

KEVIN N. HASCUP, PH.D.

Current Position: Assistant Professor
Department of Neurology / Neurosciences Institute
Center for Alzheimer's Disease and Related Disorders (CADRD)

Southern Illinois University School of Medicine
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Springfield, IL 62702

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AREAS OF RESEARCH

- Altered glutamatergic signaling in neurodegenerative disorders.
- Relationship among insulin signaling, bioenergetics, neurotransmission, and cognition in AD.
- Modifiable life-style factors that accelerate or decelerate AD progression.
- Biomarker targeted, disease stage specific pharmacotherapies to improve AD patient outcome.

EDUCATION

Undergraduate & Graduate

2003 - 2007 Ph.D. ANATOMY & NEUROBIOLOGY
UNIVERSITY OF KENTUCKY, COLLEGE OF MEDICINE Lexington, KY, USA

1997 - 2001 B.S. BIOCHEMISTRY (BIOLOGY MINOR)
UNIVERSITY OF DELAWARE Newark, DE, USA

Postgraduate

2018 - ASSISTANT PROFESSOR / SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE
Department of Neurology Springfield, IL, USA

2014 - 2018 RESEARCH ASSOCIATE / SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE
Department of Neurology Springfield, IL, USA

- Mentor: Tom Ala, M.D.

2009 - 2011 POSTDOCTORAL FELLOW / MCGILL UNIVERSITY
Department of Psychiatry Montréal, QC, CA

- Mentor: Alain A. Gratton, Ph.D.

2008 - 2009 POSTDOCTORAL FELLOW / KAROLINSKA INSTITUTE

Department of Physiology & Pharmacology

Stockholm, SE

- Mentors: Jan Kehr, Ph.D.; Per Svenningsson, Ph.D.; Aleksander Mathé, M.D., Ph.D.

HONORS, FELLOWSHIPS, and AWARDS

- 2017** Selected for oral presentation: “Riluzole, but not LY379268, is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer’s disease.” Society for Neuroscience, Washington, D.C., November 2017.
- Selected for oral presentation: “Neurotransmission spanning the Alzheimer’s disease continuum: Glutamatergic tone, cognition, and early intervention.” Society for Neuroscience, Washington, D.C., November 2017.
- Selected for oral presentation: “Riluzole is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer’s disease.” Dementia. Rome, Italy, September 2017.
- Selected for oral presentation: “Neurotransmission spanning the Alzheimer’s disease continuum: Disease-stage specific changes in glutamatergic tone and what it means for therapeutic interventions.” Dementia. Rome, Italy, September 2017.
- 2016** Selected for oral presentation: “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.
- 2015** Selected for oral presentation: “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: “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.
- 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.
- 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** Selected to attend/present (including travel award) the European College of Neuropsychopharmacology Young Scientist Conference in Nice, France.

2007 - 2008 National Institute for Health Fellowship T32 DA022738-01 Translational Neuroscience Training Grant “Therapeutic Strategies for Neurodegeneration.” Lexington, KY.

2006 Outstanding graduate poster presentation at the 11th International Conference on *In vivo* Methods: Monitoring Molecules in Neuroscience in Cagliari, Italy.

Outstanding graduate poster presentation at the annual Neuroscience Day hosted by the Bluegrass Chapter of the Society for Neuroscience. Lexington, KY

2004 - 2006 Research Challenge Trust Fund Fellowship

PROFESSIONAL EXPERIENCE

SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF MEDICINE, SPRINGFIELD IL, USA

2018 - Assistant Professor
Department of Neurology
The Center for Alzheimer’s Disease and Related Disorder (CADRD)

2014 – 2018 Research Associate
Department of Neurology
The Center for Alzheimer’s Disease and Related Disorders (CADRD)

- Advisor: Tom Ala, M.D.
- *Project:* β -amyloid activation of the glutamatergic system and effects of type 2 diabetes on Alzheimer’s disease.
- *Translational Implication:* Nonpharmacological strategies for Alzheimer’s disease and aging.
- *Technical Competence:* SDS-Page, pharmacodynamics, spatial learning and memory paradigms, immunohistochemistry, insulin/glucose tolerance testing

BRAINBITS, L.L.C., SPRINGFIELD, IL, USA

2011 – 2013 Director of Product Development
Proprietor: Greg Brewer, Ph.D.

