



Preface

Calcium and Cell Fate



The 6th European Calcium Society (ECS) workshop “Calcium and Cell Fate” held in Seillac (France) on June 21–24, 2015 attracted 64 scientists including 11 PhD students from 16 different countries worldwide (Austria, Belgium, Canada, England, France, Germany, Hungary, Israel, Italy, Netherlands, Poland, Serbia, Spain, Sweden, Taiwan and USA). The workshop took place in the charming environment of the Loire Valley and was co-organized by the Cancéropôle Grand-Ouest (CGO) and the University of Tours. The main theme of this workshop was dedicated to the role of calcium signaling in cancer. The Scientific Committee selected speakers from 13 different countries to cover many aspects of this field.

The meeting was opened by a plenary lecture given by Natalia Prevarskaya (University of Lille, France) who presented an overview of the calcium signaling toolkit with a focus on Orai and TRP channels in relation to cancer. She has set up the trend for the rest of the workshop and the following 5 scientific sessions: plasma membrane calcium channels and cancer; intracellular calcium and cancer; calcium signaling and physiopathology; calcium signaling in immunology; and calcium and neural stem cells in normal and pathological situations. These presentations were aimed at identifying how calcium can determine cell fate. Cancer development is a finely tuned balance between several cellular functions such as apoptosis, autophagy, differentiation, migration, invasion and proliferation. If calcium may not be the only element regulating these functions, this workshop proved to be a useful and focused update on the latest development in this field.

The 5 scientific sessions were organized such as the role of the main actors inside and at the surface of a cell in physiopathology was defined in a more general way while the following sessions were dedicated to one specific actor in a specific disease (i.e. pancreas, prostate, colon, kidney, immunology, asthma and T cell activation), including other divalent cations such as magnesium in kidney. The final session discussed the calcium signaling pathways in neural stem cells development and the multiple effects of calcium in determining cell fate.

Each session comprised 2 invited speakers and 1 short presentation selected from abstracts, with 4 of these short presentations given by a young investigator. As it is the philosophy of ECS to support young scientists, a young PhD student (Lamia Ait Ghezali, INSERM U978, France) received a special prize (a free registration to the 14th ECS meeting held in Valladolid, Spain in September 25–29 2016) for the best poster presentation entitled ‘Induction of endoplasmic reticulum calcium pump expression in cancer cell differentiation’.

In summary, it was a very stimulating workshop with lively discussions in a quiet and relaxed environment. This was due to the excellent Scientific Program set up by Jacques Haiech, Marc Moreau, Catherine Leclerc, Marie Potier-Cartereau, Christophe Vandier, Olivier Mignen and Thierry Capiod.

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Thierry Capiod is a senior scientist at the Institute Necker Enfants Malades in Paris. He has obtained his PhD degree in Animal Physiology from Université Paris-Sud in 1983 then went as an EMBO fellow to the Pharmacological Department at University College London until 1986. He was involved in the early development of patch-clamp during his first postdoc, then in the combined use of this technique with fluorescent calcium dyes and photolysis of caged molecules due to a long term collaboration with David Ogden in the following 9 years and during his 3-year sabbatical stay at the National Institute for Medical Research in London again between 1995 and 1998. He has a permanent position at the National Institute for Health and Medical Research (INSERM) since 1986. Although he spent most of his career in Paris, he also

spent 8 years in Lille working in the laboratory headed by Natalia Prevarskaya. Thierry Capiod has been in the field of calcium signaling and its implication in pathophysiology for 35 years. His most recent main interest was to understand a relation between the expression of calcium channels and cell proliferation. His knowledge in the biophysics of calcium channels he then applied to study the role of these channels in cancer development – first in liver and, more recently, in prostate. He is a current member of the Scientific Committee at INSERM.



Dr. Jacques Haiech is a professor at the School of Biotechnological Engineering of Strasbourg (France). He is also an expert in biotechnology and bioinformatics and acts as an expert counselor for the French Ministry of Research in life science domain. His main area of research is the role of calmodulin in deciphering calcium signals. He obtained his Masters in mathematics in 1974 and his PhD in biochemistry in 1978. In 1987 and 1993, he was a visiting associate professor of the Pharmacology Department of Vanderbilt University, Nashville, Tennessee, and a visiting professor at Northwestern University in the Molecular Pharmacology Department, Chicago (USA). He is the author of more than 150 scientific publications and awarded 'Chevalier de l'Ordre du Mérite', a high French distinction for outstanding services to the country.



