



LECTURES

Vsevolod Polotsky – Department of Anaesthesiology and Critical Care Medicine, George Washington University SMHS, USA
Leptin and control of breathing

Valery Grinevich – Department of Neuropeptide Research in Psychiatry, Central Institute of Mental Health, Heidelberg University, Germany
Principles of neuropeptide signalling in the brain: oxytocin as an example

Sue C. Bodine – Aging and Metabolism Research Program, Oklahoma Medical Research Foundation, USA
Skeletal muscle atrophy and age-related loss of muscle mass and function

Lee E. Eiden – Section on Molecular Neuroscience, National Institute of Mental Health, USA
Neuropeptide neurotransmission in stress physiology in brain and periphery

Hanns-Christian Gunga – Charité-Universitätsmedizin Berlin, Institute of Physiology, Center for Space Medicine and Extreme Environments Berlin, Germany
Thermoregulation in extreme environments – lessons learned from studies in sub-Saharan and space

Garth L. Nicolson – Institute for Molecular Medicine, Huntington Beach, USA
Fluid-mosaic membrane model and membrane lipid replacement

Enrique Forero – Regional Focal Point for the Latin American and Caribbean Region Member of the International Science Council (ISC), Colombia
The role of the International Science Council for the progress of science and knowledge in the Americas

Alicia Mattiazzi – Cardiovascular Research Center, Faculty of Medicine, Universidad de La Plata, CONICET, Argentina
Calcium handling and mishandling in the heart

Carlos Escande – Institut Pasteur de Montevideo, Uruguay
From the laboratory bench to the patient: pre-clinical and clinical development of a drug for obesity and type II diabetes

Dee Silverthorn – Dell Medical School, University of Texas at Austin, USA
Education in physiology

Carole Nicco – BioSenic, Belgium – Redox Medicine Society, France
Arsenic and Copper, a multiple-edged weapon in the fight against autoimmune and immunity-related diseases

Gregg G. Gundersen – Columbia University, USA
Nuclear positioning and mechanotransduction in health and disease

George Bloom – University of Virginia, USA
Amyloid- β and tau: the trigger and bullet in Alzheimer's disease pathogenesis

Gernot Desoye – Medical University of Austria, Austria
Feto-placental oxygen homeostasis in diabetes and obesity

Jan-Marino Ramírez – University of Washington School of Medicine, USA
The central respiratory pattern generator and control of the ventilation: new pathways and players



Walter N. Durán – New Jersey Medical School, USA

Nitric oxide: a major regulator of the beginning and the end of microvascular permeability in inflammation

David Murphy – Bristol Medical School, Translational Health Sciences, University of Bristol, UK

Incretin regulation of the hypothalamic-neurohypophysial system

Henk Granzier – University of Arizona, USA

Titin: big protein with big responsibilities

SYMPOSIUM

EXTRACELULAR VESICLES FOR DIAGNOSIS AND THERAPY

Chairs: Patricia Rocco (Federal University of Rio de Janeiro, Brazil), Maroun Khoury (Universidad de los Andes, Chile)

Ana Claudia Trocoli Torrecilhas - UNIVESP, Brazil

Extracellular vesicles: New challenges to understanding and treating diseases

Adriana Paes Leme – CNPEM, Brazil

Extracellular vesicles as diagnosis for different diseases

Patricia Rocco - Federal University of Rio de Janeiro, Brazil

Therapy with extracellular vesicles in respiratory diseases

Maroun Khoury - Universidad de los Andes, Chile

Extracellular vesicle therapy in muscle and osteoarticular diseases

CROSS TALK BETWEEN DIFFERENT ORGANS

Chairs: Pedro Leme (Federal University of Rio de Janeiro, Brazil), Marcio Moraes (Federal University of Minas Gerais, Brazil)

Pedro Leme Silva – Federal University of Rio de Janeiro, Brazil

Cross talk between lung and brain

Marcio Moraes – Federal University of Minas Gerais, Brazil

Cross talk between brain and heart

Niels Olsen Saraiva Camara – São Paulo University, Brazil

Cross talk between kidney and other organs

OBESITY: CHALLENGE OF THE FUTURE

Chairs: Egberto Moura (University of the State of Rio de Janeiro, Brazil), M Alicia Carrillo-Sepulveda (New York Institute of Technology, USA)

Egberto Moura – University of the State of Rio de Janeiro, Brazil

Mechanisms of obesity

M Alicia Carrillo-Sepulveda – Department of Biomedical Sciences, New York Institute of Technology, USA

Obesity and its vascular complications



Celso Caruso Neves – Federal University of Rio de Janeiro, Brazil
Obesity and kidney damage

Licio Augusto Velloso – State University of Campinas, Brazil
The impact of obesity on cardiovascular system

NEW HORIZONS IN CARDIORENAL ION TRANSPORT

Chairs: Oleg Palygin (Medical University of South Carolina, USA), Daria Ilatovskaya (Augusta University, Medical College of Georgia, USA)

Jin O-Uchi – Department of Medicine, Cardiovascular Division, University of Minnesota, USA
Mitochondrial calcium uniporter (MCU) and its physiological and pathological roles in the heart

Matthias Wolf – Department of Pediatrics, UT Southwestern and Children’s Medical Center Dallas, USA
The gastric hormone Ghrelin stimulates tubular magnesium absorption

Aylin Rodan – The University of Utah, Internal Medicine, Salt Lake City, USA
Water is life: defending against dehydration

Oleg Palygin – Medical University of South Carolina, USA
Protease activated receptors and glomerular function

HORMONES AND CONTROL OF BREATHING

Chairs: Monica Andersen (Universidade Federal de São Paulo, Brazil), Rodrigo Del Río (Pontificia Universidad Católica de Chile, Chile)

Vsevolod Polotsky – Department of Anesthesiology and Critical Care Medicine, George Washington University, USA
Melanocortins: new players of forgotten players in control of breathing?

Luciane Gargaglioni – Department of Animal Morphology and Physiology, Faculty of Agriculture and Veterinary Sciences, UNESP, Brazil
Sex hormones and control of breathing

Richard Kinkead – Department of Pediatrics, University of Laval, Canada.
Orexin and control of breathing

David Mendelowitz – Department of Pharmacology and Physiology, George Washington University, USA)
Oxytocin and control of breathing

HOT TOPICS IN CHRONIC KIDNEY DISEASE

Chairs: Timo Rieg (University of South Florida, USA), Annabel Biruete (Purdue University, Mexico)

Alexander Staruschenko (University of South Florida, USA)
Intracellular calcium signaling in podocytes in diabetic nephropathy

Annabel Biruete (Purdue University, Mexico)
The gut microbiome and chronic kidney disease-mineral and bone disorder

Javier Neyra (Department of Nephrology, University of Alabama Birmingham, USA)



Klotho and kidney disease risk-classification in humans

Jessica Dominguez (Department of Molecular Pharmacology and Physiology, University of South Florida, USA)

Iron deficiency anaemia – microbiome changes in response to intravenous iron administration

NEW PHYSIOLOGICAL AND THERAPEUTIC FRONTIERS OF THE INTRA-RENAL RENIN ANGIOTENSIN SYSTEM

Chair: Alexis A González (Pontificia Universidad Católica de Valparaíso, Chile)

Lucienne Morcillo – Universidade Federal do Rio de Janeiro, Brazil

Non-canonical pathways for renin regulation in the kidney

Marcela Herrera – Labidech Análisis Clínicos, Vita Medicina Reproductiva, Chubut, Argentina

Antibody-based detection of Angiotensin receptors in the kidney

Minolfa C Prieto – Department of Physiology, Tulane University, USA

The (pro)renin receptor in physiology and its impact on hypertension and diabetes

Alexis A González – Pontificia Universidad Católica de Valparaíso, Chile

Metabolic pathways involved in the regulation of the (pro)renin receptor in the renal collecting duct

PHYSIOLOGICAL AND MOLECULAR REGULATION OF THE HYPOTHALAMIC-NEUROHYPOPHYSIAL SYSTEM

Chairs: André de Souza Mecawi (Federal University of São Paulo, Brazil), David Murphy (University of Bristol, UK)

André de Souza Mecawi – Department of Biophysics, Federal University of São Paulo – UNIFESP, Brazil

