

GOLDMAN-RAKIC PRIZE

FOR OUTSTANDING ACHIEVEMENT IN COGNITIVE NEUROSCIENCE



Xiao-Jing Wang, Ph.D.

Distinguished Global Professor of Neural Science
Director, Swartz Center for Theoretical
Neuroscience
New York University

"I am humbled to receive the Goldman-Rakic Prize, and deeply grateful to BBRF for its foresight and support of cutting-edge research bridging neuroscience and psychiatry. This award is a recognition of not only my group's work, but also Computational Psychiatry as a nascent field that uses quantitative tools and theory together with experiments to uncover the brain mechanisms of abnormal functions and behavioral deficits associated with mental illness."

Xiao-Jing Wang, Ph.D., is Global Professor of Neural Science, Director of the Swartz Center for Theoretical Neuroscience, and Adjunct Professor of Physics and Mathematics at New York University. Between 2012 and 2017, he served as the founding Provost and Vice President for Research at NYU Shanghai. Prior to joining NYU in the fall of 2012, Dr. Wang was a Professor of Neurobiology and Director of the Swartz Center for Theoretical Neuroscience at Yale University. He obtained his Ph.D. in Theoretical Physics from the Free University of Brussels switching to Computational Neuroscience in 1987.

Dr. Wang uses mathematical models, in close interplay with experiments, to investigate neural circuits dedicated to cognitive functions. He is a leader in theory and modeling of the prefrontal cortex, which has been called "the CEO of the brain." Recently, Dr. Wang pioneered large-scale circuit modeling of the primate brain, which can ultimately be used as a computational platform to explain the complex global brain mechanisms of cognition and flexible behavior as well as various brain disorders.

Among Dr. Wang's notable accomplishments are the development of a biologically-realistic "cognitive-type" neural circuit model capable of working memory and decision-making; demonstration of the critical role played by NMDA receptors in persistent neural activity underlying working memory representation; proposal of a disinhibitory circuit motif formed by three subtypes of inhibitory neurons; discovery of novel mechanisms of synchronous brain rhythms; and discovery of a hierarchy of temporal response windows in a large-scale primate cortical system.

Dr. Wang has applied modeling to provide insights into the brain mechanisms of cognitive deficits associated with schizophrenia and other disorders — the beginnings of a new field of Computational Psychiatry.

His numerous awards include the John Simon Guggenheim Memorial Foundation Fellowship and the Swartz Prize for Theoretical and Computational Neuroscience from the Society for Neuroscience.

"Professor Wang brilliantly applies computational methods to circuits in neural systems important for behavior, including thalamus and hippocampus. With exceptionally able colleagues, he is a leading figure in the emergence of "computational psychiatry" which uses computational approaches to investigate cortical circuit function and dysfunction relevant to drugs such as ketamine and psychiatric disorders exemplified by schizophrenia and PTSD."

—Jack D. Barchas, M.D., Chair of the Goldman-Rakic Prize Selection Committee