CURRICULUM VITAE

Gavin Rumbaugh, PhD
Department of Neuroscience
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EDUCATION

Degree: BS *(Cum Laude)*, 1996
Westminster College, New Wilmington, PA, USA
Department of Biology

Degree: PhD, 2000
Georgetown University School of Medicine, Washington DC
Departments of Pharmacology and Physiology/Biophysics (Advisor: Stefano Vicini, PhD)

Postdoctoral Fellowship: 2000-2007
Department of Neuroscience and the Howard Hughes Medical Institute; The Johns Hopkins University School of Medicine, (Advisor: Richard L. Huganir)

ACADEMIC POSITIONS

- 2007-2009 *Assistant Professor,* Department of Neurobiology; The University of Alabama at Birmingham, (UAB) School of Medicine; 2007-2009
- 2010-2012 *Assistant Professor*, Department of Neuroscience; The Scripps Research Institute, Jupiter, FL
- 2012-2014 *Associate Professor*, Department of Neuroscience; The Scripps Research Institute, Jupiter, FL
- 2014-2019 *Tenured Associate Professor,* Department of Neuroscience, The Scripps Research Institute, Jupiter, FL
- 2019- *Professor,* Department of Neuroscience, The Scripps Research Institute, Jupiter, FL

OTHER POSITIONS

- 2019- *Paid Consultant, Stoke Therapeutics, Bedford, MA*

HONORS AND AWARDS

- NIH R01 Award (NIDA; *New Grant*), 2019-2024
- NIH R01 Award (NINDS; *New Grant*), 2019-2024
- NIH R01 Award (NIMH; *Competitive Renewal*), 2018-2023
- NIH R01 Award (NIMH; *New Grant*), 2017-2020
- NIH R13 Conference Award (NINDS; *New Grant*), 2016
- NIH R21 Award (NIMH; *New Grant*), 2016-2018
- Kavli Fellow, 2015-2019

- NIH R01 Award (NIMH; *New Grant*), 2015-2020
- NIH R01 Award (NINDS; *Competitive Renewal*), 2014-2018
- NIH/NINDS R21/R33 Phased Innovation Award, 2013-2017
- Faculty of 1000 Selection (Griggs et. al.), 2013
- Faculty of 1000 Selection (Clement et. al.), 2012
- NIH R01 Award (NIMH; *New Grant*), 2012-2017
- Faculty of 1000 Selection (Kilgore et. al.), 2010
- Faculty of 1000 Selection (Miller et. al.), 2010
- American College of Neuropsychopharmacology (ACNP) Faculty Research Fellow, 2009-2011
- NARSAD Young Investigator Award, 2009-2010
- NIH R01 Award (NINDS; *New Grant*), 2009-2014
- NIH R03 Award (NICHD; *New Grant*), 2009-2011
- Faculty of 1000 Selection (Heine et. al.), 2008
- Alabama Health Services Foundation Scholar, 2007
- Faculty of 1000 Selection (Shepherd, Rumbaugh et. al.), 2006
- Faculty of 1000 Selection (Lee et. al.), 2003
- National Research Scholar Award (**NRSA**: F32 NS043071-03; NINDS), 2002-2005
- NCAA/NAIA Academic All-American (Men's Basketball), Westminster College, 1996
- Westminster College student-athlete of the year, 1996

INVITED TALKS

National

- (2005) The Johns Hopkins University School of Medicine, Department of Neuroscience, Baltimore, MD
- (2005) The Pennsylvania State University, Dept. of Biology/Huck Institute, State College, PA
- (2005) The Chicago School of Medicine, Dept. of Cellular and Molecular Pharmacology
- (2006) NYU School of Medicine, Skirball Institute, New York, New York
- (2006) The University of Texas at Austin, Department of Neurobiology and CLM, Austin, TX
- (2006) The University of Alabama Birmingham, Department of Neurobiology, Birmingham, AL
- (2007) Molecular and Cellular Cognition Society: Annual Symposium, San Diego, CA
- (2009) 48th Annual Meeting of The American College of Neuropsychopharmacology (ACNP), Hollywood, FL
- (2009) Tulane University, Seminar: Department of Cell and Molecular Biology, New Orleans, LA
- (2009) McKnight Brain Institute Symposium, Hoover, AL
- (2010) 49th Annual Meeting of The American College of Neuropsychopharmacology (ACNP), Miami Beach, FL
- (2010) Florida Atlantic University, Department of Neuroscience, Boca Raton, FL
- (2010) Max Planck Society Symposium, Boca Raton, FL
- (2010) 34th Annual Neurobiology of Learning and Memory Conference, Park City, Utah
- (2011) 50th Annual Meeting of The American College of Neuropsychopharmacology (ACNP), Kona, HI
- (2011) Harvard Medical School, Seminar: Dept. of Neurology, Massachusetts General Hospital, Boston, MA
- (2011) The Repligen Corporation, Clinical Pharmacology Division, Waltham, MA
- (2011) Biogen Idec, Neuroscience Discovery Division, Cambridge, MA

