

## SPEAKERS

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From “**Harvard Medical School**” (Boston), “**New York Medical College**” (New York)  
and “**A. Einstein College of Medicine**” (New York), USA

**Aldebaran M. Hofer, Ph.D.** is Associate Professor at Harvard Medical School/ Brigham and Women Hospital and Deputy Associate Chief of Staff for Research at the VA Boston Healthcare System, Boston, USA. Her laboratory applies a wide range of molecular and biophysical techniques for probing interactions between two fundamental second messengers, cyclic AMP (cAMP) and  $\text{Ca}^{2+}$ . Her team discovered a new signal transduction pathway that connects calcium levels within the ER lumen to the activation of the enzyme that generates cAMP, adenylyl cyclase, and has also devised approaches to monitor and tune cAMP in various subcellular compartments using targeted genetically encoded sensors and tools. Dr. Hofer has been an invited speaker/chair at several Gordon Conferences and served as organizer of the FASEB SRC on Calcium & Cell Function. She is on the Editorial Board of *Cell Calcium* and the *Journal of Cellular and Molecular Medicine*. Dr. Hofer is a member of the Harvard Digestive Diseases Center, the Harvard Center for PKD Research, and NIH Scientific Review Groups.



**Eliana Scemes, Ph.D.** is Full Professor of Neuroscience at the Department of Cell Biology and Anatomy, New York Medical College, Valhalla, New York (USA). For the past 20 years she has been studying the contribution of gap junctions (connexin and pannexins) to astrocyte calcium signaling and to neural stem cell differentiation and migration. Recent work from her laboratory has provided evidence that pannexin-1 is a pathway for ATP release from cells and is involved in the activation of the inflammasome in neurons and astrocytes. Her recent studies indicate that pannexin1 activity underlies status epilepticus in a kainic acid mouse model of epilepsy, and in the infiltration of monocytes into the CNS in a multiple sclerosis mouse model. The techniques used in her laboratory include various in situ and in vitro systems, electrophysiology, immunohistochemistry, biochemistry, calcium and total internal reflect ion fluorescence imaging.



**David C. Spray, Ph.D.** is Full Professor of Neuroscience at Dominick P. Purpura



Department of Neuroscience and of Cardiology at the Department of Medicine at Albert Einstein College of Medicine, New York, USA. Research of his laboratory is centred on physiological and cell/molecular biological studies of gap junctions forming electrotonic synapses between neurons, permitting synchronized excitation of coupled cells, and coupling glia into complex interconnected networks where information is exchanged through calcium waves and metabolically. Research of the laboratory currently focuses on neuron-glia interactions in sensory ganglia associated with several mouse models of chronic pain, gap

junction control of the blood-brain-barrier at the astrocyte endfeet, gap junction mediated interactions between oligodendrocytes and astrocytes and cell biological and gene expression consequences of neuroinfectious disease. These studies involve primary and immortalized cell culture and *ex vivo* trigeminal and dorsal root ganglia using techniques that include patch clamp electrophysiology, live cell imaging with confocal microscopy using fluorescent tagged proteins and genetically encoded Ca<sup>2+</sup> indicators, along with gene expression, biochemistry and molecular biology.

*From “CNR-ISOF” (Bologna), “University of Basilicata” (Potenza)*

*and “Institute of Molecular Medicine (VIMM)” (Padova), ITALY*

**Valentina Benfenati, Ph.D.** is a researcher at CNR-ISOF. She is Adjunct Professor of



Physiology at Biomedical Engineering Programme at the University of Bologna (UNIBO). She is responsible of CNR ISOF-ISMN Labs for bio-organic and hybrid interface. Her research interest regards the development and validation of materials and device that modulate/record molecular and biophysical properties of membrane protein channels with particular regards to astrocytes. PhD in Cell Physiology and Neurophysiology at UNISI. Post doc at UNIBO, Italy; CMBN, University of Oslo, Norway; IEM, University of Prague, CHR and CNR-ISMN, Italy, supported by Marie Curie, EMBO and Marco Polo fellowship. Coordinator

of AFOSR research grants ASTROMAT and ASTRONIR, deputy Coordinator of FP7-ITN-Marie Curie Olimpia, coordinator of National MIUR Project, Progetto Bandiera, SILK-IT; Unit Responsible of FIRB-Futuro in Ricerca (RBFR12SJA8\_002). Main author of 40 publications, 3 book chapters, 5 international patents, 15 invited talk.

