2008 Winner

Mauro Costa-Mattioli, Ph.D.

Assistant Professor of Neuroscience
Baylor College of Medicine
Houston, TX

eppendorf & Science PRIZE FOR NEUROBIOLOGY

Mauro Costa-Mattioli received his bachelor's degree in biology from the Faculty of Science, University of the Republic, Montevideo, Uruguay. In 1998, he was offered an opportunity to continue his studies in France where he received his master's degree from the Pierre and Marie Curie University, Paris and his PhD from the University of Nantes under the supervision of Sylviane Billaudel. In his graduate work he studied genetic variability of positive stranded RNA viruses. In 2002, he joined the laboratory of Dr. Nahum Sonenberg at McGill University, Montreal as a post-doctoral fellow. His work defined the role of translational (protein synthesis) control in long-lasting synaptic plasticity and memory formation. In the summer of 2008, he joined the faculty at Baylor College of Medicine in Houston, Texas as an Assistant Professor of Neuroscience. Using multidisciplinary approaches Dr. Costa-Mattioli's laboratory studies the molecular and cellular mechanisms underlying long-term synaptic plasticity, learning and memory and related neurological disorders.

Switching memories ON and OFF

Dr. Costa-Mattioli's research is aimed at understanding the basic cellular and molecular mechanisms underlying memory storage and cognitive disorders. His research team uses a combination of approaches such as transgenic manipulation, shRNA and miRNA delivery using lentiviral vectors, molecular, biochemical, behavioral and neurophysiological methodologies to study these processes.

In his prize winning essay, Dr. Costa-Mattioli describes his recent findings that highlight the role of protein synthesis in long-lasting changes in synaptic strength and learning and memory. Costa-Mattioli and his colleagues provide new genetic evidence that translational control is critical for these processes. In addition, his studies demonstrate that phosphorylation of the translation initiation factor eIF2α may represent a type of molecular switch that contributes to enduring long-lasting memories. In mice in which eIF2α phosphorylation is reduced, long-lasting synaptic changes and memory are enhanced. In contrast, increased eIF2α phosphorylation in the hippocampus, has opposite, depressant effects on lasting synaptic changes and memory. Ultimately, his studies hold promise for both the understanding of basic brain functions and for developing new treatments of major brain disorders including impaired memory function in aging and neurodegenerative diseases.