- (2011) University of California (Irvine), Seminar: Department of Pharmacology, Irvine, CA
- (2012) Northwestern University, Seminar: Feinberg School of Medicine, Department of Physiology, Chicago, IL
- (2013) Harvard Medical School, Seminar: Department of Psychiatry, McLean Hospital, Waltham, MA
- (2014) International Epilepsy Symposium, Newport Beach, CA
- (2014) Frontiers of Biomedical Research Symposium, Indian Wells, CA
- (2015) 25TH Neuropharmacology Conference: Synaptopathy - From Biology to Therapy, Chicago, IL
- (2015) Agility Clinical, Carlsbad, CA
- (2016) 28th Annual Winter Conference on Neural Plasticity, Maui, HI
- (2016) US-Japan Meeting on Synapse Biology, Baltimore, MD
- (2016) Lurie Distinguished Endowed Lectureship, University of Cincinnati, Seminar: Department of Psychiatry and Behavioral Neuroscience, Cincinnati, OH
- (2017) Duke University, Seminar: Department of Cell and Molecular Biology, Duram, NC
- (2017) University of Texas, Southwestern Medical Center, Seminar: Department of Neuroscience, Dallas, TX
- (2017) The 5th Annual Molecular Psychiatry Meeting, San Francisco, CA
- (2017) Michigan State University, Mall Family Endowed Lecture, Department of Pediatrics, Grand Rapids/East Lansing, MI
- (2018) Children's National Hospital, Seminar: Neuroscience Research Center, Washington, DC
- (2018) 2nd International *SYNGAP1* Conference: From Biology to Therapies
- (2019) Department of Psychiatry, Zilkha Neurogenetic Institute, Keck School of Medicine, University of Southern California, Los Angeles, CA
- (2019) 6th International RASopathies Symposium: Precision Medicine – From Promise to Practice, Baltimore, MD
- (2020) Center for Autism, Feinberg School of Medicine, Northwestern University, Chicago, Il
- (2020) Stoke Therapeutics, Bedford, MA
- (2020) 3rd International *SYNGAP1* Conference, Bethesda, MD

International

- (2010) Italian National Research Council (CNR), Institute for Neurosciences, Rome, Italy
- (2011) 31st Blankenese Conference; Nucleo-Synaptic Cross-Talk in Nerve Cells, Blankenese, Germany
- (2011) University of Hamburg, Center for Molecular Neurobiology, Hamburg, Germany
- (2012) Advanced School on Membrane Biology; Montevideo, Uruguay
- (2012) International Society for Neurochemistry: 5th Special Conference; Dendritic Spine Biology, Buenos Aires, Argentina
- (2013) International Society for Neurochemistry Satellite Meeting on Synapse Biology
- (2014) Molecular Physiology of the Synapse Laboratory, Institut d'Investigació Biomèdica Sant Pau, Barcelona, Spain
- (2014) Center for Neuroregeneration, The University of Edinburgh, Edinburgh, UK
- (2015) Kavli Frontiers of Science Symposium (Co-sponsored by the National Academy of Science), Jeju Island, South Korea
- (2015) Center for Synaptic Brain Dysfunctions and Institute for Basic Science (IBS), Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
- (2015) Advanced School for the International Society for Neurochemistry: Synaptopathies: synaptic molecules with clinical implications, Fitzroy Island, Australia