**Monica Carmosino, Ph.D.** is Associate Professor in Physiology at the Department of Sciences, University of Basilicata since 2014. She spent 3 years as Assistant Professor in the Department of 'Cellular and Molecular Physiology' at the Yale School of Medicine in USA, where she focused her research in the study of ion transporters using different approaches such as patch-clamping, single-cell recordings with voltage and pH sensitive dyes, ion flux measurements with radioactive tracers. In 2011 she moved to the University of Basilicata entering in the Italian Ministry of University and Research (MIUR) program on the stabilization in Italy of Italian scientists working abroad. In the 2014 she joined as head of unit the 'Italian Network of Laminopathies' for the study of the molecular mechanism impaired in the inherited cardiomyopathies. Currently, the study of the function and regulation of both cardiac and renal ion channels in pathophysiological conditions is her main research field.



**Konstantinos Lefkimmiatis, Ph.D.** is a researcher at the Institute of Neuroscience, CNR and a junior principal investigator at the Venetian Institute of Molecular Medicine (VIMM) in Padova. He graduated from the University of Bari in Genetics and Molecular Evolution. Then, he moved to Harvard Medical School where he studied a novel crosstalk pathway where variations of Ca<sup>2+</sup> contained in the endoplasmic reticulum regulate cAMP events at the cytosol of non-excitabile cells. After being promoted to Instructor at Harvard, he started his independent work on the mechanisms that underlie the generation of cAMP and protein kinase A (PKA) microdomains, specifically at the mitochondria. In 2013 he moved at the university of Oxford where he studied the molecular mechanisms that allow the generation of distinct cAMP/PKA events in subcellular compartments. In addition, Dr. Lefkimmiatis investigates how PKA regulates cellular death, with particular attention to non-apoptotic programmed cell death forms such as necroptosis.



**Giuseppe Calamita, MSc, Ph.D.** is Full Professor of Physiology at the University of



Bari (Italy). He is active in physiological sciences education through his teaching at the University of Bari. His research career has focused on the biophysics, regulation and roles of Aquaporin membrane channels (AQPs) in health and disease. His contributions to these areas of cellular and molecular physiology helped in defining the involvement of AQPs in fluid absorption and secretion, nutrition, metabolic homeostasis, and energy balance. Grown scientifically between Italy and France, he was Post-Doc and Visiting Assistant Professor (part time) at the Johns Hopkins

University (Baltimore, USA) working at the lab of Peter Agre, 2003 Nobel laureate for the discovery of AQPs. He is part of the Editorial Board of five journals and acts as referee for a number of journals and several national and international funding agencies. He coordinates a network of public research laboratories (WAFITECH). He authored/coauthored more than 120 papers, including articles and reviews, and published 9 book chapters. He is coauthor of a university textbook of Physiology.

**Antonio Frigeri, Ph.D.** is Full Professor of Physiology at the Medical School of the



University of Bari and Faculty member (Visiting Professor) of Dominick P. Purpura Department of Neuroscience of the Albert Einstein College of Medicine (New York, USA). He obtained the European PhD in Cell Physiology from the University of Paris VI and post-doc fellowship from the National Kidney Foundation to work at the University of California San Francisco. His research is focused on water channel proteins (Aquaporins) regulating the osmotic equilibrium in the neuromuscular system in health and disease (skeletal muscle myopathies and

neuromyelitis optica). His expertise ranges from biophysical techniques for functional studies, such for ultrafast volume changes measurements in cell suspension or in single cell and tissue (TIRF-M , calcein quenching microscopy, etc) to live cell imaging with confocal microscopy and super resolution microscopy (gSTED and GSDIM, PALM/STORM). Prof. Frigeri has more than 120 publications of which about 80 full papers in prestigious journals with more than 4000 citations and H-index of 36 (Scopus).

