

ERIN R. HASCUP, PHD



CURRENT POSITION

Director, Center for Alzheimer's Disease
Associate Professor
Southern Illinois University School of Medicine
Springfield, IL, USA
Depts. of Neurology, Pharmacology
Neuroscience Institute

RESEARCH INTERESTS

- Neurotransmitter Regulation in AD
- Early Intervention in AD
- Cellular senescence in aging and AD
- Inflammation in aging and AD
- Disease Stage Specific AD Therapies

CONTACT

Phone: 217-545-6988

Email: ehascup@siumed.edu

Website:

www.siumed.edu/neuro/alz/faculty/erin-r-hascup.html

ORCID

0000-0003-1037-0809

SOCIAL



www.linkedin.com/in/erin-hascup-79b7a86/



www.researchgate.net/profile/Erin_Hascup



[@HascupLab](https://twitter.com/HascupLab)

OVERVIEW

EDUCATION

Fellowships: McGill University (2011) &
Karolinska Institute (2009)
PhD Anatomy & Neurobiology – 2007
University of Kentucky

SELECTED RECENT PUBLICATIONS

- Does SARS-CoV-2 infection cause chronic neurological complications? (2020) - *GeroScience*.
- Towards Refining Alzheimer's Disease into Overlapping Subgroups. (2020) - Alzheimer's and Dementia: Translational Research & Clinical Interventions.

CURRENT SUPPORT

- R01 AG057767
Glutamate Neurotransmission in AD Progression
- R01 AG061937
Cellular Senescence, Inflammation, and Neurotransmission in AD
- R01 AG057767 – 03S1
Equipment request to increase scientific rigor and reproducibility
- R01 AG061937 – 03S1
Sequelae of SARS-CoV-2 Infection in Alzheimer's Disease



ERIN RUTHERFORD HASCUP, PH.D.

Current Position: Director, Dale and Deborah Smith Center for Alzheimer's Research and
trEatment
Associate Professor
Departments of Neurology and Pharmacology
Neuroscience Institute

Southern Illinois University School of Medicine
P.O. Box 19628
Springfield, IL 62794-9628

Contact: T: 217-545-6988
E: ehascup@siumed.edu

AREAS OF RESEARCH

- Neurotransmitter regulation in Alzheimer's disease
- Normal and abnormal cognitive aging
- Diabetes and Alzheimer's disease
- Disease-related circadian disruption
- Early intervention in Alzheimer's disease
- Cellular senescence in aging and Alzheimer's disease

EDUCATION

Undergraduate and Graduate

- 2002-2007** **Ph.D.** Anatomy and Neurobiology
University of Kentucky College of Medicine; Lexington, KY.
- 1997-2001** **B.S.** Chemistry: concentration in Biochemistry (Honors)
Hobart and William Smith Colleges; Geneva, NY.

Postgraduate

- 2009-2011** **Post Doctoral Fellow / McGill University**
Department of Psychiatry / Montréal, Québec, Canada
- Mentor: Alain A. Gratton, Ph.D.
- 2008-2009** **Junior Faculty / Karolinska Institute**
Department of Physiology and Pharmacology / Stockholm, Sweden
- Mentors: Jan Kehr, Ph.D., Per Svenningsson, Ph.D., Aleksander Mathé, Ph.D.

HONORS, FELLOWSHIPS, ACCOMPLISHMENTS, and AWARDS

- 2020** Member Sigma Xi, The Scientific Research Honor Society
- 2019** Selected to represent Southern Illinois University as their nomination for the Blavatnik National Award for Young Scientists
- 2019** Invited speaker and sponsored participant at NIA Workshop, "Senescence in Brain Aging and Alzheimer's Disease". Bethesda, Maryland. Editorial published in *GeroScience* (DiBattista *et al.*, 2020; PMID: 31933065).
- 2019** Met with Congressman Darin LaHood to share our NIH funded research with him and a lab tour/demonstration. Springfield, IL.
- 2019** Selected for oral presentation: "Riluzole, but not LY379268, has long term glutamatergic tone and cognitive benefits in male A β PP/PS1 mice." 14th International Conference on Alzheimer's & Parkinson's Diseases. Lisbon, Portugal.
- 2019** Image from publication (Hascup *et al.*, 2018; PMID: 30472734) featured on the cover of the *Journal of Neurochemistry* (volume 148, issue 2, January 2019).
- 2018** R01 application "Glutamate neurotransmission in Alzheimer's disease progression" scored in the 8th percentile.
- 2017** Selected for oral presentation: "Neurotransmission spanning the Alzheimer's disease continuum: Glutamatergic tone, cognition, and early intervention." 47th Society for Neuroscience Annual Meeting. Washington, DC.
- 2017** Invited Speaker: "Neurotransmission spanning the Alzheimer's disease continuum: Disease-stage specific changes in glutamatergic tone and what it means for therapeutic interventions." Innovations and State of the Art in Dementia Research Conference. Rome, Italy.
- 2015** Selected for oral presentation: "Soluble amyloid- β_{42} activates $\alpha 7nAChR$ *in vivo* and alters glutamatergic neurotransmission in A β pp/PS1 mice." 45th Society for Neuroscience Annual Meeting. Chicago, IL.
- 2015** Accepted into the Early Career Reviewer program at the Center for Scientific Review, National Institutes of Health.
- 2015** Selected for oral presentation: "Soluble amyloid- β_{42} activates $\alpha 7nAChR$ *in vivo* and alters glutamatergic neurotransmission prior to cognitive decline in A β pp/PS1 mice." Alzheimer's Association International Conference. Washington, DC.
- 2014** Selected for oral presentation: "Glutamate neurotransmission is altered prior to cognitive decline in APP/PS1 mice, a mouse model of Alzheimer's disease." 44th Society for Neuroscience Annual Meeting. Washington, DC.

- 2014** Selected for oral presentation: “Local application of β -amyloid₁₋₄₂ elicits hippocampal sub-region specific glutamate release in C57BL/6 mice.” 44th Society for Neuroscience Annual Meeting. Washington, DC.
- 2009** Travel Award to attend/present at the European College of Neuropsychopharmacology Young Scientist Conference in Nice, France.
- 2007** Honorable mention at the University of Kentucky Postdoc Poster Session. Lexington, KY.
- 2007** Outstanding poster presentation at the annual Neuroscience Day hosted by the Bluegrass Chapter of the Society for Neuroscience. Lexington, KY.
- 2006** Outstanding graduate poster presentation at the 11th International Conference on *In vivo* Methods: Monitoring Molecules in Neuroscience. Sardinia, Italy.
- 2006** Outstanding graduate poster presentation at the annual Neuroscience Day hosted by the Bluegrass Chapter of the Society for Neuroscience. Lexington, KY.
- 2005** Outstanding graduate poster presentation at the annual Neuroscience Day hosted by the Bluegrass Chapter of the Society for Neuroscience. Lexington, KY.
- 2001** Graduated with Honors for outstanding original undergraduate research in Chemistry with a concentration in Biochemistry. Hobart and William Smith Colleges. Geneva, NY.

PROFESSIONAL EXPERIENCE

Faculty Appointments

Southern Illinois University School of Medicine, Springfield Illinois

- 2020- Director, Dale and Deborah Smith Center for Alzheimer’s Research and trEatment (CARE)
- 2018- Associate Professor, Departments of Neurology and Pharmacology, Neuroscience Institute, Dale and Deborah Smith Center for Alzheimer’s Research and trEatment (CARE)
- 2013-2018 Assistant Professor, Departments of Neurology and Pharmacology, Neuroscience Institute, Center for Alzheimer’s Disease and Related Disorders (CADRD), Center for Integrated Research in Cognitive and Neural Sciences (CIR-CNS)

Research Appointments

Southern Illinois University School of Medicine, Springfield Illinois

2012-2013 Research Associate, Department of Neurology and the Center for Alzheimer's Disease and Related Disorders

Advisors: Andrzej Bartke, Ph.D. and Greg Brewer, Ph.D.

- Project: Examining the metabolic theory and inflammation in Alzheimer's disease.
- Translational Implication: Therapeutic strategies for Alzheimer's disease and aging
- Technical Competence: Tissue dissection, ELISA, RT-PCR, mitochondria and synaptosome isolation and stress test.

McGill University, Montreal Canada

2009-2011 Postdoctoral Fellow, Department of Psychiatry

- Advisor: Alain A. Gratton, Ph.D.
- Project: Subregional differences in the rat nucleus accumbens glutamate reward response using enzyme-coated biosensors.
- Translational Implication: Therapeutic strategies for drug addiction.
- Technical Competence: Goal directed behavioral paradigms.

Karolinska Institute, Stockholm Sweden

2008-2009 Postdoctoral Fellow, Department of Physiology and Pharmacology

- Advisors: Jan Kehr, Ph.D. & Per Svenningsson, Ph.D.
- Project: Glutamatergic neurotransmission in Flinders Sensitive Line rat – a rodent model of depression.
- Translational Implication: Therapeutic strategies for depression.
- Technical Competence: Microdialysis, HPLC-EC.

Pfizer Inc. & Quanteon, L.L.C.