- (2015) International Society of Neurochemistry (ISN) Biennial Meeting, Cairns, Australia
- (2016) NCCR Conference, The Neurobiology of Mental Health, Geneva, Switzerland
- (2018) Winter Conference on Brain Research, Session Chair and Panel Speaker, Whistler, Canada
- (2018) Keynote Address: Genetic Epilepsy Team Australia (GETA) Annual Meeting; Melbourne, Australia
- (2018) Gordon Research Conference; Fragile X and Autism Spectrum Disorders; Barga, Italy
- (2019) US-Japan Meeting on Synapse Biology, Tokyo, Japan
- (2019) Korea Advanced Institute of Science and Technology (KAIST), Center for Synaptic Dysfunctions, Daejeon, South Korea
- (2020) Molecular and Cellular Cognition Society (MCCS) Workshop, Fiji
- (2020) Symposium on *SYNGAP1* and Related Neurodevelopmental Disorders, Vienna, Austria
- (2020) Wellcome India Alliance-EMBO Conference on Cellular and Molecular Mechanisms of Neurodevelopmental Disorders, Bangalore, India
- (2020) SynGO Consortium: Synaptopothies, Baeza, Spain

ORGANIZATIONAL DUTIES

- (2012) Scientific Advisory Board: International Society for Neurochemistry: 5th Special Conference; Dendritic Spine Biology. Buenos Aires, Argentina
    - Provided thematic input into the choice of sessions and helped invite speakers, including the plenary speaker.
- (2013) Meeting Organizer: International Society for Neurochemistry Satellite Meeting on Synapse Biology, Playa Del Carmen, Mexico.
    - With a budget of ~30,000 USD, I organized a four-day symposium with 25 speakers that focused on the role of synapse dysfunction in various brain diseases.
    - Executed all aspects of the meeting, including scouting of locations, logistics and creations of the symposium program
- (2016-2017) Member of Organizing Committee for the 3rd Korean-American Kavli Frontiers of Science Symposium
    - Panel of (10) Kavli Fellows were charged with identifying cutting-edge topics in Biology, Neuroscience, Physics, Engineering, Computer Science and Climate Science/Geology.
    - Personally invited speakers for the Neurobiology session of the Meeting, *"Neural activity during decision making".*
    - Meeting will be held in Orange County, CA in the summer of 2017
- (2016) Meeting Organizer: First International *SYNGAP1* (MRD5) Conference, Texas Children's Hospital, Houston, TX.
    - I co-organized a Stakeholder meeting (Physicians, Biologists and Patient Advocacy Groups) that aimed to find a way forward to accelerate treatments for a rare genetic brain disorder.
    - My role was to select and then invite internationally recognized speakers (~22) for a two-day symposium, which focused on the clinical phenotype of the disorder, the biology influenced by the *Syngap1* gene, and strategies to evaluate repurposed drugs for treatments of affected individuals.
    - PI on the NIH R13 application that funded a portion of the meeting.
- (2018) Meeting Organizer: Second International *SYNGAP1* (MRD5) Conference, The Scripps Research Institute, Jupiter, FL. To be held in the *Fall of 2018*

- (2018) Session Organizer and Session Chair: Postsynaptic Mechanisms Regulating the Assembly and Stability of Neural Circuits Relevant to Neuropsychiatric Disorders. Winter Conference on Brain Research, Whistler, BC
- (2019) Co-Chair; Organizing Committee for 4th Korean-American Kavli Frontiers of Science Symposium; To be Held in Inchon, South Korea in June 2019

NIH STUDY SECTIONS

- (2013) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders
    - Reviewed grant applications for three high priority Program Announcements issued by the National Institute for Mental Health (NIMH).
- (2014) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders (February)
    - Reviewed grant applications for three high priority Program Announcements issued by the National Institute for Mental Health (NIMH).
- (2014) Brain Canada; Multi-investigator Initiative
    - Review Board
- (2014) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders (November)
- (2015) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders
- (2015) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders
- (2015) NIH Special Emphasis Panel [ZRG1 MDCN-P(57)]: Molecular and Cellular Substrates of Complex Brain Disorders
- (2016) NIH Special Emphasis Panel [ZRG1 BDCN.W (03)]
- (2016) NIH Special Emphasis Panel [ZRG1 IFCN-T 02 M]
- (2016) NIH Review Panel: Molecular Neurogenetics (MNG) Study Section (*Ad Hoc*)
- (2017) NIH Special Emphasis Panel [ZRG1 BDCN-W (90)]
- (2017) NIH Review Panel: Molecular Neurogenetics (MNG) Study Section (*Ad Hoc*)
- (2018) NIH Special Emphasis Panel: ZRG1 BDCN-W (05)
- (2019) Invited Reviewer: 2019 NIH Director's Pioneer Award Program
- (2019) Invited reviewer: Special Emphasis Panel for RFA-TR-18-020: Rare Diseases Clinical Research Consortia (RDCRC) for the Rare Diseases Clinical Research Network (RDCRN) (U54 Clinical Trial Optional)
- (2019) Invited Reviewer: Special Emphasis Panel for PAR 17-179/176 (U01), *From Genomic Association to Causation: A Convergent Neuroscience Approach for Integrating Levels of Analysis to Delineate Brain Function in Neuropsychiatry*.