Multi-omics analyses of the hypothalamic-neurohypophysial system

Melina Pires da Silva – Department of Biophysics, Federal University of São Paulo – UNIFESP, Brazil

Astrocytic modulation of the hypothalamic magnocellular neurons activity in the supraoptic nucleus

Thomas Cunningham – Department of Physiology and Anatomy, University of North Texas Health Science Center at Fort Worth, USA

Sex differences in the neurohypophyseal system in an animal model of cirrhosis

Andrea Godino – The Medical Research Institute Mercedes and Martín Ferreyra, INIMEC-CONICET/Faculty of Psychology, National University of Córdoba, Argentina

Effect of early programming stimuli on magnocellular neurones and their osmoregulatory responses

MINING THE WAVEFORM, NEW APPROACHES TO DELINEATING RESPIRATORY FEATURES AND ANALYZING RESPIRATORY

Chair: Russell Ray (Baylor College of Medicine, USA)

Jose Otero – Department of Pathology, The Ohio State University College of Medicine, USA

A cognitive framework for applying machine learning to neurophysiological assays

Christopher Wilson – Departments of Pediatrics and Basic Sciences (Division of Physiology), Loma Linda University, USA

Quantification of non-linear variability in cardiorespiratory control: Open-source tools for physiology signal analysis.

Michael Sunshine – Spinal Cord and Brain Injury Research Center, University of Kentucky, USA

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Automated classification of whole-body plethysmography waveforms to quantify breathing patterns following opioid overdose or spinal cord injury

Savannah Lusk – Department of neuroscience at Baylor College of Medicine, USA
Engineering mice, robots, and software for high throughput precision modelling in SIDS/SUID

PEPTIDE MODULATION IN SYSTEMS PHYSIOLOGY

A symposium sponsored by the International Regulatory Peptide Society, affiliated to IUPS

Chairs: Limei Zhang (Universidad Nacional Autónoma de México, Mexico), Valery Grinevich (Heidelberg University, Germany)

Lei Xiao – The State Key Laboratory of Medical Neurobiology, MOE Frontiers Center for Brain Science and the Institutes of Brain Science Fudan University, China
Oxytocin protects nigrostriatal dopamine system in Parkinson's disease model

Sunny Jiang – Section on Molecular Neuroscience & Dendritic Dynamics Hub, National Institute of Mental Health Intramural Research Program, NIH, USA
PACAP neurocircuitry for endocrine and behavioural stress response

Teresa Morales – Institute of Neurobiology, National Autonomous University of Mexico, Mexico
Prolactin's role beyond reproduction: neuroprotection through neuron-glia interaction

Quirin Krabichler – Central Institute of Mental Health (CIMH-ZI), Department of Neuropeptide Research in Psychiatry, School of Medicine, Heidelberg University, Germany
Using a novel transgenic AVP-Cre rat to dissect vasopressin circuits in the brain and their behavioral roles

LIPID METABOLISM AND ADIPOSE TISSUE IN EATING BEHAVIOR AND METABOLIC REGULATION

Chairs: René Braudand (Pontificia Universidad Católica de Chile, Chile), José Galgani (Pontificia Universidad Católica de Chile, Chile)

Jeniffer Thompson – Department of Biochemistry and Molecular Biology, University of Calgary, Canada
Risk factors for adiposopathy across the lifespan

Víctor Cortés – Pontificia Universidad Católica de Chile, Chile
Determinants of insulin resistance-associated fatty liver disease

Bredford Kerr – Universidad San Sebastián, Chile
Diet induces neural plasticity-associated modifications and epigenetic changes in the hypothalamus

Claudio Pérez – Pontificia Universidad Católica de Chile, Chile
Insights into feeding behaviour in different environments: From animal models to humans

THE INTERSECTION OF METABOLIC AND INFLAMMATORY MECHANISMS UNDERLYING CARDIOVASCULAR DISEASE; EMERGING EVIDENCE OF SEX DIFFERENCES

Chairs: Patricia Molina (Louisiana State University Health Sciences Center, USA), Heddwen Brooks (Tulane University School of Medicine, USA)

Andrea Zsombok – Department of Physiology, Tulane University School of Medicine, USA
CNS regulation of metabolism



Flavia M Souza-Smith – Department of Physiology, Louisiana State University Health Sciences Center (LSUHSC), New Orleans, USA

Immunometabolic consequences of mesenteric lymphatic leak

Justin P. Van Beusecum – Department of Medicine, Division of Nephrology Medical University of South Carolina Charleston, USA

Sex differences in vascular inflammation

Licy L. Yanes Cardozo – Department of Medicine, Division of Endocrinology, Diabetes and Metabolism University of Mississippi Medical Center Jackson, USA

Androgens and cardiovascular diseases in women

OBESITY AND THE RISK OF CARDIOMETABOLIC DISEASES

Chairs: Gerardo García-Rivas (Tecnológico de Monterrey, México), Marco Rito-Palomares (Tecnológico de Monterrey, México)

Guillermo Torre-Amione – Tecnológico de Monterrey, Mexico

Obesity, inflammation, and heart failure

Amira Klip – University of Toronto, Canada

Regulation of glucose transport and defects in diabetes

Luciana V Rossoni – University of Sao Paulo, Brazil

Role of perivascular adipose tissue in vascular dysfunction in heart failure

Julieta Palomeque – Universidad de La Plata, Argentina

The implications of obesity for cardiac arrhythmia mechanisms

RECENT ADVANCES AND FUTURE AVENUES IN UNDERSTANDING OBESITY AS A PREMATURE AGING PHENOTYPE

Chairs: María Paulina Correa (INTA, Universidad de Chile, Chile), Christian González-Billaut (Universidad de Chile, Chile)

José Viña – Faculty of Medicine and Dentistry, Universitat de València, Spain

Exercise as a tool to improve health and delay frailty in experimental animals and in elderly humans.

Paola Llanos – Faculty of Dentistry, Universidad de Chile, Chile

Cholesterol, ABCA1 and NLRP3 inflammasome: new molecular targets of skeletal muscle obese related-insulin resistance

Gustavo Duque - RUISSS McGill Centre of Excellence for Sustainable Health of Seniors McGill University, Canada

Interaction between bone, muscle and fat and common mechanisms and pathways in sarcopenic obesity and age-related musculoskeletal diseases.

Christian González-Billaut – Faculty of Science, Geroscience Center for Brain Health and Metabolism, Universidad de Chile, Chile

Applications of high-throughput 'omics' data in the study of obesity-induced accelerated aging



CHANNELS AND MEMBRANE TRANSPORT IN DISEASES

Chair: Gonzalo Ferreira (Universidad de La República, Uruguay), Luis Sobrevia (Pontificia Universidad Católica de Chile, Chile)

Gonzalo Ferreira – Department of Biophysics. School of Medicine, Universidad de La República, Montevideo. Uruguay

Heat labile E. coli enterotoxin B promotes changes in cardiac function in isolated guinea pig hearts and cardiomyocytes: possible relevance for sudden cardiac death

Carlos Valverde – Centro de Investigaciones Cardiovasculares ‘Dr. Horacio E. Cingolani’, Faculty of Medical Sciences, UNLP/CCT-CONICET, Argentina

Myocardium infarction and Ca²⁺/calmodulin kinase II

Jorge Contreras – Department of Physiology and Membrane Biology, School of Medicine, University of California Davis, USA

Connexin channels as mediators of cardiac stress-induced arrhythmias and myocardial infarction

Theanne Griffith – Department of Physiology and Membrane Biology, School of Medicine, University of California Davis, USA

Molecular mechanisms of mammalian proprioception

CONNECTING STUDENTS WITH THE COMMUNITY TO ENHANCE LEARNING

Chairs: Patricia A. Halpin (University of New Hampshire, USA), Victoria Velarde (Universidad de Valparaíso, Chile)

Patricia A. Halpin – University of New Hampshire, Department of Life Sciences, Manchester NH, USA
Using a role play activity with life science and American Sign Language (ASL) interpreting students to provide undergraduates experience in the healthcare setting

Loreto Véliz – Faculty of Biological Sciences, Pontificia Universidad Católica de Chile, Chile

