XXXIX Reunión Anual SBBMCH
27-30 de Septiembre 2016, Puerto Varas

Opening lecture:
Dr. Jose Onuchic, Rice University, USA

Osvaldo Cori lecture:
Dra. Cecilia Hidalgo, Universidad de Chile

PABMB lecture:
Dr. Jose Luis Bocco , U. Nacional de Cordoba, Argentina

Severo Ochoa lecture:
Dr. Juan Valcarcel, Center for Genomic Regulation Spain

Symposium 1, Structural and Functional Characterization of Macromolecular Complexes

Chair: **Nelson Barrera,** Pontificia Universidad Católica de Chile

JM Edwardson, University of Cambridge, United Kingdom**.**

Frank Sobott, University of Antwerp, Belgium.

Nelson Barrera, Pontificia Universidad Católica de Chile.

Sebastian Brauchi, Universidad Austral de Chile

Mike Edwardson: Dr. Edwardson graduated as Bachelor in Natural Sciences in 1976 and received his PhD degree in Pharmacology in 1979 at the University of Cambridge, UK. He then worked for a short time as a post-doctoral research associate with Prof. Alan Cuthbert, FRS, before moving in 1980 to a Lectureship at the School of Pharmacy, University of London. He returned to Cambridge in 1984 to a Lectureship. He was subsequently promoted to Reader in 2000 and became Professor of Molecular Pharmacology in 2009. He is Fellow and Director of Pre-Clinical Studies at Christ's College and he is currently Head of the Department of Pharmacology at the University of Cambridge. His research interests deal with the imaging of biomolecules using atomic force microscopy. This tool is applied in his current research projects which involve the activation-induced structural changes in ionotropic receptors, the interaction of the sigma-1 receptor with ionotropic receptors and ion channels, the mechanism underlying the interaction of urinary exosomes with the primary cilium, the structure and behavior of synaptotagmin, interactions of proteins with lipid bilayers and the protection of teeth against dental caries.

Frank Sobott: Dr. Frank Sobott received his Ph.D. degree at the University of Frankfurt, Germany, at the Institute for Physical and Theoretical Chemistry, working in the Characterization and Application of Laser desorption mass spectrometry, supervised by Prof. Bernhard Brutschy and Prof. Michael Karas. From 2000- 2004 he was a Post-doctoral research associate at the laboratory of Prof. Carol V. Robinson FRS, at Cambridge and Oxford Universities, U.K. There, he specialized in Mass Spectrometry applied to large macromolecular complexes. In 2004 he became Principal Investigator at the Department of Biochemistry, University of Oxford, U.K, and later, in 2009, he moved to Belgium and joined the University of Antwerp, as Assistant Professor. The focus of his research is on the analysis of non-covalent interactions in supra-molecular systems and large functional assemblies of biomolecules. His group is developing new methods and instrumentation for the analysis of multi-component, heterogeneous and dynamic assemblies based on mass spectrometry and ion mobility spectrometry and associated techniques.

Nelson Barrera: Dr. Barrera started his academic career as a Biochemist from the Pontificia Universidad Católica de Chile, in 1997. In this institution he also received the Master Degree in Biochemistry (1999), and the PhD degree in Biological Sciences, mention in Phisiology, in 2004. During those years he worked with Professor Manuel Villalón on the beating frequency of ciliated cells and, the signaling transduction pathways underlying the process. In 2004 he moved to Cambridge for his postdoctoral training with Dr. Mike Edwardson at Cambridge University. His research focused on ionotropic receptors, particularly in the use of Atomic Force Imaging to determine its stoichiometry and spatial subunit arrangement. In 2007, still at Cambridge, he started working with Dr Carol V. Robinson. There he worked on the Mass Spectrometry analysis of membrane proteins. Since 2009 he is part of the Faculty of Biological Sciences at Pontificia Universidad Catolica de Chile as Assistant Professor. His current research is focused in protein biophysics and cell mechanical properties at the single molecule level.