- *Project:* Development of proprietary *in vitro* assays for CNS tissue culture and corresponding media.
- *Translational Implication:* *In vitro* assays for Alzheimer’s disease detection and treatment.
- *Technical Competence:* tissue dissection, neuron / glia cultures, medium formulation, western blotting, immunohistochemistry,

MCGILL UNIVERSITY, MONTRÉAL, QC, CA

2009 – 2011 Postdoctoral Fellow, Department of Psychiatry

- *Advisor:* Alain A. Gratton, Ph.D.
- *Project:* Subregional differences in the rat prefrontal cortical response to stress using enzyme-coated biosensors.
- *Translational Implication:* Therapeutic strategies for drugs of abuse.
- *Technical Competence:* Goal directed behavioral paradigms in rodents.

KAROLINSKA INSTITUTE, STOCKHOLM, SE

2008-2009 Postdoctoral Fellow, Department of Physiology & Pharmacology

- *Advisors:* Jan Kehr, Ph.D.; Per Svenningsson, Ph.D.; & Aleksander Mathé, M.D., Ph.D.
- *Project:* Glutamate dysregulation in the Flinders Sensitive Line rat, a rodent model of depression.
- *Translational Implication:* Therapeutic strategies for major depressive disorder.
- *Technical Competence:* Microdialysis, HPLC-EC

PFIZER INC. & QUANTEON, LLC

2008 – 2009 Contract Employee

- *Advisors:* Eva Hajos-Korcsok, Ph.D. & Greg A. Gerhardt, Ph.D.
- *Project:* Anxiolytic efficacy of mGluR agonists and allosteric modulators on glutamatergic neurotransmission in freely behaving rodents.
- *Translational Implication:* Therapeutic strategies for mood disorders
- *Technical Competence:* Pharmacology, Pharmacodynamics, stress and anxiety behavioral paradigms.

UNIVERSITY OF KENTUCKY, COLLEGE OF MEDICINE, LEXINGTON, KY, USA

2004 - 2007 Ph.D. Candidate, Department of Anatomy & Neurobiology

- *Advisor:* Greg A. Gerhardt, Ph.D.
- *Projects:* 1) Development and characterization of an enzyme-coated biosensor for real time neurotransmitter measurements in anesthetized and freely behaving mouse CNS. 2) Neurochemical characterization of a novel mouse model of amyotrophic lateral sclerosis.
- *Translational Implications:* Therapeutic strategies for neurodegenerative disorders including Parkinson's disease, Alzheimer's disease and amyotrophic lateral sclerosis.
- *Technical Competence:* Biological engineering, systems neurobiology, *in vivo* electrochemistry, rodent neurosurgery, intracranial drug delivery

2003 – 2004 Ph.D. Laboratory Rotations, Departments of Anatomy & Neurobiology & Pharmacology

- *Advisors:* Greg A. Gerhardt, Ph.D., Kurt Hauser, Ph.D., John Littleton, M.D., Ph.D.

DADE BEHRING, INC., (ACQUIRED BY SIEMENS CORP.), NEWARK, DE, USA

2001 - 2003 Research Scientist, R&D Division

- *Advisor:* Gerald Siefring, Ph.D.
- *Project:* Monoclonal and polyclonal assay development and optimization for clinical diagnostic analyzers.
- *Translational Implications:* Detection of biomarkers for various diseases (cardiac, toxicology, diabetes) integrated onto a single workstation rapid throughput.
- *Technical Competence:* ELISA, assay development

TEACHING

Courses

Southern Illinois University School of Medicine, Springfield, IL, USA

2014 - Neuroscience, resident - level (lecturer)

University of Kentucky, Lexington KY, USA

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.

