canonical roles for microglia and complement signaling in modulating synaptodendritic profiles*. Invited talk, Investigator's workshop. American Epilepsy Society 71st Annual Meeting, Washington, DC, December 2017.
5. *Neuropathological implications of microglia-dendritic interactions in seizure disorders.* Greater Indiana Society for Neuroscience Meeting, Indianapolis, IN, March 2017.
6. *Aberrant dendritic structures in epilepsy: a role for phagocytic microglia.* Topic: Immune and non-canonical effects of inflammation in seizure disorders. Investigator's workshop. American Epilepsy Society 69th Annual Meeting, Philadelphia, PA. December 2015.
7. *Aberrant kinase signaling in a genetic model of epilepsy*. Investigator's workshop. Topic: Dysfunctional Phosphorylation Signaling in Epilepsy. Investigator's workshop. American Epilepsy Society 66th Annual Meeting, San Diego, CA. December 2012.

Invited addresses at educational institutions:

1. *Microglial phagocytic signaling shape epileptic networks.* Cincinnati Children's Hospital Medical Center, Cincinnati, OH. February 2020. (scheduled)
2. *Pathological implications of microglial phagocytic signaling in seizure-induced brain injury.* Department of Biological Sciences, Southern Methodist University, Dallas, TX. January 2020.

3. *Microglial phagocytic dysfunction in epilepsy.* Department of Psychology and Neuroscience, Baylor University, Waco, TX. January 2020.
4. Keynote speaker. *Neuropathological implications of microglia-dendritic interactions in seizure disorders.* Building Diversity in Biomedical Sciences program, Sackler School of graduate Biomedical Sciences, Tufts University, Boston, MA. August 2019.
5. *Deciphering the roles of 'hungry' phagocytes in epilepsy.* Tufts Neuroscience Seminar Series, Tufts University School of Medicine, Boston, MA. September 2018.
6. *Microglial phagocytic dysfunction in epilepsy.* College of Veterinary Medicine. Iowa State University, Ames, IA. April 2018.
7. *Non-canonical roles for phagocytic microglia in acquired epilepsy.* Irvine Epilepsy Research Center, Department of Anatomy and Neurobiology, University of California Irvine, CA. April 2018.
8. *Non-canonical roles for phagocytic microglia in acquired epilepsy.* Department of Biological Sciences, Purdue University. March 2018.
9. *Microglia and C1q-C3 complement mediated synaptic remodeling in epilepsy.* Neuroscience Program, Michigan State University, East Lansing, MI. March 2018.
10. *Microglial phagocytic dysfunction in epilepsy.* Department of Pharmacology and Toxicology, Michigan State University, East Lansing, MI. March 2018.
11. *Translational research in epilepsy: deciphering the role of microglia.* Department of Anatomy & Neurobiology, RCMI and RISE Programs, and the Graduate Student Association (AEG) in the Biomedical Sciences, University of Puerto Rico, San Juan, PR. March 2018.
12. *Seizure-induced brain injury: The role of neuro-immune interactions.* Brian and Spinal Cord Injury Seminar Series Purdue Institute for Integrative Neuroscience, September 2017.
13. *A role for microglia in dendritic and synaptic remodeling in acquired epilepsy.* NeuroNetworking seminar Purdue Institute for Integrative Neuroscience, Purdue University. June 2016.
14. *Mechanisms of dendritic injury in epilepsy: A role for microglia*. East Los Angeles College, Monterey Park, CA. April 2016.
15. *A role for mTOR and microglia in dendritic and cognitive dysfunction associated with acquired epilepsy.* Department of Pathobiology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA. December 2015.
16. *Microglial cells; A smoking gun in the pathophysiology of epilepsy?* Weldon School of Biomedical Engineering, Purdue University. February 2015.
17. *mTOR signaling and inflammatory mechanisms in epilepsy.* School of Science and Technology, Universidad del Este, Carolina, PR. April 2014.
18. *The challenging and exciting pathway to an independent career in research and teaching.* School of Science and Technology, Universidad del Este, Carolina, PR. April 2014.
19. *Lost in Translation, mTOR signaling in epilepsy*. Department of Psychological Sciences, Clinical Colloquium, Purdue University. October 2013.
20. *A role for mTOR signaling in dendritic and cognitive dysfunction associated with acquired epilepsy*. Department of Biology, University of Nebraska, Omaha. January 2013.
21. *A role for mTOR signaling in dendritic and cognitive dysfunction associated with acquired epilepsy.* Department of Psychological Sciences, Purdue University. December 2012.
22. *Lost in Translation, mTOR signaling in epilepsy*. Department of Biology, Amherst College, MA, November 2010.
23. *HCN channels in developing hippocampus: Enduring febrile seizure-evoked plasticity.* Epicenter Symposium, University of California, Irvine. February 2007.
24. *Ion channel plasticity in developmental epilepsy recent discoveries.* Department of Biology, University of Puerto Rico, Cayey. November 2007.