2008-2009 Contract Employee

- Advisors: Eva Hajos-Korcsok, Ph.D. & Greg A. Gerhardt, Ph.D.
- Project: Anxiolytic effects of metabotropic glutamate receptor agonists and allosteric modulators on glutamate release in awake, freely moving rats.
- Translational Implication: Therapeutic strategies for anxiety and mood disorders.
- Technical Competence: Dose-response pharmacology.

University of Kentucky, Lexington Kentucky

2003-2007 Ph.D. Thesis Research, Department of Anatomy and Neurobiology

- Advisor: Greg A. Gerhardt, Ph.D.

- Projects: 1) Development and characterization of an enzyme-coated biosensor for studying neurotransmitter regulation in freely-moving rats. 2) Explored novel GDNF-based pharmacological treatments to protect dopaminergic cells in a rodent model of Parkinson's disease. 3) Evaluated experimental compounds for the treatment of Parkinson's disease, depression, and anxiety in conjunction with Amgen, Eli Lilly, and Johnson & Johnson.
- Translational Implications: Therapeutic strategies for neurodegenerative disorders including Parkinson's disease, Alzheimer's disease, depression, and anxiety.
- Technical Competence: Biological engineering, systems neurobiology, *in vivo* electrochemistry, rodent neurosurgery, intracranial drug delivery, immunohistochemistry.

2002-2003 Ph.D. Laboratory Rotations, Departments of Anatomy and Neurobiology, Biochemistry

- Advisors: Greg A. Gerhardt, Ph.D., Paul E.A. Glaser, M.D., Ph.D., and Rebecca Dutch, Ph.D.

Los Alamos National Laboratory, Los Alamos New Mexico

2001-2002 Post Baccalaureate Scientist, Bioscience Division

- Advisor: Theresa Ruscetti, Ph.D.
- Project: DNA repair mechanisms in yeast ribosomal DNA.
- Translational Implications: Therapeutic strategies for ageing and cancer.
- Technical Competence: Plasmid construction and transfection, flow cytometry, Southern and Western blots, RT-PCR.

Hobart and William Smith Colleges, Geneva New York

2000-2001 Undergraduate Research, Biology and Biochemistry Departments/Geneva, New York

- Advisor: Paul S. Pyenta, Ph.D. and Joel Kerlan, Ph.D.
- Projects: 1) Investigate the distance between antigen combining sites of IgE. 2) Effects of elevated testosterone in male Japanese Quail.
- Translational Implications: 1) Screening and therapeutic strategies for allergens. 2) Environmental effects on avian mating.
- Technical Competence: Fluorescence resonance energy transfer (FRET), avian surgery.

TEACHING

Courses

Southern Illinois University School of Medicine, Springfield Illinois

- 2020- Year Two (Y2) Neuromuscular Behavioral Unit (NMB), medical – level (Resource Session Facilitator/Instructor)
- 2019- Pharmacology Journal Club, graduate - level (PHARM 501/500; faculty mentor and instructor)
- 2018 Division of Laboratory Animal Medicine (DLAM) continuing education (lecturer)
- 2017- Neuroscience, graduate – level (PHRM 577; lecturer)
- 2016- Research in Neuroscience / Neurology, medical student elective (course director)
- 2014-2019 Neuroscience, resident - level (course director and lecturer)
- 2013-2014 Neuroscience, resident - level (lecturer)

University of Kentucky, Lexington Kentucky

- 2004-2007 Center for Microelectrode Technology Training Course, graduate- and postgraduate- level (annual). Demonstrated and taught electrochemical theory and recording techniques to worldwide course participants. Electrochemical measures in several neurobiological systems of anesthetized and freely moving rodents were taught.
- 2004 Anatomy 209: Principle of Human Anatomy, undergraduate-level (teaching assistant and lecturer)

Multiple Sites, International

- 2004-2011 Fast Analytical Sensing Technology (FAST) Training and Installation, graduate- and postgraduate- level (as needed). A technique designed for subsecond *in vivo*, *in vitro*, and *ex vivo* electrochemical monitoring of central nervous system neurotransmitters utilizing enzyme-coated biosensors. Representatives from Eicom Corporation, Kyoto, Japan; Karolinska Institutet and Umeå University, Sweden; University of Groningen, Netherlands; McGill University; University of Montréal, Montréal, Québec, Canada and Ohio State University, USA were instructed how to successfully design, implement, and analyze experiments for real time neurotransmitter recordings.

Dissertation Committees

Southern Illinois University School of Medicine, Springfield Illinois

- 2021- PhD Advisor and Dissertation Committee Chair for Sujata Pandey
Department of Pharmacology
Current: 1st year student
- 2018- PhD Advisor and Dissertation Committee Chair for Caleigh Findley
Department of Pharmacology
Current: 4th year student
- 2017- PhD Dissertation Committee Member for Jesse Britz
Committee Chair: Shelley Tischkau, PhD
Department of Pharmacology
Current: 6th year student
- 2013-2015 PhD Dissertation Committee Member for Nisha Rizvi
Committee Chair: Amy Arai, PhD
Department of Pharmacology
Current: Medical Science Liaison, Novartis

Trainees/Mentees

- 2021- Sujata Pandey, Graduate Student, Department of Pharmacology, SIU School of Medicine
- 2020- Onder Albayram, PhD, Assistant Professor at Medical University of South Carolina.
- 2020- Darrow Traylor, Medical Student at SIU School of Medicine.
- 2020- Niyant Vora, Medical Student at SIU School of Medicine.
- 2020 Matthew Nardone, Undergraduate Student at Hobart and William Smith Colleges. Remote internship/mentorship at SIU School of Medicine.
- 2019-2020 Ernesto Solis, PhD, Postdoctoral Fellow in the Hascup Laboratory, Department of Neurology, SIU School of Medicine.
- 2019 MaKayla Cox, Undergraduate Student at University of Illinois, Springfield. Internship at SIU School of Medicine.
- 2018-2019 Hannah Roberts, Undergraduate Student at University of Illinois, Springfield. Internship at SIU School of Medicine. Current: Medical Student at SIU School of Medicine.
- 2018 Thomas Johnston, Undergraduate Student at St. Louis University. Internship at SIU School of Medicine. Current: Medical Student at SIU School of Medicine.

- 2018- Caleigh Findley, Graduate Student, Department of Pharmacology, SIU School of Medicine.
- 2018-2019 Abigail Levy, Medical Student at SIU School of Medicine. Current: Neurology Residency at NYU Crossman School of Medicine.
- 2018 Collin Pauly, Undergraduate Student at University of Illinois, Springfield. Internship at SIU School of Medicine. Current: Researcher at Illinois Department of Public Health.
- 2017-2020 Nahayo Esperant-Hilaire, MD, Medical Student at SIU School of Medicine (2017-2019), NIH funded Postdoctoral Fellow in the Hascup Laboratory (2019-present). Current: Neurology Residency at UCLA.
- 2017 Brad Vost, Medical Student at SIU School of Medicine. Current: Anesthesiology Residency at Johns Hopkins Hospital.
- 2017 Nadeem Khan, MD, Neurology Resident at SIU School of Medicine. Current: Stroke Fellowship at Southwestern Texas University.
- 2016- Jesse Britz, Graduate Student, Department of Pharmacology, SIU School of Medicine.
- 2016-2017 Aaron Sul, Medical Student at SIU School of Medicine. Current: Accepted for Neurology Residency at Mayo Clinic School of Graduate Medicinal Education – Arizona.
- 2016 Matthew Cleveland, Medical Student at SIU School of Medicine. Current: Radiology Resident at SIU School of Medicine.
- 2015 Emmanuel Akano, MD, Neurology Resident at SIU School of Medicine. Current: Movement Disorder Fellowship at the National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS).
- 2014 Patrick Fitzgerald, Medical Student at SIU School of Medicine. Current: Internal Medicine Resident at Mayo Clinic, Jacksonville, FL.
- 2013 – 2015 Nisha Rizvi, PhD, Graduate Student, Department of Pharmacology, SIU School of Medicine. Current: Medical Science Liaison at Novartis.
- 2013-2014 Farah Tamizuddin, Undergraduate student at Columbia University. Summer internship. Medical Student at New York University. Current: Internal Medicine Resident at Icahn School of Medicine at Mount Sinai.

The goal of this administrative supplement application is to expand upon our current R01 funding to determine how SARS-CoV-2 affects cellular senescence and Alzheimer's disease progression.

Role: PI

Status: funded

Completed Research Support

1. Alleviating Alzheimer's Disease Pathology with Thermoneutral Housing

Illinois Department of Public Health K. Hascup (PI) 2019-2020
03282005H N/A

The goal of this application is to determine if chronic thermoneutral housing alleviates adiposopathy, plaque pathology, and cytokine signaling, thereby preventing AD-related cognitive deficits in mouse models of AD.

Role: Collaborator

2. *Does amyloid-β42 stimulate hippocampal lactate release?*

Illinois Department of Public Health K. Hascup (PI) 2017-2018
83282002F

The goal of this application is to determine the relationship between the toxic form of amyloid-β and lactate to further elucidate the metabolic component of Alzheimer's disease.

Role: Collaborator

3. *Effects of circadian clock disruption on cognitive decline in a mouse model of Alzheimer's disease*

SIU Foundation Award Tischkau (PI) 2017
N/A 0.10 FTE

The goal of this application was to expand the understanding of Alzheimer's disease neuropathology by exploring how rest/activity patterns contribute to cognitive deficits and neuropathology.