2005 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, Ohio State University and Southern Illinois University School of Medicine, USA were instructed how to successfully design, implement, and analyze experiments for real time neurotransmitter recordings.

Dissertation Committees

- 2018- PhD Dissertation Committee Member for Caleigh Findlay
Committee Co-Chairs: Erin R. Hascup, PhD & Shelley Tischkau, PhD
Department of Pharmacology
- 2017- PhD Dissertation Committee Member for Jesse Britz.
Committee Chair: Shelley Tischkau, PhD
Department of Pharmacology

Trainees

- 2018- Hannah Roberts, Undergraduate Student at University of Illinois, Springfield.
Internship at SIU School of Medicine
- 2018- Abigail Levy, Medical Student at SIU School of Medicine.
- 2018 Collin Pauly, Undergraduate Student at University of Illinois, Springfield.
Internship at SIU School of Medicine
- 2017- Nahayo Esperant-Hilaire, Medical Student at SIU School of Medicine
- 2017 Brad Vost, Medical Student at SIU School of Medicine
- 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.
- 2016 Matthew Cleveland, Medical Student 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 the Mayo School of Graduate Medical Education,
Jacksonville, FL.
- 2014 Farah Tamizuddin, Undergraduate student at Columbia University. Summer
internship. Current: Medical Student at New York University.

SCHOLARSHIP

Grants and Contracts

Current

- Does amyloid- β_{42} stimulate hippocampal lactate release?*
Illinois Department of Public Health
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.
K. Hascup (PI) 2017-2018
0.50 FTE \$30,000
- Glutamate neurotransmission in Alzheimer's disease progression*
NIH National Institute on Aging
R01 AG057767-01
The goal of this application is to determine how glutamate neurotransmission changes over the continuum of Alzheimer's disease progression and the associated mechanistic changes. This will be accomplished through local application of compounds and cognitive testing during awake recordings, followed by protein and gene expression analysis of brain tissue.
Role: Co-Investigator
Score: 8th Percentile
E. Hascup (PI) 2018 - 2023
1.0 FTE \$3,100,000

Completed Research Support

- Effects of circadian clock disruption on cognitive decline in a mouse model of Alzheimer's disease*
SIU Foundation Award
The goal of this application is to expand the understanding of Alzheimer's disease neuropathology by exploring how rest/activity patterns contribute to cognitive deficits and neuropathology.
Role: Key Personnel
Tischkau (PI) 2017
\$25,000
- Mechanisms underlying early glutamate dysregulation in Alzheimer's disease.*
SIU School of Medicine Near-Miss Grant
N/A
The goal of this study is 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 A β_{42} -specific changes in neurotransmission, neurochemistry, and brain protein content in prodromal to mild Alzheimer's disease.
Role: Key Personnel
E. Hascup (PI) 2016 - 2017
\$15,000
- Can riluzole restore glutamate function and cognition in a mouse model of Alzheimer's disease?*
Illinois Health Improvement Association
E. Hascup (PI) 2016 - 2017
\$25,000

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

Role: Key Personnel

4. *Restoring glutamate function as an early intervention for Alzheimer's disease*
Illinois Department of Public Health E. Hascup (PI) 2015 - 2016
63282003D \$30,000

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: Key Personnel

5. *Therapeutic Strategies for Neurodegeneration Training Grant*
NIH National Institute for Health Edward D. Hall (PI) 2007 - 2008
The overall goal was to prepare promising predoctoral (graduate students), postdoctoral, and clinical scholars for successful careers in translational neuroscience aimed at the discovery and development of disease-modifying pharmacological and genetic therapies for neurodegenerative and neuropsychiatric disorders, traumatic brain injury, and stroke.
Role: Fellow