**Grazia Tamma, Ph.D.** is Associate Professor of Physiology at the Department of



Bioscience, Biotechnology and Biopharmaceuticals, University of Bari. During the PhD period, she moved to the “Forschungsinstitut für Molekulare Pharmakologie (FMP)” in Berlin to investigate the molecular signals controlling the action of the hormone vasopressin in renal cells. She applied several molecular and biophysical approaches for evaluating the interaction between proteins involved in the cAMP signal transduction pathway activated by vasopressin. By using imaging technique her laboratory studied the changes of second messengers (cAMP and calcium) during stimulation with vasopressin. Then, she

moved to the Department of Physiology of the Medical School in Innsbruck to investigate the physiological mechanisms controlling renal osmoregulation. Then she moved to the Nijmegen Center of Molecular Life Science in the Netherlands to investigate posttranslational modifications regulating the functionality of the water channel AQP2. From 2008 she is back at the University of Bari where she is involved in studying molecular alterations associated with oxidative stress in health and diseases.

**Giovanna Valenti, Ph.D.** is Full Professor of Physiology at the University of Bari “Aldo



Moro” since 2002. She has worked as post doc at the Service de Biologie Cellulaire Saclay, France and at the Harvard Medical School of Boston, Massachusetts General Hospital, USA. On 1992 she has been recipient of the SIF prize (Italian Society of Physiology) for excellent research. The major research topic is the hormonal regulation of Aquaporins with a particular interest in the signal transduction associated to Aquaporin trafficking. These studies led to the development of new interesting therapeutic approaches of some inherited and acquired water balance

disorders such as Nephrogenic Diabetes Insipidus (NDI), Nephrogenic Syndrome of Inappropriate Antidiuresis (NSIAD) and nocturnal enuresis. In this research field Giovanna Valenti established several national and international scientific collaborations. Of particular interest are her studies on pathophysiology of extracellular Calcium Sensing Receptor (CaSR) and its functional interaction with the Vasopressin receptor (V2R) and renal Aquaporins and their possible role as therapeutic target in polycystic kidney disease. H-index 31 (Scopus).

**Andrea Gerbino, Ph.D.** is a researcher at the Department of Bioscience,



Biotechnology and Biopharmaceuticals, University of Bari. He is an electrophysiologist with additional expertise in imaging applications. In 2004 he completed his PhD program in Cellular and Molecular Technologies in Physiology at the University of Bari. Dr. Gerbino used Ca<sup>2+</sup>-selective microelectrodes to quantify localized Ca<sup>2+</sup> changes, a new form of intercellular communication, in the microenvironment immediately adjacent to the exterior of gastric cells. Then, he moved to Harvard Medical School where he followed two projects aimed at

unveiling how Ca<sup>2+</sup> can regulate cytosolic (Ca<sup>2+</sup>-cAMP interplay) and compartmentalized (pH in gastric tubulovesicles) molecular mechanisms. From 2006 he is back at the University of Bari where his main scientific goal is to understand how diverse Ca<sup>2+</sup>-mediated signal transduction pathways modulate physiological processes in both excitable (cardiac) and nonexcitable (renal) cells.

**Maria Grazia Mola, Ph.D.** is a physiologist at the University of Bari with major



expertise in methodological approaches to measure water and solute permeabilities in living cells and sealed membranes vesicles. Her research is mainly focused on the pathophysiological role of aquaporin-4 expressed in CNS astrocytes. At the Dept. of Neuroscience of New York and at the Central Research Lab of the Jilin University (China) she optimized a functional cell-based throughput screening for potential modulators of AQP activity useful for the treatment of water balance disorders. Of considerable interest are her studies on the molecular

interplay between AQP4-mediated astrocyte swelling and proteins involved in calcium signalling and cell volume regulation. She is recently focusing on using astrocytes in an *in vivo* like condition using biocompatible nanointerfaces. During her scientific career, Dr. Mola gained technical competences on a panel of molecular, biochemical, biophysical and fluorescence imaging techniques.