Sebastian Brauchi: Dr. Brauchi graduated as Biochemist in 2001 from Pontificia Universidad Catolica de Valparaiso, Chile, working on olfactory physiology with Dr. Juan G. Reyes. In 2006 he got his Ph.D. in Sciences, mention in Molecular and Cellular Biology from Universidad Austral de Chile, working on protein biophysics of thermo TRP channels with Dr. Ramon Latorre. In 2008 Dr. Brauchi was awarded with a PEW Fellowship, and moved to Boston for his postdoctoral training with Dr. David E. Clapham at Boston Children's Hospital, Harvard Medical School. There, he studied the effect of TRPM7 conductance on synaptic vesicle fusion and the gating mechanisms of TRPM8 channels. Dr. Brauchi joined the Physiology Institute at Universidad Austral de Chile as an Investigator in 2008. His research group studies the activation and modulation of molecular sensors, the evolution of TRP ion channels proteins, and the biophysical properties of ion channels. His group is also interested in the development of novel experimental approaches including optical methods and platforms for image analysis.

Symposium 2, Functional Genomics of *P. salmonis*: *Unraveling the pathogenicity traits in the P. salmonis genome*

Chair: Alejandro Yañez, Universidad Austral de Chile

Sergio Marshall, Pontificia Universidad Católica de Chile

Javier Santander, Universidad Mayor, Chile

Alejandro Yáñez, Universidad Austral de Chile

Marcos Mancilla, ADL Diagnostic Chile Ltda.

Marcos Mancilla studied Biochemistry at the Universidad Austral de Chile, Valdivia, Chile. In 2008, he obtained his Ph.D. in Molecular and Cell Biology from the same university studying Brucella abortus genomic islands, the etiologic agent of bovine brucellosis. After a postdoctoral stay at the Universidad de Navarra, Pamplona, Spain and intense research on genetics of B. abortus lipopolysaccharide (2009 – 2011), he returned to Chile to join the Institute for Biochemistry and Microbiology at the Universidad Austral de Chile (2012 – 2013), where he was employed as a Research Associate to improve diagnostics of bovine tuberculosis. In 2014, he moved to ADL Diagnostic Chile Ltd, a diagnostic and biotechnology company based in Puerto Montt, Chile, where he is currently holding the position of Research Director. The focus of Mancilla's Lab is on pathogenesis of bacterial salmonid diseases. The group pioneered a method for genetic manipulation of Piscirickettsia salmonis, and recently obtained the first mutant strains. He will present this work in the conference under the title "Dissecting the pathogenesis of Piscirickettsia salmonis by mutational analysis".

Sergio H. Marshall studied undergraduate Biology at Pontificia Universidad Católica de Valparaíso Chile (PUCV), institution that granted him a LASPAU scholarship for a B.Sc - MSc Program at Braindeis University, Waltham, Mass. USA, from where he graduated with honors in 1970 and 1971, respectively. He then went to NIH-National Cancer Institute in Bethesda whe he worked on human retrovirus (HTCLV-III) with Dr David H. Gillespie and Robert C. Gallo on the initial work of HIV (1971-1972). He returned to PUCV as a Full Time Faculty member, when he was offered through an OSA international Scholarship and a Ryan Fellowship from Harvard Medical School to work on a Ph.D. Thesis on RNA viruses at the Department of Microbiology and Molecular Genetics, from where he graduated cum laude in 1981. He returned to PUCV and started a research line on salmonis fish pathogens, which allowed to have a sabbatical year at the University of Saouthampton and in the Biotechnology Center in Edimburgh, United kingdom, from 1991 - 1992. Once again back to PUCV, he was Vice Rector for Research ans Graduates studies at the University, consolidated his research cell lines and at present is Head of the reference Laboratory for the bacteria Piscirickettsia salmonis and the Infectious Salmon Anemia Virus, for the Chilean Government, as well as the only Reference Lab in the Americas for Infectious Salmon Anemia Virus granted form OIE- The International Animal Health Office in Paris, France. He runs three different laboratories (Diagnostics, Micriobiology and Molecular Genetics, Immunology and Bioniformatics and Chemical Peptide

Synthesis), with a research group of over 20 people. He will present their studies on "Evaluation of selective virulence factors in P salmonis expression as potential targets for the design of novel therapeutic strategies"

