

## **Kirsten Scarlett Evonuk**

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### **Education**

<i>Institution</i>	<i>Degree</i>	<i>Date Received</i>	<i>Field of Study</i>
University of Portland	B.A. (summa cum laude)	05/2011	Psychology
University of Alabama at Birmingham	Ph.D.	Defense: 03/25/2016	Neuroscience

B.A. mentor: Jeffrey Smith, Ph.D.

B.A. thesis title: Effects of Social and Enriched Environments on Recovery from Medial Frontal Cortex Contusion in a Rat Model

Ph.D. mentor: Tara M. DeSilva, PhD

Ph.D. dissertation title: The role of glutamate in immune cell infiltration and excitotoxic mechanisms in autoimmune demyelination

### **Research Description**

My research interest is in understanding the mechanisms underlying neuroinflammation and demyelination in autoimmune neuroinflammatory diseases. One such disease is multiple sclerosis (MS), in which autoreactive immune cells infiltrate the central nervous system (CNS), causing demyelination and neurodegeneration. Current treatments for MS reduce clinical relapses or dampen symptoms by modulating the immune system. However, most of these treatments are not effective for progressive MS, and none are cures for the disease, highlighting the need for studies focusing on neuroprotective mechanisms to directly protect the CNS. One promising target in the search for neuroprotective therapeutic targets is excitotoxicity, defined by excessive stimulation of cells by the excitatory neurotransmitter glutamate. My current projects in the DeSilva laboratory focus on the role of excess glutamate signaling in the pathogenesis of MS, and the normal role of glutamate signaling in the development of myelin. Understanding normal and pathological glutamate signaling in oligodendrocytes will facilitate future research in the neuroprotective potential of glutamate signaling regulation.

### **Positions and Employment**

2009-2010	Undergraduate Research Assistant with Dr. Jeffrey Smith, University of Portland, Portland, OR
2010-2010	Undergraduate Research Assistant with Dr. Linda Overstreet-Wadiche, Summer Program in Neuroscience Research Experiences for Undergraduates (REU) program, University of Alabama at Birmingham, Birmingham, AL
2012-2016	Graduate Student Trainee with Dr. Tara DeSilva, University of Alabama at Birmingham, Birmingham, AL
2016-present	Postdoctoral Fellow with Dr. Tara DeSilva, Cleveland Clinic, Cleveland, OH

### **Other Experiences**

2009-2011	Student Advisory Council Member, University of Portland
8/3/2012	Center for Community Outreach Development Summer Science Programs Poster Judge, University of Alabama at Birmingham, Birmingham, AL
8/2012-10/2012, 8/2014-10/2014	Art of Giving Charity Art Auction Volunteer, University of Alabama at Birmingham, Birmingham, AL
3/9/2013, 3/1/2014	Central Alabama Regional Science and Engineering Fair Poster Judge, University of Alabama at Birmingham, Birmingham, AL
11/21/2013- 4/19/2016	Volunteer at Sci Talks: Science Talks for the Community, University of Alabama at Birmingham, Birmingham, AL
2013-2014	Brain Awareness Week Planning Committee Member, University of Alabama at Birmingham, Birmingham, AL
2014-2015	Brain Awareness Week Co-Coordinator, University of Alabama at Birmingham, Birmingham, AL

	AL
2016-present	Cleveland Clinic Data on the Table Volunteer
4/2019-11/2019	National Multiple Sclerosis Society Tykeson Fellows Conference Planning Committee Member
11/15/2019	National Multiple Sclerosis Society Tykeson Fellows Conference "Myelin Repair Vs. Neuroprotection" Session Co-Chair
11/2019-present	Lerner Postdoctoral Association (LPDA) Communications Team Member
2/29/2020	Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS) 2020 Forum "CNS Cellular Networks in MS" Young Investigator Co-Chair

### **Professional Memberships**

2009-present	Member, Psi Chi (University of Portland Chapter)
2012-present	Member, Society for Neuroscience
2014-2015	Member, American Society for Neurochemistry
2015-2016	Member, Research Civitan Club (Birmingham Chapter)