EDITORIAL AND SCIENCTIFIC ADVISORY BOARDS

- (2015-) Scientific Advisor: *Bridge-The-Gap - SYNGAP Education and Research Foundation*
    - Provide expertise with respect to advances in *Syngap1* biology and the potential for therapeutic development for *SYNGAP1*-related brain disorders
- (2017-) Editorial Board Member: *Molecular Neuropsychiatry Journal,* Karger Publishing
- (2019-) Paid Consultant; Stoke Therapeutics, Bedford, MA

GRADUATE STUDENT AND POST-DOCTORAL TRAINING

Current

- Graduate Students
    - Murat Klinic, BS
- Post-doctoral Fellows
    - Sheldon Michaelson, PhD
    - Nerea Llamosas, PhD
    - Thomas Cresson
    - Thomas Vaissiere
    - Vineet Aurora

Past

- Graduate Students
    - Maria Dolores Rubio
        - Mentored by Dr. Rumbaugh from 2008-2011
        - Became Resident in Psychiatry, McLean Hospital, Harvard Medical School (2013-2017)
        - Board Certified Psychiatrist in private practice (SF Bay Area)
    - Cristin F. Gavin – Graduation Date - November 2012
        - Mentored by Dr. Rumbaugh from 2008-2012
        - Current Position: Assistant Professor; UAB
    - Mark Kilgore (co-mentored with David Sweatt, PhD)
        - Mentored by Dr. Rumbaugh from 2008-2013
        - Current Position: Patent Law Program; Birmingham Southern University
    - Antoine Almonte (co-mentored with David Sweatt, PhD)
        - Mentored by Dr. Rumbaugh from 2008-2013
        - Postdoctoral Fellow; UNC

- Post-doctoral Fellows
    - Xiaochuan Guo, MD, PhD
        - Graduate training at UAB
        - Member of Rumbaugh Lab from 2007-2010
        - Became Resident in Anesthesia at SUNY Downstate (2010-2014)
        - Current Position: Anesthesiologist with Emcare, Milford, CT
    - James Chelliah Clement, PhD
        - Graduate training at University of Bristol, UK
        - Member of Rumbaugh Lab from 2010-2013
        - Current Position: PI/Assistant Professor, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
    - Emin Ozkan, PhD
        - Graduate training at UT Southwestern
        - Member of Rumbaugh Lab from 2011-2017
        - Current Position:
    - Massimilliano Aceti, PhD
        - Graduate training at University of Rome
        - Member of Rumbaugh Lab from 2011-2017

- Current Position: Staff Scientist, Department of Drug Discovery, Moffitt Cancer Center, Tampa, FL

SERVICE TO INSTITUTE/UNIVERSITY/GRADUATE SCHOOL

1. Philanthropy and community participation

- Speaker; Children Services Council of Palm Beach County, 2014
- Speaker; Science of Health, Palm Beach, Florida, 2012
- Speaker, Science of Health, Vero Beach, Florida, 2012
- Speaker; Front Lines of Hope, TSRI-Florida, 2012
- Speaker; Mental Health Society of Palm Beach, 2011
- Speaker; "Lunch and Learn" Series; TSRI-Florida, 2010
- Speaker, BioFlorida Meeting, TSRI-Florida, 2010

2. Teaching and Course Development

- Lecturer; Neuroscience Core Curriculum; UAB Graduate School, 2008-2010
  - 2-4 lectures per year + critical reading component; 10-20 contact hours
- Co-Course Director; Learning and Memory; TSRI Kellogg School, 2011-2012
  - 10 contact hours
- Lecturer; Current topics in Neural Circuit Plasticity, TSRI Kellogg School, 2014-2016
- 8 contact hours