25. *Plasticity of HCN channel expression in the developing rat hippocampus.* Chemistry Department, East Los Angeles College, Monterey Park, CA. September 2006; The Howard Florey Institute, University of Melbourne, Australia. June 2006; The Cain Foundation Laboratories, Baylor College of Medicine, Houston, TX. April 2006.

Selected conference/symposium presentations; <u>28, senior (13) or first author (15)</u> (Total 71: 1999-2019)

1. Wyatt-Johnson, S.K., Sommer, A.L., Lam, S., **Brewster, A.L.** (2019). A role for microgliosis in the neuropathology of prolonged seizures. Poster, SFN (Abst. 467.10), Chicago, IL.
2. Sommer, A.L., Schartz, N.D., Aroor, A., **Brewster, A.L.** (2019). *The status of immune complement cascade activation in human epilepsy*. Poster, SFN (Abst. 467.09), Chicago, IL.
3. Schartz, N.D., **Brewster, A.L.** (2019). *Inhibition of complement C3 activation attenuates pathological cognitive and synaptic changes in a rat model of status epilepticus.* Poster, SFN (Abst. session 467.11), Chicago, IL.
4. Wyatt-Johnson, S.K., **Brewster, A.L**. (2018). *Altered levels of triggering receptor expressed on myeloid cells 2 (Trem2) in epilepsy*. Poster, SFN (Abst. Session 39.09), San Diego, CA.
5. Schartz, N.D., **Brewster, A.L.** (2018). *Complement C3 contributes to seizure-induced behavioral deficits in mice*. Poster, SFN (Abst. Session 041.03), San Diego, CA.
6. Schartz, N.D., **Brewster, A.L.** (2018). *C3 contributes to seizure-induced behavioral deficits in mice.* Poster, Mechanisms of Epilepsy and Neuronal Synchronization, GRC, West Dover, VT.
7. Wyatt, S.K., Rangarajan, A., Witt, T., Barbaro, N.M. Cohen-Gadol, A.A., **Brewster, A.L.** (2017). *Microglia-associated phagocytic molecules are altered in human and experimental epilepsy.* Poster, AES (Abst. 1.395), Washington, D.C.
8. Schartz, N.D., **Brewster, A.L**. (2016). *Prolonged seizures trigger activation of the classical complement pathway in the hippocampus.* Poster, AES (Abst. 3.007), Houston, TX.
9. Wyatt, S.K., Herr, S.A., **Brewster, A.L**. (2016). *Status epilepticus triggers shifts in microglia morphology associated with specific cytokine profiles.* Poster, AES (Abst. 3.012), Houston, TX.
10. Schartz, N.D., **Brewster, A.L**. (2016). *Prolonged seizures trigger activation of the classical complement pathway in the hippocampus.* Poster, SFN (Abst**.** 688.06), San Diego, CA.
11. Wyatt, S.K., Herr, S.A., **Brewster, A.L**. (2016). *Status epilepticus triggers changes in microglia morphology that are associated with specific biochemical properties.* Poster, SFN (Abst. 688.04), San Diego, CA.
12. Schartz, N.D., Madsen, L., Murillo, R., **Brewster, A.L.** (2015). *Prolonged seizures trigger transient alterations in NeuN and Map2 expression in hippocampal CA1 cells.* Poster, SFN (Abst. 494.14), Chicago, IL.
13. Herr, S., Schartz, N.D., Madsen L., Wyatt, S., Woodliff, J., **Brewster, A.L.** (2015). *Spatiotemporal profile of microglial changes in the hippocampus following prolonged continuous seizure activity in an experimental model of acquired epilepsy.* Poster, SFN (Abst. 494.05), Chicago, IL.
14. **Brewster, A.L.,** Nguyen, L., Anderson, A.E. (2014). Evidence for neuroinflammation in the NS-PTEN KO mouse model of cortical dysplasia with epilepsy. Poster, 11th European Congress on Epileptology, Stockholm, Sweden.
15. **Brewster, A.L.,** Lee, W.L., Lai, Y.C., Anderson AE. (2012). *Rapamycin suppresses hippocampal microgliosis induced by status epilepticus.* Poster, AES (Abst. 2.001), San Diego, CA.
16. **Brewster, A.L.,** Lugo, J.N., Carter, A., Anderson, A.E. (2012). *Seizure-induced mTOR hyperactivation modulates aberrant hippocampal dendritic structure and ion channel localization in epilepsy.* Poster, 45th Winter Conference on Brain Research, Snowbird, UT.

