

## RITA LEVI-MONTALCINI: A LIFE OF SCIENCE AT ANY COST

*The 2013 Ri.MED Symposium is dedicated to the memory of Rita Levi-Montalcini, MD (1909-2012).*

Rita Levi-Montalcini was born and grew up in Turin, Italy, the daughter of a well-to-do family headed by her mathematician/engineer father and her mother, who was a painter. Her traditional, Victorian father did not believe women should study, so when Levi-Montalcini enrolled in medical school she did so against his wishes. She graduated in 1936 and became assistant to Giuseppe Levi, a histologist who taught her the technique of silver-staining nerve cells to make them more visible under magnification. As a Jew, she was banned from academia by Italy's fascist government. Risking death or imprisonment if her work was discovered, she set up a secret lab for studying the growth of nerve fibers in chicken embryos in her bedroom and, later, at a farmhouse in the countryside. She fashioned her own microsurgery instruments from sewing needles and watchmakers' tools. Her experiments indicated that embryonic limb buds produced a substance that stimulated nerve growth.

When she emerged from hiding in 1944, she worked for the allies as a doctor in the appalling conditions of the refugee camps. After the war, she moved to Washington University in St. Louis, where she joined with Stanley Cohen to prove the existence of nerve growth factor, eventually publishing the structure of the elusive protein and identifying receptor molecules on the membranes of developing cells. The meticulous, painstaking work took a quarter century, but the petite scientist was also known for her overt displays of passion and emotion. She gained fame in the 1950s when she smuggled experimental mice into Brazil in her handbag so that she could set up a research project with a colleague. In 1986, she shared the Nobel Prize in Physiology or Medicine with Cohen for their discoveries related to nerve growth factor. Beginning in the 1960s, Levi-Montalcini conducted research in both Rome and St. Louis. She worked tirelessly, well into what would be considered "retirement age." She was the first Nobel laureate to reach the age of 100.

Levi-Montalcini was an outspoken champion of women in science. In 2002, she founded the European Brain Research Institute in response to the need in Italy for a center that would foster and promote brain research, with the aim of finding new therapies for neurodegenerative diseases and other neurological disorders.

Levi-Montalcini was the 10th woman elected to the United States National Academy of Sciences. In addition to the Nobel Prize, she was awarded the Albert Lasker Award for Basic Medical Research and the U.S. National Medal of Science, which is the nation's highest award for scientists.

# VII Annual Ri.MED Scientific Symposium

## Advances in Neuroscience

*Presented in Memory  
of Rita Levi-Montalcini*

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Research and development in the Mediterranean basin



Wednesday, 30  
October 2013

*Università degli Studi Roma Tre  
Aula Magna del Rettorato - Via Ostiense 159  
Roma, Italy*

Fondazione  
Ri.MED

**8:30 a.m.** Registration

**9:00 a.m.** **Camillo Ricordi**  
Welcome and Introduction

**9:10 a.m.** **Mario Panizza**  
Welcome to Rome

**9:20 a.m.** **Arthur S. Levine**  
Introduction to Symposium Theme

**9:30 a.m.** **Peter L. Strick**  
Levi-Montalcini Keynote Address  
“A Tale of Two Primary Motor Areas: 'Old' and 'New' M1”

**10:10 a.m.** **Andrew B. Schwartz**  
“Recent Work toward a High-Performance Brain-Computer Interface”

**10:45 a.m.** Break

**11:05 a.m.** **Silvia Conforto**  
“The Muscle Synergy Model in Neuromechanics:  
A Simple Explanation of a Complex Problem”

**11:40 a.m.** **Robert M. Friedlander**  
“Role of Caspase Cell Death Pathways in Neurological Diseases”

**12:15 p.m.** **David A. Lewis**  
“Cortical Excitatory/Inhibitory Balance and Cognitive Dysfunction in Schizophrenia”

**12:50 p.m.** Lunch

**1:50 p.m.** **Alessandra Biffi**  
“Hematopoietic Stem Cell Gene Therapy for the Treatment of Metachromatic Leukodystrophy”

**2:25 p.m.** **Beatriz Luna**  
“Adolescence Is Not a Disease - Understanding the Adolescent Brain”

**3:00 p.m.** **Paolo Maria Rossini**  
“Brain Connectivity as a Marker of Physiological and Pathological Aging”

**3:35 p.m.** Refreshment Break

*The official language of the  
Symposium will be English*

**3:55 p.m.** **Colleen A. McClung**  
“Circadian Genes, Dopamine, and the Biology of Psychiatric Disorders”

**4:30 p.m.** Ri.MED Fellow Talks

**Pierangelo Cifelli**  
“GABA(A) Current Rundown in Temporal Lobe Epilepsy”

**Chiara Milanese**  
“Nitrite-Mediated Cysteine S-Nitrosation Is Protective in PD”

**Roberto Di Maio**  
“Muscarinic/Glutamatergic Stimulation Elicits Abnormal GABA-ergic Differentiation: Relevance in Epileptic Disorder”