Role: Co-PI

4. *Mechanisms underlying early glutamate dysregulation in Alzheimer's disease.*

Harriss and Fannie Belle Roe Malan Research Endowment from the SIU Foundation at the School of Medicine E. Hascup (PI) 2016-2017
N/A 0.15 FTE

The goal of this study was to purchase and establish a breeding colony of a novel knock-in mouse model of Alzheimer's disease, *APP^{NL-F/NL-F}* mice, and to generate preliminary data for external grant applications. This research focuses on Aβ₄₂-specific changes in neurotransmission, neurochemistry, and brain protein content in prodromal to mild Alzheimer's disease.

Role: PI

5. *Can riluzole restore glutamate function and cognition in a mouse model of Alzheimer's disease?*

Illinois Health Improvement Association Research Endowment from the SIU Foundation at the School of Medicine E. Hascup (PI) 2016-2017

N/A 0.05 FTE

The goal of this study was to gather preliminary data regarding the effectiveness of riluzole as an early treatment for Alzheimer's disease.

Role: PI

6. *Restoring glutamate function as an early intervention for Alzheimer's disease*

Illinois Department of Public Health E. Hascup (PI) 2015-2016
63282003D 0.10 FTE

The goal of this study was to evaluate the mGluR Group II agonist, LY379268, as an early intervention for the treatment of Alzheimer's disease.

Role: PI

7. *Training in Drug Abuse Related Research*

NIH National Institute on Drug Abuse L. Hersch (PI) 2006-2007
T32 DA016176-03

The goal of this training program was to prepare promising graduate students and postdoctoral fellows for successful careers in drug abuse research. Broad-based training in modern concepts of drug abuse research will emphasize: (i) cellular and molecular studies of receptors involved in the response to drugs (ii) development of ligands which interact with these receptors as potential pharmacotherapies for drug abuse and (iii) cellular and molecular aspects of neuroAIDS. The unifying focus of the training faculty is our interest in understanding basic mechanisms related to drug abuse at the molecular level.

Role: Fellow

Publications

Peer-reviewed

<https://www.ncbi.nlm.nih.gov/myncbi/erin.hascup.1/bibliography/public/>

1. A Bartke, **E. Hascup**, K. Hascup, M Masternak. (2021) Growth Hormone and Aging; New Findings. World Journal of Men's Health. WJMH-20-0201. Invited Review Article. Accepted January 5, 2021.
2. K.N. Hascup, C.A. Findley, J. Britz, N. Esperant-Hiliare, S.O. Broderick, S. Tischkau, A. Bartke, **E.R. Hascup**. (2020) Riluzole Attenuates Glutamatergic Tone and Cognitive Decline in A β PP/PS1 Mice. Journal of Neurochemistry. Epub ahead of print October 26, 2020. PMID 33107040. NIHMS 1640895. DOI: 10.1111/jnc.15224.
3. A. Bartke, S. Brannan, **E.R. Hascup**, K.N. Hascup, J. Darcy. (2020) Energy Metabolism and Aging. World Journal of Men's Health. 38:e49. Invited Review Article. PMID 33151044. DOI: 10.5534/wjmh.200112.
4. K.N. Hascup, C.A. Findley, L. Sime, **E.R. Hascup**. (2020) Hippocampal Alterations in Glutamatergic Signaling During Amyloid Progression in A β PP/PS1 Mice. Scientific Reports. 10 (1): 14503. PMID 32879385. PMCID 7467928.
5. **E.R. Hascup** and K.N. Hascup. (2020) Towards Refining Alzheimer's Disease into Overlapping Subgroups. Alzheimer's and Dementia: Translational Research & Clinical Interventions. 6(1): e12070. PMID 32885025. PMCID 7453148. Review article.

6. E. Solis, Jr., K.N. Hascup, **E.R. Hascup**. (2020) Alzheimer's disease: the link between amyloid beta and neurovascular dysfunction. *Journal of Alzheimer's Disease*. 76: 1179-1198. PMID 32597813. PMCID 7483596. NIHMS 1608566. DOI 10.3233/JAD-200473. Review Article.
7. **E.R. Hascup** and K.N. Hascup. (2020) Does SARS-CoV-2 infection cause chronic neurological complications? *GeroScience*, 42(4):1083-1087. PMID 32451846. PMCID 7247778. Opinion Article.
8. Y. Fang, S. McFadden, J. Darcy, **E.R. Hascup**, K.N. Hascup, A. Bartke. (2020) Lifespan of long-lived growth hormone receptor knockout mice was not normalized by housing at 30°C since weaning. *Aging Cell*. 19: e13123. PMID 32110850. PMCID 7253058.
9. C.A. Findley, A. Bartke, K.N. Hascup, **E.R. Hascup**. (2019) Amyloid-beta Related Altered Glutamate Signaling Dynamics During Alzheimer's Disease Progression. *American Society for Neurochemistry Neuro*. 11: 1-20. PMID 31213067. PMCID 6582288. Review article.
10. K.N. Hascup, J. Britz, C.A. Findley, S. Tischkau, **E.R. Hascup**. (2019) LY379268 does not have Long-term Procognitive Effects nor Attenuate Glutamatergic Signaling in A β PP/PS1 Mice. *Journal of Alzheimer's Disease*. 68(3): 1193-1209. PMID 30909243. PMCID 6481939. NIHMS 1020328.
11. **E.R. Hascup**, S.O. Broderick, M.K. Russell, Y. Fang, A. Bartke, H.A. Boger, K.N. Hascup. (2019) Diet-induced insulin resistance elevates hippocampal glutamate as well as VGLUT1 and GFAP expression in A β PP/PS1 Mice. *J. Neurochem*. 148(2): 219-237. PMID 30472734. PMCID 6438176. NIHMS 998715. Image selected to feature on JNC cover (volume 148, issue 2, January 2019; doi:10.1111/jnc.14490).
12. K.N. Hascup, M.K. Lynn, P. Fitzgerald, S. Randall, J.J. Kopchick, H.A. Boger, A. Bartke, **E.R. Hascup**. (2017) Enhanced Cognition and Hypoglutamatergic Signaling in a Growth Hormone Receptor Knockout Mouse Model of Successful Aging. *Journal of Gerontology: Biological Sciences*. 72(3): 329-337. PMID 27208894. PMCID 6410893.
13. K.N. Hascup and **E.R. Hascup**. (2016) Soluble Amyloid- β 42 Stimulates Glutamate Release through Activation of the α 7 Nicotinic Acetylcholine Receptor. *Journal of Alzheimer's Disease*. 53(1): 337-347. PMID 27163813.
14. **E.R. Hascup**, F. Wang, J.J. Kopchick, A. Bartke. (2016) Inflammatory and Glutamatergic Homeostasis are Involved in Successful Aging. *Journal of Gerontology: Biological Sciences*. 71(3): 281-289. PMID 25711529. PMCID 5864157.
15. K.N. Hascup and **E.R. Hascup**. (2015) Altered Neurotransmission Prior to Cognitive Decline in A β PP/PS1 Mice, a Model of Alzheimer's Disease. *Journal of Alzheimer's Disease*. 44(3): 771-776. PMID 25374106.
16. K.N. Hascup and **E.R. Hascup**. (2014) Electrochemical Techniques for Sub-second Neurotransmitter Detection in Live Animals. *Comparative Medicine*. 64(4): 249-255. PMID 25296011. PMCID 4170089.