17. **Brewster, A.L,** Lugo, J.N., Qian, Y., Carter, A., Anderson, A.E. (2011). *Inhibition of mTOR signaling improves memory and associated dendritic pathology following status epilepticus.* Poster, AES (Abst. 1.007), Baltimore, MD.
18. **Brewster, A.L.,** Lugo, J.N., Vanegas, F., Qian, Y., Anderson, A.E. (2011). *mTORC1 suppression reverses the dendritic damage and spatial learning and memory deficits induced by prolonged seizures.* Poster, 44th Winter Conference on Brain Research, Keystone, CO.
19. **Brewster, A.L.,** Lugo, J.N., Anderson, A.E. (2010). *Aberrant activation and localization of mammalian target of rapamycin (mTOR) pathway effectors in hippocampus following prolonged limbic seizures.* Poster, Winter Conference on Brain Research, Breckenridge, CO.
20. **Brewster, A.L.,** Lugo, J.N., Vanegas, F., Qian, Y., Anderson, A.E. (2010). *A candidate role for aberrant mTORC1 signaling in SE-associated alterations in dendritic ion channel homeostasis.* Poster, AES (Abst. 1.007), San Antonio, TX.
21. **Brewster, A.L.,** Lugo, J.N., Vanegas, F., Qian, Y., Anderson, A.E. (2010). *Aberrant mTORC1 signaling cascade in epilepsy.* Poster, SFN (Abst. 848.5), San Diego, CA.
22. **Brewster, A.L.,** Vanegas, F., Anderson, A.E. (2009). *Status epilepticus induces aberrant activation of mTOR signaling in the rat hippocampus.* Poster, AES (Abst. 3.041), Boston, MA; Poster, SFN (Abst. 438.3), Chicago, IL.
23. **Brewster, A.L.,** Vatta, M., Burchhardt, D., Willis, S.E., Lugo, J.N., Barnwell, L.F., Anderson, A.E. (2008). *SUDEP in a rodent model of epilepsy*. Poster, Gordon Research Conference (GRC), Mechanisms of Epilepsy & Neuronal Synchronization, Waterville, ME.
24. **Brewster, A.L.,** Zha, Q., Noam, Y., Baram, T.Z. (2007). *Native hippocampal HCN channels: less promiscuous than in heterologous systems.* Poster, SFN (Abst. 467.10), San Diego, CA.
25. **Brewster, A.L.,** Bender, R.A., Yeh, A., Shigemoto, R., Baram, T.Z. (2005). *Quantitative analysis of mRNA and protein expression, and the evolution of sub-cellular transport of the hyperpolarization-activated cyclic nucleotide gated (HCN) channels throughout development in rat hippocampus.* Poster, SFN (Abst. 377.15), Washington, DC.
26. **Brewster, A.L.,** Bender, R.A., Yeh, A., Richichi, C., Baram, T.Z. (2004). *Time course of seizure-induced changes of HCN channel expression.* Poster, AES (Abst. 1.003), New Orleans, LA.
27. **Brewster, A.L.,** Simeone, T.A., Bender, R.A., Baram, T.Z. (2003). *Mechanisms of Activity-dependent regulation of hyperpolarization-activated cyclic nucleotide-gated channels (HCNs) in developing hippocampus.* Poster, SFN (Abst. 369.6), New Orleans, LA.
28. **Brewster, A.L.,** Bernard, J.A., Gall, C.M., Baram, T.Z. (2003). *Seizures induce the formation of heteromeric HCNs (hyperpolarization activated cAMP gated channels): a novel mechanism for 'channelopathies'?* Poster, American Epilepsy Society (AES) (Abs. 2.047), Boston, MA.