Publications

Peer-reviewed

1. **K.N. Hascup**, M.K. Lynn, P. Fitzgerald, S. Randall, J.J. Kopchick, H.A. Boger, A. Bartke, E.R. Hascup. (2017) Hippocampal Glutamatergic Signaling Predicts Cognitive Performance in Aged Growth Hormone Receptor Knockout Mice. *J. Gerontol. A. Biol. Sci. Med. Sci.* 72(3): 329-337. PMID: 27208894. RCR: N/A
2. **K.N. Hascup** and E.R. Hascup. (2016) Soluble Amyloid-β42-Evoked Glutamate Release by Activation of the α7 Nicotinic Acetylcholine Receptor. *Journal of Alzheimer's Disease* 53: 337-347. PMID: 27163813. RCR: N/A
3. **K.N. Hascup** and E.R. Hascup (2015) Altered Neurotransmission Prior to Cognitive Decline in AβPP/PS1 Mice, a Model of Alzheimer's Disease. *Journal of Alzheimer's Disease* 44(3): 771-776. PMID: 25374106. RCR: 1.72.
4. **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. RCR: 0.39.
5. 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. NIHMS: 460628. RCR: 1.77.

6. 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. NIHMS: 560766. RCR: 0.59.
7. **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. RCR: 1.59.
8. **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. RCR: 0.38.
9. E.K. Michaelis, X. Wang, R. Pal., X. Bao, **K.N. Hascup**, Y. Wang, W-T. Wang, D. Hui, A. Agbas, I-Y. Choi, A. Belousov, G. A. Gerhardt. (2011) Neuronal *Glud1* (Glutamate Dehydrogenase 1) Over-Expressing mice: Increased Glutamate Formation and Synaptic Release, Loss of Synaptic Activity, and Adaptive Changes in Genomic Expression. *Neurochem Int.* 59 (4): 473-81. PMID: 21397652. NIHMS: 287010. RCR: 0.62.
10. E.R. Hascup, **K.N. Hascup**, 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. PMCID: 2996468. NIHMS: 247588. RCR: 2.75.
11. E.R. Hascup, S. 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. PMCID: 2980830. NIHMS: 139988. RCR: 1.53.
12. X. Bao, R. Pal, **K.N. Hascup**, T. McKerchar, D. Hui, A. Agbas, P. Huettl, F. Pomerleau, S.C. Fowler, M.L. Michaelis, E.K. Michaelis, G.A. Gerhardt. (2009) Mice Transgenic for Glutamate Dehydrogenase 1 (*Glud1*) Under the Control of the Neuron-Specific Enolase Promoter: A Model of Hyperglutamatergic Nervous System. *J Neurosci.* Nov 4; 29(44):13929-44. PMID: 19890003. NIHMS 167788. RCR: 1.56.
13. **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. RCR: 1.74

Under Review

1. **K.N. Hascup**, S.O. Broderick, M.K. Russell, H.A. Boger, E.R. Hascup. Diet-induced insulin resistance elevates hippocampal glutamate as well as VGLUT1 and GFAP expression in A β PP/PS1 Mice. (Scientific Reports).

In Preparation

1. **K.N. Hascup**, J. Britz, S.O. Broderick, S. Tischkau, E.R. Hascup. Prodromal intervention with Riluzole prevents cognitive decline and attenuates glutamatergic tone in A β PP/PS1 mice.
2. **K.N. Hascup**, J. Britz, S.O. Broderick, S. Tischkau, E.R. Hascup. LY379268 does not have long-term procognitive effects nor attenuate glutamatergic signaling in A β PP/PS1 mice.

Chapters

1. J.J. Burmeister, E.R. Hascup, **K.N. Hascup**, S. Batton, F. Pomerleau, J.E. Quintero, P. Huettl, I. Stromberg, 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: Vol 1. Fundamentals and Applications. Eds. George S. Wilson and Adrian C. Michael. World Scientific Publishing Company. 2015. ISBN: 978-981-4619-76-9
2. 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.
3. **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.
4. 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.

