

Latin American Training Program 2018

From Molecules to Behavior: The Quest for New Treatments of Neuropathologies

Course Director: **Juan C. Sáez**

Sunday, August 26th.

17:00-19:00. Reception for graduate students and postdoctoral fellows

Monday, August 27th.

MODULE 1. FROM ION CHANNELS TO NEURONAL NETWORK ACTIVITY

Chair: John Ewer

9:00-9:10 “Opening remarks to the school by the director of the CINV”- **Ramón Latorre**

9:10-10:00 “Developmental Neurogenetics and Behavior using Zebrafish as a Model System”. **Kathleen Whitlock.**

10:00-11:00 “Illuminating chemical synapses to dissect neural circuits in the brain”.
Chiayu Chiu.

11:00-11:30 Coffee Break

11:30-12:30 “Fundamental mechanisms of neuronal excitability”. **Andrés Chávez**

12:30:14:30 Lunch Break

14:30-17:00

Hands on

Techniques used to study the brain development in zebra fish.

Tuesday, August 28th

Chair: Agustín Martínez

9:00-10:00 "Axonal translation and trafficking of plasma membrane proteins". **Andrés Couve**

10:00-11:00 “Functional membrane protein synthesis by isolated squid giant axons”
Ramón Latorre.

11:00-11:30 Coffee Break

11:30-12:30 “The visual system: From the retina to the brain”. **Francois Paquet-Durand**

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Wednesday, August 29th

Chair: Oliver Schmachtenberg

9:00-10:00 “Balanced excitatory and inhibitory signaling in a sensory network”. **Diamond, Jeffrey**

10:00-11:00 Signal transduction mechanisms beyond the dopamine receptor”. **Angus Nairn.**

11:00-11:30 Coffee Break

11:30:12:30 “Tuning of synaptic transmission and plasticity at excitatory and inhibitory synapses by endogenous neuromodulators.” **Andrés Chávez**

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Thursday, August 30th

Chair: Chiayu Chiu

9:00-10:00. “Protein phosphorylation and dephosphorylation in the central nervous system”. **Angus Nairn.**

10:00-11:00. "A Spike Timing-dependent plasticity rule for single, distributed, and clustered dendritic spines". **Roberto Araya.**

11:00-11:30 Coffee Break

130:00-12:30. “Mechanisms underlying synaptic transmission and plasticity at a central synapse”. **Andrés Chávez**

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Friday, August 31st

Chair: Juan C. Sáez

9:00:10:00. “Input transformation by dendritic spines of pyramidal neurons”. **Roberto Araya.**

10:00-11:00. “ NO signaling in the retina”. **Oliver Schmachtenberg**

11:00-11:30 Coffee Break

11:30-12:30. ”Visual Computation in the Vertebrate Retina”. **Jeffrey Diamond**

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Saturday, September 1st

MINISYMPOSIUM ON ION CHANNELS

Chair: Patricio Orio

9:00-9:30 “Gating mechanisms of H⁺ channels”. **Carlos González**

9:30-10:00 ” Allosteric regulation of of Ca²⁺ channels”. **Alan Neely**

11:00-10:30 “Regulation of connexin hemichannels by Ca²⁺ ”. **Helmuth Sánchez**

10:30-11:00 Coffee Break

11:00-11:30 “Voltage gating regulation of hemichannels”. **Isaac García**

11:30-12:00 “Regulation of intercellular communication by Cx-Cx interactions”. **Agustín Martínez**

12:00-12:30 “Exploring the molecular elements for temperature detection in the cold receptor TRPM8 channel”. **Karen Castillo**

12:30:14:30 Lunch Break

15:00-17:00 Students presentations

17:00-17:30 Coffee Break

17:30-19:00 Student’s presentations

Monday, September 3rd

Chair: Ana M. Cardenas

9:00-10:00 Hemichannel trafficking by using TIRF microscopy”. **Agustín Martínez**

10:00-11:00. “Regulation of glial connexin-based channel by cannabinoids”. **Juan C. Sáez**

11:00-11:30 Coffee Break

11:30-12:30 “Neuromodulation of synaptic function by cannabinoids in the rat retina”.
Andrés Chávez.

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Tuesday, September 4th

Chair: Carlos Lagos

9:00-10:00 "Neurotransmitter transporters in health and disease". **Pablo Moya**

10:00-11:00 "The neurochemistry of vision in normal and diseased eyes ". **Monica Acosta.**

11:00-11:30 Coffee Break

11:30-12:30 “The retina as an earlier biomarker of degeneration: Some case studies”.
Monica Acosta

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Wednesday, September 5th

MODULE 2. FROM GENES TO NORMAL AND PATHOLOGICAL BEHAVIOR

Chair: Pablo Moya

9:00-10:00 “From molecules to behavior: a fly’s perspective of the logic underlying the molecular clock”. **Fernanda Ceriani .**

10:00-11:00. “Regulation of Drosophila behavior by neuropeptides and the circadian clock”. **John Ewer**

11:00-11:30 Coffee Break

11:30-12:30 “How does the molecular clock control physiology and behavior?” **Fernanda Ciriani.**

12:30-13:30 “The influence of diet on neurogenesis” **Andrea Calixto**

13:30:15:00 Lunch Break

15:00-17:00 Hands on

Thursday, September 6th

Chair: Andrés Chávez

9:00-10:00 . The diversity of neurodegenerative mechanisms: Apoptosis, Necrosis, or what? **Francois Paquet-Durand**.