Teaching Awards and Nominations

1. James C. Naylor Award for Teaching Excellence 2014-2015, Department of Psychological Sciences, Purdue University, West Lafayette, IN.
2. Nominated by the Department of Psychological Science to the College of Health and Human Sciences Jane S. Link Outstanding Teaching Award (2016, 2017, and 2018).

Courses taught during past six years (course numbers and titles)

Course Number	Title
PSY 58100	Neuroethics
PSY 43400	Neurobiology of Disease

PSY 39000/39100	Research Experience in Psychology
BIOL 49400	Neuroinflammation in Epilepsy
PSY 22200	Introduction to Behavioral Neuroscience
PSY 69600	Seminar in Neurobiology, Endocrinology, and Behavior
PSY 40400/40500	Seminar for Research Focused Honors Program

New Courses Introduced/Developed at Purdue University (two):

Neuroethics Course (PSY 58100) Overview: This new course explores ethical dilemmas accompanying recent advances in neuropharmacology and neuroimaging techniques. These advances that allow for unprecedented manipulation and visualization of the human brain also have significant implications for individuals, social and legal systems. The course identifies issues such as safety, responsibility, fairness, risks, benefits, free will, and privacy, among others, associated brain-modulating drugs and neuroimaging to predict behavior. The course relies on a discussion format to engage student participation and promote critical thinking on these issues—particularly important for one of the few courses on ethics in the field on this campus, open to students across levels. Students are required to self-assess the quality of their in-class participation to encourage personal responsibility for their own education. Assignments are designed to stimulate and encourage higher-level thinking, and feature weekly homework and in-class discussions, a short presentation, and a final independent research project.

Neurobiology of Disease (PSY 43400) Course Overview: This new course has expanded the Behavioral Neuroscience Program's appeal to a range of students by exploring bases of major neurobiological disorders. Specifically, this course covers cellular and molecular mechanisms associated with alterations in brain function and human behavior linked to various neurological and psychiatric disorders. Apart from some basic lectures, the course relies on three elements to promote student-focused learning in this intermediate-level course. First is facilitation of regular in-class discussion; active participation is required. Second, the use of a variety of multimedia tools to challenge students to identify, compare, and explain brain changes potentially driving clinical/pathological behaviors. Third, and perhaps most importantly, the course requires readings from peer-reviewed scientific articles instead of textbooks, with the goal of teaching students to read, understand, and review primary research literature.

