

Robert Ryley Parrish, PhD

Curriculum Vitae

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EDUCATION

- 2008-2014 **Ph.D.**, Department of Neurobiology, University of Alabama at Birmingham (UAB), Birmingham, AL
Advisor: Dr. Farah Lubin
Dissertation Title: *Altered DNA Methylation Contributes to Temporal Lobe Epilepsy and Associated Memory Deficits*
- 2003-2007 **B.S.**, Major: Physical Science, Summa cum laude
Auburn University Montgomery (AUM), Montgomery, AL

PROFESSIONAL EXPERIENCE

- 2022-Present Assistant Professor, Department of Cell Biology and Physiology, Brigham Young University, Provo, Utah
- 2021-2022 Senior Research Scientist, *In vitro* Biology, Xenon Pharmaceuticals, Burnaby, British Columbia, Canada
- 2019-2021 Research Scientist II, *In vitro* Biology, Xenon Pharmaceuticals, Burnaby, British Columbia, Canada
- 2014-2019 Postdoctoral Researcher, Advisor: Prof Andrew Trevelyan, Institute of Neuroscience, University of Newcastle, Newcastle upon Tyne, UK
- 2009-2014 Graduate Assistant, Advisor: Dr Farah Lubin, Neurobiology, UAB, Birmingham, AL
- 2007-2008 Research Technician, Advisor: Dr David Sweatt, Neurobiology, UAB, Birmingham, AL

GRANTS

- 2019: Wellcome Trust ISSF Small Grant Scheme (£9,500)
- 2019: Wellcome Trust Broadening Our Horizons Travel Grant (£850)
- 2019: The Physiological Society Travel Grant (£375)
- 2017 – 2020: Co-PI (My split, 40%) Medical Research Council (UK) (£386,000)
- 2015 – 2017: Co-PI (My split, 15%) Epilepsy Research UK Project Grant (£150,000)
- 2013: Curing the Epilepsies 2013: Pathways Forward Travel Grant (NINDS) (\$1,000)
- 2013: UAB Graduate Student Association Travel Grant (\$500)

AWARDS AND HONORS

- 2017-2018: Visiting postdoctoral fellow at Columbia University (involved visits to the Department of Neurology with accommodations and travel paid by Columbia University)
- 2016: 1st place platform presentation (UK-Ireland International League Against Epilepsy meeting)
- 2015: 1st place poster prize (Northeast Epilepsy Research Meeting - NEERM)
- 2012: 2nd place poster presentation (UAB Neurobiology Retreat)

2008: 1st place for talk on original research in biological sciences (85th Annual Meeting of the Alabama Academy of Sciences)
2007: AUM Chancellor's Scholar (awarded to the top student in the School of Science)
2007: AUM Physical Science Student of the Year

INVITED/SELECTED TALKS

- Brigham Young University, Cell Biology and Physiology Department, Provo, UT. November 2021
- University of Strathclyde, Institute of Pharmacy and Biomedical Sciences, Glasgow, UK. September 2019
- Auburn University, College of Veterinary Medicine, Auburn, AL, USA. August 2019
- Xenon Pharmaceuticals, Burnaby, BC, Canada. July 2019
- Illinois State University, Department of Biological Sciences, Normal, IL, USA. January 2019
- Northeast Epilepsy Research Meeting, Newcastle, UK. September 2018
- Western Kentucky University, Department of Biology, Bowling Green, KY, USA. April 2017
- International League Against Epilepsy (ILAE) British and Irish Chapter Annual Scientific Meeting, Dublin, Ireland. October 2016
- Northeast Epilepsy Research Meeting, Beamish, UK. November 2015
- International League Against Epilepsy British Chapter Annual Scientific Meeting, London, UK. October 2015
- Northeast Epilepsy Research Meeting, Beamish, UK. September 2014
- International League Against Epilepsy British Chapter Annual Scientific Meeting, Nottingham, UK. September 2014
- UAB Neuroscience Day, University of Alabama at Birmingham Neuroscience Day, Birmingham, Alabama, USA. July 2013
- University of Alabama at Birmingham Neurobiology Retreat, Columbiana, Alabama, USA. September 2011
- Society for Neuroscience Annual Meeting, San Diego, California, USA. November 2010
- 85th Annual Meeting of the Alabama Academy of Sciences, Birmingham, Alabama, USA. March 2008

MENTORING EXPERIENCE

- Primary Supervisor of 7 undergraduate research students: September 2022 – Present
- Primary Supervisor of a Senior Research Associate III (Matt Waldbrook): October 2020 – July 2022
- Primary Supervisor of a Research Scientist II (Arjun Mahadevan): June 2020 – July 2022
- Co-mentored a PhD student (Connie McKenzie-Gray-Scott): October 2017 – December 2019
- Co-mentored two master's student (Mark Conway and Adam Davison): February 2019 – July 2019
- Co-mentored an undergraduate research student (Courtney Pringle): January 2019 - March 2019
- Co-mentored a master's student (Tom Jackson-Taylor): January 2018 - July 2018
- Co-mentored an undergraduate research student (Anthony Offer): January 2017 - March 2017
- Co-mentored two undergraduate research students (Mariam Kudehinbu and Natasha Majid): January 2016 - March 2016

