

BRADLEY R. KRAEMER

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Education

Ph.D. <i>Vanderbilt University</i> , Nashville, TN Neuroscience Graduate Program Department of Biochemistry Advisor: Dr. Bruce Carter, Professor of Biochemistry	August 2014
B.S. <i>Centenary College of Louisiana</i> , Shreveport, LA Major: Neuroscience Minor Concentration: Psychology Advisor: Dr. Greg Butcher, Assistant Professor of Neuroscience	May 2008

Employment

Assistant Professor , University of Alabama in Huntsville, Huntsville AL	Aug. 2022 - Present
Associate Professor , Eastern Kentucky University, Richmond, KY	May 2022 – June 2022
Assistant Professor , Eastern Kentucky University, Richmond, KY Department of Biological Sciences	Aug. 2016 – June 2022
Post-doctoral Fellow. <i>Vanderbilt University</i> , Nashville, TN Advisor: Dr. Laura Dugan, Head of Geriatric Medicine Department of Medicine, Geriatric Neurology	Sept 2014- August 2016

Other Relevant Training

Vanderbilt Certificate in College Teaching	2015
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Teaching

<u>Course Prefix and Number</u>	<u>Title</u>	<u>Sections Taught</u>
BIO 111 (Lab)	Cell and Molecular Biology	6
BIO 111 (Lecture)	Cell and Molecular Biology	3
BIO 331	Cell Biology	9
BIO 599/799	Special Topics in Neurobiology	1
BIO 549/749	Neurobiology	3
BIO 598	Special Problems	5
HON 420	Honors Thesis	4

Awards

QEP Critical Reading and Critical Thinking Teaching Award	2018
MTNCSfN Data Blitz Speaker Award	2012

Professional Memberships

Faculty for Undergraduate Neuroscience (FUN)	2015 – Present
Society for Neuroscience	Intermittently between 2007 - Present
Kentucky Academy of Science	2018 - 2022

Publications

Clements RT^{#*}, Fuller LE^{#*}, Kraemer KR, Radomski SA*, Hunter-Chang S, Hall WC*, Kalantar AA*, and **Kraemer BR**. “Quantification of Neurite Degeneration with Enhanced Accuracy and Efficiency in an in vitro Model of Parkinson’s disease, *eNeuro*. 9 (2) ENEURO.0327-21.2022; DOI: <https://doi.org/10.1523/ENEURO.0327-21.2022>

Kraemer BR and Carter BD. (2021) Neurotrophin Receptor Signaling. In: Jez J. et al. (Eds). *Encyclopedia of Biological Chemistry (Third Edition)*, Volume 6, (pp.187-200). Cambridge, MA: Elsevier. <https://doi.org/10.1016/B978-0-12-819460-7.00310-8>

Kraemer BR, Clements RT*, Escobedo CM, Nelson KS*, Waugh CD*, Elliott AS*, Hall WC*, and Schemanski MT* (2021) “c-Jun N-terminal Kinase Mediates Ligand-independent p75^{NTR} Signaling in Mesencephalic Cells Subjected to Oxidative Stress” *Neuroscience*. 453:222-236. doi:10.1016/j.neuroscience.2020.11.036.

Mobley BC, Kwon M, **Kraemer BR**, Hickman FE, Qiao J, Chung DH, Carter BD (2015). “Expression of MYCN in Multipotent Sympathoadrenal Progenitors Induces Proliferation and Neural Differentiation, but Is Not Sufficient for Tumorigenesis.” *PLoS One*. 10(7):e0133897.

Kraemer BR, Snow JP*, Vollbrecht PJ, Pathak A, Valentine WM, Deutch AY, and Carter BD (2014). “A Role for the p75 Neurotrophin Receptor in Axonal Degeneration and Apoptosis Induced by Oxidative Stress” *Journal of Biological Chemistry*, 289(31):21205-16.

Kraemer BR, Yoon SO, and Carter BD (2014). “The Biological Functions and Signaling Mechanisms of the p75 Neurotrophin Receptor”. in *Neurotrophic Factors, Handbook of Experimental Pharmacology* (Book 220, Carter BD and Lewin GR, ed.), Springer. pp 121-164

* denotes undergraduate co-author

denotes co-first author

Student Supervision (Research Training)

Graduate Students

Cassandra Escobedo. The Effects of Oxidative Stress On p75^{NTR} Signaling in Dopaminergic Neurons. Fall 2016 – Summer 2018.

Jacob Ruden. Aging-related Alterations in Autophagy in Parvalbumin-expressing Neurons. Fall 2014 – Spring 2016.