Recognition received from students and other evidence of impact on students

Each semester the Department of Psychological Sciences uses an online anonymous survey to evaluate teaching success for each course. Students are encouraged to rate each course through a set of University Core items that include the course and the instructor, among others as follows**: 5-Excellent; 4-Good; 3-Fair; 2-Poor; 1-Very Poor.** University core pices 1 (overall course rate) and pices 2 (overall instructor rate):

Course Number	# of students enrolled	# of evaluations	PICES 1- Course	PICES 2- Instructor
PSY581 (Fall 13)	15	9	5.0	5.0
PSY434 (Sp 14)	28	15	4.6	4.7
PSY581 (Fall 14)	13	6	4.9	5.0
PSY434 (Sp 15)	28	11	4.7	5.0
PSY434 (Fall 15)	24	12	4.9	4.9
PSY222 (Fall 15)	80	31	4.0	4.6
PSY222 (Sp 16)	116	45	4.0	4.1

PSY581 (Fall16)	17	11	4.9	4.9
PSY696 (Fall16)	9	4	3.5	4.5
PSY222 (Sp 17)	140	61	4.1	4.5
PSY581 (Fall17)	16	8	4.2	4.2
PSY222 (Sp 18)	143	61	4.1	4.0
PSY581 (Fall18)	14	7	4.9	4.9

Ph.D and M.S. thesis-based committees chaired:

1. Nicole D. Schartz, Neuroscience & Behavior, Psychological Sciences. Aug 2015-May 2019. Ph.D. dissertation (April 10, 2019): *The role of complement component 3 in status epilepticus-induced hippocampal dendritic injury and memory deficits.*
   Postdoctoral fellow, Department of Molecular Biology and Biochemistry, UC Irvine.
2. Season K. Wyatt-Johnson, Neuroscience & Behavior, Psychological Sciences. August 2016-
3. Alisha Aroor, Neuroscience & Behavior, Psychological Sciences. August 2019-

Member of the following Masters/Ph.D. committees at Purdue University:

1. Zhefu Que, Medicinal Chemistry and Molecular Pharmacology, 2018-present
2. Arryn T. Blaine, Medicinal Chemistry and Molecular Pharmacology, 2018-present
3. Seth A. Herr, PULSe program, 2017-present
4. Elizabeth Sahagun, Behavioral Neuroscience, Psychological Sciences, August 2016-
5. Cynthia Alvarado, PULSe program, Neuroscience, Psychological Sciences, August 2016-
6. Marcela C. Haces, Biomedical Engineering, Purdue University. Ph.D. completed June 2019.
7. Alexandra L. Sommer, Biological Sciences, Purdue University. Master's completed July 2018.
8. Steven Lee, Biomedical Engineering, Purdue University. Ph.D. completed April 2015.

Evidence of involvement of undergraduates in research

I have been the research advisor and mentor to the following undergraduate students. **Bold** names are from students who contributed to peer-reviewed published studies from my research program.

Catherine Nagy (Aug 2018-) ● Kevin Shim (Aug 2018-) ● Zoe Carlson-Sadler (August 2016-) Lauren Fesas (Aug 2018-May 2019) ● Alisha Aroor (Jan 2018-May 2019) ● Colleen Gamache (Aug 2017-May 2019) ● Olivia Cummings (Jan 2016-May 2018) ● Daniel Polonsky (Jan 2016-May2018) ● Aditi Rangarajan (January 2016-May 2018) ● Adagio Liggins (Jan-May2018) ● Eileen Miller (January 2017-Dec 2017) ● Shelby Tucker (August 2016-Dec 2017) ● Gianna Nossa (Aug 2015-May 2017) ● **Seth Herr** (Jan 2014-May 2016) ● **Lauren Price** (Jan 2016-Dec 2015) ● **Sarah Butts** (Jan 2015-Dec 2016) ● **Samantha Colin** (Aug 2015-May 2016) ● **Season Wyatt** (Aug 2014-May 2015) ● Nicholas Lazar (Jan-Dec 2015) ● **Lauren Madsen** (Aug 2014-May 2016) ● Daniel Clark (Aug-Dec 2014) ● **Kyle Marzec** (Jan 2014-May 2015) ● Evan Bonhotal (Jan-Dec 2014) ● **Alexandria Hairston** (Jan 2014-May 2015) ● Katherine Olivares (Jan 2014-May 2017) ● Elizabeth Tatum (Jan-May 2014).

