

# Kelly B. Menees

(Formerly Kelly E. Baker)

University of Georgia, Athens, GA

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## EDUCATION

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### ***PhD Candidate, Neuroscience***

August 2017-Present

Advisor: Jae-Kyung (Jamise) Lee, PhD

Department of Physiology & Pharmacology

Biomedical and Translational Sciences Institute

University of Georgia, Athens, GA

### ***Master of Science, Biomedical Sciences***

July 2017

Thesis: "Targeting the Downregulation of Kremen1 with RVG-9R/siRNA Complexes in the Triple-Transgenic Mouse Model of Alzheimer's Disease"

Advisor: Alexander K. Murashov, MD, PhD

East Carolina University, Greenville, NC

### ***Bachelor of Science, Biological Sciences***

May 2015

Minors: Chemistry & Psychology

University of South Carolina, Columbia, SC

## RESEARCH EXPERIENCE

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### ***Graduate Research Assistant***

January 2018-Present

Department of Physiology & Pharmacology, College of Veterinary Medicine, University of Georgia

PI: Jae-Kyung Lee, PhD

- Focus: Investigating the role of innate immune cells in synucleinopathies and aging

### ***Graduate Research Assistant***

August 2015-June 2017

Physiology Department, Brody School of Medicine, East Carolina University

PI: Alexander K. Murashov, MD, PhD

- Focus: downregulating Kremen1 to prevent synaptic loss and memory deficits in the triple transgenic mouse model of Alzheimer's disease
- Worked with adult cortico-hippocampal primary cell culture and Neuro2a cell culture models to determine the most efficient and effective ratio of RVG peptide to siRNA to target downregulation of Kremen1
- *in vivo* application of RVG/siRNA complexes in 3xTg-AD mice
- Performed behavioral assessment of memory using Barnes Maze
- Immunohistochemistry, Western blots, and qRT-PCR of mouse brains

### ***Undergraduate Research Assistant***

May 2014-May 2015

Neurodevelopmental Disabilities Lab, University of South Carolina

PI: Jane Roberts, PhD

- Compiled data sets from multiple universities
- Updated protocols of all assessments performed
- Contributed to the development of a coding scheme for behaviors observed in the Lab-TAB: Stranger assessment

## RELEVANT SKILLS

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qRT-PCR, Western blot, Immunohistochemistry (IF and bright field), Immunocytochemistry, Adult cortico-hippocampal cell culture, Barnes maze, Open field, Novel object recognition, Neuro2a cell culture, Tail vein injections, Intraperitoneal injections, Subcutaneous injections, Rodent brain stereotaxic surgery, Mouse husbandry, Tissue cryosectioning, GraphPad Prism, Image J, Confocal microscopy, Peripheral immune cell isolation, CNS immune cell isolation, Flow cytometry

## COURSE WORK

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Neuroanatomy, Neurophysiology, Statistical Methods, Immunology, Toxicology, Biochemistry, Molecular and Cellular Biology, Neuroscience Journal Club, Neuroscience Seminar, Physiology and Pharmacology Seminar

## PUBLICATIONS

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**Menees, K.B.**, Preston, C., Chung, J., Jernigan, J., Earls, R.H., Snider, I., Brown, K., Wagner, J., Lee, J.K. RGS10-deficient mice display an insulin resistance phenotype and impaired long-term potentiation. *In Preparation*.

Chung, J., Jernigan, J., **Menees, K.B.**, Lee, J.K. Dual role of RGS10 in managing oxidative stress and inflammatory responses to enhance microglia phagocytosis of synuclein aggregates. *In Preparation*.

**Menees, K.B.\***, Earls, R.H.\*, Chung, J., Jernigan, J., Filipov, N.M., Carpenter, J.M., Lee, J.K. (2021) Sex- and age-dependent alterations of splenic immune cell profile and NK cell phenotypes and function in C57BL/6J mice. *Immunity and Ageing*, 18, 3.

*\*These authors contributed equally*

**Menees, K.B.\***, Earls, R.H.\*, Chung, J.\*, Gutekunst, C.A., Lee, H.J., Rada, B., Hazim, M.G., Lee, J.K. (2020) NK cells clear  $\alpha$ -synuclein and the depletion of NK cells exacerbates synuclein pathology in a mouse model of  $\alpha$ -synucleinopathy. *Proc Natl Acad Sci U S A*, 117 (3) 1762-1771.

*\*These authors contributed equally*

Earls, R.H., **Menees, K.B.**, Chung, J., Barber, J., Gutekunst, C.A., Hazim, M.G., Lee, J.K. (2019) Intrastratial injection of preformed alpha-synuclein fibrils alters central and peripheral immune cell profiles in non-transgenic mice. *Journal of Neuroinflammation*, 16(1): p. 250.

Ross, S.P., **Baker, K.E.**, Fisher, A., Hoff, L., Pak, E.S. and Murashov, A.K. (2018) miRNA-431 prevents amyloid- $\beta$ -induced synapse loss in neuronal cell culture model of Alzheimer's disease by silencing Kremen1. *Front. Cell. Neurosci*, 12:87.

## POSTERS & PRESENTATIONS

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**Menees, K.B.**, Earls, R.H., Chung, J., Lee, J.K. (December 2020). Evaluating the effects of systemic NK cell depletion in a preclinical mouse model of Parkinson's disease. Cold Spring Harbor Laboratory Neurodegenerative Diseases: Biology & Therapeutics. *Virtual*.

**Menees, K.B.** (April 2020). Investigating the role of innate immune cells in synucleinopathies and aging. University of Georgia, Physiology and Pharmacology Department Seminar. *Virtual*.