### **Honors**

2007	Foodland Scholarship, Foodland Super Market, Ltd.
2007-2009	Academic Competitiveness Grant, U.S. Department of Education
2007-2011	President's Scholarship, University of Portland
2007-2011	Presidential Scholarship, Realtors' Association of Maui
2007-2011	M. M. Scott Scholarship, Gertrude S. Straub Trust Estate
2009-2011	Father Lloyd Teske C.S.C. Scholarship, University of Portland
2010	Psi Chi WPA Travel Grant, Psi Chi International Honor Society in Psychology
2011	Sr. Marian Dolores Robinson Award for Achievement in Psychology, University of Portland
2011	Graduated Summa Cum Laude with Bachelor of Arts, University of Portland
2013	1st Place Data Blitz Presentation at Comprehensive Neuroscience Center Retreat, University of Alabama at Birmingham
2014	2nd Place Poster Presentation at Comprehensive Neuroscience Center Neuroscience Research Day, University of Alabama at Birmingham
2014	University of Alabama at Birmingham Graduate Student Association Travel Grant
2014	American Society for Neurochemistry Travel Fellowship
2015	Data Blitz Presentation Award Winner at Comprehensive Neuroscience Center Retreat, University of Alabama at Birmingham
2018	Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS) Educational Travel Grant
2018	Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS) Best Young Investigator Oral Presentation (2nd place)
2018	Cleveland Clinic Neurological Institute Research Day Neurosciences Award for Oral Presentation
2018	European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) Travel Award
2018	Alumni Association Career Development Postdoctoral Fellow Award
2019	4th Place Poster Presentation at Cleveland Brain Health Initiative (CBHI) 2019 Annual Retreat at Case Western Reserve University

### **Publications**

1. **Evonuk, K. S.**, Baker, B. J., Doyle, R. E., Moseley, C. E., Sestero, C. M., Johnston, B. P., De Sarno, P., Tang, A., Gembitsky, I., Hewett, S. J., Weaver, C. T., Raman, C., DeSilva, T. M. 2015. Inhibition of System Xc(-) Transporter Attenuates Autoimmune Inflammatory Demyelination. *J Immunol.* 195: 450-463. doi: 10.4049/jimmunol.1401108. PMID: 26071560; PMCID: PMC4490999

2. **Evonuk, K. S.**, Moseley, C. E., Doyle, R. E., Weaver, C. T., DeSilva, T. M. 2016. Determining immune system suppression versus CNS protection for pharmacological interventions in autoimmune demyelination. *J Vis Exp.* Sep 12;(115). doi: 10.3791/54348. PMID: 27685467; PMCID: PMC5092010
3. **Evonuk, K. S.**, Prabhu, S. D., Young, M. E., DeSilva, T. M. 2017. Myocardial Ischemia/Reperfusion impairs neurogenesis and hippocampal-dependent learning and memory. *Brain Behav Immun.* 61: 266-273. doi: 10.1016/j.bbi.2016.09.001. PMID: 27600185; PMCID: PMC5511033
4. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Thornell, I. M., Adler, K., Bingaman, A. M., Bevensee, M. O., Weaver, C. T., Min, B., DeSilva, T. M. 2020. Reduction of AMPA receptor activity on mature oligodendrocytes attenuates loss of myelinated axons in autoimmune neuroinflammation. *Sci Adv.* 6(2): eaax5936. doi: 10.1126/sciadv.aax5936. PMID: 31934627; PMCID: PMC6949032

## **Talks**

1. **Evonuk, K. S.**, Baker, B. J., Doyle, R. E., Moseley, C. E., Sestero, C. M., Johnston, B. P., De Sarno, P., Tang, A., Gembitsky, I., Hewett, S. J., Weaver, C. T., Raman, C., DeSilva, T. M. *Inhibition of system Xc- transporter attenuates autoimmune inflammatory demyelination.* Talk at the 3<sup>rd</sup> Multiple Sclerosis Research Symposium at the University of Alabama at Birmingham, Birmingham, Alabama (June 4, 2015; Invited speaker).
2. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective Deletion of AMPA Receptors on Oligodendrocytes Prevents Demyelination and Axonal Injury in Autoimmune Demyelination.* Talk at the ACTRIMS Forum 2018, San Diego, California (February 1, 2018; Best Young Investigator Oral Presentation).
3. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Thornell, I. M., Adler, K., Bingaman, A. M., Bevensee, M. O., Weaver, C. T., Min, B., DeSilva, T. M. *Selective reduction of AMPA receptors on mature oligodendrocytes prevents demyelination and axonal injury in experimental autoimmune encephalomyelitis.* Talk at the Cleveland Clinic Neurological Institute Research Day, Cleveland, Ohio (May 24, 2018; received The Neurosciences Award).
4. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Thornell, I. M., Adler, K., Bingaman, A. M., Bevensee, M. O., Weaver, C. T., Min, B., DeSilva, T. M. *Selective reduction of AMPA receptors on mature oligodendrocytes prevents demyelination and axonal injury in experimental autoimmune encephalomyelitis.* Talk at the ECTRIMS Congress 2018, Berlin, Germany (October 11, 2018).