Carolina Serrano – Faculty of Biological Sciences, Pontificia Universidad Católica de Chile, Chile

Victoria Velarde – Faculty of Sciences, Universidad de Valparaíso, Chile

Reflective diaries as a tool for the development of metacognition in students from a physiology course

Ricardo Alfonso Pena Silva – Faculty of Medicine, Universidad de los Andes, Colombia

Addressing health literacy as a foundation to create biomedical educational content for communities

Robert Carroll - Brody School of Medicine, East Carolina University, USA

IUPS efforts stimulate broader community engagement

NEW INSIGHTS INTO THE STUDY OF ADAPTIVE AND MALADAPTIVE MYOCARDIAL GROWTH

ISHR LAT symposium

Chairs: Martín Vila Petroff (CONICET-UNLP, Argentina), Irene L. Ennis (CONICET-UNLP, Argentina)

Sergio Lavandero - Advanced Center for Chronic Diseases (ACCDiS), Faculty of Chemistry and Pharmaceutical Sciences, Faculty of Medicine, Universidad de Chile, Chile & University of Texas Southwestern Medical Center Dallas, USA

Regulation of mitochondrial function and morphology during cardiomyocyte adaptive growth

Alejandro Aiello - Centro de Investigaciones Cardiovasculares “Horacio E. Cingolani”, Faculty of Medical Sciences, CONICET-Universidad Nacional de La Plata, Argentina

Role of the alkalinizing transporters in the development of pathological cardiac hypertrophy.



Judith Bernal Ramírez – Tecnológico de Monterrey, The Institute for Obesity Research, Hospital Zambrano Hellion, San Pedro Garza Garcia, Mexico

Mitochondrial dysfunction in cardiac hypertrophy and failure: chicken or egg?

Alejandra M. Yeves – Centro de Investigaciones Cardiovasculares “Horacio E. Cingolani”, Faculty of Medical Sciences, CONICET-Universidad Nacional de La Plata, Argentina

Apelin signalling pathway as a mediator of cardioprotection in the hypertrophied myocardium.

HORMONAL SIGNALING IN CARDIOVASCULAR DISEASE

ISHR LAT symposium

Chairs: Celeste Villa-Abrille (CONICET-UNLP, Argentina), Zully Pedrozo (Universidad de Chile, Chile)

Gustavo Pérez – Centro de Investigaciones Cardiovasculares “Horacio Cingolani”, Faculty of Medical Sciences, CONICET-Universidad Nacional de La Plata, Argentina

Adrenocortical hormones and cardiac dysfunction

Valentina Parra – Advanced Center for Chronic Diseases (ACCDiS), Faculty of Chemistry and Pharmaceutical Sciences, Faculty of Medicine, Universidad de Chile, Chile

Oestrogen signalling as a bridge between the nucleus and mitochondria in cardiovascular diseases.

Maria J Campagnole-Santos – National Institute of Science and Technology in Nanobiopharmaceutics, Institute of Biological Sciences, Universidade Federal de Minas Gerais, Brazil

Hormones of the protective branch of the renin-angiotensin-system induces neuroprotection in ischemic stroke models.

Verónica De Giusti - Centro de Investigaciones Cardiovasculares “Horacio Cingolani”, Faculty of Medical Sciences, CONICET-Universidad Nacional de La Plata, Argentina

Cardiac dysfunctional hormonal signalling during menopause

RENAL VASCULAR DYSFUNCTION

Chairs: Andrey Sorokin (Medical College of Wisconsin, USA), John Imig (University of Arkansas for Medical Sciences, USA)

David P Basile – Cell Biology & Physiology Indiana University School of Medicine Indianapolis, USA

Acute kidney injury and altered vasculature

Rita Tostes – Ribeirao Preto Medical School University of Sao Paulo, Brazil

Nrf2 & diabetic nephropathy

Sarah Yuan – Department of Molecular Pharmacology and Physiology University of South Florida, USA

Renal vascular dysfunction during septic injury

Dolores Prieto – Complutense University of Madrid, Spain

Renal vascular dysfunction in obesity

OVERVIEW OF PLACENTA – BRAIN AXIS IN PREGNANCY COMPLICATIONS.

Chair: Carlos Escudero (Universidad del Bío-Bío, Chile)

Carlos Escudero – Universidad del Bío-Bío, Chile

Impaired brain angiogenesis in offspring from preeclampsia. What we have learnt from preclinical models



Marcelo González Ortiz – Universidad de Concepción, Chile
Placenta and maternal mental health during COVID-19 pandemic. Focus in Latin America

Pablo Torres-Vergara – Universidad de Concepción, Chile
Potential mediators involved on the cerebrovascular complications of preeclampsia

Verónica Palma - Universidad de Chile, Chile
Schizophrenia, a debilitating mental disorder that originates during embryogenesis

NOCICEPTION AND PAIN: FROM MECHANISMS TO THERAPEUTIC APPROACHES

Chairs: Trinidad Mariqueo (Universidad de Talca, Chile), Carolina A Oliva (Universidad Autónoma de Chile)

Karen Castillo – Universidad Católica del Maule (UCM) & Centro Interdisciplinario de Neurociencias de Valparaíso (CINV), Chile
Molecular and cellular elements of thermal sensitivity in thermoTRP channels and their modulation as a therapeutic target for pain relief

Carolina A Oliva – Centro de Transversalización de la Perspectiva de Género, Universidad Autónoma de Chile
The role of inhibitory currents in sex-dependent pain perception processing in the central amygdala

Jimmy Stehberg – Universidad Nacional Andrés Bello, Chile
Animal models to measure itching, acute and chronic pain, and their use for novel drug development

Trinidad Mariqueo – Universidad de Talca, Chile
Physiopathological aspects of chronic pain: a clinical perspective

NEW PATHOLOGICAL MECHANISMS OF CARDIOVASCULAR DISEASES

Chairs: Sergio Lavandero (Universidad de Chile, Chile), Mario Chiong (Universidad de Chile, Chile)

Jaime Riquelme – Advanced Center for Chronic Diseases, Universidad de Chile, Chile
Anti-inflammatory role of vascular endothelial cells

Alejandra San Martín – Universidad Andrés Bello, Chile
Role of the mitochondrial protease Clpp in the vasculature

Sergio Lavandero – Advanced Center for Chronic Diseases, Universidad de Chile & UT Southwestern Medical Center Dallas, USA
Primary cilia in cardiac fibrosis

Mario Chiong – Advanced Center for Chronic Diseases, Universidad de Chile, Chile
New insight of the renin angiotensin system on vascular remodelling

NOVEL ASPECTS OF CELL COMMUNICATION IN THE MICROCIRCULATION

Session in Honor of Professor Walter Duran

Chairs: Mauricio Boric (Pontificia Universidad Católica de Chile, Chile), Daniel R González (Universidad de Talca, Chile)

Sarah Yuan – University of South Florida, USA



The endothelial glycocalyx as a double-edged sword in microvascular homeostasis and pathogenesis

Fabiola Sánchez Universidad Austral de Chile, Chile
eNOS signalling via S-nitrosylation in leukocyte and tumour cell adhesion

Xavier Figueroa – Pontificia Universidad Católica de Chile, Chile
Connexins and pannexins in the regulation of vascular tone

Eliete Bouskela – Universidade do Estado do Rio de Janeiro, Brazil
Non-invasive techniques to access in vivo the skin microcirculation in patients

PATHOPHYSIOLOGY SIGNALLING MECHANISMS IN DISEASES

Chair: Daniel Peluffo (Universidad de la República, Uruguay)

Mauricio Lillo – Department of Pharmacology, Physiology & Neuroscience, Rutgers - New Jersey Medical School, Rutgers, The State University of New Jersey, USA
Connexin hemichannels: an unexplored critical component in endothelial function

Daniel González-Reinoso – Faculty of Health Sciences, Universidad de Talca, Chile
Role of NOX2 in the dystrophic cardiomyopathy

R Daniel Peluffo – Group of Biophysical Chemistry, Department of Biological Sciences, CENUR Litoral Norte - sede Salto, Universidad de la República, Uruguay
Modulation of L-arginine transport by nitric oxide: pathophysiological implications

Luis Sobrevia – Cellular and Molecular Physiology Laboratory (CMPL), Department of Obstetrics, Faculty of Medicine, Pontificia Universidad Católica, Chile
Adenosine/L-arginine-NO signalling in human placenta endothelium from gestational diabetes mellitus

MUSCLE-ORGAN CROSSTALK: FOCUS ON DISEASES

Chairs: Paola Llanos (Universidad de Chile, Chile), Denisse Valladares (Universidad de O'Higgins, Chile)

Sonja Buvinic – Universidad de Chile, Chile
Molecular linkers between skeletal muscle atrophy and bone loss after muscle paralysis.