**Menees, K.B.** (September 2019). Investigating the role of NK cells in synucleinopathies using an in vitro model system. University of Georgia, Regenerative Bioscience Collective. *Athens, GA.*

**Menees, K.B.**, Chung, J., Earls, R.H., Lee, J.K. (June 2019). Natural killer cells scavenge extracellular  $\alpha$ -synuclein aggregates and modulate synuclein pathology in mouse primary neuron coculture system. Gordon Research Conference on Parkinson's Disease. *Newry, ME.*

Earls, R.H., **Menees, K.B.**, Lee, J.K. (June 2019). Depletion of natural killer cells augment synuclein pathology in a preclinical mouse model of Parkinson's disease. Gordon Research Conference on Parkinson's Disease. *Newry, ME.*

**Menees, K.B.**, Chung, J., Earls, R.H., Lee, J.K. (April 2019). Natural killer cells uptake and degrade extracellular  $\alpha$ -synuclein aggregates. University of Georgia, Regenerative Bioscience Symposium. *Athens, GA.*

Jernigan, J., Chung, J., **Menees, K.B.**, Lee, J.K. (April 2019). A novel mechanism for maintaining microglial homeostasis in response to chronic inflammation and metabolic dysregulation. University of Georgia, Regenerative Bioscience Symposium. *Athens, GA.*

*\*Served as graduate student mentor*

Lee, J.K., Chung, J., Earls, R.H., **Menees, K.B.** (November 2018). Human Natural Killer cells clear extracellular alpha synuclein while their effector functions are inhibited. Nanosymposium for Society for Neuroscience. *San Diego, CA.*

Earls, R.H., **Menees, K.B.**, Chung, J., Lee, J.K. (September 2018). Intracerebral injection of pre-formed alpha synuclein fibrils into mice alters immune cell profiles. Southeastern Neurodegenerative Disease Conference. *Orlando, FL.*

Weinstock, L., Earls, R.H., Sankar, S., **Baker, K.E.**, Chung, J., Wood, L., Lee, J.K. (July 2018) Elucidating natural killer cells as a cell therapy for Parkinson's disease. Regenerative Medicine and Engineering Symposium.

**Baker, K.E.**, Snider, I., Jernigan, J., Earls, R.H., Lee, J.K. (April 2018). The novel role of RGS10 in metabolic homeostasis and diet-induced obesity in age- and sex-specific manners. University of Georgia: Graduate Students and Postdocs in Science Research Day. *Athens, GA.*

**Baker, K.E.**, Fisher, A., Hoff, L., Pak, E., Murashov, A.K. (April 2017). Investigating the downregulation of Kremen1 in the triple-transgenic mouse model of Alzheimer's disease. East Carolina University: Research and Creative Achievement Week. *Greenville, NC.*

**Baker, K.E.**, Murashov, A.K. (January 2017). Preventing Memory Deficits in the 3xTg Mouse Model of AD. East Carolina University: Neuroscience Collaborative Meeting. *Greenville, NC.*

**Baker, K.E.**, Fisher, A., Hoff, L., Murashov, A.K. (October 2016). *In vivo* application of RVG-9R/siRNA complexes targeting Kremen1 in the triple transgenic mouse model of AD. Eastern Carolina Chapter of the Society for Neuroscience: 18<sup>th</sup> Annual Neuroscience Symposium. *Greenville, NC.*

*\*Awarded Best Neurodegenerative Disease Poster at Symposium*

Fisher, A., Hoff, L., **Baker, K.E.**, Murashov, A.K. (October 2016). Downregulating Kremen1 in cortico-hippocampal neurons with a siRNA-RVG complex in a triple-transgenic mouse model of Alzheimer's disease. Eastern Carolina Chapter of the Society for Neuroscience. 18<sup>th</sup> Annual Neuroscience Symposium. *Greenville, NC.*

*\*Served as graduate student mentor*

**Baker, K.E.**, Murashov, A.K. (October 2016). Lost connections: What can we do about Alzheimer's disease? East Carolina University Three Minute Thesis Competition. *Greenville, NC.*

**Baker, K.E.**, McGrath, S., Roberts, J. (April 2015). Physiological arousal during a non-social task in cross-syndrome autism spectrum disorders. University of South Carolina Discovery Day. *Columbia, SC.*

**Baker, K.E.**, Rague, L., Roberts, J. Schworer, E. (July 2014). The relationship between age and CARS score in ASIB and FXS males. Neurodevelopmental Disorders Lab Summer Symposium. *Columbia, SC.*

## TEACHING EXPERIENCE

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Teaching Assistant for Elements of Physiology, University of Georgia May 2019-Present

## HONORS AND AWARDS

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Biomedical and Health Sciences Institute Travel Award (\$300) June 2019

Graduate Assistantship, East Carolina University August 2015-June 2016

Dean's List, University of South Carolina Spring 2014-Spring 2015

Honors College, University of South Carolina August 2011-December 2013

Cooper Scholarship, University of South Carolina August 2011-May 2015

## ORGANIZATIONS & INVOLVEMENT

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COVID-19 Virtual Design Sprint April 2020-May 2020

- Competition designed to develop solutions for a wide range of problems exacerbated by the COVID-19 pandemic. Team (Community Connections) placed 5<sup>th</sup>.

Graduate Students and Postdocs in Science, University of Georgia August 2017-Present

*President* August 2019-May 2021

*Vice President* August 2018-July 2019

Eastern Carolina Chapter of the Society for Neuroscience August 2015-July 2017

Brody Graduate Student Association, East Carolina University August 2015-July 2017

## REFERENCES

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Available upon request