- Co-mentored a PhD student (Emma Craddock): July 2015 - December 2015
- Co-mentored a master's student (Raphael Heilig): February 2015 - July 2015
- During my PhD training, I co-mentored multiple undergraduate students (Katie Mascia, Brittney Carver, Jarvis Johnsonm, Michal Matyjasik, Davis Haselden, and Ashton Wheeler)

TEACHING EXPERIENCE

- Instructor for The Microelectrode Techniques for Cell Physiology workshop put on by The Marine Biological Association, Plymouth, UK (2018 and 2019)
- Instructor on the Optical Imaging and Electrophysiological Recording in Neuroscience course in Paris, France (2019)
- Former lecturer on the Anatomy and Physiology for Speech and Language masters and undergraduate course, Newcastle University (2019)
- Former lecturer on the Biomedical Sciences Stage 2 undergraduate course, Newcastle University (2019)
- Former lecturer for the Newcastle University Institute of Neuroscience undergraduate summer school (2016 and 2017)
- Served on committee that organized and planned the Newcastle University Institute of Neuroscience summer school (2016)
- Worked as a paid tutor for undergraduate students in chemistry, physics, and biology at the Auburn University Montgomery Instructional Support Lab (2005-2007)

TEACHER TRAINING

Introduction to learning and teaching in higher education (ILTHe) course offered at Newcastle University (2015)

OUTREACH/PUBLIC ENGAGEMENT

- Participated in a “visit the lab” public night at Newcastle University, demonstrating and explaining my research to groups of the public coming through the lab during Brain Awareness week: (2018)
- Fundraised for Epilepsy Research UK and participated in an awareness run: (2017).
- Served as an Epilepsy Research UK delegate at a fundraising event at Consett Country Club, Consett, UK: (2016)
- Visited a middle school in Wallsend, UK to teach about the brain during Brain Awareness Week: (2015)
- Served on UAB Brain Awareness Week committee and taught lessons to middle school students for three years: (2011 – 2013)

GRANT REVIEWS

Grant reviewer for ZonMw (The Netherlands Organisation for Health Research and Development)

SOCIETY MEMBERSHIPS

2019 - Present	The Physiological Society
2008 - Present	Society for Neuroscience
2014 - 2019	British Neuroscience Association
2014 - 2019	Federation of European Neuroscientists

PUBLICATIONS

1. Thouta S, Waldbrook MG, Lin S, Mahadevan A, Mezeyova J, Soriano M, Goodchild SJ, **Parrish RR**. Pharmacological determination of the fractional block of Nav channels required to impair neuronal excitability and ex vivo seizures. *Frontiers in Cellular Neuroscience*, accepted.
2. Trevelyan AJ, Graham RT, **Parrish RR**, Codadu NK. Synergistic Positive Feedback Mechanisms Underlying Seizure Initiation. *Epilepsy Currents*, 2022
3. Mulroe F, Lin WH, Mackenzie-Gray Scott CA, Aourz N, Fan YN, Coutts G, **Parrish RR**, Smolders I, Trevelyan A, Wykes R, Allan S, Freeman S, Baines RA. Targeting firing rate neuronal homeostasis can prevent seizures. *Disease Models & Mechanisms*, 2022.
4. Mahadevan A, Codadu NK, **Parrish RR**. Xenon LFP Analysis Platform Is a Novel Graphical User Interface for Analysis of Local Field Potential From Large-Scale MEA Recordings. *Frontiers in Neuroscience*, 2022.
5. Mackenzie-Gray Scott CA*, **Parrish RR***, Walsh DA, Racca C, Cowell RM, Trevelyan AJ. PV-specific loss of the transcriptional coactivator PGC-1 α slows down the evolution of epileptic activity in an acute ictogenic model. *The Journal of Neurophysiology*, 2021 ***equal contribution**.
6. Pappasavvas CA, **Parrish RR**, Trevelyan AJ. Propagating activity in neocortex, mediated by gap-junctions and modulated by extracellular potassium. *eNeuro*, 2020.
7. Codadu NK, Graham R, Jackson-Taylor T, Burman RJ, Raimondo JV, Trevelyan AJ, **Parrish RR**. Divergent paths to seizure-like events. *Physiological Reports*, 2019.
8. Burman RJ, Selfe JS, Lee JH, van den Burg M, Calin A, Codadu NK, Wright R, Newey S, **Parrish RR**, Katz AA, Wilmschurst JM, Akerman CJ, Trevelyan AJ, Raimondo JV. Activity-dependent chloride accumulation and excitatory GABAergic signaling contribute to benzodiazepine resistance in a model of status epilepticus. *Brain*, 2019.
9. **Parrish RR**, Codadu NK, MacKenzie-Gray-Scott C, Trevelyan AJ. Feedforward inhibition ahead of ictal wavefronts is provided by both parvalbumin and somatostatin expressing interneurons. *The Journal of Physiology*, 2019.
10. Codadu NK, **Parrish RR**, Trevelyan AJ. Region-specific differences and areal interactions underlying transitions in epileptiform activity. *The Journal of Physiology*, 2019.
11. Schevon CA, Tobochnik T, Eissa T, Merricks E, Gill B, **Parrish RR**, Bateman LM, McKhann G, Emerson RG, Trevelyan AT. Multiscale recordings reveal the dynamic spatial structure of human seizures. *Neurobiology of Disease*, 2019.
12. Sanchez RG, **Parrish RR**, Rich M, Webb WM, Lockhart RM, Nakao K, Ianov L, Buckingham SC, Broadwater DR, Jenkins A, DeLanerolle NC, Cunningham MO, Eid T, Riley K, Lubin FD. Human and Rodent Temporal Lobe Epilepsy is Characterized by Changes in O-GlcNAc Homeostasis that can be Reversed to Dampen Epileptiform Activity. *Neurobiology of Disease*, 2019.
13. **Parrish RR**, Codadu NK, Racca C, Trevelyan AJ. Pyramidal cell activity levels affect the polarity of gene expression changes in interneurons. *The Journal of Neurophysiology*, 2018.
14. Burman RJ and **Parrish RR**. The widespread network effects of focal epilepsy. *The Journal of Neuroscience*, 2018.
15. **Parrish RR**, Grady J, Codadu NK, Racca C, Trevelyan AJ. Graphical user interface for simultaneous profiling of activity patterns in multiple neuronal subclasses. *Data in Brief*, 2018.
16. **Parrish RR** and Trevelyan AJ. Stress-testing the brain to understand its breaking points. *Journal of Physiology*, 2018.