Gonzalo Jorquera – INTA, Universidad de Chile, Chile
Gut-Muscle axis: The role of gut microbiota on muscle function during old age.

Rodrigo Troncoso – INTA, Universidad de Chile, Chile
Exercise regulation of hepatic LD-mitochondria interaction in non-alcoholic fatty liver disease.

Claudio Cabello-Verrugio – Universidad Andrés Bello, Chile
The dark side of bile acids in the connection liver-skeletal muscle.

HEART FAILURE: MORE THAN A CARDIAC DISEASE

Chairs: Luciana Venturini Rossoni (Brazil), Gerardo García Rivas (Tecnologico de Monterrey, México)

Adriana Castello Costa Girardi – Medical School, University of Sao Paulo, Brazil
Mechanisms underlying the cardiorenal benefits of SGLT2 inhibitors in heart failure



Gerardo García Rivas – The Institute for Obesity Research, Tecnológico de Monterrey, Centro de Investigación Biomédica, Hospital Zambrano Hellion, TecSalud, San Pedro Garza García, Mexico
Intracellular calcium management in heart failure with preserved ejection fraction

Luciana Venturini Rossoni – Physiology and Biophysics Department, Biomedical Science Institute, University of Sao Paulo, Brazil
Vascular dysfunction in heart failure

José Geraldo Mill – Department of Physiological Sciences, Federal University of Espirito Santo, Brazil
Brazilian longitudinal study of adult health (ELSA-Brazil): What are we learning?

ROLE OF THE IMMUNE SYSTEM IN HYPERTENSION AND DIABETES

Chairs: Luis Michea (Universidad de Chile, Chile), Kristine DeLeon-Pennell (Medical University of South Carolina, USA)

Heddwen Brooks – Department of Physiology, Tulane University School of Medicine, New Orleans, USA
Sex differences in T cell mediated hypertension

Carmen De Miguel – Department of Medicine – Nephrology, University of Alabama, Birmingham, USA
Role of macrophages in renal function and end-organ damage in diabetes

Luis Michea – ICBM-Hospital Clínico Universidad de Chile, Faculty of Medicine, Universidad de Chile, Chile
Antigen-presenting cell modulation of hypertension

Annet Kirabo – Department of Molecular Physiology and Biophysics, Vanderbilt University, USA
The gut microbiome, inflammation, and salt-sensitive hypertension

CHEMORECEPTORS IN HEALTH AND DISEASE: EXPLORING NEW AVENUES OF TREATMENT

Chairs: Rodrigo Del Río (Pontificia Universidad Católica de Chile, Chile), Camilo Toledo (Universidad Austral de Chile, Chile)

Rodrigo Iturriaga – Department of Physiology, Universidad de Antofagasta, Chile
Peripheral chemoreception and the control of breathing

Jaime Eugenin – Departamento de Biología, Universidad de Santiago de Chile, Chile
Central chemoreception and breathing control

Silvia Conde – NOVA Medical School, Universidade Nova de Lisboa, Portugal
Altered breathing control in diabetes and the role of chemoreception

Noah Marcus – Department of Physiology and Pharmacology, Des Moines University, Des Moines, USA.
Chemoreceptors and kidney function regulation in sleep apnea

MYOFILAMENT-BASED MECHANISMS OF MUSCLE DISEASE

Chair: Henk Granzier (University of Arizona, USA)

Dilson Rassier – McGill University, Montreal, Canada
Molecular mechanisms of muscle contraction in health and disease

Brett Colson – University of Arizona, Tucson, USA
Roles of myosin-binding protein C in cardiac contraction, disease and therapy



Danuta Szczesna-Cordary – University of Miami, Miller School of Medicine, Miami, USA
Myosin light chain mutant induced cardiomyopathies

J. P-Jin – University of Illinois at Chicago, College of Medicine, USA
Structure-function relationship of thin filament regulatory protein in cardiovascular health

VASCULAR DYSFUNCTION WITH COVID-19

Chairs: Shampa Chatterjee (University of Pennsylvania School of Medicine, USA), Amaro Nunes Duarte Neto (Universidade de São Paulo, Brazil)

Dragan Primorac – St. Catherine Hospital, Croatia
Cardiovascular risk with COVID-19

Roxana Campisi – Diagnostico Maipu, Buenos Aires - Argentina
The impact of COVID-19 on diagnosis of heart disease in Latin America

Shampa Chatterjee – University of Pennsylvania School of Medicine, Philadelphia, USA
Endothelial oxidant signalling post SARS-CoV-2 infection

Amaro Nunes Duarte Neto – Universidade de São Paulo, Brazil
Ultrastructural findings in fatal COVID-19: Vessel injury and endothelialitis

WORKSHOPS

WORKSHOP PHYSIOLOGY AND NARRATIVES

Coordinator

Wilson Andrés Parra Chico (Colombia)

Speakers

Leonardo Gómez Duarte (Veterinarian) – Universidad Nacional de Colombia

Iris del Mar Lineros (Physiotherapist) – Universidad Nacional de Colombia

Wilson Andrés Parra Chico (MD) – Universidad de la Sabana, Colombia

Carlos Orlando Wilches (Psychologist) – Unigermana Universidad del País Vasco, Spain

Allocated time

1 h (60 min)

Topics

Southern physiology and epistemologies

Narrative methodology applied to research in physiology

Physiology and narrative didactics

Description

The transversal question of our work is why using a human sciences approach can be useful in an exact science such as physiology is considered? During the last 10 years we focused on understanding the identity of the physiologists in Latin America. Through courses in the history of physiology, epistemology of physiology and didactics of physiology, we favored disciplinary reflection to give postgraduate training in science a humanistic character. Currently the group has appropriated a voice in contemporary physiology in the context of (1) narrative inquiry methods applied to physiology, (2) fluid physiology and pertinent in addressing complex problems, and (3) we are a physiology didactics

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laboratory to the extent that we value the voice and experience of the student who intends to acquire physiological thinking.

The objective of our workshop is to demonstrate the need for the relationship between human sciences and physiology. The narrative approach applied to educational practices has emerged with great force since the late eighties at the head of Anglo-Saxon research groups mainly from Canada and the United States. Narratives have been used with greater emphasis for two purposes, namely 1) to understand how teaching practices have been configured from the story of experiences in life cycles and as an element in the pedagogical knowledge of the contents, and 2) the role of the narrative in the formation of students, mainly in the field of morality. Teaching and learning within educational practices are an imminently social process, which develops from and in the joint experience of all those who share this scenario. It is precisely in those accounts of the experience configured in community where important elements are found to understand what teachers do and at the same time for students to understand what they do as professionals. In the context of Physiology, we consider life as its object of study, and we intend to convey the idea of the physiologist as a cultivator of the living in the Latin American context.

NEURAL ORBIT (THE NEO PROJECT): IMPLEMENTING NEW PHYSIOLOGICAL TECHNOLOGIES TO MOTIVATE NEW GENERATIONS OF PHYSIOLOGISTS

Coordinators

Alain Riveros-Rivera (Colombia/Germany)
Tatiana Mendes (Brazil)

Speakers

Alain Riveros-Rivera (Medical physiologist) – Pontificia Universidad Javeriana, Colombia, & Center for Space Medicine and Extreme Environments-Charité Berlin, Germany
Tatiana Mendes (Biomedical engineer) – ADI Training Manager Latin America

Topics

Shooting Stars: in this experiment, the participants review the speed of different cosmic phenomena and compare them with physiological ones (e.g., pulse wave and the nerve conduction velocity)
Space Spinning Tops: in this experiment, the participants review the rotation axis of different Solar Systems planets and calculate the cardiac axis using ECG signals.
The Cosmic Elevator: in this experiment, the participants review the concept of microgravity and the effect of gravity on physiological parameters such as pulse rate and blood pressure.