Javier Santander obtained his bachelor degree in Marine Biology at Universidad Catolica del Norte and his Master Degree in Microbiology at the Pontificia Universidad Catolica de Valparaiso. After work as a laboratory technician at Washington Universty in St. Louis, Dr. Santander moved to Arizona State University, where he obtained his Ph.D. degree in Microbiology. After a postdoctoral stay at The Biodesign Institute, Center for Infectious Diseases and Vaccinology, he joined the same Institute as Research Professor. In 2013, Dr. Santander became Assistant Professor at Universidad Mayor, Center for Genomics and Bioinformatics, where he is the head of the Microbial Pathogenesis and Vaccinology Laboratory. The focus of the Santander Lab is the study of molecular mechanism of pathogenesis in bacterial fish pathogens and recombinant attenuated vaccine design. Dr. Santander group have been worked on metal acquisition related to pathogenesis, and he will present the conference titled ”Iron Acquisition of Piscirickettsia salmonis”.

Alejandro Yáñez Carcamo obtained his bachelor degree and professional title of Biochemistry at Universidad Austral de Chile. Also he got his PhD degree in Sciences, Molecular and Cell Biology in the same university. He works as a Research Associate at Dr. Marino Martinez-Carrion lab´s in the University of Missouri-Kansas City. In 1999, Dr. Yañez became Associated Professor at Institute of Biochemistry in Universidad Austral de Chile and in 2011 became Full Professor. Actually, he is the head of *AUSTRAL omics* the first core facility in the south of Chile. The team of Yañez group is divided into two main areas: 1) Investigation of a possible treatment for diabetic nephropathy and 2) Study of the pathogens involved in the pathology of the most important fish diseases affecting our national aquaculture. In the latter area, Yañez team has been able to generate a novel broth medium for the culture of the fish pathogen *Piscirickettsia salmonis* and elucidate the main features of these bacteria genome. He will present the conference titled "Discovering and comparing pathogenic mechanisms present in the *P. salmonis* strains genomes and proteomes".

Symposium 3, Molecular basis of Alzheimer’s disease

Chair: **Victor Bustos,** Rockefeller University, USA

Nibaldo Inestrosa, Pontifica Universidad Católica de Chile

Patricia Burgos, Universidad Austral de Chile

Waldo Cerpa, Pontificia Universidad Católica de Chile

Gonzalo Bustos, Pontificia Universidad Católica de Chile

Victor Bustos, Rockefeller University, USA

Dr. Waldo Cerpa is an Assistant Professor of the Department of Molecular and Cellular biology at the Pontificia Universidad Catolica de Chile. His research focuses on the elucidation of the mechanisms by which the oxidative stress modulates the function of NMDA receptors. Dr. Cerpa studied biochemistry and neurobiology at the Pontificia Universidad Catolica de Chile. His thesis focused on the protective role of the Amyloid Precursor Protein against copper-induced neurotoxicity. He received his PhD in 2009, working on the regulation of NMDA-receptor synaptic transmission by the Wnt signaling, under the direction of Nibaldo Inestrosa. His postdoctoral training was in the group of Professor Andres Barria in the Department of Physiology and Biophysics at the University of Washington Seattle, where he identified RoR2 as a Wnt receptor that regulates synaptic NMDARs.

Dr. Patricia Burgos is an Assistant Professor of the Department of Physiology at the Universidad Austral de Chile. Her laboratory studies the crosstalk between endoplasmic reticulum-associated degradation and lysosomal function. Dr. Burgos received her bachelor's and master's degrees in biochemistry from the Universidad Austral de Chile. She received her PhD in Cell and Molecular biology from the Pontificia Universidad Catolica de Chile, where she studied the mechanisms of regionalization of proteins on the cell surface, under the direction of Alfonso Gonzalez. Her first postdoctoral position was at University of Colorado in Denver, in the laboratory of John Hutton, where she studied the trafficking of the dense-core vesicle membrane protein phogrin. Next, she held a postdoctoral position at the NIH in the laboratory of Juan Bonifacino, where she studied the trafficking of the Amyloid precursor protein with emphasis on the endocytic pathway. Dr. Burgos is a member of the Chilean Society for Cell Biology and the American Society for Cell Biology.

