

Katharine R. Smith Ph.D.

Associate Professor

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Department of Pharmacology

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Family/parental leave: March-June 2019, September-December 2021.

Education and Training

- 2015-2016 **Elizabeth Blackwell Institute Early Career Fellow**
University of Bristol, UK.
- 2012- 2015 **Marie Curie Outgoing Postdoctoral Fellow**
2012-2014: Northwestern University, Chicago, USA. Advisor: Prof. Peter Penzes.
2014-2015: University of Bristol, UK. Advisor: Dr. Jonathan Hanley.
- 2010-2012 **Postdoctoral Researcher**, Kittler Lab, UCL.
- 2005-2010 **Ph.D. Molecular Neurobiology (MRC funded)**
University College London (UCL), London, UK.
Supervisor: Prof. Josef Kittler
- 2001-2005 **MSci Biochemistry** 2i Honors Degree, Imperial College London, UK.

Professional Positions/Academic Appointments

- 2023-present **Associate Professor with Tenure**, Department of Pharmacology, University of Colorado School of Medicine, USA.
- 2022-2023 **Associate Professor**, Department of Pharmacology, University of Colorado School of Medicine, USA.
- 2016-2022 **Assistant Professor**, Department of Pharmacology, University of Colorado School of Medicine, USA.
- 2014-2016 **Postdoctoral Fellow**, Department of Biochemistry, University of Bristol, UK.
- 2012-2014 **Postdoctoral Fellow**, Department of Physiology, Northwestern University Feinberg School of Medicine, Chicago, USA.
- 2010-2012 **Postdoctoral Fellow**, Department of Neuroscience, Physiology and Pharmacology, University College London, London, UK.
- 2005-2010 **Ph.D. Student**, Department of Neuroscience, Physiology and Pharmacology, University College London, London, UK.

Selected Publications

1. MiR153-mediated control of gephyrin expression during inhibitory long-term potentiation.
Theresa M. Welle, Dipen Rajgor, Joshua D. Garcia, Dean Kareemo, Sarah M. Zych, Sara E.