Allocated time

1 h (60 min)

Description

Keeping alive the flame for physiological research is one of the responsibilities of those of us who currently live in this science. For this reason, implementing simple but attractive pedagogical strategies in middle and high school students should be part of our actions. The truth is that most of the time, our efforts are focused on research centers or universities, leaving out the younger ones. This is likely due to the limitations in infrastructure and human and technical resources that a physiology laboratory demands. The aforementioned is even more marked in Latin American countries with tight educational budgets. In this context, the NEO project emerges for mixing space with physiological sciences to bring advanced technology resources to vulnerable student populations in Bogotá-Colombia. This project aims to reduce the gaps in access to technology among the different social classes, allowing low-income students to work with university-level equipment.



The objective of this workshop is that participants can perform some practices of the NEO project using portable sensors (Lt sensors technology). These physiological experiments will demonstrate the technology's versatility and how simple demonstrations can motivate students to study physiological and space sciences. As a model, these practices could inspire the teachers in attendance to create their experiments with portable sensors, allowing low-cost experiments to be done in or out-side the laboratory.

PRECISION IN BREATHING, A WORKSHOP ON SMALL ANIMAL ADULT AND NEONATE PLETHYSMOGRAPHY

Coordinator

Russell Ray (USA)

Speakers

Russell Ray (Associate Professor) – Department of Neuroscience, Baylor College of Medicine, USA
Kevin Cummings (Associate Professor) – Department of Biomedical Sciences, University of Missouri, USA

Topics

Advances in small animal cardio-respiratory measurements
Key fundamentals and best practices

Allocated time

1 h (60 min)

Description

The aim of this workshop is to cover the recent advances in small animal cardio-respiratory measurements while revisiting key fundamentals and best practices that have been, at times, overlooked. Respiratory measurements are being increasingly recognized as important outcome measures in a variety of congenital, neurodegenerative, affective, and infectious disease models that inform upon disease mechanism and clear a path toward therapeutic and diagnostic advances. Poor execution of these techniques will lead to wasted resources, and erroneous results that misdirect translational efforts. Thus, there is a need in the field to both revisit key fundamentals in breathing studies as well as to highlight novel advances in the field.

Adult respiratory measurement techniques will focus on conscious, unrestrained whole body barometric plethysmography (WPB) in rodents. Turnkey and bespoke systems will be compared and contrasted. Key plethysmographic features needed for effective respiratory measurements will be covered. Caveats, pitfalls, and common mistakes will be discussed. Lastly, new approaches in adult respiratory measurements going beyond WBP will be previewed.

Neonatal respiratory measurement techniques will focus on facemask pneumotachography. Pneumotachography, whole body barometric, and sealed neck collar approaches for neonates will be contrasted and compared. Key aspects of developing and carrying out neonatal respiratory measurement assays will be discussed with a focus on best practices and potential challenges. Innovative approaches to high-throughput measurement assays will be previewed. Modifications to systems that allow the measurement of additional, non-respiratory variables (blood pressure, heart rate, state of vigilance) in both neonatal and adult rodents will be discussed.

BEST PRACTICES FOR PUBLISHING IN THE AMERICAN JOURNAL OF PHYSIOLOGY – RENAL PHYSIOLOGY

Coordinators

Luis Michea (Chile)
Heddwyn Brooks (USA)



Speakers

Heddwen Brooks (Editor-in-Chief AJP-Renal) – Tulane University, USA
Alexander Starushchenko (Deputy Editor-in-Chief AJP-Renal) – University of South Florida, USA
Timo Rieg (Associate Editor AJP-Renal) University of South Florida, USA
Luis Michea (Associate Editor AJP-Renal) – Universidad de Chile, Chile

Topics

Aspects of publishing in the AJP-Renal Physiology

Allocated time

1 h (60 min)

Description

The goal of this workshop will be to demonstrate different aspects of publishing in the American Journal of Physiology – Renal Physiology. The Editor-in-Chief (Dr. Heddwen Brooks, Tulane University, USA), Deputy Editor in Chief (Dr. Alexander Starushchenko, University of South Florida, USA), Associate Editors Dr. Timo Rieg (University of South Florida, USA) and Dr. Luis Michea (Universidad de Chile, Santiago, Chile) will give presentations about different aspects of the publishing process. The session will be chaired by Drs Brooks and Michea. Dr. Brooks will talk about the state of the journal, including statistics on the geographic region of origin of articles, ongoing calls for papers and the early career fellowship. She will expand on the required rigor and reproducibility for the journal. Dr. Starushchenko will present on how to prepare the newly required graphical abstract with the focus on the best visual presentation and summary of results. Dr. Rieg will discuss ways to present graphs and data as part of figures as well as how to write figure legends according to ARRIVE Guidelines. Dr. Michea will talk about the editorial process, how reviewers are selected and how decisions are made.

LEVERAGING EDUCATIONAL TECHNOLOGY IN PHYSIOLOGY EDUCATION

Coordinator

Diego F. Niño (USA)

Speakers

Diego F. Niño (MD, PhD, Associate Professor) – Department of Cell Biology & Pharmacology, Herbert Wertheim College of Medicine (HWCOCM), Florida International University, USA
Stephanie Tadal (PhD, Director) – Instructional Design & HWCOCM, Florida International University, USA
Jessica Giraldo (BS, Instructional designer) – HWCOCM, Florida International University, USA
Catarina Vale (BS, 2nd year medicine student) – HWCOCM, Florida International University, USA

Topics

Tools needed to promote active learning
Synchronous and asynchronous instructional materials

Allocated time

1 h (60 min)

Description

The workshop proposed has been designed as a faculty development workshop for health sciences educators. The goal is to provide participants with the tools needed to promote active learning in their own instructional environments through an interactive “hands-on” experience. Participants will gain the knowledge and skills needed to design and develop effective, interactive, and engaging synchronous and asynchronous instructional materials. The course format is justified to allow adequate level of



interaction among participants and facilitators. Ample time will be provided for participants to learn and practice the skills taught.

This workshop is designed to help health sciences educators gain the skills needed to design and develop effective, interactive, and engaging asynchronous instructional materials to support active learning. We seek to promote the adoption of new educational technologies and approaches that can enrich the learning environment for pre-clinical, clinical, and post-graduate learners. Participation in this course will help educators to integrate evidence-based educational practices and appropriate instructional technology through a series of hands-on activities.

At the end of the learning experience the participant will be able: 1. Understand and apply the Technological Pedagogical Content Knowledge (TPACK) framework for designing a learning experience, 2. Identify applications of the TPACK framework in their teaching environment, 3. Define and review the benefits of Active Learning, 4. Summarize Cognitive Load and Multimedia Learning Theory, 5. Apply the theories of cognitive load and best practices of multimedia design to create instructional materials including interactive learning modules, videos, podcasts, and infographics.

Throughout the workshop, participants will have the opportunity to work collaboratively with their peers from other institutions to facilitate creative and shared problem-solving. Small groups will be used to ensure a high degree of interaction, and facilitators will be available to help with questions and guide discussion.

PRECONGRESS COURSES

SHAPING THE FUTURE OF SKELETAL MUSCLE: METHODOLOGIES AND EMERGING FINDINGS

Coordinators

Denisse Valladares (Universidad de O'Higgins, Chile)

Luis Peñailillo (Universidad Andrés Bello, Chile)

Description

This course focused on the latest research methodologies and emerging findings related to skeletal muscle function. The course is designed to give participants an in-depth understanding of the factors affecting skeletal muscle function and how to enhance it. The course is divided into four main sections. The first section covers the epigenetic regulation of skeletal muscle, focusing on DNA methylation and extracellular vesicle-derived miRNAs. The second section covers methods for assessing mitochondrial function in skeletal muscle, including the Oxygraph-2k respirometer and the Seahorse Extracellular Flux Analyzer. The third section focuses on chronic inflammation in skeletal muscle function, including the role of the inflammasome in obesity and insulin resistance, inflammaging and its implications in obesity and sarcopenia, and the fibro-adipogenic progenitors in obese-skeletal muscle. The fourth section covers new muscle function enhancers, such as omega-3 lipid mediators in the muscle regeneration process, eccentric exercise in skeletal muscle, and the possibility of increasing skeletal muscle mass in individuals over 85 years old.