Dr Gonzalo Bustos is an emeritus professor at the Pontificia Universidad Catolica de Chile. He has authored more than 70 scientific articles, focusing on neuropharmacology and signal transduction in the brain. After obtaining his PhD in pharmacology from the University of Toronto, Dr. Bustos received postdoctoral training in the department of pharmacology in Yale University. His main research interests are the regulation of excitatory amino acid release and excitatory amino acid receptor function and expression in basal ganglia structures in the brain, the neurochemical adaptive changes of dopamine-and glutamate-neurons in experimental models of brain neurodegenerative disease, and the Interaction between glutamate-neurons and neurotrophic factors (BDNF and GDNF) in experimental models of Parkinson's disease. During his career, Dr. Bustos has held the position of Director, Vice-president and President of the Society of Pharmacology of Chile. Currently, Dr. Bustos is a professor in the PhD program of Chemical Sciences and Pharmacology at the Universidad de Chile and professor and coordinator of a program in neuropsicopharmacology in the Faculty of Medicine at the Universidad de Chile.

Dr. Nibaldo Inestrosa is the director of the Centre for Aging and Regeneration (CARE), he is Full Professor of the Faculty of Biological Sciences at the Pontificia Universidad Catolica de Chile, where he runs the Molecular Neurobiology Laboratory. In 2008, he was awarded the

National Award in Natural Sciences for a life-time achievement in Science. After obtaining his PhD in Cell Biology, he carried out postdoctoral training at the Neuroscience Division of the University of California in San Francisco, working with Zach W. Hall and Louis F. Reichardt. His initial research focused on the interaction of acetylcholinesterase with the synaptic basal lamina and he was the first to purify the mammalian enzyme from the brain. In 2000 he proposed that the canonical Wnt signaling function was loss in Alzheimer's disease, and eventually he established that the Wnt signaling pathway plays a key role in the regulation and differentiation of the pre- and postsynaptic regions of chemical synapses. More recently, he expanded his interests into the relationship between Wnt signaling and learning and memory, as well as to the interaction between Metabolic Syndrome and Cognition.

Victor Bustos: Dr. Bustos is a senior research associate at the Rockefeller University in the laboratory of Paul Greengard. His research focuses on the cellular and molecular mechanisms which regulate Abeta levels in the brain. He completed his Bachelor degree at the Pontificia Universidad Catolica de Chile, where he did an undergraduate thesis under the direction of professor Gonzalo Bustos. He received his PhD in Biomedicine from the Universidad de Chile where he worked under the direction of professor Jorge Allende. His graduate research focused on revealing the mechanisms by which protein kinases recognize their substrates. He performed his postdoctoral training in the Venetian Institute for Molecular Medicine, before moving to the Rockefeller University.

Symposium 4, Effect of force in Biology: from enzymes to signaling in the cell

Chairs: **Lisette Leyton** and **Christian A.M. Wilson**, Universidad de Chile

Giovanni Zocchi, UCLA, USA

Christian A.M. Wilson, Universidad de Chile

Lisette Leyton, Universidad de Chile

Thomas H. Barker, Georgia Inst of Tech and Emory School of Medicine, uSA

Giovanni Zocchi studied undergraduate Physics at the Universita' di Pisa and Scuola Normale Superiore in Italy. He obtained his Ph. D. in Physics from the University of Chicago in 1990, working on nonlinear dynamics and turbulence under the direction of Albert Libchaber. After a postdoctoral stay at the Ecole Normale Superieure in Paris, France (1990 – 1993) he joined the Niels Bohr Institute in Copenhagen, Denmark (1994 – 1999), where he changed his field of research to biological physics. He moved to the Dept. of Physics and Astronomy at UCLA in 1999, where he is currently Full Professor. The focus of the Zocchi Lab is mechano-chemical coupling in enzymes. The group pioneered the artificial mechanical control of enzymes, and recently obtained the first experimental demonstration that enzyme conformational dynamics is viscoelastic.

Christian A.M. Wilson was trained as a Biochemist and obtained his Ph.D. from the University of Chile, Chile in 2011. CW permorfed a posdoctoral training at University of California, Berkeley, USA with Dr. Carlos Bustamante and Dr. Susan Marqusee (2011-2013). He then joined the Faculty of Chemistry and Pharmaceutical Sciences at the University of Chile in 2013, where he is currently an Assistent Professor at the Biochemistry and Molecular Biology department. One topic of his group is focused in determining the importance of the force associated to the domain movements of different protein to perform their function. Dr. Wilson lab has assembled the first optical tweezers instrument to measure force in individual molecules in the country.