17. O.M. Littrell, J.F. Fuqua, A.D. Richardson, J. Turchan-Cholewo, **E.R. Hascup**, P. Huettl, F. Pomerleau, L.H. Bradley, D.M. Gash, G.A. Gerhardt. (2013) A synthetic five amino acid propeptide increases dopamine neuron differentiation and neurochemical function. *Neuropeptides*. 47(1): 43-49. PMID 22981157. PMCID 3558608. NIHMS 407897.
18. T.M. Eriksson, A. Alvarsson, T.L. Stan, X. Zhang, K.N. Hascup, **E.R. Hascup**, J. Kehr, G.A. Gerhardt, J. Warner-Schmidt, M. Arango-Lievano, M.G. Kaplitt, S.O. Ogren, P. Greengard, P. Svenningsson. (2013) Bidirectional regulation of emotional memory by 5-HT(1B) receptors involves hippocampal p11. *Molecular Psychiatry*. 18(10): 1096-1105. PMID 23032875. PMCID 3781317. NIHMS 460628.
19. **E.R. Hascup**, K.N. Hascup, F. Pomerleau, P. Huettl, E. Hajos-Korcsok, J. Kehr, G.A. Gerhardt. (2012) An Allosteric Modulator of Metabotropic Glutamate Receptors (mGluR₂), (+)-TFMPIP, Inhibits Restraint Stress-Induced Phasic Glutamate Release in Rat Prefrontal Cortex. *J. Neurochem*. 122: 619-627. PMID 22578190. PMCID 3970435. NIHMS 560766.
20. K.N. Hascup, **E.R. Hascup**, M. Stephens, P.E.A. Glaser, T. Yoshitake, A. Mathé, G.A. Gerhardt, J. Kehr. (2011) Resting Glutamate Levels and Rapid Bursts of Glutamate Release in the Prefrontal Cortex of the Flinders Sensitive Line Rat—A Genetic Rodent Model of Depression. *Neuropsychopharm*. 36: 1769-1777. PMID 21525860. PMCID 3138656.
21. K.A. Kelps, J. Turchan-Cholewo, **E.R. Hascup**, T.L. Taylor, D.M. Gash, G.A. Gerhardt, and L.H. Bradley. (2011) Evaluation of the Physical and *In Vitro* Protective Activity of Three Synthetic Peptides Derived from the Pro- and Mature GDNF Sequence. *Neuropeptides*. 45: 213-218. PMID 21507484. PMCID 3091812. NIHMS 286232.
22. K.N. Hascup, X. Bao, **E.R. Hascup**, D. Hui, W. Xu, F. Pomerleau, P. Huettl, F. Pomerleau, M.L. Michaelis, E.K. Michaelis, G.A. Gerhardt. (2011) Differential Levels of Glutamate Dehydrogenase 1 (GLUD1) in BALB/c and C57BL/6 and the Effects of Over-expression of *Glud1* Gene on Glutamate Release in Striatum. *American Society for Neurochemistry Neuro*. 3(2): 99-108. PMID 21446915. PMCID 3086280.
23. **E.R. Hascup**, K.N. Hascup, M. Stephens, F. Pomerleau, P. Huettl, A. Gratton, and G.A. Gerhardt. (2010) Rapid microelectrode measurements and the origin and regulation of extracellular glutamate in rat prefrontal cortex. *J. Neurochem*. 115: 1608-1620. PMID 20969570. PMCID 2996468. NIHMS 247588.
24. **E.R. Hascup**, S. af Bjerkén, K.N. Hascup, F. Pomerleau, P. Huettl, I. Strömberg, and G.A. Gerhardt. (2009) Histological Studies of the Effects of Chronic Implantation of Ceramic-Based Microelectrode Arrays and Microdialysis Probes in Rat Prefrontal Cortex. *Brain Research* 1291: 12-20. PMID 19577548. PMCID 2980830. NIHMS 139988.
25. K.N. Hascup, **E.R. Hascup**, F. Pomerleau, P. Huettl., G.A. Gerhardt. (2008) Chronic Second-By-Second Measures of L-glutamate in the CNS of Conscious, Freely Moving Mice. *J. Pharm. and Exp. Therap*. 324(2): 725-731. PMID 18024788. PMCID 3404456. NIHMS 390173
26. T.C. Thomas , P.J. Kruzich, B.M. Joyce, C.R. Gash, K.L. Suchland, **E.C. Rutherford**,

S.P. Surgener, D.K. Grandy, G.A. Gerhardt, P.E.A. Glaser (2007) Dopamine D4 Receptor Knockout Mice Exhibit Behavioral and Neurochemical Changes Consistent with Decreased Dopamine Release. *J. Neurosci. Meth.* 166: 306-314. PMID 17449106. PMCID 2699616. NIHMS 34501.

27. **E.C. Rutherford**, F. Pomerleau, P. Huettl, I. Strömberg, G.A. Gerhardt (2007) Chronic Second-by-Second Measures of L-Glutamate in the Central Nervous System of Freely Moving Rats. *J. Neurochem.* 102 (3), 712-722. PMID 17630982. PMCID 3482110. NIHMS 390177.

Other Publications

1. Editorial Highlight showcasing Hascup Laboratories' publication: Gulyaeva NV. (2020) Hippocampal hyperglutamatergic signaling matters: Early targeting glutamate neurotransmission as a preventive strategy in Alzheimer's disease: An Editorial Highlight for "Riluzole attenuates glutamatergic tone and cognitive decline in A β PP/PS1 mice" *J Neurochem.* doi: 10.1111/jnc.15238. Epub ahead of print. PMID: 33276416.
2. Editorial published covering my presentation at the NIA workshop of senescence in brain aging and Alzheimer's disease: DiBattista AM, Sierra F, Masliah E. (2020) NIA workshop on senescence in brain aging and Alzheimer's disease and its related dementias. *Geroscience.* 42(2):389-396. PMID 31933065. PMCID 7206469.
3. Image from publication (Hascup *et al.*, 2018; PMID: 30472734) featured on the cover of the *Journal of Neurochemistry* (volume 148, issue 2, January 2019).

Chapters

1. J. Darcy, Y. Fang, S. McFadden, K. Hascup, **E. Hascup**, A. Bartke. Thermogenesis and Aging. Chapter 7 of Handbook of the Biology of Aging, 9th Edition. Eds. Nicolas Musi and Peter Hornsby. Academic Press. 2021. DOI: 10.1016/b978-0-12-815962-0.00007-x, EISBN: 012816283X, EISBN-13: 978-0128162835.
2. J.J. Burmeister, **E.R. Hascup**, K.N. Hascup, V. Davis, S.R. Batton, F. Pomerleau, J.E. Quintero, P. Huettl, P.M. Talauliker, I. Strömberg, G.A. Gerhardt. Real-Time In Vivo Neurotransmitter Measurements Using Enzyme-Based Ceramic Microelectrode Arrays: What we have Learned about Glutamate Signaling. Chapter 5 of Compendium of In Vivo Monitoring in Real-Time Molecular Neuroscience: Volume 1: Fundamentals and Applications. Eds. George S. Wilson and Adrian C. Michael. World Scientific Publishing Company. 2015. ISBN-10: 9814619760.
3. **E.R. Hascup**, K.N. Hascup, P.M. Talauliker, D.A. Price, F. Pomerleau, J.E. Quintero, P. Huettl, A. Gratton, I. Strömberg, G.A. Gerhardt. Sub-Second Measurements of Neurotransmitter signaling using Enzyme-Based Microelectrode Arrays. Chapter 15 of Microelectrode Biosensors. Eds. Stephan Marinesco and Nicholas Dale. Humana Press. 2013. ISBN-10: 1627033696.
4. K.N. Hascup, **E.R. Hascup**, O.M. Littrell, J.M. Hinzman, C.E. Werner, V.A. Davis, J.J. Burmeister, F. Pomerleau, J.E. Quintero, P. Huettl, G.A. Gerhardt. Microelectrode Array Fabrication and Optimization for Selective Neurochemical Detection. Chapter 2 of

Microelectrode Biosensors. Eds. Stephan Marinesco and Nicholas Dale. Humana Press. 2013. ISBN-10: 1627033696.

5. M.L. Stephens, D.D. Spencer, I. Cavus, M. Hsiao, D. Song, S.H. Courellis, S.A. Deadwyler, R.E. Hampson, D. Putz, J.E. Quintero, M.K. Bensalem-Owen, K.N. Hascup, **E.C. Rutherford**, B.K. Day, J.R. Nickell, F. Pomerleau, P. Huettl, J.J. Burmeister, P.M. Talauliker, V.Z. Marmarelis, J.J. Granacki, T. Berger and G.A. Gerhardt. Microelectrode Based Epilepsy Therapy: A Hybrid Neural Prosthesis Incorporating Seizure Prediction and Intervention with Biomimetic Maintenance of Normal Hippocampal Function. Chapter 33 of Computational Neuroscience in Epilepsy. Eds. Ivan Soltesz and Kevin Staley. Academic Press pp 559-586, 2008. ISBN-10: 0123736498.
6. K.N. Hascup, **E.C. Rutherford**, J.E. Quintero, B.K. Day, J.R. Nickell, F. Pomerleau, P. Huettl, J.J. Burmeister, G.A. Gerhardt. Second-by-Second Measures of L-Glutamate and Other Neurotransmitters Using Enzyme-Based Microelectrode Arrays. Chapter 19 of Electrochemical Methods for Neuroscience. Eds. Adrian C. Michael and Laura M. Borland. CRC Press. Boca Raton, FL. pp 407-450, 2006. PMID: 21204381. ISBN-10: 0849340756.

Abstracts

1. M.F. Cox, C.A. Findley, K.N. Hascup, **E.R. Hascup**. Riluzole attenuates glutamate and cognitive decline in an Alzheimer's disease mouse model. Association of American Physicians / The American Society for Clinical Investigation / American Physician Scientists Association Joint Meeting. Chicago, IL, USA, April 2021.
2. J.T. McDaniel, K.N. Hascup, **E.R. Hascup**, D.L. Albright, J.P. Wallace. Social Support, Cigarette Use, and Alcohol Misuse among Individuals with Subjective Cognitive Decline. Conference of the American Academy of Health Behavior. Virtual, March 2021.
3. **E.R. Hascup**, S. McFadden, L.N. Sime, C. Findley, A. Bartke, and K.N. Hascup. Thermoneutral Housing Improves Metabolism and Cognition in Alzheimer's Disease Mice. Alzheimer's and Parkinson's Diseases Congress. Barcelona, Spain (changed to virtual), March 2021. Selected for oral presentation.
4. C.A. Findley, S. McFadden, L.N. Sime, K.N. Hascup, **E.R. Hascup**. Riluzole Attenuates Spatial Learning and Memory Impairments in Female Transgenic Alzheimer's Disease Mice. Alzheimer's and Parkinson's Diseases Congress. Barcelona, Spain (changed to virtual), March 2021. Selected for poster presentation.
5. L.N. Sime, S. McFadden, C.A. Findley, E. Solis Jr., N. Esperant-Hilaire, T.R. Evans, Y. Fang, A. Bartke, **E.R. Hascup**, K.N. Hascup. Altering Environmental Temperature as a Therapeutic Strategy in Alzheimer's Disease Mouse Models. Alzheimer's Association International Conference. Virtual due to COVID, July 2020. Selected for poster presentation.
6. N. Esperant-Hilaire, Y. Fang, C.A. Findley, A. Bartke, K.N. Hascup, **E.R. Hascup**. The Effects of Senolytic Compounds on Neuronal Cell Survival and Cognition. Alzheimer's

Association International Conference. Virtual due to COVID, July 2020. Selected for poster presentation.