- Gookin, Tyler Martinez, Mark L. Dell'Acqua, Christopher P. Ford, Matthew J. Kennedy, **Katharine R. Smith**, *in press at **EMBO Reports***.
2. Amelia M. Burch, Joshua D. Garcia, Heather O'Leary, Ami Haas, James E. Orfila, Erika Tiemeier, Nicholas Chalmers, **Katharine R. Smith***, Nidia Quillinan*, Paco S. Herson* (2024) TRPM2-CaMKII signaling drives excessive GABAergic synaptic inhibition following ischemia. ***Journal of Neuroscience***. PMID: 38565288. *co-senior authors.
 3. Samantha S. Olah, Dean Kareemo, William Buchta, Brooke Sinnen, Carley N. Miller, Hannah Actor Engel, Sara S. Gookin, Kevin Crosby, Jason Aoto, **Katharine R. Smith**, Matthew J. Kennedy (2023). Acute reorganization of postsynaptic neurotransmitter receptors reveals the functional impact of molecular nanoarchitecture at inhibitory synapses, ***Cell Reports***. PMID: 37910506.
 4. Garcia JD, Wolfe SE, Stewart AR, Tiemeier E, Gookin SE, Guerrero MB, Quillinan N, **Katharine R. Smith** (2023) Distinct mechanisms drive sequential internalization and degradation of GABA_ARs during global ischemia and reperfusion injury, ***iScience***. PMID: 37860758.
 5. Ramsay HJ, Gookin SE, Ramsey AM, Kareemo DJ, Crosby KC, Stich DG, Olah SS, Actor-Engel HS, **Katharine R. Smith***, Kennedy MJ* (2023) AMPA and GABAA receptor nanodomains assemble in the absence of synaptic neurotransmitter release. ***Frontiers in Molecular Neuroscience***. PMID: 37602191 PMCID: PMC10435253. *co-senior authors.
 6. Sara E. Gookin, Matthew Taylor, Samantha Schwartz, Matthew Kennedy, Mark L. Dell'Acqua, Kevin C. Crosby, **Katharine R. Smith** (2022) Complementary use of super-resolution modalities to study the nanoscale architecture of inhibitory synapses, ***Frontiers in Synaptic Neuroscience***, PMID: 35463850.
 7. Joshua D. Garcia, Sara E. Gookin, Kevin C. Crosby, Samantha L. Schwartz, Erika Tiemeier, Matthew J. Kennedy, Mark L. Dell'Acqua, Paco S. Herson, Nidia Quillinan and **Katharine R. Smith** (2021) Step-wise disassembly of GABAergic synapses during pathogenic excitotoxicity, ***Cell Reports***, PMID: 34936876
 8. Hannah Actor-Engel, Samantha Schwartz, Kevin Crosby, Brooke Sinnen, Olga Prikhodko, Harrison Ramsay, Jennifer Bourne, Christina Winborn, Alexandra Lucas, **Katharine R. Smith**, Mark Dell'Acqua, and Matthew Kennedy (2021). Precision mapping of amyloid beta binding reveals perisynaptic localization and spatially restricted plasticity deficits, ***eNeuro***, PMID: 34789478.
 9. Rajgor D, Purkey AM, Sanderson J, Welle TM, Garcia JD, Dell'Acqua ML and **Katharine R. Smith** (2020) Local miRNA-dependent translational control of GABA_AR synthesis during inhibitory Long-Term Potentiation, ***Cell Reports***, PMID:32579917.
 10. Guthman EM, Garcia JD, Ma M, Chu P, Baca SM, **Smith KR**, Restrepo D, Huntsman MM (2020). Cell-type-specific control of basolateral amygdala neuronal circuits via entorhinal cortex-driven feedforward inhibition, ***Elife***, PMID:31916940.
 11. Crosby KC, Gookin SE, Garcia JD, Hahm KM, Dell'Acqua ML and **Smith KR** (2019). Nanoscale subsynaptic domains underlie the organization of the inhibitory synapse, ***Cell Reports***, PMID:30893601.
 12. **Smith KR***, Jones KA, Kopeikina KJ, Burette AC, Copits BA, Yoon S, Forrest M, Fawcett-Patel JM, Hanley JG, Weinberg RJ, Swanson GT and Penzes P* (2017). Cadherin-10 maintains excitatory/inhibitory ratio through interactions with synaptic proteins, ***Journal of Neuroscience***, PMID:29030434. *Co-corresponding author.
 13. **Smith KR***, Rajgor D and Hanley JG (2017). Differential regulation of the Rac1 GTPase activating protein (GAP) BCR during oxygen/glucose deprivation in hippocampal and cortical neurons, ***Journal of Biological Chemistry***, PMID: 29046349. *Corresponding author.
 14. **Smith KR**, Kopeikina KJ, Fawcett-Patel JM, Leaderbrand K, Gao R, Schürmann B, Myczek K, Radulovic J, Swanson GT and Penzes P (2014). Psychiatric risk factor ANK3/Ankyrin-G nanodomains regulate the structure and function of glutamatergic synapses, ***Neuron***, PMID:25374361.

15. **Smith KR**, Davenport EC, Wei J, Li X, Pathania M, Vaccaro V, Yan Z and Kittler JT (2014). GIT1 and β PIX are essential for GABA_A receptor synaptic stability and inhibitory neurotransmission, *Cell Reports*, PMID:25284783.
16. **Smith KR**, Muir J, Rao Y, Browarski M, Gruenig M, Sheehan DF, Haucke V, Kittler JT (2012), Stabilisation of GABA_A receptors at endocytic zones is mediated by an AP2 binding motif within the GABA_A receptor β 3 subunit, *Journal of Neuroscience*, PMID: 22396422.

Reviews:

17. Rajgor D, Welle TM and **Smith KR** (2021) The coordination of local translation, membranous organelle trafficking and synaptic plasticity in neurons, invited review for *Frontiers in Cell and Developmental Biology*, PMID 34336865.
18. Oh WC and **Smith KR** (2018), Activity-dependent development of GABAergic synapses, invited review for *Brain Research*, PMID: 30439352.
19. **Smith KR** and Penzes P (2018), Ankyrins: roles in synaptic biology and pathology, invited review for *Molecular and Cellular Neuroscience*, PMID: 29730177.