Lisette Leyton studied Biochemist and obtained her Ph.D. from the University of Chile, Chile in 1990. In her doctoral thesis project, she described a sperm receptor for the zona pellucida, which upon interaction lead to the acrosome reaction. She then performed a postdoctoral training at Duke University, Durham, USA with Dr Patricia Saling (1990-1994) and another Postdoc at the Institute of Biochimie at Lausanne, Switzerland with Dr Claude Bron (1994-1998) studying signaling mechanisms involved in T cell activation. She then joined the Faculty of Medicine at the University of Chile in 1999, where she is currently Full Professor at the Cell and Molecular Biology Program. Dr. Leyton is currently studying the bi-directional communication that exists between neurons and astrocytes and how these cell-cell interactions increase astrocyte adhesion and migration as well as induce shortening of dendrites and axons in neurons under inflammatory processes.

Thomas Barker was trained in Chemistry, Physics and Biomedical Engineering and obtained his Ph.D. on the topic of cell cytoskeletal signaling from the University of Alabama at Birmingham, USA in 2003. He performed his postdoctoral training at the University of Washington and Hope Heart Institute, Seattle WA, USA with Dr. Helene Sage exploring mechanisms of action of the matricellular protein SPARC in regulating cell contractility and at École Polytechnique Federal de Lausanne, Switzerland with Dr. Jeffrey Hubbell developing engineering extracellular matrices to guide cell differentiation. He joined the faculty at Georgia Institute of Technology in 2006 and now holds the post of Associate Professor. Dr. Barker currently studies mechanisms of cell-ECM mechanotransduction in tissue homeostasis and fibrosis.

Symposium 5, Photobiology: from gene expression to optogenetics

Chairs: Claudia Stange, Universidad de Chile and **Luis Larrondo**, Pontificia Universidad Católica

Manuel Rodriguez-Concepción Centre for Research in Agricultural Genomics (CRAG), UAB Bellaterra, Barcelona, Spain

Claudia Stange, Universidad de Chile.

Jaime Martínez-García Centre for Research in Agricultural Genomics (CRAG)- CSIC. UAB Bellaterra, Barcelona, Spain

Luis Larrondo, Pontificia Universidad Católica de Chile.

Claudia Stange studied Biochemistry at the University of Chile and received her degree in 1996. She got her doctoral degree in Biological Science from the Catholic University of Chile in 2004. She started a postdoctoral training at the Faculty of Science, University of Chile, in 2005. Two years later she obtained the position of Assistant Professor and in 2014 she was promoted to Associate Professor at the Department of Biology, Faculty of Science, University of Chile. At her postdoc training she started working on carotenoid biosynthesis regulation in carrot to 1) understand the effect of light on root development and carotenoid accumulation, 2) determine the functionality and regulation of key genes in the carotenoid pathway and 3) to apply this knowledge in new biotechnological applications.
Carrot (*Daucus carota*) is one of the most important vegetable cultivated worldwide and the main source of dietary provitamin A. Contrary to other plants, almost all carrot varieties accumulate massive amounts of carotenoids in the root grown in darkness. She described the inhibitory effect of light on carotenoid synthesis and carrot storage root development and actually she is looking for master genes that regulate this processes by means of highthroughput approaches. She is also working on the production of carotenoids (acting as vitamins, antioxidants and pigments) or abiotic stress inducible transcription factors in plants of agronomic interest, such as apples and kiwi.