7. C.A. Findley, L.N. Sime, S. McFadden, K.N. Hascup, **E.R. Hascup**. Alzheimer's Disease-Related Sex Differences in Insulin Sensitivity, Glucose Metabolism, and Spatial Memory. Alzheimer's Association International Conference. Virtual due to COVID, July 2020 *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. Citation pending.
8. **E.R. Hascup**, C.A. Findley, N. Esperant-Hilaire, J. Britz, L. Sime, S. McFadden, E. Lokaitis, Y. Fang, S. Tischkau, H.A. Boger, A. Bartke, K.N. Hascup. Glutamatergic neurotransmission and cognition in health, disease, aging, and intervention: evidence from mouse models. Society for Neuroscience Annual Meeting. Chicago, IL, October, 2019.
9. C.A. Findley, N. Esperant-Hilaire, H. Roberts, K.N. Hascup, **E.R. Hascup**. The effects of Riluzole treatment on glucose metabolism, insulin sensitivity, and cognition in male and female mouse models of normal aging and Alzheimer's disease. Society for Neuroscience Annual Meeting. Chicago, IL, October, 2019. Selected for oral presentation.
10. K.N. Hascup, H.A. Boger, **E.R. Hascup**. Hyperglutamatergic signaling throughout disease progression in Alzheimer's mouse models. Society for Neuroscience Annual Meeting. Chicago, IL, October, 2019.
11. **E.R. Hascup**, C. Findley, J. Britz, N. Esperant-Hilaire, S. Tischkau, K.N. Hascup. Riluzole, but not LY379268, has long term glutamatergic tone and cognitive benefits in male A β PP/PS1 mice. 14th International Conference on Alzheimer's & Parkinson's Diseases. Lisbon, Portugal. March, 2019. Selected for oral presentation.
12. K.N. Hascup, **E.R. Hascup**. Elevated Hippocampal Glutamatergic Signaling in Mouse Models of Alzheimer's Disease. 14th International Conference on Alzheimer's & Parkinson's Diseases. Lisbon, Portugal. March, 2019. Selected for oral presentation.
13. H. Boger, K.N. Hascup, J. Jackson, **E.R. Hascup**. Neural activity in disease and cognition. Winter Conference on Brain Research. Snowmass, CO, January, 2019. Selected for oral/panel presentation.
14. **E.R. Hascup**, N. Esperant-Hilaire, K.N. Hascup. Soluble β -amyloid₄₂ stimulates gender specific hippocampal lactate release in C57BL/6 mice. Society for Neuroscience Annual Meeting. San Diego, CA, November, 2018.
15. **E.R. Hascup**, J. Britz, M.K. Russell, S. Tischkau, H.A. Boger, K.N. Hascup. Glutamate neurotransmission, cognition, and risk factors in Alzheimer's disease. Society for Neuroscience Annual Meeting. San Diego, CA, November, 2018.
16. K.N. Hascup, S.O. Broderick, J. Britz, S. Tischkau, **E.R. Hascup**. Riluzole as an early therapeutic agent for Alzheimer's disease. Alzheimer's Association International Conference. Chicago, IL, July, 2018. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 14 (7) P690.

17. K.N. Hascup, S.O. Broderick, M.K. Russell, H.A. Boger, **E.R. Hascup**. Dietary insulin resistance impairs cognition and elevates hippocampal glutamate dynamics in A β PP/PS1 mice. Alzheimer's Association International Conference. Chicago, IL, July, 2018. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 14 (7) P729-730.
18. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Riluzole, but not LY379268, is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer's disease. Society for Neuroscience Annual Meeting. Washington D.C., November, 2017. Selected for oral presentation.
19. **E.R. Hascup**, S.O. Broderick, K.N. Hascup. Neurotransmission spanning the Alzheimer's disease continuum: Glutamatergic tone, cognition, and early intervention. Society for Neuroscience Annual Meeting. Washington D.C., November, 2017. Selected for oral presentation.
20. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Neurotransmission spanning the Alzheimer's disease continuum: Disease-stage specific changes in glutamatergic tone and what it means for therapeutic interventions. Innovations and State of the Art in Dementia Research Conference. Rome, Italy, September, 2017. Selected for oral presentation.
21. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Riluzole is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer's disease. Innovations and State of the Art in Dementia Research Conference. Rome, Italy, September, 2017. Selected for oral presentation.
22. J. Britz, M.C. Cleveland, K.N. Hascup, **E.R. Hascup**, S. Tischkau. Activity Monitoring and Metabolic Measures in Pre-Symptomatic APP/PS1 Alzheimer's Disease Model. Midwest Chronobiology Seminar. Champaign, IL, September, 2016.
23. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Can Alzheimer's-Related Cognitive Decline be Delayed through Prodromal Treatment? Evidence from a Mouse Model of Alzheimer's Disease. Alzheimer's Association International Conference. Toronto, Canada, July, 2016. Published: *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 12 (7), P1017.
24. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Diet-Induced Obesity Causes Glutamatergic Dysregulation and Exacerbates Memory Impairment in A β PP/PS1 Mice. Alzheimer's Association International Conference. Toronto, Canada, July, 2016. Published: *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 12 (7), P339. Selected for oral presentation.
25. K.N. Hascup, P.J. Fitzgerald, S.O. Broderick, S. Randall, J.J. Kopchick, A. Bartke, **E.R. Hascup**. Conserved Memory and Hippocampal Glutamate in a Growth Hormone Receptor Knockout Model of Extended Life Span. Society for Neuroscience Annual Meeting. Chicago, IL, October 2015.
26. **E.R. Hascup**, S.O. Broderick, K.N. Hascup. Soluble Amyloid- β_{42} Activates $\alpha 7nAChR$ *In Vivo* and Alters Glutamatergic Neurotransmission in A β pp/PS1 Mice. Society for Neuroscience Annual Meeting. Chicago, IL, October 2015. Selected for oral presentation.

27. S.O. Broderick, K.N. Hascup, **E.R. Hascup**. Hippocampal Glutamate and Cognition is Altered in Normal Aging C57BL/6J Mice. Society for Neuroscience Annual Meeting. Chicago, IL, October 2015.
28. K.N. Hascup, S.O. Broderick, **E.R. Hascup**. Soluble Amyloid- β_{42} Activates $\alpha 7nAChR$ *In Vivo* and Alters Glutamatergic Neurotransmission Prior to Cognitive Decline in A β pp/PS1 Mice. Alzheimer's Association International Conference. Washington D.C., July 2015. Published: *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 11 (7), P202. Selected for oral presentation.
29. K.N. Hascup, S. Pehlman-Reeter, **E.R. Hascup**. Glutamate neurotransmission is altered prior to cognitive decline in APP/PS1 mice, a mouse model of Alzheimer's disease. Society for Neuroscience Annual Meeting. Washington D.C., November 2014. Selected for oral presentation.
30. K.N. Hascup and **E.R. Hascup**. Local application of β -amyloid $_{1-42}$ elicits hippocampal sub-region specific glutamate release in C57Bl/6 mice. Society for Neuroscience Annual Meeting. Washington D.C., November 2014. Selected for oral presentation.
31. **E.R. Hascup**, F. Wang, J.J. Kopchick, A. Bartke. Inflammatory and glutamatergic markers maintain homeostasis with age in the brain of genetically long-lived mice compared to age-matched control mice. American Aging Association Annual Meeting. San Antonio, Texas, May-June 2014.
32. **E.R. Hascup** and G.J. Brewer. Bioenergetic function is altered prior to disease pathology in a mouse model of Alzheimer's disease. Alzheimer's Association International Conference. Boston, Massachusetts, July 2013. Published: *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 9 (4), P348.
33. A. Alvarsson, T.M. Eriksson, T. Stan, K.N. Hascup, **E.R. Hascup**, G.A. Gerhardt, P. Svenningsson. The effects of 5-HT $_{1B}$ receptor modulation on glutamatergic neurotransmission *in vivo*. 24th ENCP Congress. Paris, France, September 2011.
34. G.A. Gerhardt, V. Parikh, **E.R. Hascup**. A Hitchhiker's Guide to the Phasic Brain: Sub-Second Measures of Glutamate and Acetylcholine Neurotransmission. 44th Winter Conference on Brain Research. Keystone, Colorado, January 2011. Selected for panel presentation.
35. **E.R. Hascup**, K.N. Hascup, J. Jackson, G.A. Gerhardt, A. Gratton. Glutamate and Neuronal Activity are Preferentially Elevated in Nucleus Accumbens Shell Over Core During Conditioned Stimulus Reward: A Study in Freely Behaving Long Evans Rats. 44th Winter Conference on Brain Research. Keystone, Colorado, January 2011. Selected for oral/panel presentation.
36. P.F. Huettl, M. Stephens, V. Davis, J. Quintero, F. Pomerleau, J. Burmeister, K.N. Hascup, **E.R. Hascup**, G.A. Gerhardt. Ceramic-Based Microelectrode Array vs. MicrodialysisProbe Measurements in the CNS of awake animals: It's about time. 44th Winter Conference on Brain Research. Keystone, Colorado, January 2011. Selected for oral/panel presentation.
37. K.N. Hascup, **E.R. Hascup**, P.E.A Glaser, A.A. Mathé, G.A. Gerhardt, J. Kehr. Resting Glutamate Levels and Rapid Bursts of Glutamate Release in the Prefrontal Cortex of the

Flinders Sensitive Line Rat - A Genetic Rodent Model of Depression. 49th Annual Meeting of the American College of Neuropsychopharmacology, Miami Beach, FL. December 2010.