3. Committees (thesis committees; search committees;)

- *Institutional Committees*
  - TSRI-Florida Graduate School Theme Committee; 2010-2012
  - TSRI-Florida Seminar Series Committee; 2010-2012
  - Max Planck Florida Institute IACUC Committee; 2011-2012
  - Kellogg School Graduate Admission Committee (2015-2017)
- *Graduate School Thesis Committees*
  - University of Alabama, Birmingham
    - Antoine Almonte, Dept. of Neurobiology; 2008-2012
    - Brandon Walters, Dept. of Neurobiology; 2008-2010
    - Laura Hobbs, Dept. of Psychology; 2008-2010
    - Faraz Sultan, Dept. of Neurobiology; 2008-2010
    - John Hammond, Dept. of Psychiatry; 2008-2010
    - Adam Funk, Dept. of Psychiatry; 2008-2010
  - *TSRI Kellogg School*
    - Wesley Dang (Mayford Lab), Department of Neuroscience, 2014-
    - Andre Sousa (Mayford Lab), Department of Neuroscience, 2014-
    - Nadine Jospeh (Miller Lab), Department of Metabolism and Ageing, 2015-2017
    - Murat Klinic (Rumbaugh Lab), Department of Neuroscience, 2015-
    - Min Huang (Maximov Lab), Department of Neuroscience, 2016-
    - Jingyi Chen (Stowers Lab), Department of Neuroscience, 2017-
- *Faculty Search Committee*
  - University of Alabama, Birmingham
    - Assistant Professor of Neurobiology Search; 2009

PUBLICATIONS

1. **Summary of Research Accomplishments** *(Search terms: Rumbaugh G or Rumbaugh GR, 1999-present):*

Sum of Times Cited:	>4000
h-index:	31
Number of Articles with >100 citations:	13
Number of Articles with >200 citations:	5
Number or Articles with >300 citations:	4
Number or Articles with >400 citations:	3
Number of F1000 Prime Articles:	7
Number of Cover articles:	4

