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.
  2018

• 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.
  2017; 20 (3): 417-426

• 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.
  2017; 357 (6355): 1033–36

• Axonal Filtering Allows Reliable Output during Dendritic Plateau-Driven Complex Spiking in CA1 Neurons NEURON
  Apostolides, 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
  2015; 18 (8): 1133-7

• 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.
  2009; 106 (27): 11348-11351

- **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.
  2007; 55 (6): 905-918