

# The Mechanisms of Cypin Underlying Neurocognitive, Neurodegenerative, and Neurological Disorders



Bonnie L. Firestein  
Professor of Cell Biology and Neuroscience

## CURRENT RESEARCH

Elucidating the role of cypin protein in various mental disorders to develop novel treatments

Neurons play an important role of communicating cognitive functions of the brain and producing an elaborate network of dendrites, whose extent of branching is influenced by factors like learning, which increases branching, or alcohol exposure or disease, which decreases branching. In conditions like mental retardation, autism, schizophrenia, and Alzheimer's disease, there are fewer branches on neurons in the hippocampus and cortex, potentially reflecting the deficits in learning and memory so prevalent in these disorders. Dr. Bonnie Firestein, Professor of Cell Biology and Neuroscience at Rutgers University, studies the role of a protein called cypin as an important regulator of dendrite number in neurons involved in learning and memory. Cypin, also known as Gda, can help increase the number of dendrites and alter or increase the number of synapses or connection sites in neurons involved in learning and memory. Changing levels of cypin, therefore, can protect neurons from damage, and Dr. Firestein and her team use multiple novel tools including mice, cellular assays, and pharmacological assays to develop drugs to alter cypin activity and improve learning and memory, and identify biomarkers that will help diagnose disorders. These drugs are applicable to a number of neurological and neurocognitive conditions, including autism, traumatic brain injury, schizophrenia, and Alzheimer's Disease.

After identifying cypin over 15 years ago, Dr. Firestein's laboratory extensively characterized cypin's influence on dendrite branching and spine stability, which direct the neuron on how to integrate incoming information. Dr. Firestein has also found that changes to cypin protein expression result in alterations at the...

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## AFFILIATION



Rutgers University

## EDUCATION

- Postdoc in Neurosciences 2000, University of California, San Francisco
- Ph.D. in Neurosciences 1995, University of California, San Diego
- B.S. with High Honors in Cellular and Molecular Biology 1988, University of Michigan

## AWARDS

- Board of Trustees Award for Excellence in Research, 2013
- NARSAD Distinguished Investigator Award, 2012
- Researcher of the Year, 2012
- NARSAD Toulmin Independent Investigator Award, 2008

## RESEARCH AREAS

Life Science, Diagnostics, Neurological / Cognitive

## FUNDING REQUEST

Your contributions will help continue Dr. Bonnie Firestein and her team's research at Rutgers University as they examine cypin as a target for neurodegenerative and neurocognitive disorders. Donations will help fund \$1M/year required for drug screening, animal studies, and translational studies to validate therapeutic targets, screen and test new compounds, and identify and verify biomarkers for schizophrenia, TBI, and learning and memory disorders. Help develop novel approaches to treat disorders; fund Dr. Firestein.