Manuel Rodriguez-Concepcion graduated in Biology from the Univ. Valencia and completed his doctoral thesis in 1995 under the supervision of Jose Pio Beltran at the IATA-CSIC (currently IBMCP) in Valencia (Spain). After a brief postdoctoral period in Valencia, he joined Wilhelm Gruissem's laboratory (Univ. California at Berkeley, USA) in 1996. On this stay, he developed and consolidated his interest on the molecular study of plant metabolism in general and isoprenoid biosynthesis and carotenoids in particular. In 1999 he returned to Spain and joined the lab of Albert Boronat (Univ. Barcelona). In 2001, he got a "Ramón y Cajal" award to start his independent research line on the molecular regulation of carotenogenesis in Arabidopsis. In 2006 he joined the Barcelona's Center for Research in Agricultural Genomics (CRAG) as a CSIC Staff Scientist CSIC and in 2010 he was promoted to Research Professor. In 2011 he spent a sabbatical year in the laboratory of Jay Keasling (Joint BioEnergy Institute, Berkeley, USA).
His work has enabled to complete the metabolic pathway responsible for the synthesis of plastid isoprenoids (including carotenoids), characterize its main enzymes, and reveal novel components involved in its transcriptional and post-transcriptional regulation. His current interests include the application of the generated knowledge in biotechnological approaches to increase the production of isoprenoids and carotenoids of interest (such as vitamins, antioxidants, or pigments) in plants of agronomic interest (such as tomatoes) and bacteria using diverse experimental approaches from molecular biology and genetics to synthetic and systems biology.

Jaime Martinez-Garcia graduated in Biology by the Universitat de València (Spain). Then he got his PhD in 1993 under the supervision of José Luis García-Martínez (IATA-CSIC, Valencia). In 1993 he moved to work with plant transcription factors in Cathie Martin's group (JIC, Norwich, UK) and in 1996 he was part of Peter Quail's team (PGEC, UC-Berkeley, USA) to work on phytochrome signaling in Arabidopsis. After a short stay in Salomé Prat lab (IBMB-CSIC, Barcelona) working on photoperiod-regulated potato tuberization, in 2001 he joined the *Institució Catalana de Recerca i Estudis Avançats* (ICREA) to establish his own research line on light control of plant development. Currently, he is a group leader at the Center for Research in Agricultural Genomics (CRAG, Consortium CSIC-IRTA-UAB-UB), in Barcelona. He is interested in analyzing the molecular and genetic mechanisms behind the plant responses to vegetation proximity and shade, working with the model plant *Arabidopsis thaliana*, a shade-avoider plant. These set of light responses are of great biotechnological and agricultural importance. In addition, he is carrying out comparative analyses between *Cardamine hirsuta* (a close relative of *A. thaliana* that tolerates vegetation proximity and shade), and *A. thaliana* as a way to dissect the genetic and molecular basis for differences in shade avoidance vs. shade tolerant species.

Luis Larrondo was born and raised in Santiago, Chile, where he received a Ph.D in Cellular and Molecular Biology at the P. Universidad Católica de Chile. With the support of the PEW foundation he conducted his postdoctoral work at Dartmouth Medical School (EE.UU) where he became interested in fungal functional genomics and circadian regulation. In 2009, he then went back to his home institution, in Chile, where he is now and associate professor and the director of the Millennium Nucleus for Fungal Integrative and Synthetic Biology. Currently, his lab works with different fungal systems studying the molecular mechanisms underlying biological oscillators, and assessing the impact that circadian clocks have on physiology and in host-pathogen interactions. Through optogenetics and synthetic biology-based approaches his lab is also exploring the design of new oscillatory circuits capable of starting and sustaining circadian rhythms.

Symposium 6, Advanced molecular modeling methods to study biochemical systems

Chairs: Julio Caballero and **Jans Alzate**, Universidad de Talca

Leandro Martinez, University of Campinas, Brazil

Adrian Turjansky, Universidad de Buenos Aires, Argentina

Jeff Comer, Kansas State University, USA

Sergio Pantano, The Institut Pasteur de Montevideo, Uruguay

Leandro Martínez is a graduate in Chemistry from the University of Campinas (2002), Brazil. There he also performed his master and doctoral studies on the

molecular dynamics of nuclear hormone receptors. Afterwards he joined as a postdoctoral researcher the Group of Structural Bioinformatics of the Institute Pasteur, in Paris (2008), where he studied binding properties of an Anthrax pathogenic enzyme. Returning to Brazil, he joined the Institute of Physics of São Carlos of the University of São Paulo as an assistant professor, and currently holds an assistant professor position at the Institute of Chemistry of the University of Campinas. His primary research concerns the study of the molecular dynamics of biomolecules, and the development of computational tools for computational chemistry. He is the lead developer of the popular Packmol package for building initial configurations for molecular dynamics simulations.