## **Posters**

1. Zemanek, A. N., Keating, J., **Neeck, K.**, Fraser, E., Smith, J. *Post-injury environment and recovery from medial frontal cortex lesion.* Poster presented by all authors at the Psi Chi Session, Western Psychological Association 90<sup>th</sup> Annual Convention, Cancun, Mexico (April 23, 2010).
2. **Neeck, K.**, Smith, J. *Effects of social and enriched environments on recovery from medial frontal cortex lesion in a rat model.* Poster presented by Neeck, K. at Society for Neuroscience Faculty for Undergraduate Neuroscience Poster Session, Society for Neuroscience 40<sup>th</sup> Annual Meeting, San Diego, California (November 15, 2010).
3. **Evonuk, K. S.**, Baker, B. J., Sestero, C. M., Doyle, R. E., Timberlake, M. A., Raman, C., DeSilva, T. M. *Inflammatory signaling associated with multiple sclerosis causes excitotoxicity to oligodendrocytes.* Poster presented by Evonuk, K.S. at the University of Alabama at Birmingham Multiple Sclerosis Symposium, Birmingham, Alabama (May 16, 2013).
4. **Evonuk, K. S.**, Baker, J., Sestero, C. M., Doyle, R. E., Timberlake, M. A., Sontheimer, H., Raman, C., DeSilva, T. M. *System xc- inhibition improves histopathological and clinical outcomes in experimental autoimmune encephalomyelitis.* Program#/Poster#: 441.09/Z11. Poster presented by Evonuk, K. S. at the Society for Neuroscience Meeting, San Diego, California (November 11, 2013).
5. **Evonuk, K. S.**, Baker, J., Sestero, C. M., Doyle, R. E., Timberlake, M. A., Sontheimer, H., Raman, C., DeSilva, T. M. *System xc- inhibition improves histopathological and clinical outcomes in experimental autoimmune encephalomyelitis.* Poster presented by Evonuk, K.S. at the University of Alabama at

Birmingham Comprehensive Neuroscience Center Neuroscience Research Day, Birmingham, Alabama (February 7, 2014; 2nd place presentation).

6. Doyle, R., **Evonuk, K. S.**, Baker, B. J., Sestero, C. M., Johnston, B., De Sarno, P., Tang, A., Gembitsky, I., Raman, C., DeSilva, T. M. *Inhibition of system Xc- transporter protects the CNS in autoimmune inflammatory demyelination*. Program#/Poster#: 223.22/H11. Poster presented by Doyle, R. at the Society for Neuroscience Poster Session, Washington, D. C. (November 16, 2014).
7. **Evonuk, K. S.**, Baker, B. J., Doyle, R. E., Sestero, C. M., Johnston, B. P., De Sarno, P., Tang, A., Gembitsky, I., Hewett, S. J., Sontheimer, H., Raman, C., DeSilva, T. M. *System Xc- transporter modulates CNS infiltration of immune cells in autoimmune inflammatory disease*. Program#/Poster#: 223.11/G12. Poster presented by Evonuk, K. S. at the Society for Neuroscience Poster Session, Washington, D. C. (November 16, 2014).
8. Johnston, B., **Evonuk, K. S.**, Young, M. E., DeSilva, T. M. Hippocampal neuroinflammation and cognitive decline as a consequence of acute myocardial ischemia-reperfusion. Program#/Poster#: 545.13/PP2. 2014 Neuroscience Meeting Planner. Poster presented by Johnston, B. at the Society for Neuroscience Poster Session, Washington, DC (November 16, 2014).
9. **Evonuk, K. S.**, Baker, B. J., Doyle, R. E., Moseley, C. E., Sestero, C. M., Johnston, B. P., De Sarno, P., Tang, A., Gembitsky, I., Hewett, S. J., Sontheimer, H., Raman, C., DeSilva, T. M. *System xc- transporter modulates CNS infiltration of immune cells and reactive gliosis in autoimmune inflammatory disease*. Poster#: PSM03-17. Poster presented by Evonuk, K. S. at the American Society for Neurochemistry 46<sup>th</sup> Annual Meeting, Atlanta, Georgia (March 16, 2015).
10. **Evonuk, K. S.**, Baker, B. J., Doyle, R. E., Moseley, C. E., Sestero, C. M., Johnston, B. P., De Sarno, P., Tang, A., Gembitsky, I., Hewett, S. J., Sontheimer, H., Raman, C., DeSilva, T. M. *System xc- transporter modulates CNS infiltration of immune cells and reactive gliosis in autoimmune inflammatory disease*. Poster presented by Evonuk, K. S. at the 4<sup>th</sup> Southeastern Immunology Symposium, Atlanta, Georgia (June 13, 2015).
11. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective deletion of AMPA receptors on oligodendrocytes prevents excitotoxicity in EAE*. Program#/Poster#: 511.06/U18. Poster presented by Evonuk, K.S. at the Society for Neuroscience Poster Session, San Diego, California (November 15, 2016).
12. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective deletion of AMPA receptors on oligodendrocytes prevents axonal injury in autoimmune demyelination*. Poster#: T14-110A. Poster presented by Evonuk, K.S. at the XIII European Meeting on Glial Cells in Health and Disease, Edinburgh, United Kingdom (July 10, 2017). <https://doi.org/10.1002/glia.23157>
13. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective Deletion of AMPA Receptors on Oligodendrocytes Prevents Demyelination and Axonal Injury in Autoimmune Demyelination*. Poster#: P194. Poster presented by Evonuk, K.S. at the ACTRIMS Forum 2018, San Diego, California (February 2, 2018). <https://doi.org/10.1177/1352458517750967>
14. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective Deletion of AMPA Receptors on Oligodendrocytes Prevents Demyelination and Axonal Injury in Autoimmune Demyelination*. Poster presented by Evonuk, K.S. at the Case Western University Cleveland Brain Health Initiative (CBHI) 2019 Annual Retreat, Cleveland, Ohio (August 26, 2019; 4th place presentation).
15. **Evonuk, K. S.**, Doyle, R. E., Moseley, C. E., Monyer, H., DeSilva, T. M. *Selective Reduction of AMPA Receptors on Oligodendrocytes Prevents Demyelination and Axonal Injury in Autoimmune Demyelination*. Poster presented by Evonuk, K.S. at the National Multiple Sclerosis Society Tykeson Fellows Conference, Atlanta, Georgia (November 14 and 15, 2019).