17. **Parrish RR**, Grady J, Codadu NK, Trevelyan AJ, Racca C. Simultaneous profiling of activity patterns in multiple neuronal subclasses. *Journal of Neuroscience Methods*, 2018.
18. Penner MR, **Parrish RR**, Hoang LT, Roth TL, Lubin FD, Barnes CA. Age-related changes in *zif268* transcription and DNA methylation within the hippocampus. *Hippocampus*. 2016.
19. **Parrish RR**, Buckingham SC, Mascia KL, Johnson JJ, Matyjasik MM, and Lubin FD. Methionine Increases BDNF DNA Methylation and Improves Memory in Epilepsy. *Annals of Clinical and Translational Neurology*, 2015.
20. **Parrish RR**, Albertson AJ, Buckingham SC, Hablitz JJ, Mascia KL, Haselden WD, and Lubin FD. Status epilepticus triggers early and late alterations in brain-derived neurotrophic factor and NMDA glutamate receptor *Grin2b* DNA methylation levels in the hippocampus. *Neuroscience*, 2013.
21. **Parrish RR**, Day JJ, Lubin FD. Direct bisulfite sequencing for examination of DNA methylation with gene and nucleotide resolution from brain tissue. *Current Protocols in Neuroscience*, 2012.
22. Lubin FD, Gupta S, **Parrish RR**, Grissom NM, Davis RL. Epigenetic mechanisms: critical contributors to long-term memory formation. *Neuroscientist*, 17(6), 616-32, 2011.
23. Gupta S, **Parrish RR**, and Lubin FD, "Epigenetic regulation and translational medicine" in *Translational Neuroscience: Applications in Neurology, Psychiatry, and Neurodevelopmental Disorders*, Dr. James E. Barrett, Ed., Cambridge University Press, 2011.
24. **Parrish RR**, Gupta S, and Lubin FD. The epigenetics of memory storage in the brain. *Cell Science*, 2010.
25. Miller CA, Gavin CF, White JA, **Parrish RR**, Honasoge A, Yancey CR, Rivera IM, Rubio MD, Rumbaugh G, Sweatt JD. Cortical DNA methylation maintains remote memory. *Nature Neuroscience*, 2010.

MANUSCRIPTS IN REVISIONS

1. **Parrish RR**, Jackson-Taylor T, Grundmann A, Codadu NK, Calin A, Alfonsa H, Wykes RC, Voipio J, Trevelyan AJ. Indirect effects of Halorhodopsin activation: potassium redistribution, non-specific inhibition and spreading depression. In revisions at *The Journal of Neuroscience*. Manuscript ID: JN-RM-114122
2. Graham RT, **Parrish RR**, Alberio L, Johnson EL, Trevelyan AJ. Optogenetic stimulation reveals a latent tipping point in cortical networks during ictogenesis. In revisions at *Brain*. Manuscript ID: BRAIN-2022-01452