Postbaccalaureate Research Associates

Rachel Clements. Development of An Automated Method for Measuring Neurite Degeneration in Micrographs of Cultured Neurons. Summer 2020 – Summer 2021.

Briana Ford. Investigating the Effects of Oxidative Stress on p75^{NTR} Signaling in Dopaminergic Neurons. Summer of 2017.

Undergraduate Students

Samantha Radomski. Investigating the Contributions of p75 Neurotrophin Receptor (p75^{NTR}) Signaling on Neuronal Death Associated with Parkinson’s Disease. Spring 2021 - Present.

- Sarah Sparks. Evaluating the Effects of the p75 Neurotrophin Receptor on Dopaminergic Neurite Degeneration in a Mouse Model of Parkinson's Disease. Spring 2021 – Present.
- Brooke Jackson. Characterization of TrkA and TrkB Expression in Lund Human Mesencephalic Cells. Summer 2021 – Present.
- Cassidy Spease. Characterization of TrkC and Sortilin Expression in Lund Human Mesencephalic Cells. Summer 2021 – Present.
- Wesley Hall. Investigating the Effects of the p75 Neurotrophin Receptor on Neurite Degeneration associated with Parkinson's Disease Spring 2020 – Fall 2020.
- Lauren Fuller. Quantification of Neurite Degeneration through use of an Optimized and Automated Method. Summer 2019 – Fall 2020.
- Rachel Clements. Investigating the Proteolysis of p75^{NTR} in Response to Oxidative Stress in Dopaminergic Neurons. Spring 2019 – Fall 2019.
- Jeanne Reix Charat. Exploring the Contributions of TACE Signaling to Oxidative Stress-Induced p75^{NTR} Proteolysis in Dopaminergic Neurons. Spring 2020 – Fall 2020.
- Marcus Harris. Investigating p75^{NTR} Signaling Mechanisms in Lund Human Mesencephalic Cells. Spring of 2020.
- Andrew Elliott. The Role of c-Jun N-terminal Kinase in Oxidative Stress-induced p75^{NTR} Signaling. Summer 2019 – Fall 2019.
- Kendall Nelson. The Effects of Gamma-Secretase on Oxidative Stress-induced Cleavage of p75^{NTR} in Dopaminergic Neurons. Summer 2018 – Summer 2019.
- Brooke Tompkins. Characterization of Mechanisms Underlying p75^{NTR} Proteolysis in Dopaminergic Neurons. Spring of 2019.
- Montana Schemanski. The Effects of Metalloproteinase Activity on Oxidative Stress-induced Cleavage of p75^{NTR} in Dopaminergic Neurons. Summer 2018 – Fall 2018.
- Carter Waugh. Analysis of p75^{NTR} Localization in Human Neurons Derived from the Ventral Mesencephalon. Spring 2018 – Spring 2019
- Joshua Arnett. The Role of the p75 Neurotrophin Receptor in Regulation of Exercise-Induced Neurogenesis. Fall 2018.
- Alborz Kalantar. Developing a Protocol for Culturing Dopaminergic Neurons Derived from the Ventral Mesencephalon. Summer 2017 – Fall 2017.
- Briana Ford. Investigating the Effects of Klotho on Astrocyte Proliferation and Reactivity. Fall 2016 – Spring 2017.
- John P. Snow. Determining the Effects of 6-hydroxydopamine on p75^{NTR} Cleavage in Sympathetic Neurons. 2013 - 2014

Conference Posters and Presentations

Radomski S, Sparks S, Spease C, Jackson B, and Kraemer B (2021) "Characterization of Ligand-independent p75^{NTR} Signaling and Associated Effects on Neurodegeneration in Parkinson's Disease." Kentucky Academy of Science Annual Meeting, Virtual Meeting.

Clements RT, Fuller LE, Hall WC, Kalantar AA, and **Kraemer BR** (2021), "Measuring Neurite Degeneration in an In Vitro Model of Parkinson's Disease using an Automated and Optimized Method." University Presentation Showcase Event. Eastern Kentucky University. Poster 23.

Fuller LE, Clements RT, Hall WC, and **Kraemer BR** (2020) "Quantification of Neurite Degeneration through use of an Optimized and Automated Method." Kentucky Academy of Science Annual Meeting, Virtual Meeting.