Dr. Claus W. Heizmann is Professor of Clinical Biochemistry at the University of Zurich in Switzerland. He received his Diploma in Chemistry from the University of Basel and his PhD in 1970 from the University of Konstanz, Germany. Subsequently he was trained as a post-doctoral fellow in the laboratory of Dr. Edmond Fischer at the University of Washington, Seattle and at the Federal Institute of Technology (ETH) in Zurich. In 1989–2007 he was Director of Clinical Chemistry and Biochemistry at the Department of Pediatrics at the University of Zurich. His research focuses on the structure and functions of calcium-binding proteins and RAGE in health and disease. Recently, he edited the book: Calcium-Binding Proteins and RAGE: from structural basics to clinical applications published in: *Methods in Molecular Biology*, Vol 963, Springer Protocols/Humana Press, 2013.

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Dr. Joachim Krebs has been working in the field of calcium-binding and calcium-transporting proteins for many years. After receiving his PhD from the University of Tübingen, Germany, he spent 2 years as a postdoctoral fellow in the Lab of Prof. R.J.P. Williams at the Institute of Inorganic Chemistry at the University of Oxford, UK. In 1977 he accepted a position at the Institute of Biochemistry at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. He has authored, coauthored, and edited numerous articles in international journals and books in the field of calcium biochemistry and calcium signaling. After his retirement from the ETH he continued his research at the Department of NMR based Structural Biology of the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany. Recently, he edited together with Marek Michalak from the University of Alberta, Edmonton, Canada, the book "Calcium: A Matter of Life or Death", published by Elsevier in 2007.

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Olivier Mignen is senior scientist at the University of West Brittany (Brest, France) where he is leading the research group "Channelopathies and Calcium signaling" at the National Institute for Health and Medical Research (INSERM) Unit U1078. He obtained his PhD degree in Cellular Physiology in 1998 from University of West Brittany before taking a postdoctoral position in the laboratory of Pr. Trevor Shuttleworth at the Pharmacology and Physiology Department of the Rochester University Medical Center (NY, USA) until 2000. He was involved in the identification of the store independent Ca_{2+} channel regulated by arachidonic acid (1) using electrophysiological approaches. He obtained a permanent position as a Research Assistant Professor at University Paris XI (Paris, France) in 2000 until 2004. He then

went back to the University of Rochester as an Assistant Professor and with the honorific title of Wedd visiting Professor. During the following 5 years he pursued the characterization of store dependent and independent calcium entries before getting in 2009 an INSERM "Chaire d'excellence" position in the University of West Brittany where he created a research group focusing on the deregulation of calcium entries in different pathologies such as Cystic Fibrosis. Taking advantage of his 15 years working on STIM and ORAI proteins, Olivier Mignen is now focusing his research on calcium entries deregulations in cancer and autoimmune disorders. He is a current member of the Scientific Committee at INSERM and deeply involved in Calcium Signaling networks.

Thierry Capiod

Inserm U1151, Institut Necker Enfants Malades (INEM), Faculté de Médecine Paris Descartes, Paris, France

Corresponding author at: Inserm U1151, Institut Necker Enfants Malades (INEM), Faculté de Médecine Paris Descartes, Paris, France.

E-mail address: thierry.capiod@inserm.fr.

Jacques Haiech

UMR7175, Ecole Supérieure de Biotechnologie de Strasbourg (ESBS) and Faculté de Pharmacie, Université de Strasbourg, Illkirch, France

E-mail address: haiech@unistra.fr.

Claus W. Heizmann

Division of Clinical Chemistry and Biochemistry, Department of Pediatrics, University of Zurich, Zurich, Switzerland

E-mail address: claus.heizmann@bluewin.ch.

Joachim Krebs

NMR-based Structural Biology, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany

E-mail address: jkrebs@nmr.mpibpc.mpg.de.

Olivier Mignen

Inserm U1078, Faculté de Médecine et des Sciences de la Santé, Université de Bretagne Occidentale, Brest, France

E-mail address: olivier.mignen@univ-brest.fr.