**5:30 p.m.** Symposium Conclusion

## Advances in Neuroscience

*Like the nervous system itself, the field of neuroscience includes an extensive and sophisticated network of connections that make it relevant to a great many areas. It is an interdisciplinary science involving collaborations with fields like chemistry, engineering, philosophy, law, physics, mathematics, linguistics, computer science, medicine, and all of the health-related professions. Recent advances in neuroscience, highlighted by the development of sophisticated, noninvasive imaging tools, are enabling rapid expansion of scientific research and practical applications.*

*The broad range of neuroscience research includes molecular and cellular neuroscience, neural circuits and systems neuroscience, and cognitive and behavioral neuroscience. The translation of neuroscience research to clinical medicine and other applications is equally broad. Medical specialties with neuroscience applications include neurology, psychiatry, neurosurgery, anesthesiology, neuropathology, neuroradiology, and neurophysiology. The techniques used by neuroscientists have expanded enormously, from molecular and cellular studies of individual nerve cells to imaging of sensory and motor tasks in the brain. In brain studies, the delicate nature of the organ precludes the use of many invasive techniques for both scientific observation and clinical intervention; however, powerful new imaging tools and techniques are rapidly transforming our idea of what is achievable in neuroscience.*

*The 2013 Ri.MED Symposium will deal broadly with advances in neuroscience and their promise for therapeutic application and further research. There will be presentations by keynote faculty speakers, as well as current Ri.MED scientists. In this symposium, advances in neuroscience will be explored as they pertain to understanding of brain structure and function, normal and disordered neural development, Alzheimer's disease, schizophrenia, circadian rhythms and psychiatric disorders, neural prostheses for spinal cord injury, and neuroprotection.*

## University of Pittsburgh Speakers

**Arthur S. Levine, MD**  
Ri.MED Scientific Director  
Senior Vice Chancellor for the Health Sciences  
John and Gertrude Petersen Dean  
School of Medicine  
Professor of Medicine and of  
Molecular Genetics

**Peter L. Strick, PhD**  
Professor and Chair of Neurobiology  
Professor of Psychiatry and of  
Neurological Surgery  
Professor of Systems Neuroscience  
(endowed)  
Distinguished Professor of Neurobiology  
Director, Systems Neuroscience  
Institute  
School of Medicine  
Professor of Physical Medicine and  
Rehabilitation  
School of Health and Rehabilitation  
Sciences  
Co-Director, Center for the Neural  
Basis of Cognition (joint program with  
Carnegie Mellon University)

**Andrew B. Schwartz, PhD**  
Professor of Neurobiology

**Robert M. Friedlander, MD, MA**  
UPMC Professor and Chair of  
Neurological Surgery

**David A. Lewis, MD**  
UPMC Professor and Chair of  
Psychiatry  
School of Medicine  
Professor of Neuroscience  
Dietrich School of Arts and Sciences

**Beatriz Luna, PhD**  
Professor of Psychiatry  
School of Medicine  
Professor of Psychology  
Dietrich School of Arts and Sciences

**Colleen A. McClung, PhD**  
Associate Professor of Psychiatry

## Italian Speakers

**Camillo Ricordi, MD**  
Ri.MED President  
Stacy Joy Goodman Professor of  
Surgery  
Distinguished Professor of Medicine  
Professor of Biomedical Engineering,  
of Microbiology, and of Immunology  
Scientific Director and Chief Academic  
Officer, Diabetes Research Institute  
Leonard M. Miller School of Medicine  
University of Miami

**Silvia Conforto, PhD**  
Associate Professor of Bioengineering  
Università Roma Tre

**Alessandra Biffi, MD**  
Senior Physician-Scientist  
Ospedale San Raffaele

**Paolo Maria Rossini, MD**  
Professor of Neurology  
Università Cattolica del Sacro Cuore

**Mario Panizza, PhD**  
Rector, Università Roma Tre  
Full Professor of Architecture and  
Urban Design

## Ri.MED Fellows and Scholars

**Pierangelo Cifelli, MD, PhD**

**Roberto Di Maio, PhD**

**Chiara Milanese, PhD**