NIS Colloquium

ION CHANNELS IN CELL
PHYSIOLOGY AND DISEASE:
new perspectives and
biosensor-based approaches

TURIN, 28-29 June, 2019
Torino Esposizioni, aula Gialla
Corso Massimo d’Azeglio 15, CAP 10125 Turin

Organizing Committee:
Valentina Carabelli (valentina.carabelli@unito.it), Andrea Marcantoni (andrea.marcantoni@unito.it),
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SPEAKERS:

• G. Aicardi (University of Bologna, ITALY)
• P. Baldelli (University of Genoa, ITALY)
• R. Borges (University of Tenerife, SPAIN)
• P. Calabresi (University of Perugia, ITALY)
• C. Distasi (University of Eastern Piedmont, ITALY)
• A.C. Dolphin (University College London, UK)
• C. Grassi (University of Rome, ITALY)
• A.G. García (University of Madrid, SPAIN)
• J.M. Hernández-Guijo (University of Madrid, SPAIN)
• A. Marcantoni (University of Turin, ITALY)
• A. Pasquarelli (University of Ulm, GERMANY)
• F. Picollo (University of Turin, ITALY)
• G. Rispoli (University of Ferrara, ITALY)
• E. Sher (Eli Lilly, London, UK)
• M. Taglialatela (University of Naples, ITALY)
• G. Tomagra (University of Turin, ITALY)
• D. Vandael (Institute of Science & Technology, AUSTRIA)
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Although more than 50 years have passed since the discoveries of Hodgkin and Huxley, ion channels are still at the centre of numerous debates about their regulation of cellular functions under pathological and physiological conditions. Recent decades have been characterised by the considerable development of innovative and challenging methodologies, starting from the Patch Clamp technique proposed in the early 1970s by E. Neher and B. Sakmann, that have brought much deeper knowledge of the role that ion channels play.

This workshop aims to describe the state of art of ion channel function in cell physiology and disease. Novel tools of investigation and the use of biosensors for multiparameter cell monitoring will also be debated.

SCIENTIFIC PROGRAM:

Friday, 28th June

14.00-14.10 Welcome

INTRODUCTION

14.10-14.30 P. Strata (University of Torino)
               G. Ricchiardi (University of Torino, NIS Inter Departmental Centre)

Session I: ION CHANNELS IN CELL PHYSIOLOGY AND DISEASE

Chair: P. Calabresi (University of Perugia, ITALY)

14.30-15.00 A.C. Dolphin (University College London, UK) Consequences of mutations in the selectivity filter of calcium channels for their trafficking in neurons

15.00-15.30 A.G. Garcia (Universidad Autónoma de Madrid, SPAIN) Modulation of chromaffin cell calcium channels: a rich interaction with professor Emilio Carbone

15.30-16.00 M. Taglialetela (University of Naples Federico II, ITALY) How a calcium channel project turned into a potassium channel one: lessons from the University of Carbone

Coffee break 16.00-16.30

Session II: SYNAPTIC DISFUNCTION AND BIOSENSOR-BASED APPROACHES

Chair: C. Grassi (University of Rome, ITALY)

16.30-17.00 P. Calabresi (University of Perugia, ITALY) Synaptic dysfunction in Parkinson’s disease: the role of alpha-synuclein

17.00-17.30 G. Aicardi (University of Bologna, ITALY) Synaptic plasticity in physiology and disease
17.30-18.00 R. Borges (University La Laguna, SPAIN) Inside a secretory vesicle: lessons from chromaffin cells

18.00-18.30 A. Pasquarelli (University of Ulm, GERMANY) The technology of diamond-MEAs at Ulm University: past, present and future

18.30-19.00 F. Picollo and G. Tomagra (University of Turin, ITALY) Diamond-based MEA for a multi-sensing approach in neuronal cells investigation

Saturday, 29th June

Session III: ION CHANNELS IN SYNAPTIC PLASTICITY

Chair: A.C. Dolphin (University College London, UK)

9.00-9.30 C. Grassi (Catholic University Sacro Cuore, Rome, ITALY) Altered Ca$^{2+}$ signaling in astrocytes plays a critical role in synaptic dysfunction induced by Tau oligomers

9.30-9.50 A. Marcantoni (University of Turin, ITALY) Early impairments of NMDA receptors function induced by Abeta42 oligomers

9.50-10.20 P. Baldelli (University of Genoa, ITALY) Intrinsic and synaptic homeostatic plasticity induced by neuronal hyperactivity

10.20-10.50 D. Vandael (Institute of Science and Technology, AUSTRIA) Post-tetanic potentiation allows flexible single-synapse computations at hippocampal mossy fiber synapses by regulating the readily releasable pool

10.50-11.20: Coffee break

Session IV: ION CHANNEL MODULATION, NOVEL APPROACHES AND SELECTIVE DRUGS

Chair: P. Baldelli (University of Genoa, ITALY)

11.20-11.50 E. Sher (Eli Lilly, London, UK) TARP-γ8-associated AMPA receptors: discovery of the first selective antagonist with anticonvulsant and analgesic properties

11.50-12.20 G. Rispoli (University of Ferrara, ITALY) A novel technique to study the intracellular regulatory pathways targeted to ion channels in health and disease

12.20-12.50 C. Distasi (University of Eastern Piedmont, ITALY) The interaction of SiO$_2$ nanoparticles with the neuronal cell membrane: activation of ionic channels and calcium influx

12.50-13.20 J.M. Hernández-Guijo (Universidad Autónoma de Madrid, SPAIN) A friendship based on the modulation of calcium channels

Concluding remarks