38. P. Huettl, **E.R. Hascup**, G.A. Gerhardt. Removable and Reusable Ceramic-Based Microelectrode Arrays for Second-By-Second Measurements of Neurotransmitters in the CNS of Awake Animals. Monitoring Molecules in Neuroscience. 13th International Conference *In Vivo* Methods. Brussels, Belgium, September 2010.
39. K.N. Hascup, **E.R. Hascup**, G.A. Gerhardt, A.A. Mathe, J. Kehr. Neuropeptide Y Modulation of the Glutamatergic System in the Flinders Sensitive Line Rats: A Rat Model of Depression. European College of Neuropsychopharmacology Workshop on Neuropsychopharmacology for Young Scientist in Europe. Nice, France. March 2009. Selected for oral presentation.
40. **E.R. Hascup**, K.N. Hascup, F. Pomerleau, P. Huettl, G.A. Gerhardt, J. Kehr. The Source of Resting and Physiologically Evoked L-Glutamate Levels in Prefrontal Cortex in Awake Rats. European College of Neuropsychopharmacology Workshop on Neuropsychopharmacology for Young Scientist in Europe. Nice, France, March 2009.
41. P. Huettl, **E.R. Hascup**, K.N. Hascup, M. Lundblad, M. Stephens, G. Quintero, F. Pomerleau, and G.A. Gerhardt. Understanding Resting Neurotransmitter Levels in the CNS: Second-by-Second Measurements using Microelectrode Arrays. 42nd Winter Conference on Brain Research. Copper Mountain, Colorado, January 2009.
42. K.N. Hascup, **E.R. Hascup**, F. Pomerleau, P. Huettl, G.A. Gerhardt, and J. Kehr. L-glutamate Regulation and the Prefrontal Cortex and Striatum of Awake, Freely Moving C57BL/6 Mice. Monitoring Molecules in Neuroscience: 12th International Conference on *In Vivo* Methods. Vancouver, Canada, May 2008.
43. **E.R. Hascup**, K.N. Hascup, J.M. Hinzman, F. Pomerleau, P. Huettl, K.W. Johnson, I. Strömberg, G.A. Gerhardt, and J. Kehr. Determining the source of resting and physiologically-evoked L-glutamate levels using enzyme-based microelectrode arrays in awake rats. Monitoring Molecules in Neuroscience: 12th International Conference on *In Vivo* Methods. Vancouver, Canada, May 2008.
44. O.M. Littrell, J.L. Fuqua, A. Richardson, **E.R. Hascup**, F. Pomerleau, P. Huettl, D.M. Gash, G.A. Gerhardt. Characterization of the effects of Dopamine Neuron Stimulating Peptide (DNSP-11) on Dopamine Neuron Function. Monitoring Molecules in Neuroscience. 12th International Conference *In Vivo* Methods. Vancouver, British Columbia, Canada, May 2008.
45. F. Pomerleau, P. Huettl, **E.R. Hascup**, K.N. Hascup, J.J. Burmeister, and G.A. Gerhardt. Second-by-second measurements of glutamate and other neurotransmitters in awake, animals using microelectrode arrays. Monitoring Molecules in Neuroscience: 12th International Conference on *In Vivo* Methods. Vancouver, Canada, May 2008.
46. G.A. Gerhardt, F. Pomerleau, P. Huettl, **E.R. Hascup**, K.N. Hascup, J.E. Quintero, M.L. Stephens, P.M. Talauliker, and J.J. Burmeister. Real-time (2 Hz) measurements of neurotransmission *in vivo* using enzyme-based microelectrode arrays. Monitoring

Molecules in Neuroscience: 12th International Conference on *In Vivo* Methods. Vancouver, Canada, May 2008.

47. O.M. Littrell, J.L. Fuqua, **E.R. Hascup**, P. Huettl, F. Pomerleau, G.A. Gerhardt. *In Vivo* Effects of D- and L- Isomers of a Novel Dopamine Neuron Stimulating Peptide (DNSP-11). Bluegrass Chapter Neuroscience Poster Session. Lexington, Kentucky March 2008.
48. P. Huettl, **E.R. Hascup**, K.N. Hascup, F. Pomerleau, K.W. Johnson, G.A. Gerhardt. What Affects Resting Glutamate Levels in the Striatum and Prefrontal Cortex of Awake Rats and Mice? 41st Winter Conference on Brain Research. Snowbird, Utah January 2008.
49. **E.R. Hascup**, K.N. Hascup, F. Pomerleau, P. Huettl, K.W. Johnson, G.A. Gerhardt. The Source of Resting Glutamate Levels in Prefrontal Cortex of Awake Rats. University of Kentucky Postdoc Poster Session. Lexington, KY December 2007.
50. M.L. Stephens, **E.C. Rutherford**, J.E. Quintero, F. Pomerleau, P. Huettl, I. Strömberg, G.A. Gerhardt. Subregional Comparisons of Second-by-second Glutamate Clearance in the Rat Hippocampus During Aging. 14th Annual Meeting of the American Society for Neural Therapy and Repair, Clearwater Beach, FL, May, 2007.
51. **E.C. Rutherford**, F. Pomerleau, P. Huettl, I. Strömberg, K.W. Johnson, G.A. Gerhardt. Second-by-Second Enzyme-Based Amperometric Recordings of L-Glutamate in Awake Rats. 12th Institute of Biological Engineering Meeting. St. Louis, Missouri, March, 2007.
52. K.N. Hascup, **E.C. Rutherford**, F. Pomerleau, P. Huettl, G.A. Gerhardt. Second-by-Second Measures of L-glutamate Resting Levels Using Enzyme-Based Microelectrode Arrays in the CNS of Conscious Freely Moving Mice. 12th Institute of Biological Engineering Meeting. St. Louis, Missouri, March 2007.
53. G.A. Gerhardt, **E. Rutherford**, K.N. Hascup, J.E. Quintero, P. Talauliker, T. Currier Thomas, M.L. Stephens, J. Fuqua. T. Coates. J.J. Burmeister, F. Pomerleau, P. Huettl. Second-by-Second Measurements of L-glutamate and Other Neurochemicals in the CNS of Animal Models and Humans. 12th Institute of Biological Engineering Meeting. St. Louis, Missouri, March 2007.
54. P.M. Talauliker, F. Pomerleau, **E. Rutherford**, P. Huettl, J.T. Hastings, G.A. Gerhardt. Evaluation of Ceramic-based Microelectrode Arrays for In Vivo Recordings. 12th Institute of Biological Engineering Meeting. St. Louis, Missouri, March, 2007.
55. P. Huettl, G. E. Quintero, **E.C. Rutherford**, F. Pomerleau, K.W. Johnson, D.D. Schoepp G.A. Gerhardt. Pharmacological Studies of mGlu_{2/3} Drugs on Glutamate Release Utilizing Ceramic-Based Microelectrode Arrays. 40th Winter Conference on Brain Research. Snowmass, Colorado, January 2007.
56. **E.C. Rutherford**, F. Pomerleau, P. Huettl, I. Strömberg, K.W. Johnson, G.A. Gerhardt. Second-by-Second Enzyme-Based Microelectrode Recordings of Basal L-Glutamate in the Prefrontal Cortex of Awake Rats. Monitoring Molecules in Neuroscience: 11th International Conference on *In Vivo* Methods. Villasimius-Cagliari, Italy, May, 2006.
57. K.N. Hascup, **E.C. Rutherford**, F. Pomerleau, P. Huettl, G.A. Gerhardt. Second-By-Second Measures of L-Glutamate Using Enzyme-Based Microelectrodes in the CNS of

Conscious, Freely Moving Mice. Monitoring Molecules in Neuroscience: 11th International Conference on *In Vivo* Methods. Villasimius-Cagliari, Italy, May 2006.