10:00-11:00. “Connexin Hemichannels in models of depression”. **Juan C. Sáez**

11:00-11:30 Coffee Break

11:30-12:30 "Neuronal Glutamate Transporter EAAT3: a novel target in Obsessive-Compulsive Disorder". **Pablo Moya**

11:30-12:30.

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Friday, September 7th

MODULE 3. THE QUEST FOR NEW TREATMENTS OF NEUROPATHOLOGIES

Chair: Juan C. Sáez

9:00-10:00 “From basic research to clinical translation: What do you need to make it happen?” **Francois Paquet-Durand**.

10:00-11:00 Mitochondrial function in glial reactivity” **Patricia Cassina**

11:00-11:30 Coffee Break

11:30-12:30 “Detrimental effects of α -synuclein in major functions of astrocytes” **Juan A. Orellana**.

12:30:14:30 Lunch Break

14:30-17:00 Hands on

Saturday, September 8th

Chair: Chiayu Chiu

9:00-10:00. “Participation of glial cells in the pathogenesis of ALS” **Patricia Cassina**.

10:00-11:00. “Metabolic and functional changes during astrocyte activation” **Sonia L. Albarracín**

11:00-11:30 Coffee Break

11:30-12-12:30 “Mechanism of syndromic deafness mutations in Cx26”. **Agustín Martínez**

12:30:14:30 Lunch Break

14:30-16:00 “How to write papers” Andrés Chavez

Monday, September 10th

Chair: Agustin Martínez

9:00-10:00 “Structure/function relationships coded at the molecular architecture of Cx-based channels”. Tomás Pérez-Acle

10:00-11:00 “Molecular Simulations applied to ion channels”. Danilo González

11:00-11:30 Coffee Break

11:30-12:30 “Structure-Based Virtual Screening”. Carlos Lagos

12:30-14:30 Lunch Break

14:30 and on. Discover new bioactive compounds by virtual screening -Carlos Lagos.

Tuesday, September 11th

Chair: Helmuth Sanchez

9:00-10:00 ““H⁺ channels new players in important diseases”. Carlos González

10:00-11:00 “Thermal and pain sensation”. Ramón Latorre

11:00-11:30 Coffee Break

11:30-12:30 “Thermo TRP channels and Kv1 channels in damage-triggered peripheral neuropathies” Rodolfo Madrid

12:30-14:30 Lunch Break

14:30 Hands on

Wednesday, September 12

Chair: Juan C. Sáez

9:00-10:00 “The role of TRPM8 channels in basal tearing and dry eye sensation”. Rodolfo Madrid

10:00-11:00 “*In vivo* heavy ethanol exposure and its impact on neuroinflammation and hemichannel activity” Juan A. Orellana

11:00-11:30 Coffee Break

11:30-12:30 “Epigenetic Editing to treat neurodegenerative diseases”. Brigitte van Zundert

12:30:14:30 Lunch Break

14:30- 15:30 "The endosomal Na⁺/H⁺ exchangers in Autism Spectrum Disorders: from neurodevelopment to neurodegeneration." **Laurent Counillon.**

15:30 and on "How to prepare a grant application". **Juan C. Sáez, Andrés Chávez and Agustín Martínez**

Thursday, September 13th

Chair: Helmuth Sánchez

9:00-10:00 "GABAergic synaptic Plasticity in health and disease." **Marco Fuenzalida**

10:00-11:00 "Obesity and hypothalamic neurons" **Eugenia Morselli**

11:00-11:30 Coffee Break

11:30-12:30 "Cellular and molecular basis of the memory-stress interactions." **Jimmy Stehberg**

12:30:14:30 Lunch Break

14:30 Preparing data for Student presentations

Friday, September 14th

9:00-11:00 Students presentation Part I (Laboratory Results)

11:00-11:30 Coffee Break

11:30-12:30 Students presentation Part II (Laboratory Results)

12:30-14:30 Lunch Break

Free afternoon

Saturday, September 15th

12:30-13:00 Closing ceremony and awards

13:00-15:00 Final Banquet

Hands on Laboratory seminars

- 1. Kathleen Whitlock. Introduce techniques using the zebra fish model to study development of the nervous system.**
- 2. John Ewer. Study gene expression and neural network in *Drosophila melanogaster*.**
- 3. Helmuth Sánchez / Isaac García. Electrophysiology of Connexin Hemichannels and Gap junction channels linked to genetic deafness**
- 4. Oliver Schmachtenberg. Electrophysiology and calcium imaging in the retina.**
- 5. Nicolás Palacios / Agustín Martínez / Jaime Maripillán. Functional analysis of gap junction channels.**
- 6. Andrés Chavez / Chiayu Chiu. Classical and new methodologies to study synaptic function and plasticity**
- 7. R. Sotomayor. Brain neurochemistry.**
- 8. Carlos González / Karen Castillo. Electrophysiological and fluorescent techniques to study ion channels structure-function relationship**
- 9. Carlos Lagos. Discover new bioactive compounds by virtual screening**
- 10. Patricio Orió. Mathematical Modelling of Neuron Behavior**
- 11. David Naranjo / Hans Moldenhauer. Expression of ion channels and electrophysiology of larva muscle in *Drosophila***
- 12. Arlek González-Jamett / Ana María Cárdenas Díaz. Monitoring the release of transmitters using electrochemical techniques.**