Clements RT, Escobedo CM, Nelson KS, Waugh CD, Elliott AS, Schemanski MT, and **Kraemer BR** (2019) "Neurotrophin-independent p75^{NTR} Processing is Facilitated by c-Jun N-terminal Kinase in Dopaminergic Cells Subjected to Oxidative Stress" Southeast Regional IDeA Conference

Nelson K, Escobedo C, Waugh C, Schemanski M, Kalantar A, **Kraemer B** (2019) "The Effects of p75^{NTR} Signaling on Oxidative Stress-induced Dopaminergic Neurodegeneration." Symposium for Young Neuroscientists and Professors of the Southeast. High Point, NC

Nelson K, Schemanski M, Escobedo C, Waugh C, Kalantar A, and **Kraemer B** (2018) "The Effects of Oxidative Stress on p75^{NTR} Signaling in Dopaminergic Neurons." Kentucky Academy of Science Annual Meeting, Bowling Green, KY.

Waugh C, Escobedo C, Kalantar A, Ford B, and **Kraemer B** (2018), "Activation of the p75 Neurotrophin Receptor in Degenerating Dopaminergic Neurons Subjected to Oxidative Stress" Symposium for Young Neuroscientists and Professors of the Southeast. High Point, NC.

Escobedo C, Kalantar A, Ford B, Waugh C, and **Kraemer B** (2018) "Oxidative Stress Promotes Activation of the p75 Neurotrophin Receptor in Dopaminergic Neurons." Association of Southeastern Biologists Meeting. Myrtle Beach, SC.

Tang Q, **Kraemer BR**, Dixit M, Ruden JB, Spitzler PJ, Dugan LL (2016) "Are Parvalbumin Interneurons Selectively Targeted by Ineffective Autophagy and Mitophagy in Aging Brain?" Society for Neuroscience 46th annual meeting. San Diego, CA

Kraemer BR, Snow JP, Vollbrecht PJ, Valentine WM, Deutch AY, and Carter BD (2013) "A Role for p75^{NTR} in Oxidative Stress-induced Axonal Degeneration and Neuronal Death" Neurotrophic Factors Gordon Conference. Newport, RI.

Kraemer BR, Snow JP, and Carter BD (2012) "A role for p75^{NTR} in Neuronal Apoptosis Induced by Oxidative Stress" Society for Neuroscience 42nd annual meeting. San Diego, CA

Kraemer BR, Kenchappa RS, Snow JP, and Carter BD (2012) "Oxidative Stress Induces p75^{NTR}-mediated Programmed Cell Death" Vanderbilt Kennedy Center Science Day, Vanderbilt University, Nashville, TN.

Kraemer BR, Kenchappa RS, Scheib JS, Carter BD (2010), “Reduced p75-mediated Apoptosis of Sympathetic Neurons in Transgenic Mice Expressing a γ -secretase-Resistant p75 Mutant” Society for Neuroscience 40th annual meeting. San Diego, CA

Kenchappa RS, **Kraemer BR**, Scheib JL, Carter BD (2010) “Investigating Developmental programmed cell death: Reduction of p75-mediated apoptosis in transgenic animals expressing a non-cleavable p75 mutant (p75FasTM)” Vanderbilt IGP recruitment poster session.

Kenchappa RS, **Kraemer BR**, Scheib JL, Yoon SO, and Carter BD (2009), “Attenuation of p75-mediated apoptosis in transgenic animals expressing the g-secretase resistant p75 mutant (p75FasTM)” Neurotrophic Factors Gordon Conference. Newport, RI.

Apple D*, **Kraemer BR*** and Butcher GQ. (2007) “Localization and Connectivity of Cells Containing pRSK and pMSK within the Mammalian SCN.” Faculty for Undergraduate Neuroscience poster session, Society for Neuroscience 37th annual meeting, San Diego, CA. *denotes co-first-author

Invited Talks

Kraemer BR, Identification of p75^{NTR} Signaling Mechanisms and the Effects of Such Events on Neurodegeneration Associated with Parkinson's Disease. University of Alabama in Huntsville, March 24th, 2022.

Kraemer BR, Characterization of p75^{NTR} Signaling Mechanisms and the Effects of Such Events on Neurodegeneration Associated with Parkinson's Disease. Department of Biological Sciences Seminar Series, Eastern Kentucky University, February 11th, 2022.

Kraemer BR, Clements RT, Fuller LE, Hall WC, and Kraemer KR, An Enhanced and Automated Method for Measuring Neurite Degeneration in an *in vitro* Model of Parkinson's Disease. KY INBRE Seminar Series. September 22nd, 2021.

Kraemer BR, Contributions of the p75 Neurotrophin Receptor to Oxidative Stress-Associated Neurodegeneration. *Anatomical Sciences and Neurobiology Seminar* at the University of Louisville, Louisville, KY. March 8th, 2018.

Kraemer BR. Investigating the Role of the p75 neurotrophin receptor in the Regulation of Neurodegeneration in the CNS. *KBRIN External Advisory Committee Meeting*, Louisville, KY. October 26th, 2017.