**Completed Support**

<i>Grant Name</i>	<i>Role</i>	<i>Grant Number</i>	<i>PI</i>	<i>Dates</i>
Immunologic Diseases and Basic Immunology T32	Trainee	NIH/NIAID 5 T32 AI007051-37 and NIH/NIAID 5 T32 AI007051-38	Harry Schroeder	07/01/2014-06/30/2015 and 07/01/2015-06/30/2016
Cole Eye Institute Vision Science Training Program	Trainee	NIH/NEI 5 T32 EY 24236-2	Bela Anand-Apte and Joe Gilbert Hollyfield	03/30/2017-03/31/2018

**Ongoing Support**

<i>Grant Name</i>	<i>Role</i>	<i>Grant Number</i>	<i>PI</i>	<i>Dates</i>
NMSS Postdoctoral Fellowship	PI	FG-1807-31882	Kirsten S. Evonuk	7/1/2019-6/30/2022

**Teaching**

3/19/2012	Brain Awareness Week Volunteer, University of Alabama at Birmingham, Birmingham, AL
6/2012-7/2012,	Summer Program in Neuroscience Student Mentor, University of Alabama at Birmingham, Birmingham, AL
6/2014-7/2014,	
6/2015-7/2015	
10/2013-3/2014	Brain Awareness Week Planning Committee Member, University of Alabama at Birmingham, Birmingham, AL
4/5/2014	Research Educator, Walk MS: Birmingham, Birmingham, AL
7/18/2014	Summer Science Institute Lecturer, University of Alabama at Birmingham, Birmingham, AL
9/14/2014-	Brain Awareness Week Co-Coordinator, University of Alabama at Birmingham, Birmingham, AL
4/3/2015	
3/4/2015	Mood and Cognition in Multiple Sclerosis Course Instructor, Town Village, Vestavia, AL
4/11/2015	Research Educator, Walk MS: Birmingham, Birmingham, AL
5/7/2015	Brain Day Instructor for Pomaika'i Elementary School 2nd Grade Class, Kahului, HI
6/6/2015	Research Educator, Center for Pediatric Onset Demyelinating Disease (CPODD) Family Retreat at Children's Harbor at Lake Martin, Alexander City, AL
6/2019-present	Research Student Mentor
3/25/2019	Brain Day Instructor for Pomaika'i Elementary School 2nd Grade Class, Kahului, HI