58. G.A. Gerhardt, F. Pomerleau, P. Huettl, J. Nickell, **E. Rutherford**, K.N. Hascup, J.E. Quintero, B.K. Day, T. Currier Thomas, M.L. Stephens, J.J. Burmeister, Ceramic Enzyme-Based Microelectrode Arrays for Second-by-Second Measurements of L-glutamate and Other Neurochemicals in the CNS. Monitoring Molecules in Neuroscience: 11th International Conference on *In Vivo* Methods. Villasimius-Cagliari, Italy, May 2006.
59. P.M. Talauliker, **E.C. Rutherford**, F. Pomerleau, P. Huettl, M.L. Stephens, J.T. Hastings, G.A. Gerhardt. Multisite Microelectrode Array Studies of L-Glutamate Dynamics in the Rodent Hippocampus. Monitoring Molecules in Neuroscience: 11th International Conference on *In Vivo* Methods. Villasimius-Cagliari, Italy, May 2006.
60. **E. Rutherford**, F.P. Pomerleau, G.A. Gerhardt. Second-by-Second Recordings of Stress Induced L-Glutamate Release in the Striatum and Prefrontal Cortex of Unanesthetized Rats: Strain Differences. Society for Neuroscience Annual Meeting. Washington D.C., November 2005.
61. F.P. Pomerleau, **E. Rutherford**, P. Huettl, R.E. Hampson, S.E. Deadwyler, I. Strömberg, G.A. Gerhardt. Histopathology Studies of Long-Term Implantation of Ceramic-Based Microelectrodes in the rat Prefrontal Cortex. Society for Neuroscience Annual Meeting. Washington D.C., November 2005.
62. K.N. Hascup, **E.C. Rutherford**, F. Pomerleau, G.A. Gerhardt. Real Time (Second-By-Second) Measures of L-Glutamate in the CNS of Conscious, Freely Moving Mice. Society for Neuroscience Annual Meeting. Washington, D.C., November 2005.
63. P.M. Talauliker, **E. Rutherford**, F. Pomerleau, P. Huettl, J.T. Hastings, G.A. Gerhardt. Surface analysis of chronically implanted ceramic based microelectrode arrays using scanning electron microscopy. Society for Neuroscience Annual Meeting. Washington D.C., November 2005.
64. J. Allen, **E. Rutherford**, J.J. Burmeister, P.F. Huettl, F.P. Pomerleau, G.A. Gerhardt. Basal glutamate measures using m-phenylenediamine coated vs. Nafion[®] coated ceramic microelectrode arrays. Society for Neuroscience Annual Meeting. Washington D.C., November 2005.
65. **E. Rutherford**, F.P. Pomerleau, I Stromberg, K.W. Johnson, G.A. Gerhardt. Second-by-second recordings of L-glutamate due to stress in the striatum and prefrontal cortex of unanesthetized rats. 5th International mGluR Meeting. Taormina-Sicily, Italy, September 2005.
66. F.P. Pomerleau, **E. Rutherford**, G.A. Gerhardt. Improvements in real time (second-by-second) in vivo measures of L-glutamate in the striatum of conscious, freely moving rats: Effects of stress. Society for Neuroscience Annual Meeting. San Diego, CA, October 2004.
67. **E. Rutherford**, C.R. Gash, B.M. Joyce, S. Surgener, T.D. Currier, D. Grandy, G.A.

Gerhardt, P.E.A. Glaser. Dopamine Neuron Dynamics are Altered in the Nucleus Accumbens of Mice Lacking the D4 Dopamine Receptor. Society for Neuroscience Annual Meeting. New Orleans, LA, November 2003.

68. F.P. Pomerleau, **E.C. Rutherford**, G.A. Gerhardt. Real Time (second-by-second) *in vivo* Measures of L-Glutamate in the CNS of Conscious, Freely Moving Rats Using Multisite Microelectrode Arrays. Society for Neuroscience Annual Meeting. New Orleans, LA, November 2003.
69. J.C. Martin, J. Parsons, **E. Rutherford**, T. Ruscetti and W.P. Ambrose. Development of an Imaging Flow Cytometer. International Society for Analytical Cytology (ISAC) Conference. San Diego, CA, May 2002.
70. **E. Rutherford**, T. Max, J.A. Nickoloff, and T. Ruscetti. Strict Regulation of Ribosomal DNA Homologous Recombination. Radiation Research Society Meeting. Reno, NV, April 2002.
71. **E. Rutherford** and T. Ruscetti. Aging Process Linked to Homologous Recombination in Specific DNA Sequence. Symposium 2001—Championing Scientific Careers. Santa Fe, NM, August 2001.

Oral Presentations

Invited

1. Alzheimer's Disease: Perspectives from the Bench. Carle Illinois College of Medicine, virtual, January 2021.
2. The role of neurotransmission, inflammation, and cellular senescence in Alzheimer's disease. Southern Illinois University, Carbondale, Illinois. November, 2019.
3. Beta amyloid-related cellular senescence, inflammation, and neurotransmission. Senescence in Brain Aging and Alzheimer's Disease Workshop. National Institute on Aging, Bethesda, Maryland. September, 2019. Editorial published in *Geroscience* (DiBattista *et al.*, 2020; PMID: 31933065).
4. Neurotransmission spanning the Alzheimer's disease continuum: Risk factors and therapeutic interventions. Medical University of South Carolina, Charleston, South Carolina. October, 2018.
5. Neurotransmission spanning the Alzheimer's disease continuum: Disease-stage specific changes in glutamatergic tone and what it means for therapeutic interventions. Innovations in Dementia Research Conference. Rome, Italy. September, 2017.
6. Glutamate Neurotransmission and Cognition in Health and Disease: Evidence from Mouse Models. Neurology Grand Rounds. SIU School of Medicine, Springfield, Illinois. April, 2016.
7. Glutamate Neurotransmission in Mouse Models of Cognitive Health and Disease. Southern Illinois University, Carbondale, Illinois. December, 2014.

8. Using Enzyme-Based Microelectrode Arrays to Measure Neurotransmitters *In Vivo*. Pharmacology Seminar Series. SIU School of Medicine, Springfield, Illinois. April, 2013.
9. Get Excited: Glutamate in Neurological Diseases and Disorders. Neurology Grand Rounds. SIU School of Medicine, Springfield, Illinois. February, 2013
10. Extracellular L-Glutamate Regulation: Pharmacological and Ethological Studies in the Awake Rat. Uppsala University, Uppsala, Sweden. January, 2009.
11. Interface Technology: Histopathological Studies of the Effects of MEAs on Brain Tissue. University of Southern California, Los Angeles, California. May, 2007.
12. L-Glutamate Dynamics in the Brains of Freely Moving Rats. University of Texas MD Anderson Cancer Center, Houston, Texas. May, 2007.

International

1. Riluzole, but not LY379268, has long term glutamatergic tone and cognitive benefits in male A β PP/PS1 mice. 14th International Conference on Alzheimer's & Parkinson's Diseases. Lisbon, Portugal, March 2019.
2. Neurotransmission spanning the Alzheimer's disease continuum: Glutamatergic tone, cognition, and early intervention. Society for Neuroscience Annual Meeting. Washington, DC, November 2017.
3. Soluble Amyloid- β_{42} Activates $\alpha 7nAChR$ *In Vivo* and Alters Glutamatergic Neurotransmission in A β PP/PS1 Mice. Society for Neuroscience Annual Meeting. Chicago, IL, November 2015.
4. Local application of β -amyloid₁₋₄₂ elicits hippocampal sub-region specific glutamate release in C57Bl/6 mice. Society for Neuroscience Annual Meeting. Washington D.C. November, 2014.
5. Exciting Possibilities: Tonic and Phasic Glutamate in the Awake Behaving Rat Focusing on Depression and Reward. 44th Annual Winter Conference on Brain Research. Keystone, Colorado. January, 2011.
6. Exciting Possibilities: A Novel Approach for Measuring L-glutamate in the Awake Behaving Rat. Douglas Mental Health University Institute, Montreal, Quebec, Canada. September, 2009.

National

1. Second-by-Second Enzyme-Based Amperometric Recordings of L-Glutamate in Awake Rats. 12th Institute of Biological Engineering Meeting. St. Louis, Missouri. March, 2007.
2. Aging Process Linked to Homologous Recombination in Specific DNA Sequence. Symposium 2001 Meeting. Santa Fe, New Mexico. August 2001.

State, Regional and Local

1. Alzheimer's Disease Research in the Neuroscience Institute at SIU School of Medicine. Illinois Lt. Governor Juliana Stratton Meeting. SIU School of Medicine, Springfield, Illinois. November 2019.
2. Alzheimer's Disease Research in the Neuroscience Institute at SIU School of Medicine. U.S. Congressman Darin LaHood Meeting. SIU School of Medicine, Springfield, Illinois. June 2019.
3. Update on Basic and Translational Research at the Center for Alzheimer's Disease and Related Disorders. Memory and Aging Network Meeting. Villa Maria Retreat, Springfield, Illinois. April 2019.
4. Basic Science Research at the Center for Alzheimer's Disease and Related Disorders: Past, Present, and Future. Memory and Aging Network Meeting. SIU School of Medicine, Springfield, Illinois. September, 2013.
5. Microelectrode array recordings of L-glutamate dynamics in the brain of freely moving rats. Ph.D. Dissertation Defense Seminar, University of Kentucky, Lexington, Kentucky. March, 2007.
6. Second-by-Second Measures of L-Glutamate Dynamics in Awake Rats. University of Kentucky Department of Anatomy and Neurobiology Seminar Series, Lexington, KY. May 2006.
7. Second-by-Second Glutamate Measures in Behaving Rats: New Answers to Drug Abuse Questions. University of Kentucky NIDA Training Grant Symposium, Lexington, Kentucky. October 2005.
8. Second-by-Second Recordings of L-glutamate in the Striatum and Prefrontal Cortex of Unanesthetized Rats. University of Kentucky Department of Anatomy and Neurobiology Seminar Series, Lexington, Kentucky. March 2005.
9. Second-by-Second Recordings of L-glutamate in the Striatum of Unanesthetized Rats. University of Kentucky Department of Anatomy and Neurobiology Seminar Series, Lexington, Kentucky. May 2004.
10. Investigation of the Relative Distance between Antigen Combining Sites of IgE. Hobart and William Smith Student Research Symposium, Geneva, New York. April 2001.