Adrián Turjanski obtained his Master degree in Chemistry from the University of Buenos Aires in Argentina in 1999, and then his PhD in Biophysics in 2003. He conducted postdoctoral studies in the area of molecular modeling from 2003 to 2005 in the Department of Physiology and Molecular Biology, School of Sciences, University of Buenos Aires. He then conducted postdoctoral work in Bioinformatics as a 2005 Pew Latin American Fellow in the National Institute of Dental and Craniofacial Research at the National Institutes of Health. Bethesda, MD,USA. In 2008 he returned to Argentina where he is in charge of the Structural Bioinformatics Lab, in the school of sciences at the University of Buenos Aires. He is part of the research staff of the National Research and Technology Council (CONICET) as Independant Investigator. He has also been Full Professor of Bioinformatics at the University of Buenos Aires since 2008. In 2013 he became director of the Argentinian Bioinformatic Platform and in 2015 his the Director of the Center for Interdisciplinary Sciences. His research is focused in the developing and application of Bioinformatics tools for drug discovery, going from the genome to structural characterizations of proteins.

Jeffrey Comer received an undergraduate degree in Physics from the University of Akron (USA) in 2005. Thereafter, he began a PhD program at the University of Illinois (USA), using molecular simulation to better understand how nanotechnology could be used to sequence DNA in the lab of Aleksei Aksimentiev. He completed a PhD in Physics in 2010. He then moved to Chile, where he performed simulations of nanomaterial–biomolecule interaction in the group of Fernando D. González-Nilo, in association with Fraunhofer Chile Research, Universidad de Talca, and Universidad Andrés Bello. During a postdoctroal position in Nancy, France (2013–2014) supported by the Centre National de la Recherche Scientifique, he developed expertise in free-energy calculation and passive membrane transport of small molecules under Christophe Chipot. In 2014, he began his current position as an Assistant Professor in the Department of Anatomy and Physiology at Kansas State University (USA), associated with the Nanotechnology Innovation Center of Kansas State and Institute of Computational Comparative Medicine. The Comer Research Lab applies modeling and simulation to nanotechnology and biology, focusing on the adsorption of biomolecules to synthetic nanomaterials and transmembrane transport.

Sergio Pantano obtained his degree in Physics at the Universidad Nacional de San Luis, San Luis, Argentina working on statistical mechanics models of polyelectrolytes. Then he moved to Trieste, Italy, where he completed his Master and PhD at the sector of condensed matter of

the Scuola Internazionale Superiore di Studi Avanzati (SISSA) in 2001. During that period he used Car-Parrinello and classical simulations to characterize a number of biological processes under the supervision of Paolo Carloni and Mauro Giacca. After short stays in San Luis and Trieste he was appointed as independent researcher at the Venetian Institute for Molecular Medicine (VIMM). In 2007 he became PI at the Institut Pasteur de Montevideo, Uruguay, where he lives currently. The group of Biomolecular Simulations headed by Dr. Pantano is among the very few research teams in South America devoted to the development of coarse-grained methods for the study of macromolecular systems related to cAMP signaling, among others.

Symposium 7, Involvement of innate immune receptors in physiological, pathological, and therapeutic immune response

Chair: María Inés Becker, BIOSONDA S.A., and Fundación Ciencia Tecnología para el Desarrollo (FUCITED).

Luisa Martinez-Pomares, University of Nottingham, UK

Marcela Hermoso, Universidad de Chile.

Fabián Salazar, University of Nottingham, UK

María Inés Becker, BIOSONDA S.A., and Fundación Ciencia Tecnología para el Desarrollo (FUCITED).

LUISA MARTINEZ-POMARES, is an Associate Professor in the School of Life Sciences, University of Nottingham, UK. She is internationally recognized for her research on lectin receptors expressed by immune cells and, in particular the mannose receptor (MR). The main focus of her work is to unravel the contribution of lectin receptors to the modulation of immune responses. Dr. Martinez-Pomares combines expertise in molecular biology, biochemistry, cellular biology and immunochemistry to study the molecular characteristics of lectin receptors and identify ligands of endogenous and microbial origin. She also investigates the *in vivo* tissue distribution of receptors and their ligands as a mean to determine their contribution to immunity under steady state and inflammatory conditions. Dr. Martinez-Pomares has recently developed novel reagents to specifically reduce MR function both *in vitro* and *in vivo* that are being evaluated in a therapeutic context for the control of ischemia-reperfusion injury. Furthermore, Dr. Martinez-Pomares is exploiting her expertise in myeloid cells (macrophages, dendritic cells and neutrophils) to study the interaction of *P. aeruginosa* with the host. The main theme of this work is the identification of cellular and soluble parameters that underpin *P. aeruginosa* ability to colonise the immune compromised host. She is Section Editor Journal of Leukocyte Biology and Associate Editor Molecular Antigen Presenting Cell Biology Section of Frontiers in Immunology.