Special activities that have contributed to teaching effectiveness:

1. Teaching for Tomorrow Fellowship (April 2015-2016). Purdue Provost Office.

2. Postdoctoral Scholar: Faculty Institutes for Reforming Science Teaching (First IV), National Science Foundation. Director: Diane Ebert-May, Ph.D., Michigan State University (2009-2013). The goal of this program was to design an inquiry-based, student-centered introductory biology course.
3. School Outreach Volunteers Committee, Winter Conference on Brain Research, Keystone, CO (2011, 2012), Director: Frank Welsh, Ph.D., University of Pennsylvania. The goal of this program is to teach basic neuroscience to elementary school students using active learning methods.
4. Science Education Leadership Fellow, Howard Hughes Medical Institute, Baylor College of Medicine (2009-2010). Faculty: Nancy P. Moreno, Ph.D. and Barbara Z. Tharp, M.S. The goal of this program is to reform science education in school classrooms by mentoring middle school teachers in a short research project in the laboratory and teaching neuroscience to elementary school students.

University Service

1. Poster Judge, Biomedical Engineering Graduate Student Association annual graduate research symposium, February 2016; Three minute thesis competition, Weldon School of Biomedical Engineering, March 2017; Purdue Undergraduate Research Conference. April 2018; Office of Interdisciplinary Graduate Program Spring Reception. May 2018.
2. Primary academic advisor, Purdue Engineering in Medicine and Biology Society Chapter. February 2016- present.
3. Purdue Provost's Postdoc Advisory Committee, August 2015.

College Service

1. College Marshal, College of Health and Human Sciences Commencement Ceremony, May 2017.
2. Faculty representative, College of Health and Human Sciences recruitment event for admitted undergraduates, August 2014, September 2015, and March 2017.

Department Service (Psychological Sciences)

1. Clinical Psychology faculty search, August 2017-March 2019
2. Faculty Animal Care coordinator, August 2016-June 2017
3. Undergraduate committee, August 2016-present
4. Learning Community committee (Fall 2015/2016)

National Organizations Service

1. Co-Chair Special Interest Group on Basic Mechanisms and Neuroscience, American Epilepsy Society, 2020-2023.
2. American Epilepsy Society, Scientific Program Committee, 2016-2019.
3. Chair of Epilepsy Social, Society for Neuroscience, 2017, 2018.
4. American Epilepsy Society, Anti-Harassment Task Force, 2016
5. Co-Chair. Investigator's Workshop. Topic: The Role of Fragile X Mental Retardation Protein in Epilepsy, Ion Channels, and Behavioral Comorbidities. American Epilepsy Society, December 2015.
6. Co-Chair, *session organizer*. Basic Mechanisms and Neuroscience Special Interest Group, American Epilepsy Society, 2013-2015.

    2015- Interneuron Dysfunction in Epilepsy
    2014- Microglia and Their Role in Neuronal and Dendritic Homeostasis
    2013- Basic Mechanisms Underlying Cognitive and Behavioral Deficits

Other Evidence of Local and National Recognition

1. Featured junior faculty in the end of year report for the American Epilepsy Society. June 2017.
2. Graduate student trainees Season K. Wyatt and Nicole D. Schartz won the first and third place, respectively, in the Neuroscience Category at The Health and Disease: Science, Technology, Culture and Policy Research Poster Session at Purdue University (>100 posters). March 2017.
3. Speaker, Neuroethics talk at the Science on Tap series organized by Purdue graduate students. The title of her talk was: *"Liars, Killers, and Mind Drugs: Studies on Neuroethics".* The event was held at the Lafayette Brewing Company and was attended by approximately 150 people. Lafayette, IN. April 2016.
4. Speaker, panel on Women on Science, Technology, Engineering and Math. The event was held at East Los Angeles College and was attended by 130 students & faculty. Monterey Park, CA. April 2016.
5. Undergraduate research honors student Seth Herr won the first place in the Purdue University Undergraduate Research and Poster Symposium for the HHS College (>100posters). March 2015.