Overall, this course is for students interested in the latest research on skeletal muscle and its function. It aims to provide participants with practical knowledge and skills to enhance muscle function and promote healthy ageing.

Date

Monday 27 November

Pan-American (PANAM) *Physiological Sciences* 2023

E-Mail: panamchile2023@gmail.com – Twitter: [@PanamChile2023](https://twitter.com/PanamChile2023)

URL: <https://www.cienciasfisiologicas.cl/panam-2023/>



Allocated time

3 h (180 min)

Activities and speakers

Section 1: Epigenetic regulation of skeletal muscle function

Bernardo Krause – Universidad de O'Higgins, Chile

Challenges in the study of DNA methylation

Denisse Valladares – Universidad de O'Higgins, Chile

Impact of skeletal muscle-derived extracellular vesicles and miRNAs

Section 2: Methods for assessing skeletal muscle function

Matías Monsalves – Universidad de O'Higgins, Chile

Oxygraph-2k respirometer (Oroboros)

César Cárdenas – Universidad Mayor, Chile

Extracellular flux analyzer (Seahorse)

Juan Camilo Calderón – Universidad de Antioquia, Colombia

Excitation-contraction coupling: Blending old and last-decade research

Section 3: Chronic inflammation in skeletal muscle function

Paola Llanos, Universidad de Chile, Chile

Inflammasome: Role in obesity and insulin resistance in skeletal muscle

Gonzalo Jorquera – INTA, Universidad de Chile, Chile

Inflammaging: Implications in obesity and age-related sarcopenia

Marcelo Flores – Universidad de O'Higgins, Chile

Fibro-adipogenic progenitors in obese-skeletal muscle

Section 4: New muscle function enhancers

Sebastián Jannas – Universidad de O'Higgins, Chile

Unleashing the benefits of omega-3 lipid mediators in the muscle regeneration process

Luis Peñailillo – Universidad Andrés Bello, Chile

Eccentric exercise in skeletal muscle: good or bad?

Gabriel N. Marzuca-Nassr – Universidad de la Frontera, Chile

Is it possible to increase skeletal muscle mass over 85 years old?

PRE-CONGRESS TEACHING ONE DAY WORKSHOP

Coordinators

Robert G. Carroll (Brody School of Medicine, East Carolina University, USA)

Patricia A. Halpin (University of New Hampshire, Department of Life Sciences, USA)

Fernanda Klein Marcondes (Dept of Biosciences, Piracicaba Dental School, University of Campinas (UNICAMP), Brazil)

Dee U. Silverthorn (Dell Medical School, University of Texas at Austin, USA)

Date

Monday 27 November

Allocated time

7 h (420 min)

Activities and speakers

Tatiana Mendes, Patricia Mendes – ADInstruments

ADInstruments - Using active learning methodology for laboratories classes in different models: hybrid, online, or in lab

Paulo Fernando Guedes Pereira Montenegro (Brazil)

Pan-American (PANAM) Physiological Sciences 2023

E-Mail: panamchile2023@gmail.com – Twitter: @PanamChile2023

URL: <https://www.cienciasfisiologicas.cl/panam-2023/>



Basic electronics for physiologists: a tool to create physical manipulatives for teaching purposes
Loreto Véliz (Chile), Carolina Serrano (Chile), Victoria Velarde (Chile)

Learning physiology and contributing to the community
Robert G. Carroll (USA), Ricardo Peña Silva (Colombia), Dee U. Silverthorn (USA)

Publishing your educational scholarship
Camilo Lellis-Santos (Brazil)

Smartphone-assisted experimentation for physiology education
Patricia A. Halpin (USA), Helena Carvalho (USA)

Using dramatizations in face-to-face and online courses to teach physiology
Fernanda Klein Marcondes (Brazil), Luís Henrique Montrezor (Brazil)

Using educational games to teach physiology
Chaya Gopalan (USA)

Using flipped teaching in underserved colleges to promote student engagement

Tentative schedule (All workshops are 80 min long)

MONDAY 27 NOVEMBER			
Time	ROOM 1	Time	ROOM 2
9:15-10:35 AM	Using educational games to teach physiology	9:15-10:35 AM	Using active learning for laboratory classes in different models: hybrid, online, or in lab
10:35 - 10:45	BREAK	10:35 - 10:45	BREAK
10:45 AM-12:05 PM	Basic electronics for physiologists: a tool to create physical manipulatives for teaching purposes	10:45 AM-12:05 PM	Using dramatizations in face-to-face and online courses to teach physiology
12:05-1:15 PM	LUNCH	12:05-1:15 PM	LUNCH
1:15-2:35 PM	Smartphone-assisted experimentation for physiology education	1:15-2:35 PM	Using flipped teaching in underserved colleges to promote student engagement
2:35-2:45	BREAK	2:35-2:45	BREAK
2:45-4:05 PM	Learning physiology and contributing to the community	2:45-4:05 PM	Publishing your educational scholarship

Specific details for each activity

Activity

ADInstruments - Using active learning for laboratory classes in different models: hybrid, online, or in lab

Facilitators

Tatiana Mendes – ADInstruments

Patricia Mendes – ADInstruments. Email: P.mendes@adinstruments.com

Abstract



ADInstruments' Lt is an award-winning online learning platform with ready-to-use content for life sciences, nursing, and medicine. In the workshop, participants will carry out laboratory experiments using active learning and evaluate the results with the statistical analysis tools of the teaching platform. Some of the editable content created in Lt Kuracloud will be presented as a solution for teaching physiology.

Resources

Internet connection, power plugs for equipment, TV or projector. Desks for at least 3 different stations.

Activity

Basic electronics for physiologists: a tool to create physical manipulatives for teaching purposes

Facilitator

Paulo Fernando Guedes Pereira Montenegro – Laboratório de Ecofisiologia Animal, Universidade Federal da Paraíba, Brazil. Email: pmonte@dse.ufpb.br

Aims

To recognize the most common electronic concepts and components
To build simple circuits as part of physical models to aid learning in physiology
To engage in a continuous learning process in electronics

Abstract

Physical manipulatives are concrete objects used as models for a given phenomenon, structure or concept, and they foster hands-on experiential opportunities in the classroom. Electronic circuits are one of the most amusing models because they can easily simulate simple physiological stimulus-response pathways. In this workshop, students will be introduced to the basic concepts of electronics, the most commonly used components, wiring diagrams and online resources on electronic materials, projects and circuit simulation. They will then gather in small groups to build simple circuits according to pre-defined diagrams and come up with ideas to use them in manipulative models. At the end of the workshop, it is expected that the participants will be able to recognize the most common electronic concepts and components, and also build simple circuits as part of physical models to aid learning in physiology. We also expect that participants will be encouraged to engage in a continuous learning process in electronics.

Proposed Structure and timing

Part 1 (15 min) – Presentation on electronics theory and common components (slideshow and hands-on activity)
Part 2 (35 min) – Building simple circuits with given components and brainstorm on how to use electronics in physiology teaching

Participation requirements

Participants will be given reading material before the workshop.

Number of participants

Maximum of 30

Activity

Learning physiology and contributing to the community

Facilitators

Loreto Véliz – Faculty of Biological Sciences, Pontificia Universidad Católica de Chile. Email: iveliz@bio.puc.cl

Carolina Serrano – Faculty of Biological Sciences, Pontificia Universidad Católica de Chile. Email: cserrano@bio.puc.cl

Victoria Velarde – Faculty of Sciences, Universidad de Valparaíso, Chile. Email: maria.velarde@uv.cl

Aims

To work on some strategies that will allow you to visualize how you can carry out an activity of A+S in your physiology course
To exemplify the incorporation of reflection and feedback to the social activity developed in the context of the course



To exemplify the development of key transversal skills in your students, such as teamwork, oral communication, and social commitment.

Abstract

Service learning (*aprendizaje+servicio*, A+S) is a teaching-learning method that allows linking the learning objectives of a course into a project that contributes to the community, solving genuine needs in real contexts. In this workshop you will be able to work on some strategies that will allow you to visualize how you can carry out an activity of A+S in your physiology course, incorporating reflection, feedback and promoting the development of key transversal skills in your students, such as teamwork, oral communication, and social commitment.