2. Publications

1. Rumbaugh G, Vicini S. (1999) Distinct synaptic and extrasynaptic NMDA receptors in developing cerebellar granule neurons. **J Neurosci** 19(24): 10603-10.
2. Rumbaugh G, Prybylowski K, Wang JF, Vicini S. (2000) Exon 5 and spermine regulate deactivation of NMDA receptor subtypes. **J Neurophysiology** 83(3): 1300-6.
3. Prybylowski K, Rumbaugh G, Wolfe BB, Vicini S. (2000) Increased exon 5 expression alters extrasynaptic NMDA receptors in cerebellar neurons. J **Neurochem** 75(3): 1140-6.
4. Ceccon M, Rumbaugh G, Vicini S. (2001) Distinct effect of pregnenolone sulfate on NMDA receptor subtypes. **Neuropharmacology** 40(4): 491-500.
5. Vicini S, Rumbaugh G. (2000) A slow NMDA channel: in search of a role. **J Physiology** 525 Pt. 2:283.
6. Lee HK, Takamiya K, Han JS, Man H, Kim CH, Rumbaugh G, Yu S, Ding L, He C, Petralia RS, Wenthold RJ, Gallagher M, Huganir RL. (2003) Phosphorylation of the AMPA receptor GluR1 subunit is required for synaptic plasticity and retention of spatial memory. **Cell** 112(5): 631-43.
7. Rumbaugh G, Sia GM, Garner CC, Huganir RL. (2003) Synapse-associated protein-97 isoform-specific regulation of surface AMPA receptors and synaptic function in cultured neurons. **J Neurosci** 23(11): 4567-76.
8. Rumbaugh G*, Tao YX*, Wang GD*, Petralia RS, Zhao C, Kauer FW, Tao F, Zhuo M, Wenthold RJ, Raja SN, Huganir RL, Bredt DS, Johns RA. (2003) Impaired NMDA receptor-mediated postsynaptic function and blunted NMDA receptor-dependent persistent pain in mice lacking postsynaptic density-93 protein. **J Neurosci** 23(17): 6703-12. (*Co-First Author)
9. Landree LE, Hanlon AL, Strong DW, Rumbaugh G, Miller IM, Thupari JN, Connolly EC, Huganir RL, Richardson C, Witters LA, Kuhajda FP, Ronnett GV. (2004) C75, a fatty acid synthase inhibitor, modulates AMP-activated protein kinase to alter neuronal energy metabolism. **J Biol Chem** 279(5): 3817-27.
10. Rumbaugh G. (2005) Synapses fight for Glutamate Receptor 1. **J Neurosci** 25(38): 8347-8348.
11. Hayashi T, Rumbaugh G, Huganir RL. (2005) Differential regulation of AMPA receptor subunit trafficking by palmitoylation of two distinct sites. **Neuron** 47(5): 709-723.
12. Thomas GM, Rumbaugh G, Harrar DB, Huganir RL. (2005) RSK2 interacts with and phosphorylates PDZ domain-containing proteins and regulates AMPA-R transmission. **Proc Nat'l Acad Sci.** 102(42): 15006-11**.**
13. Rumbaugh G, Adams JP, Kim JH, Huganir RL. (2006) SynGAP regulates synaptic strength and mitogen-activated protein kinases in cultured neurons. **Proc Nat'l Acad Sci.** 21; 103(12): 4344-51
14. Shepherd JS*, Rumbaugh G*****, Chowdhury A, Huganir RL, Worley P. (2006) Arc regulates homeostatic synaptic scaling of AMPA receptors in cultured neurons. **Neuron**. 52(3): 475-484. ****Co-First Author***
15. Sia GM, Beique JC, Rumbaugh G, Cho R, Worley PF, Huganir RL. (2007) Interaction of the N-Terminal Domain of the AMPA Receptor GluR4 Subunit with the Neuronal Pentraxin NP1 Mediates GluR4 Synaptic Recruitment. **Neuron**. 55(1): 87-102.
16. Wu Y, Arai AC, Rumbaugh G, Srivastava AK, Turner G, Hayashi T, Suzuki E, Jiang Y, Zhang L, Rodriguez J, Boyle J, Tarpey P, Raymond FL, Nevelsteen J, Froyen G, Stratton M, Futreal A, Gecz J, Stevenson R,

Schwartz CE, Valle D, Huganir RL, Wang T. (2007) Mutations in ionotropic AMPA receptor 3 alter channel properties and are associated with moderate cognitive impairment in humans. **Proc Nat'l Acad Sci**. 104(46): 18163-18168

17. Heine M, Groc L, Frischknecht R, Béïque JC, Lounis B, Rumbaugh G, Huganir RL, Cognet L, Choquet D (2008) Surface Mobility of Postsynaptic AMPARs Tunes Synaptic Transmission. **Science**. 320 (1): 201 – 205.
18. Guo X, Hamilton PJ, Reish NJ, Sweatt JD, Miller CA, Rumbaugh G (2009) Reduced expression of the NMDA receptor-interacting protein SynGAP causes behavioral abnormalities that model symptoms of schizophrenia. **Neuropsychopharmacology**. 34: 1659-1672.
19. Funk AJ, Rumbaugh G, Harotunian V, McCullumsmith RE, Meador-Woodruff JH (2009) Decreased Expression of NMDA Receptor Associated Proteins in Frontal Cortex of Elderly Patients with Schizophrenia. **Neuroreport.** 20(11): 1019-22.
20. Kilgore M, Miller CA, Haggarty SJ, Sweatt JD, Rumbaugh G. (2010) Inhibitors of class 1 histone deacetylases reverse contextual memory deficits in a mouse model of Alzheimer's disease. **Neuropsychopharmacology**. 35: 870-880.
21. Miller CA, Gavin CF, White JA, Parrish RR, Honasoge A, Yancey CR, Rivera IM, Rubio MD, Rumbaugh G, Sweatt JD (2010) Cortical DNA methylation maintains remote memory. **Nat Neurosci**. 13(6): 664-6.
22. Rex CS, Gavin CF, Rubio MD, Kramar EA, Chen LY, Jia Y, Huganir RL, Muzyczka N, Gall CM, Miller CA, Lynch G, Rumbaugh G (2010) Myosin IIb regulates actin dynamics during synaptic plasticity and memory formation. **Neuron**, 67(4): 603-617

23. Rubio MD, Johnson RC, Miller CA, Huganir RL, Rumbaugh G (2011) Regulation of synapse structure and function by distinct Myosin II motors. **J Neurosci**. 31(4): 1448-60.

