Bio

ACADEMIC APPOINTMENTS

• Instructor, Neurosurgery

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Aaron Milstein studies how dynamic synapses, neuronal cellular diversity, network connectivity, and plasticity mediate learning and memory. He trained with Roger Nicoll, Jeff Magee, and Sandro Romani, employing electrophysiology, optogenetics, pharmacology, and computational modeling to investigate information processing in neuronal circuits. Currently Aaron uses modern parallel computing methods to simulate spatial memory encoding in the hippocampus and its disfunction in epilepsy.

Publications

PUBLICATIONS

• Persistent Sodium Current Mediates the Steep Voltage Dependence of Spatial Coding in Hippocampal Pyramidal Neurons. *Neuron*
  Hsu, C., Zhao, X., Milstein, A. D., Spruston, N.
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• Inhibitory suppression of heterogeneously tuned excitation enhances spatial coding in CA1 place cells. *Nature neuroscience*
  Grienberger, C., Milstein, A. D., Bittner, K. C., Romani, S., Magee, J. C.
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• Behavioral time scale synaptic plasticity underlies CA1 place fields. *Science (New York, N.Y.)*
  Bittner, K. C., Milstein, A. D., Grienberger, C., Romani, S., Magee, J. C.
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• Hippocampal Dentate Mossy Cells Improve Their CV and Trk into the Limelight. *Neuron*
  Milstein, A. D., Soltesz, I.
  2017; 95 (4): 732–34

• Axonal Filtering Allows Reliable Output during Dendritic Plateau-Driven Complex Spiking in CA1 Neurons *NEURON*
  Apostolidis, P. F., Milstein, A. D., Grienberger, C., Bittner, K. C., Magee, J. C.
  2016; 89 (4): 770-783

• Inhibitory Gating of Input Comparison in the CA1 Microcircuit *NEURON*
  2015; 87 (6): 1274-1289

• Conjunctive input processing drives feature selectivity in hippocampal CA1 neurons *NATURE NEUROSCIENCE*
Functional comparison of the effects of TARPs and cornichons on AMPA receptor trafficking and gating *Proceedings of the National Academy of Sciences of the United States of America*
2010; 107 (37): 16315-16319

TARP modulation of synaptic AMPA receptor trafficking and gating depends on multiple intracellular domains *Proceedings of the National Academy of Sciences of the United States of America*
Milstein, A. D., Nicoll, R. A.
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The stoichiometry of AMPA receptors and TARPs varies by neuronal cell type *Neuron*
Shi, Y., Lu, W., Milstein, A. D., Nicoll, R. A.

Pungent agents from Szechuan peppers excite sensory neurons by inhibiting two-pore potassium channels *Nature Neuroscience*
2008; 11 (7): 772-779

Regulation of AMPA receptor gating and pharmacology by TARP auxiliary subunits *Trends in Pharmacological Sciences*
Milstein, A. D., Nicoll, R. A.
2008; 29 (7): 333-339

TARP subtypes differentially and dose-dependently control synaptic AMPA receptor gating *Neuron*
Milstein, A. D., Zhou, W., Karimzadegan, S., Bredt, D. S., Nicoll, R. A.
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