Proposed Structure and timing

Participants will be divided into groups of 4 people.

Part 1 (10 min) – Introduction. Participants receive the context of the methodology and the objectives that are considered.

Part 2 (10 min) – Reflection activity. In the working groups the participants reflect on situations in different learning contexts.

Part 3 (15 min) – The participants plan, using the selected learning context, an A+S activity that could be carried out, considering one of the learning objectives and/or skills to be developed in a physiology course.

Part 4 (25 min) – Plenary. Each group presents the work that has been done.

Participation requirements

No preparation is needed in advance for the participants.

Room requirements

Markers, small coloured *Post-it* notes and large *Post-it* notes

Activity

Publishing your educational scholarship

Facilitators

Robert G. Carroll – Brody School of Medicine, East Carolina University, USA. Email: carrollr@ecu.edu

Ricardo Peña Silva – College of Medicine, Conecta-TE, Universidad de los Andes, Bogotá, Colombia.

Email: rpena@uniandes.edu.co

Dee U. Silverthorn – Dell Medical School, University of Texas at Austin, USA. Email:

silverthorn@utexas.edu

Aims

To familiarise attendees with the various formats that manuscript submissions can take

To support colleagues in creating their next submission

To enhance chances of manuscript acceptance

Abstract

Publication of peer-reviewed articles is a meritorious way of increasing scholarly output, gaining international exposure, and is frequently required for career progression of teaching-focused staff. Physiology teachers can publish their innovative teaching methods and teaching-related research in The American Physiological Society journal *Advances in Physiology Education*. This journal offers the optimal platform for publishing scholarly work on teaching and learning of physiology, neuroscience, anatomy and physiology, and pathophysiology, at all educational levels. *Advances* attracts submissions worldwide and has a broad international reading audience because articles are freely available to readers from the time of publication. The workshop facilitators are *Advances* authors, reviewers, and members of the editorial board who will familiarise the participants with the types of articles and the submission and review process. Attendees in small groups will discuss potential educational projects and manuscripts and will have an opportunity to receive feedback on their ideas.

Proposed Structure

Description of the journal (including the Sourcebook of laboratory activities) (10 min)

Types of articles/requirements/do's and don'ts (20 min)

Discussion groups (participant led) on projects and manuscript feedback (40 min)

Summary remarks (facilitator led) (20 min)



Participation requirements

Participants are asked to bring their ideas for educational research projects or manuscripts in preparation for the discussion groups.

Activity

Smartphone-assisted experimentation for physiology education

Facilitator

Camilo Lellis-Santos – Universidade Federal de São Paulo, Department of Biological Sciences, São Paulo, Brazil. Email: lellis.unifesp@gmail.com

Abstract

Smartphones are not just a communication technology but an extension of the bodies and minds of the digital-native generation of students. However, many teachers do not explore the total capacity of smartphones as a didactic tool. In this workshop, attendees will discuss the pedagogical uses of smartphones to improve and facilitate learning. Ideas and lab protocols will be presented to pave discussions on which smartphones can monitor physiological systems. The principles of inquiry-based learning will be introduced in order to inspire attendees to transform the practical content of a course and engage students as scientists through scientific methodology and creativity.

Resources

Internet access and participants' smartphones 7

Activity

Using dramatizations in face-to-face and online courses to teach physiology

Facilitators

Patricia A. Halpin – University of New Hampshire, Department of Life Sciences, Manchester NH USA.
Email: Patricia.Halpin@unh.edu

Helena Carvalho – Virginia Tech Carilion School of Medicine, Roanoke VA USA. Email: helena@vt.edu

Aims

To demonstrate how dramatizations can engage students in learning
To provide the opportunity to create a dramatization to use in your classroom
To illustrate how dramatization can be used in online courses

Abstract

Adding in-class dramatizations to class time is a fun activity in which students act out different roles in a 'play' that simulates a physiological process; it has been demonstrated to effectively teach Starling forces, the cardiac cycle, membrane transport, and cell signaling. Dramatizations are inclusive activities for diverse learning styles as each student in the class has a role to play. Students benefit by increasing their confidence level through active participation in an accessible venue that invites them to ask questions and promotes long-term retention of material. The instructor benefits by being able to identify misconceptions and remediating them immediately. Dramatizations can be used in any level of instruction, are free or with minimal costs, and are adaptable to any class size. This workshop will provide participants the opportunity to create a dramatization they can use in their own courses. At the end of the session, the participants will showcase their newly created dramatization and receive feedback from the other attendees. Examples of dramatizations using Zoom, which can be used in a lecture or an asynchronous online course will be shared.

Proposed Structure

Introduction and group participation in the cardiac cycle dramatization (10 min)
With input from presenters each group will design and perform a group dramatization activity based on participants' needs (30 min)
Demonstration of groups' newly created dramatizations (20 min)
Demonstration of using dramatizations in online classes (5 min)
Debrief, provide feedback and share ideas with all workshop participants (15 min)

Resources

Colored markers, colored paper, scissors and tape that will stick to clothing



Participant requirements

Bring creativity

Room Requirements

Some open space to move or ability to move tables to the side of the room

Activity

Using educational games to teach physiology

Facilitators

Fernanda Klein Marcondes – Department of Biosciences, Piracicaba Dental School, University of Campinas (UNICAMP), Brazil. Email: ferklein@unicamp.br

Luís Henrique Montezor – Department of Biosciences, Piracicaba Dental School, University of Campinas (UNICAMP), Brazil. Email: ferklein@unicamp.br

Abstract

The aim of this workshop is to present examples of educational games (printed and digital) developed to teach physiology, combined with instructions to promote student engagement, and also with formative assessments. In groups (4 to 6), the participants will receive one education game to solve, and they will analyse and discuss the sequence of activities that are used to provide pre-preparation of students and to evaluate their learning before, during, and after the use of educational games. This workshop includes the educational games: 1) Puzzle of cardiac cycle, and 2) Integrating physiology of synapses, muscle contraction, and autonomic nervous system.

Resources

Participants' laptops (at least one per group)

Activity

Using flipped teaching in underserved colleges to promote student engagement

Facilitator

Chaya Gopalan – Southern Illinois University Edwardsville, Edwardsville IL USA. Email: cgopala@siue.edu

Aims

To offer faculty development on flipped teaching

To teach physiology that is practical, flexible, effective, and student-centered

To engage participants in learning using examples of various assignments and assessments requiring minimal or no technology to integrate into their classes

Abstract

Rural colleges may need more professional development opportunities and resources for developing innovative student-centered teaching methods to promote critical thinking and student engagement in the classroom. Most students in these rural colleges are under-represented, under-resourced, and come from underserved high schools. Development of innovative teaching methods that are practical, flexible, effective, and student-centered are needed to teach pre-health students physiology. The flipped classroom is a contemporary instructional design with a central focus on student learning both in the classroom through discussion, peer interaction, and engaging activities and outside, using instructor-guided assignments. The proposed workshop will offer faculty development on flipped teaching. Participants will be engaged in learning examples of various assignments and assessments using minimal or no technology to integrate into their classes. The participants are expected to select one of their own courses to incorporate flipped teaching during this workshop.

Proposed Structure and timing

Part 1 (5 min) – A polling activity to learn the teaching methods used by the participants

Part 2 (15 min) – Introduction of the flipped teaching model

Part 3 (15 min) – Group activity to allow course design using new knowledge

Part 4 (15 min) – Discussion and tips for successful implementation of flipped teaching with minimum or no technology

Participation requirements



The participants are expected to select one of their own courses to incorporate flipped teaching during this workshop.

ACTIVITY WITH AND FOR THE COMMUNITY (AWFC)

CHALLENGES IN CAREER DEVELOPMENT PATHWAYS: WOMEN VERSUS MAN

Coordinator

Alexis González (Pontificia Universidad Católica so, Chile)

Participants

Alexis A González – Pontificia Universidad Católica de Valparaíso, Chile

Minolfa Prieto – Department of Physiology, Tulane University, USA

Lucienne Morcillo – Associate Professor at Universidade Federal do Rio de Janeiro, Brazil

Marcela Herrera – Labidech Análisis Clínicos, Vita Medicina Reproductiva, Chubut, Argentina

Pilar Cárdenas – Pontificia Universidad Católica de Valparaíso, Chile

General description

This activity will target the community of Puerto Varas and surrounding areas along with the assistant to the meeting. The activity is based on experience about women and men in sciences and their opportunities in the field of physiology and related areas with focus in new career researchers and PhD student students interested in postdoctoral positions and internships abroad.