5. **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. **K.N. Hascup**, S.O. Broderick, M.K. Russell, Heather 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.
2. **K.N. Hascup**, S.O. Broderick, J. Britz, E.R. Hascup. Riluzole as an early therapeutic agent for Alzheimer's disease. Alzheimer's Association International Conference. Chicago, IL, July 2018.
3. **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, Washington, D.C., November 2017.
4. **K.N. Hascup**, S.O. Broderick, E.R. Hascup. Neurotransmission spanning the Alzheimer's disease continuum: Glutamatergic tone, cognition, and early intervention. Society for Neuroscience, Washington, D.C., November 2017.
5. **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. Dementia. Rome, Italy, September 2017.
6. **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. Dementia. Rome, Italy, September 2017.
7. 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.

8. **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.
9. **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.
10. **K.N. Hascup**, S.O. Broderick, E.R. 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.
11. **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.
12. 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.
13. **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.
14. **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.
15. **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.
16. 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.
17. 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. Microdialysis Probe Measurements in the CNS of awake animals: It's about time. 44th Winter Conference on Brain Research. Keystone, Colorado, January 2011.

18. 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.
19. **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 5-9, 2010.
20. **K.N. Hascup**, E.R. Hascup, G.A. Gerhardt, A.A. Mathé, 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 6, 2009.
21. 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.
22. 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.
23. E.K. Michaelis, X. Bao, R. Pal, **K.N. Hascup**, T. McKerchar, W. Xu, D. Hui, A. Agbas, X. Wang, J. Pinkston, F. Pomerleau, P. Huettl, S. Fowler, M. Michaelis, G.A. Gerhardt. Transgenic expression of glutamate dehydrogenase 1 in neurons: An in vivo model of hyperglutamatergic nervous system and chronic neurodegeneration. Alzheimer's Association International Conference on Alzheimer's Disease. Chicago, Illinois, July 2008.
24. **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.
25. 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.

26. 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.
27. 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.
28. 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.
29. **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.
30. 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.
31. **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.
32. 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.
33. **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 Meeting. Washington, D.C. November 2005.

34. X. Bao, **K.N. Hascup**, R. Pal, X. Wang, G.A. Gerhardt, S.C. Fowler, M.L. Michaelis, E.K. Michaelis. Glutamate Dehydrogenase (GLUD1) Transgenic Mice: A Model of Age-Dependent Endogenous Glutamate Excitotoxicity. Society for Neuroscience Meeting. Washington, D.C. November 2005.
35. **K.N. Hascup**, C.R. Gash, F.P. Pomerleau, X. Bao, D. Hui, E. K. Michaelis, G.A. Gerhardt. Second-By-Second *in Vivo* Electrochemical Analysis of L-Glutamate in the Striatum of GPT and GDH Over-expressing Mice. Society for Neuroscience Meeting. San Diego, CA. October 2004.
36. X. Bao, G. Wang, **K.N. Hascup**, C.R. Gash, F.P. Pomerleau, G.A. Gerhardt, S.C. Fowler, M.L. Michaelis, E.K. Michaelis. Behavioral and Neurochemical Characterization of c57BL/6, BALB/c, and CD1 Mice and generation of Glutamate Dehydrogenase (GDH) Transgenic BALB/c. Society for Neuroscience Meeting. San Diego, CA. October 2004.
37. S. Buch, V.K. Khurdayan, J. Wang, **K.N. Hascup**, N. El-Hage, I.N. Singh, P.E. Knapp, A. Nath, and K.F. Hauser. Vulnerability of glial-restricted precursors (GRPs) to combined opioid and HIV-1 Tat and gp120 *in vitro*. Soc. Neuroimmune Pharmacol. Abstrs. 10:49. Santa Fe, N.M., March 2004.
38. **K.N. Hascup**, Y. Yue, M. Staples. Demonstration of a 150 ng/mL Cutoff for the Urine Cocaine Metabolite Assay on the Dimension[®] Clinical Chemistry System. Clinical Chemistry Meeting. Philadelphia, PA, July 2003.

Presentations

Invited

1. Biosensor Development for In Vivo CNS Studies of Glutamate. SRC Inc. Syracuse, NY. March 11th 2011.
2. Dysregulation of Glutamate Dehydrogenase: A Model of Age-Related Neurodegeneration. Uppsala Universitet, Uppsala, Sweden. January 16, 2009.