SERVICE

Membership and Activities in Professional Societies – International

International Cell Senescence Association

2021- Member

Sigma Xi, The Scientific Research Honor Society

2020- Member

International Society to Advance Alzheimer's Research and Treatment (ISTAART)

2013- Member

Society for Neuroscience (SfN)

2004- Member
2016- Find A Neuroscience (FAN) Program Member

International Behavioral Neuroscience Society (IBNS)

2009-2012 Member

European College of Neuropsychopharmacology (ENCP)

2009-2012 Member

Membership and Activities in Professional Societies – National and Local

Center for Integrated Research in Cognitive and Neural Sciences (CIR-CNS)

2014-2018 Member

American Aging Association

2013- Member

Federation of American Societies for Experimental Biology (FASEB)

2001-2002 Member

American Chemical Society (ACS)

2000-2001 Member

Board Memberships

Alzheimer's Disease Advisory Committee – Illinois Department of Public Health

2020- Member

University Committees and Review Work

Southern Illinois University School of Medicine

2021- Member, Internal Advisory Council for the Office of Community Care
2020- Member, Research Subcommittee for SIU School of Medicine Strategic Plan
2020- Research Representative, Strategic Planning for SIU Medicine Goal 8: The Message – Tell a Clear, Unified and Compelling Story
2020- SIUMED Representative, System-Wide Research Working Group reporting to SIU President Mahony
2020 Chair, Search Committee for the Chair of the Department of Pharmacology and Neuroscience, and the Department of Medical Microbiology, Immunology, and Cell Biology
2018-2019 Reviewer, Dissertation Research Assistantship Award
2017- Chair and Reviewer, Grant Review Committee
2017- Member, Allocations Committee

2017-	Ex-Officio Member, Research Policy Committee
2017-	Member, Concept Development Award Committee
2016-2017	Vice Chair and Reviewer, Grant Review Committee
2016	Member, Department of Neurology Promotion and Appointment Committee
2015-2016	Member, Research Strategic Planning Committee
2014-2016	Member and Reviewer, Grant Review Committee
2014-	Medical Student Admissions Interviewer
2014-2015	New Faculty Applicant Interviewer
2014-2015	Member, CARRD Director Search Committee
2014	Non-GRC member, Reviewer for Research Seed Grants
2013-	Member, Laboratory Animal Care & Use Committee
2013-2017	Member, Infection Control & Safety Committee

University Relations

Southern Illinois University School of Medicine

2020	Laboratory tour/demonstration for University of Illinois-Springfield Medical Laboratory Science group
2019	Laboratory tour/demonstration for Lt. Governor Juliana Stratton
2019	Laboratory tour/demonstration for Lincoln Trail College
2019	Laboratory tour/demonstration for Linda Lorenz and Tracy Satterthwaite
2019	Laboratory tour/demonstration for Kerry Tepe
2019	Laboratory tour/demonstration for U.S. Congressman Darin LaHood
2019	Laboratory tour/demonstration for SIU-E Upward Bound (grades 9-12)
2019	Laboratory tour/demonstration for Montessori Children's House (grades 1-6)
2018	Laboratory tour/demonstration for Michaela Schroeder
2017	Laboratory tour/demonstration for Sara Yant and family
2017	Laboratory tour/demonstration for Chicago SIU Foundation fundraiser, Mary Carroll
2017	Research presentation to Healthcare Explorers of Central Illinois
2016	Laboratory tour/demonstration for Illinois Neurological Institute (OSF)
2015	Laboratory tour/demonstration for SIUSOM alumni David Riesenberger, MD and family
2015	Laboratory tour/demonstration for Illinois House Representative Tim Butler
2014	Illinois Math and Science Academy (Blessed Sacrament) Presentation
2014	4H Medical Special Interest Group Presentation
2014	UIS PreHealth Society Presentation
2013	Take Your Child to Work Day Presentation

Advocacy

2019	Meeting with Congressman LaHood and Mary Ellen Richardson
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Granting Agency Review Work

2021	NIH Molecular and Cellular Causal Aspects of Alzheimer's Disease (ZAG1 MDCN P (56)) Special Emphasis Panel Member/Reviewer
2020	NIH National Institute on Aging Panel (ZAG1 ZIJ-U [J1]) Member/Reviewer
2020	NIH Molecular and Cellular Causal Aspects of Alzheimer's Disease (ZRG1 MDCN-P [56]) Special Emphasis Panel Member/Reviewer
2020-	NIH National Institute on Aging Neurobiology of Learning and Memory (LAM) Study Section Reviewer
2019-	NIH National Institute on Aging P01 reviewer
2019	Fondation pour la Recherche Médicale and Foundation Alzheimer Grant International Expert Reviewer (Interdisciplinary Approaches to Understand the Fundamental Mechanisms of Alzheimer's Disease Grant)
2019	NIH National Institute on Aging Special Emphasis Panel (ZAG1 ZIJ-2 [J1]) Member/Reviewer
2019	NIH U.S.-Brazil Collaborative Biomedical Research Program (ZRG1 IMM-S [50]) Member/Reviewer
2019	NIH Molecular and Cellular Aspects of Alzheimer's Disease (ZRG1 MDCN-A [56]) Special Emphasis Panel Member/Reviewer
2018-	Department of Defense Congressionally Directed Medical Research Programs (CDMRP) Peer Reviewed Alzheimer's Research Program (PRARP) Scientific Reviewer
2018	Brain Canada/Azrieli Foundation Grant Reviewer (Early-Career Capacity Building Grant)
2018	NSF Graduate Research Fellowship Program Reviewer, Neurosciences I
2016-2019	Collaborative Cancer Disparities Research Program Reviewer
2016	NIH Chronic Dysfunction and Integrative Neurodegeneration (CDIN) Study Section Early Career Reviewer (Cycle I)
2016	Caryl Towsley Moy, PhD Endowed Fund for Collaborative Research Review Panel Member
2013-	Alzheimer's Association Grant Review Panel
2013-2019	Illinois Dept. of Public Health Alzheimer's Disease Research Fund Peer Review Panel Member (2013, 2016 - 2019)

Editorial and Ad Hoc Review Activities

Editorial Boards

2020-	Editorial Board Member, Gerontology
2020-2021	Section Editor, Current Alzheimer Research (Neurotransmission and Cellular Senescence in Alzheimer's disease)
2015, 17, 20-	Associate/Handling Editor, Journal of Alzheimer's Disease
2017	Chapter Editor, StatPearls

Ad Hoc Manuscript Review

Aging Cell, American Journal of Physiology, Analytic Chemistry, Brain Research, Cell Transplantation, Comparative Medicine, Current Psychopharmacology, Frontiers in Aging Neuroscience, Gerontology, GeroScience, International Journal of Neuropsychopharmacology, Journal of Alzheimer's Disease, Journal of Biomolecular Screening, Journal of Chemical Neuroanatomy, Journal of Gerontology: Biological Sciences, Journal of Neurochemistry, Journal of Neuroscience Methods, Journal of Nutritional Biochemistry, Nature Protocols, Neurochemistry International, Neuropeptides, Neuroscience Letters, Physiology and Behavior.

Media Activities

2020 Live radio interview on WTAX "Ask the Expert" with Joey McLaughlin.
<https://wtax.com/podcasts/ask-the-expert-with-memorial-health-system-2-4/>

Other Service

2020 Rural Health Summit discussion on "Caring for a Rural Aging Population"
2019- Conference on Healthy Brain Aging – Risk and Prevention, Organizing
Committee Member
2019 Poster Judge at the Winter Conference on Brain Research

PROFESSIONAL DEVELOPMENT

2020 Trained in InsideOut Coaching
2019 Center for Human and Organizational Potential (cHOP) Professional Development Workshop: Funny things happen along the way...A reflective discussion about leadership (Facilitator: Dr. John Mellinger, SIU School of Medicine)
2019 From Brain to Pain: The effects of unconscious bias and how we can regain control Seminar (Dr. Sacharitha Bowers, SIU School of Medicine)
2019 Fostering Diversity and Inclusion in Neuroscience Webinar (Society for Neuroscience)
2019 Center for Human and Organizational Potential (cHOP) Leadership and Excellence Launch/Workshop
2019 Chair of panel session at the Winter Conference on Brain Research
2018 Alliance of Women's Alzheimer's Researchers (AWARE) Career Development Panel Discussion
2016 NIH Chronic Dysfunction and Integrative Neurodegeneration (CDIN) Study Section Early Career Reviewer (Cycle I)
2015 Lean Six Sigma Executive White Belt Certified
2014 Write Winning Grant Proposals Workshop, Grant Writers' Seminars and Workshops

2014 Early Career Women Faculty Professional Development Seminar, American Association of Medical Colleges.
2013 Professional Grant Development Workshop, Grant Training Center.
2013 NIH Grant Writing Workshop, Grant Training Center