OPEN SEMINAR TO PUERTO VARAS

Coordinator

Luis Sobrevia (Pontificia Universidad Católica de Chile, Chile)

Participants

PANAM meeting attendees and local Community

Speaker

To select from the PANAM's attendees.

Seminar title

To be determined

Place

Puerto Varas

General description

It has to be general, informative, ludic, short, “amazing”

It must be in Spanish (considering that attendees will be mainly local community)

BRING A BOOK TO PUERTO VARAS'S SCHOOLS

Coordinator

Luis Sobrevia (Pontificia Universidad Católica de Chile, Chile)

Participants

Pan-American (PANAM) *Physiological Sciences* 2023

E-Mail: panamchile2023@gmail.com – Twitter: [@PanamChile2023](https://twitter.com/PanamChile2023)

URL: <https://www.cienciasfisiologicas.cl/panam-2023/>



PANAM meeting attendees

General description

All participants of the PANAM Physiological Sciences 2023 meeting are invited to bring a book to the meeting.

The books can be on any topic ("physiology", literature, science, ecology and ecosystems, history, maths, astronomy, science fiction, medicine, poetry, social sciences, philosophy, etc.).

A series of boxes will be signed with the topics to deposit the books at the validation/registration desk during the whole meeting.

A designated group of people from the meeting will help classify and check the books for topics, general conditions, or any other characteristics that could be inappropriate.

During the last day of the meeting, the books will be donated to different primary Schools in Puerto Varas as a legacy and sign of gratitude to the Community from PANAM Physiological Sciences 2023.

This activity is expected to have a permanent impact from Pan-American physiologists on the local Community.

SCIENTIFIC COMPETITION SESSION

SCIENTIFIC COMPETITION SESSION IN PHYSIOLOGICAL SCIENCE FOR UNDERGRADUATE STUDENTS PANAM 2023

Coordinator

Ivanita Stefanon (Universidade Federal do Espírito Santo, Vitória, Brazil)

Speakers

Selected from applicants attending PANAM 2023

Topics

Various

Allocated time

1 h (60 min)

Description (see below for details)

The objective of the Scientific Competition Session in Physiological Sciences is to provide undergraduate students with a platform to showcase their research work and foster academic excellence in the field of physiology. The competition aims to promote scientific inquiry, critical thinking, and effective communication skills among participants. By encouraging active participation and recognizing outstanding achievements, the competition seeks to inspire a passion for physiology research and pave the way for future advancements in the field. Through the presentation, students will have the opportunity to share their findings, methodologies, and conclusions with a panel of evaluators, fostering collaboration and intellectual growth. At the end of the competition, the top three participants will be awarded honorable mentions, acknowledging their exceptional contributions to the field of physiology.

Information: panamchile2023@gmail.com or ivanita.stefanon@ufes.br



Scientific Competition Session in Physiological Science for Undergraduate Students

**PANAM Physiological Sciences 2023
Puerto Varas, Chile**

REGULATIONS

Coordinator: Ivanita Stefanon, UFES-Brazil

1. Objective:

The objective of the Scientific Competition Session in Physiological Sciences is to provide undergraduate students with a platform to showcase their research work and foster academic excellence in the field of physiology. The competition aims to promote scientific inquiry, critical thinking, and effective communication skills among participants. By encouraging active participation and recognizing outstanding achievements, the competition seeks to inspire a passion for physiology research and pave the way for future advancements in the field. Through the presentation, students will have the opportunity to share their findings, methodologies, and conclusions with a panel of evaluators, fostering collaboration and intellectual growth. At the end of the competition, the top three participants will be awarded honorable mentions, acknowledging their exceptional contributions to the field of physiology.

2. Eligibility:

- 2.1. The competition is open to all undergraduate students from any recognized educational institution. Six (6) students from those subscribed will be selected to the final oral presentation. Selected students for the final oral presentation will be notified in advance via email. Confirmation of presence is required to secure their participation.
- 2.2. Each participant must be the primary author and presenter of the work submitted in the English language.

3. Registration:

- 3.1. Students interested in participating must register online by the specified meeting deadline, providing their personal and academic information, along with an abstract of their research work in English.
- 3.2. The abstract should include a concise summary of the research question, methodology, results, conclusions and financial support.

4. Presentation Format:

- 4.1. The competition will be conducted through **5 min oral presentation (5 slides) (5 min talk + 5 min questions)** as the following model:

Slide 1: Title, Authors, Institution

- ✓ Title of the study: Clearly state the title of the research study.
- ✓ Names of authors and co-authors: List the names of all the authors and co-authors involved in the study.
- ✓ Institution: Mention the name of the educational institution or research organization affiliated with the study.
- ✓ Location: Include the state and country where the institution is located.

Slide 2: Introduction

- ✓ Briefly introduce the research topic and its significance.
- ✓ Clearly state the research objectives.
- ✓ Provide context and background information to engage the audience.

Slide 3: Methods

- ✓ Highlight the methodology employed in the study.
- ✓ Provide a concise overview of the research methodology.
- ✓ Explain the approach, data collection methods, and experimental design.
- ✓ Mention any specific procedures or techniques used.



- ✓ Optionally, include visuals or diagrams to aid understanding.
- ✓ Inform Ethics Committee approval (mandatory)

Slide 4: Results

- ✓ Present key findings and data in a concise and visually appealing manner.
- ✓ Use graphs, charts, or tables to effectively convey results.
- ✓ Highlight significant trends or patterns observed.
- ✓ Provide an analysis of the results, explaining their significance.
- ✓ Optionally, include any statistical analysis or measures used.

Slide 5: Discussion, Conclusion, and Financial Support

- ✓ Discuss the implications of the results and their relevance.
- ✓ Summarize the main conclusions drawn from the research.
- ✓ Acknowledge any financial support received for the study.
- ✓ Mention grants, scholarships, or funding sources that contributed to the research.
- ✓ Highlight the importance of the financial support in enabling the study and its impact on the research outcomes.

It is recommended that the presentation slides be designed in accordance with the branding guidelines of PANAM 2023 Congress. This includes incorporating the official logo, color scheme, and overall visual identity of the congress to ensure a cohesive and professional presentation. Adhering to the congress branding will not only enhance the visual appeal of the slides but also create a sense of unity and alignment with the event.

5. Presentation Time:

- 5.1. Each participant will have a maximum of 5 min to present their work in a slot of 10 min (5 min talk + 5 min questions) to the evaluating committee.
- 5.2. Participants must strictly adhere to the time limit and manage their presentation time effectively.
- 5.3. All presentations and discussions during the competition must be conducted in English.

6. Evaluation:

- 6.1. The evaluating committee will assess the quality and relevance of the research work presented based on scientific content, methodology, results, conclusions and the ability to effectively convey the research within the given time (max 2 min).
- 6.2. The evaluating committee's decision will be final and cannot be appealed.

7. Awards:

- 7.1. The top three (3) participants with the highest scores will receive an honorable mention for their outstanding achievements. All participants will receive a certificate of participation as proof of their involvement in the competition.
- 7.2. The awards will be presented during the congress closing ceremony.

8. Code of Conduct:

- 8.1. Participants must maintain a professional and respectful demeanor throughout the competition.
- 8.2. Any form of plagiarism or academic misconduct will lead to immediate disqualification from the competition.

9. Intellectual Property:

- 9.1. Participants retain full ownership of their research work and intellectual property rights.
- 9.2. By participating in the competition, participants grant the organizing committee the right to display their presentation for promotional purposes with appropriate attribution.

10. Disclaimer:

The organizing committee reserves the right to modify the competition regulations, schedule, or any other aspect deemed necessary. Participants will be duly notified of any changes in a timely manner. By



registering for the Scientific Competition Session in Physiological Sciences, participants agree to comply with the aforementioned regulations and guidelines.