International

1. Riluzole, but not LY379268, is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer's disease. Society for Neuroscience, Washington, D.C., November 2017.
2. Neurotransmission spanning the Alzheimer's disease continuum: Glutamatergic tone, cognition, and early intervention. Society for Neuroscience, Washington, D.C., November 2017.

3. Riluzole is an effective prodromal treatment in the A β PP/PS1 model of Alzheimer's disease. Dementia. Rome, Italy, September 2017.
4. 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.
5. 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.
6. 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.
7. 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.
8. Stress-Evoked Glutamate Release in the Prefrontal Cortex of Sprague Dawley Rats. Douglas Mental Health University Institute, Montreal, Quebec, Canada, September 2009.
9. Neuropeptide Y Modulation of the Glutamatergic System in the Flinders Sensitive Line Rats: A Rat Model of Depression. European College of Neuropsychopharmacology Young Scientist Conference in Nice, France. March 6, 2009.

National

1. Measures of L-glutamate Resting Levels Using Enzyme-Based Microelectrode Arrays in the CNS of Conscious Freely Moving Mice. Institute of Biological Engineering. St. Louis, Missouri, April 2007.

State, Regional, and Local

1. Understanding the Relationship Between Amyloid- β , Glutamatergic Signaling, and Cognition in Alzheimer's Disease. Department of Pharmacology at SIU School of Medicine. Springfield, IL. March 2015.
2. Dysregulation of Glutamate Dehydrogenase: A Model of Age-Related Neurodegeneration. Department of Anatomy and Neurobiology Defense Seminar. Lexington, Kentucky. October 2007.
3. Glutamate Dehydrogenase Transgenic Mice: A New Model of Neurodegeneration? Department of Anatomy and Neurobiology Seminar Series. Lexington, Kentucky. February 2006.
4. ALT and GDH Over-expressing Mice: A New Model of Age-Induced Neurodegeneration? Department of Anatomy and Neurobiology Seminar Series. Lexington, KY, February 2005.

SERVICE

Membership and Activities in Professional Societies – International

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

2014- Member

Society for Neuroscience (SFN)

2004- 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

American Chemical Society (ACS)

2001-2003 Member

American Association for Clinical Chemistry (AACC)

2003 Member

University Committees and Review Work

Southern Illinois University School of Medicine

2018 (FY2019) Southern Illinois University Dissertation Research Assistantship Committee
Grant Reviewer

2017 (FY2018) Southern Illinois University School of Medicine Grant Review Committee
Grant Reviewer

2016 (FY2017) Southern Illinois University School of Medicine Grant Review Committee
Grant Reviewer

University Relations

Southern Illinois University School of Medicine

2018 Laboratory tour/demonstration for Southern Illinois University School of
Medicine's Division of Laboratory Animal Management

2017 Laboratory tour/demonstration for Sara Yant and family

2016 Laboratory tour/demonstration for Illinois Neurological Institute (OSF)

- 2015 Laboratory tour/demonstration for SIUSOM alumni David Riesenberger, MD and family
- 2014 Laboratory tour/demonstration for Illinois House Representative Tim Butler
Illinois Math and Science Academy (Blessed Sacrament) Presentation

Media Relations

- 2017 WTAX New Radio: Local Research: Hope to Fight Alzheimer's
<http://wtax.com/news/101101-local-research-hope-to-fight-alzheimers/>

Granting Agency Review Work

- 2018 (FY2019) Illinois Dept. of Public Health Alzheimer's Disease Research Fund
Peer Review Panel Member
- 2014 (FY2015) Illinois Dept. of Public Health Alzheimer's Disease Research Fund
Peer Review Panel Member

Ad Hoc Manuscript Review

Biomedicine & Pharmacotherapy
Journal of Pharmacology & Experimental Therapeutics
Cell Transplantation

PROFESSIONAL DEVELOPMENT

- 2017 Responsible Conduct of Research
- 2014 Writing Winning Grants Seminar