24. Rumbaugh G, Miller CA. (2011) Epigenetic changes in the brain: measuring global histone modifications. Methods Mol Biol. 2011; 670:263-74

25. Gavin CF, Rubio MD, Young E, Miller CA, Rumbaugh G. (2011) Myosin II motor activity in the lateral amygdala is required for fear memory consolidation. **Learn Mem**. Dec 14; 19(1): 9-14. doi: 10.1101/lm.024042.111. Print 2012 Jan.

26. Kramár EA, Babayan AH, Gavin CF, Cox CD, Jafari M, Gall CM, Rumbaugh G*, Lynch G* (2012) Synaptic Evidence for the Efficacy of Spaced Learning. **Proc Nat'l Acad Sci**. *Mar 27;109(13):5121-6.*
(Co-corresponding author)

27. Clement JP, Aceti M, Creson TK, Shi Y, Reish NJ, Almonte AG, Miller B, Miller CA, Wiltgen BJ, Xu X, Rumbaugh G* (2012) Pathogenic SYNGAP1 mutations impair cognitive development by disrupting maturation of dendritic spine synapses. **Cell**. 151(4):709-23.
28. Almonte AG, Qadri LH, Sultan FA, Watson JA, Mount DJ, Rumbaugh G, Sweatt JD (2013) Protease-activated receptor-1 modulates hippocampal memory formation and synaptic plasticity. **J Neurochem.** Jan;124(1):109-22.
29. Griggs EM, Young EJ, Rumbaugh G, Miller CA (2013) MicroRNA-182 Regulates Amygdala-Dependent Memory Formation. **J Neurosci**. 33(4):1734-40.
30. Lynch G, Kramár EA, Babayan AH, Rumbaugh G, Gall CM. (2013) Differences between synaptic plasticity thresholds result in new timing rules for maximizing long-term potentiation. **Neuropharmacology.** Jan;64:27-36.
31. Clement JP, Ozkan ED, Miller CA, Rumbaugh G (2013) SYNGAP1 links the maturation rate of excitatory synapses to the duration of critical period synaptic plasticity. **J Neurosci.** 33(25): 10447-52
32. Young EJ, Griggs EM, Aceti M, Fuchs RA, Zigmond Z, Rumbaugh G, Miller CA (2014) Maintenance Phase F-actin Dynamics Enable Persistent Disruption of Methamphetamine-Associated Memory. Biological Psychiatry. In Press Young EJ, Aceti M, Griggs EM, Fuchs RA, Zigmond Z, Rumbaugh G, Miller CA (2014) Selective, Retrieval-Independent Disruption of Methamphetamine-Associated Memory by Actin Depolymerization. **Biol Psychiatry.** 75(2):96-104.