MARCELA HERMOSO RAMELLO, studied undergraduate Biochemist at the Universidad de Buenos Aires in Argentina. She obtained her Ph.D. in Biological Sciences from the Pontificia Universidad Católica de Chile in 1997, working on ciliary activity regulated by steroid hormones under the direction of Manuel Villalón. After a postdoctoral stay at the Universidad de Chile, Chile (1998 – 2002) and National Institutes of Environmental Health Sciences (NIEHS/NIH, USA), she joined the Faculty of Medicine, Universidad de Chile (2004 – present), where she changed his field of research to innate immune responses, being currently Associate Professor. The focus of the Dr. Hermoso´s Lab is mucosal innate immunity mechanisms in health and disease. The group pioneered the study of alarmin IL33 signaling pathway and receptor regulation by pro- and anti-inflammatory agents. Moreover, her group provided recently demonstration of the phagocytosis regulation by glucocorticoids and the genes related to this process.

FABIAN SALAZAR, studied undergraduate and MSc in Biochemistry and Biotechnology at the Universidad de Chile. After working as Research Assistant at the Fundación Ciencia y Tecnología para el Desarrollo (FUCITED, Santiago, Chile) in the purification and characterization of antimicrobial peptides from mollusk hemocytes with biotechnological applications, and also contributing to investigations on the immunomodulatory effects of mollusk hemocyanins in mammals, he was awarded with a PhD studentship from the Chilean Government (CONICYT). He obtained his PhD in Immunology from the University of Nottingham, UK, in 2016, investigating the role of C-type lectin receptors -in particular DC-SIGN and mannose receptor- in the regulation of the immune responses to airborne allergens. Dr. Salazar research interests include understanding how the immune system is regulated for developing new therapeutic strategies to fight back immune-related diseases.

MARÍA INÉS BECKER, obtained her PhD in Biological Sciences at the Universidad de Chile in 1989, working on mechanism of differentiation during preimplantation development of mammals under the direction of Dr. Luis Izquierdo. Then, she moved to BiosChile Ingeniería Genética, were she developing diagnostic reagents for human health using monoclonal antibodies. In 1992, Dr. Becker and Professor Alfredo De Ioannes founded BIOSONDA S.A., conducing research to discover natural immunomodulatory substances, focusing in the extensive marine Chilean resources. Dr. Becker is also Professor in the Faculty of Physical and Mathematical Sciences, at the Universidad de Chile, and in 2006, started the Fundación Ciencia y Tecnología para el Desarrollo (FUCITED), a non-profitable institution. Dr. Becker Lab´s has contributed to introduce the hemocyanins obtained from the mollusk *Concholepas concholepas* and *Fissurella latimarginata,* demonstrating that both proteins have a quaternary structure that is distinct from that of the traditional keyhole limpet (*Megathura crenulata*) hemocyanin, and both induce a potent Th1-dominant immune response with beneficial clinical outcomes. In order to better understand how these hemocyanins influence innate immune response, leading beneficial adaptive immune responses, Dr. Becker Lab´s studied their endocytosis through its engagement by **some membrane C-type lectin** receptors, demonstrating the involvement of some of them and also, that these hemocyanins are slowly processed by antigen presenting cells. Furthermore, provide the first evidence that

macrophages undergo activation in response to structurally diverse hemocyanins and display a **different** temporal pattern of pro-inflammatory cytokine gene **expression, along with protein secretion**, which leads to an M1 polarized pro-inflammatory milieu.

Simposio 8, area Biología Vegetal Brasil-Chile

Chair: **Raúl Hererra**, Universidad de Talca

Marcos Buckeridge, Brasil

Marcelo Menossi, Brasil

Alejandra Moya, Chile

Raúl Herrra, Universidad de Talca, Chile