Kraemer BR. Investigating the Role of the p75 Neurotrophin Receptor and Klotho in the Regulation of Neurodegeneration. *Eastern Kentucky University*, Richmond, KY. April 13th, 2016.

Kraemer BR. Investigating the Role of the p75 Neurotrophin Receptor and Klotho in the Regulation of Neurodegeneration. *Manchester University*, North Manchester, IN. March 28th, 2016

Kraemer BR. A Role for the p75 Neurotrophin Receptor and the Aging-Suppressor Protein Klotho in Mediating Cellular Responses to Neural Injury. *Columbus State University*, Columbus, Georgia. February 23rd, 2016.

Grant Applications

The Role of the p75 Neurotrophin Receptor in Dopaminergic Neurodegeneration Induced by Oxidative Stress. (Resubmission). *PI:* Bradley R. Kraemer. National Institute of Neurological Disorders and Stroke (NINDS). **Approved for Funding by NINDS Director; Notice of Award Pending.** \$438,000. Submitted June 24th, 2021.

Effects of p75^{NTR} on Oxidative Stress-Induced Degeneration of CNS Neurons (Renewal Application). *PI:* Bradley R. Kraemer. Kentucky IDeA Networks of Biomedical Research Excellence (KY INBRE). **Funded**, \$56,800. December 9th, 2020.

Effects of the p75 Neurotrophin Receptor on Neurite Degeneration in a Mouse Model of Parkinson's Disease. *PI:* Bradley R. Kraemer. ECU University-Funded Scholarship Program. **Funded**, \$3,000. February 17th, 2020.

Evaluating the Contributions of the p75 Neurotrophin Receptor to Neurodegeneration Associated with Parkinson's Disease. *PI:* Bradley R. Kraemer. ECU Sponsored Programs. **Funded**, \$14,998. September 16th, 2019.

SE IDeA KBRIN Travel Award. *PI:* Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, estimated \$1500. July 25th, 2019.

Effects of p75^{NTR} on Oxidative Stress-induced Degeneration of CNS Neurons (Renewal Application). *PI:* Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, \$56,800. December 19th, 2019.

Investigating the Effects of the p75 Neurotrophin Receptor on Exercise-induced Neurogenesis. *PI:* Bradley R. Kraemer. Kentucky Academy of Science. **Not funded**, \$4,952.70. November 15th, 2018.

Allentown, 70-cage Nexgen LoProfile Cage System. *PI:* Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, \$14,484. November 30th, 2018.

The Role of the p75 Neurotrophin Receptor in Dopaminergic Neurodegeneration Induced by Oxidative Stress. *PI:* Bradley R. Kraemer. National Institute of Neurological Disorders and Stroke (NINDS). **Not funded**, \$417,800. June 22nd, 2018.

Horizontal Laminar Flow Hood with Vibration Isolator. *PI:* Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, \$8,893.07. January 31st, 2018.

Role of the p75 Neurotrophin Receptor in Apoptosis of Dopaminergic Neurons Induced by Oxidative Damage. *PI:* Bradley R. Kraemer. ECU College of Science - Junior Faculty Summer Research Award. **Funded**, \$4,500. January 25th, 2018.

Effects of p75^{NTR} on Oxidative Stress-induced Degeneration of CNS Neurons (Renewal Application). *PI:* Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, \$56,747. December 19th, 2018.

Effects of the p75 Neurotrophin Receptor on Hippocampal Neurodegeneration

Induced by Oxidative Stress. *PI*: Bradley R. Kraemer. ECU College of Science - Junior Faculty Summer Research Award. **Funded**, \$4,500. January 25th, 2017.

Effects of p75NTR on Oxidative Stress-Induced Degeneration of CNS Neurons. *PI*: Bradley R. Kraemer. Kentucky Biomedical Research Infrastructure Network (KBRIN). **Funded**, \$113,200. January 13th, 2017.

Immunobiology of Blood and Vascular Systems Training Grant (5T32HL069765-13). **Subaward Recipient**. 2015.

Vanderbilt Neuroscience Program Training Grant (T32 MH064913). **Subaward Recipient**. 2009-2011.

Professional and Community Service

Manuscript reviewer:

PLoS ONE, 2019 – Present

Cellular and Molecular Neurobiology – 2022 – Present

Health Sciences Section Leader for Kentucky Academy of Science meeting, 2021

Judge, Kentucky Academy of Science annual meeting, 2020

Judge, Southeast Regional IDeA conference, 2019

Judge, Kentucky Science and Engineering Fair, annually 2018 – 2021

Consultant, Pulaski County High School science fair project, 2019 – 2021