Selected Funding

2022-2027	NIH R01MH128199 Smith (PI) 'Local translation mechanisms to control inhibitory synaptic plasticity'.
2019-2024	NIH R01 MH119154 Smith (PI) Nanoscale organization of the inhibitory synapse.
2021-2026	NIH R01 MH123700 (PI: Dell'Acqua, Co-PI: Smith) L-type Ca ²⁺ Channel Spike Regulation of Spine Structural Plasticity and Excitation-Transcription Coupling.
2019-2021	Brain Research Foundation, Frank/Fay Seed Grant. Excitatory and inhibitory synapse communication in synaptic plasticity. Smith (PI).
2019-2022	American Heart Association, Career Development Award. Investigating excitatory and inhibitory synaptic communication during oxygen-glucose deprivation. Smith (PI).
2018-2020	Brain and Behavior Research Foundation, NARSAD Young Investigator Award. Molecular mechanisms underlying disrupted Excitatory/Inhibitory (E/I) balance and relevance to neuropsychiatric disease. Smith (PI).

Awards

2023	Faculty Excellence in Teaching Award , Department of Pharmacology.
2023	Dream Team Award (for collaborative science), Department of Pharmacology.
2023	Nominated for Dean's Doctoral Mentoring Award
2022	UC Anschutz SOM Faculty Research Collaboration Award
2022	Nominated for School of Medicine Faculty Excellence in Research Award
2022	Faculty Excellence in Research Award , Department of Pharmacology, University of Colorado School of Medicine.
2022	Nominated for Dean's Doctoral Mentoring Award
2021	Nominated for 2021 Colorado School of Medicine Outstanding Women in STEM Mentorship Award .
2020	Winter Conference on Brain Research Panel Travel Fellow Award to attend Winter Conference on Brain Research, Big Sky, MT, 2020.
2019	International Society of Neurochemistry Child Care Fellowship to attend ISN 2019, Montreal.
2019	American Heart Association, Career Development Award.
2018	Brain and Behavior Research Foundation, NARSAD Young Investigator Award.
2015	Elizabeth Blackwell Institute Early Career Award , University of Bristol, UK.
2014	ISN Special Conference Travel Award , for attendance and presentation at 6 th Special Conference of the International Society for Neurochemistry, University of Tokyo, Japan

2013 **SfN Postdoctoral Fellow Travel Award**, for attendance and presentation at SfN Neuroscience 2013.

Professional activities

Reviewing

2021-3 NIH Study Section: Molecular and cellular mechanisms of complex brain diseases.

2020 NIH Study Section: Special Emphasis Panel ZRG1-MDCN

2019-present Reviewer for Medical Research Council (UK).

2018 Review Editor for Frontiers in Molecular Neuroscience.

2017-present Reviewer for Fédération pour la Recherche sur le Cerveau (France).

2012-present Regular reviewer for: Journal of Neuroscience, Journal of Neural Transmission, Nature Communications, Cell Reports, BMC Biology, Journal of Neuropharmacology, eLife, Cell Discovery, Frontiers in Molecular Neuroscience, PLOS Biology, Biochemical Journal, Journal of Visualized Experiments, Frontiers in Synaptic Neuroscience, Frontiers in Cellular Neuroscience, Frontiers in Cellular Physiology, Science, PNAS, Science.

Other Service

2023-present Winter Conference on Brain Research Program Committee

2023-2027 NIH Study Section chartered member: Neural Communications

2023 Neurotechnology Center Inaugural Symposium Program committee, CU Anschutz

2023-2024 Department of Pharmacology Faculty Search Committee

2022-present **Chair**, Pharmacology Graduate Program Admissions Committee

2022-present Pharmacology Graduate Program Graduate Training Committee

2022-2023 Department of Pharmacology Faculty Search Committee

2022-2023 Department of Pharmacology Diversity, Equity and Inclusion Committee

2019- 2020 Department of Pharmacology Faculty search Committee

2020-2023 Neuroscience Graduate Program Graduate Training Committee

2020-present Advanced Light Microscopy Core Steering Committee

2020 **Chair**, Neuroscience Graduate Program Retreat organizer

2019-2020 Neurotechnology Center and Department of Pharmacology Faculty Recruitment Committee

2018 **Chair**, Department of Pharmacology Retreat Organizing Committee

2018,2019 **Co-chair**, Neuroscience Graduate Program Retreat organizer

2018-2021 Neuroscience Graduate Program Steering Committee

2018- present Faculty mentor for Pharmacology Program Major seminars

2017- present *Ad hoc* faculty mentor for Pharmacology Program Journal Club

2017-2024 Pharmacology Graduate Program Admissions Committee