33. Ozkan ED, Creson TK, Kramar EA, Rojas CS, Shi Y, Lucero R, Xu X, Noebels JL, Miller CA, Lynch GS, Rumbaugh G (2014) Reduced cognition in Syngap1 mutants is caused by isolated damage within developing forebrain excitatory neurons. **Neuron.** 82(6):1317-33.
34. Aguilar-Valles A, Vaissière T, Griggs EM, Mikaelsson MA, Takács IF, Young EJ, Rumbaugh G, Miller CA (2014) Methamphetamine-Associated Memory Is Regulated by a Writer and an Eraser of Permissive Histone Methylation. **Biol Psychiatry.** 76(1):57-65
35. Aceti M, Creson TK, Vaissiere T, Rojas C, Huang WC, Wang YX, Petralia RS, Page DT, Miller CA, Rumbaugh G (2015) *Syngap1* Haploinsufficiency Damages a Postnatal Critical period of Pyramidal Cell Structural Maturation Linked to Cortical Circuit Assembly. **Biol Psychiatry.** May 1;77(9):805-15. doi: 10.1016/j.biopsych.2014.08.001. Epub 2014 Aug 13.
36. Zhou M, Ottenberg G, Sferrazza GF, Hubbs C, Fallahi M, Rumbaugh G, Brantley A, Lasmézas CI (2015) Neuronal death induced by misfolded prion protein is due to NAD+ depletion and can be relieved in vitro and in vivo by NAD+ replenishment. **Brain**. Apr;138(Pt 4):992-1008. doi: 10.1093/brain/awv002.
37. Rumbaugh G, Sillivan SE, Ozkan ED, Rojas CS, Hubbs CR, Aceti M, Kilgore M, Kudugunti S, Puthanveettil SV, Sweatt JD, Rusche J, *Miller CA. (2015) Pharmacological Selectivity within Class I Histone Deacetylases Predicts Effects on Synaptic Function and Memory Rescue. **Neuropsychopharmacology**. Apr 3. doi: 10.1038/npp.2015.93. [Epub ahead of print]; [*Corresponding Author]
38. Ozkan ED, Aceti M, Creson TK, Rojas CS, Hubbs C, McGuire MN, Kakad PP, Miller CA, Rumbaugh G (2015) Input-specific regulation of hippocampal circuit maturation by non-muscle Myosin IIB. **J Neurochem.** Aug;134(3):429-44. doi: 10.1111/jnc.13146. Epub 2015 May 29.
39. Young EJ, Blouin A, Briggs SB, Sillivan SE, Rumbaugh G, Miller CA (2016) Nonmuscle myosin IIB as a therapeutic target for the prevention of substance use relapse**. Mol Psychiatry.** May;21(5):615-23. doi: 10.1038/mp.2015.103.
40. Ogden KK, Ozkan ED, Rumbaugh G (2016) Prioritizing the development of mouse models for childhood brain disorders. **Neuropharmacology.** Jan;100:2-16. doi: 10.1016/j.neuropharm.2015.07.029.
41. Young EJ, Briggs SB, Rumbaugh G, Miller CA (2017) Nonmuscle myosin II inhibition disrupts methamphetamine-associated memory in females and adolescents. **Neurobiol Learn Mem.** 2017 Mar;139:109-116. doi: 10.1016/j.nlm.2017.01.001. Epub 2017 Jan 7.
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3. PATENTS AND PATENT APPLICATIONS

Miller C, Griffin P, Kamenecka T, Rumbaugh G, Surman M, Young S, Duddy S, Radnai L; "Nonmuscle myosin II inhibitors for Substance Use Relapse" 62/685,158, June 14, 2018

CURRENT GRANT SUPPORT

R01NS110307 **Rumbaugh (PI)** 12/01/2019-11/30/2024
NIH/NINDS
Causal Interactions between genetic risk, precise cortical connectivity, and autism-associated behaviors.
The goal of this project is to determine how a major neurodevelopmental disorder risk factor in mice regulates the circuits driving active touch.

R01MH096847 **Rumbaugh (PD/PI);** *Miller and Christie (MPIs)* 09/01/2012-04/30/2023
NIH/NIMH
Circuit-level substrates of ASD-related cognitive and behavioral impairments
This grant was awarded to understand how sensory impairments common in neurodevelopmental disorders contribute to cognitive and behavioral abnormalities.

R01DA049544 *Miller (PD/PI);* **Rumbaugh (MPI)** 12/15/2019-11/30/2024
NIH/NIDA
Myosin II regulation of actin dynamics and the selective vulnerability of methamphetamine- and opioid-associated memory. The goal of this project is to define the role of myosin II in the brain, to better understand its potential as a therapeutic target in memory disorders.

R01MH108408 **Rumbaugh (PI)** 04/01/2015-01/31/2020
NIH/NIMH
Evaluation of novel biomarkers of cognition in a model of sporadic developmental brain disorders and their application in efficacy testing of Ras pathway inhibitors. The goal of this project is to develop biomarkers of cognitive ability in *Syngap1* mutant mice and then test the efficacy of Ras/ERK pathway inhibitors using these optimized measures.

1R01MH113648 **Rumbaugh(PD/PI);** *Scampavia and Spicer(MPIs)* 07/01/2017-03/31/2020
NIH/NIMH
A Scalable Neuron-Based High-Throughput Screening Platform for the Discovery of Compounds that Restore Protein Expression Caused by Genetic Haploinsufficiency. The goal of this project is to test the limits of scalability of HTS-compatible assays built from primary neurons. We will optimize scalability using a HTS-compatible assay for *Syngap1* expression in mouse primary neurons.