

Latin American Training Program
Montevideo, September 26 - October 14, 2022

Latin American Training Program 2022

MOLECULES, CELLS AND CIRCUITS: UNDERSTANDING NERVOUS SYSTEM MECHANISMS

Montevideo, September 26 -October 14

Program

ASISTENCIA LIBRE A CONFERENCIAS

INTRODUCTION

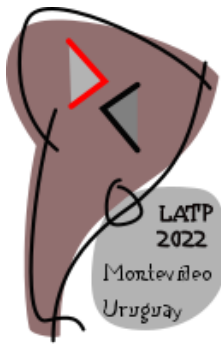
The aim of the Latin American Training Program (LATP) Course 2022 entitled “From Molecular and Cellular Neuroscience to Cognition: Clues to Understand Brain Diseases” is to provide the next generation of leading Latin American neuroscientists with intensive training on different aspects of neurobiology for three weeks. The selected students will be taught by leading neuroscientists from the region and overseas. A key feature of the LATP 2022 course is the strong hands-on lab activities that will give the students the opportunity to work side-by-side with expert neurobiologists and learn first-hand about state-of-the-art technologies (from electrophysiology, advanced imaging, microdialysis, and behavior analysis). In addition to lectures on fundamental topics of neuroscience, the students will actively engage in discussions about the development of professional skills. The overall goal of this course is to promote among Latin American students a broad knowledge of neuroscience within the context of critical thinking.

MODULE I. CELLULAR AND MOLECULAR NEUROBIOLOGY: NEURONS, GLIA, AND PLASTICITY

September 26-October 1, 2022

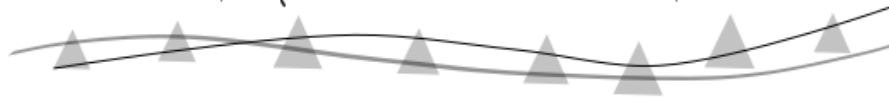
Coordination: Michel Borde and Raúl E. Russo

This module will focus on central aspects of cellular neurobiology such as the development of neural circuits, the biology of neural stem cells and neurogenesis, the biophysical basis of



Latin American Training Program

Montevideo, September 26 - October 14, 2022



excitability and synaptic transmission together with the analysis of various forms of plasticity of neural circuits. Cutting edge experimental approaches will be discussed.

Monday September 26

Chair: *Raúl E. Russo*

09:00-09:10 | Opening Introduction to the School

09:10-10:00 | Cellular aspects of early neural development in vertebrates. *Flavio Zolessi*.

10:00-10:50 | TRP channels and thermosensation. *Gonzalo Budelli*.

10:50-11:20 | **Coffee break**

11:20-12:00 | The integrative properties of neurons: intrinsic properties and neuronal compartments. *Michel Borde*.

12:00-14:30 | **Lunch break**

14:30-19:00 | **Introduction to Hands-on lab activities I**

Tuesday September 27

Chair: *Michel Borde*

09:00-09:50 | Presynaptic protein synthesis and synaptic function. *Pablo Castillo*.

09:50-10:40 | The axon: far more complex than a signal carrier. *Federico Trigo*.

10:40-11:10 | **Coffee break**

11:10-12:00 | Electrical synaptic transmission. *Alberto Pereda*.

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

Wednesday September 28

Chair: *Federico Trigo*

09:00-09:50 | Ca²⁺ voltage-dependent channels and the Ca²⁺- and voltage -activated K⁺ (BK) channel. *Gonzalo Ferreira*

09:50-10:40 | Endocannabinoids as regulators of synaptic plasticity. *Pablo Castillo*.

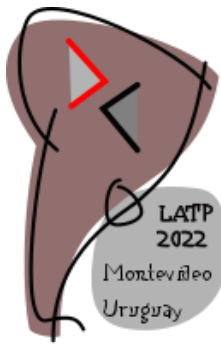
10:40-11:10 | **Coffee break**

11:10-12:00 | Molecular complexity of electrical synapses. *Alberto Pereda*.

12:00-14:30 | **Lunch break**

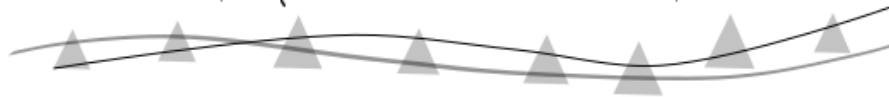
14:30-19:00 | Hands-on

20:00-21:00 | PROFESSIONAL SKILLS I "How to write a research proposal". *Benedikt Berninger & "A look into the process of scientific publishing". Pablo Castillo.*



Latin American Training Program

Montevideo, September 26 - October 14, 2022



Thursday September 29

Chair: Raúl E. Russo

09:00-09:50 | Membrane properties and neural circuits: Focus on the role of striatal cholinergic interneurons in Parkinson's disease. *Cecilia Tubert*

09:50-10:40 | Engineering new interneurons for grown-up brains. *Benedikt Berninger.*

10:40-11:10 | **Coffee break**

11:10-12:00 | How to mend the adult mammalian CNS: Neuronal repair and replacement.

Christian Göritz.

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

20:00-21:00 | Neuroscience by night: an informal open discussion. "*Synapse proposes, neuron disposes. Is that so?*". Active and passive intrinsic neuronal properties and synaptic integration and plasticity. *Sebastián Curti, Pablo Castillo and Cecilia Tubert.*

Friday September 30

Chair: Pablo Castillo

09:00-09:50 | Cerebral organoids as a model system to study human brain development.

Benedikt Berninger.

09:50-10:40 | What is wrong with the striatal cholinergic interneurons in Parkinson's disease and dyskinesia? Focus on intrinsic excitability. *Cecilia Tubert*

10:40-11:10 | **Coffee break**

11:10-12:00 | Neurogenesis in the adult hippocampus. *Alejandro Schinder.*

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

20:00-21:00 | Meet the PIs (Optional) In this activity students will have the chance, by their request, to meet principal investigators that participate in the course in an informal environment to discuss their science, future training possibilities and other aspects of interest for the young researchers.

Saturday October 1 - Location Palladium Business Hotel

Chair: Benedikt Berninger

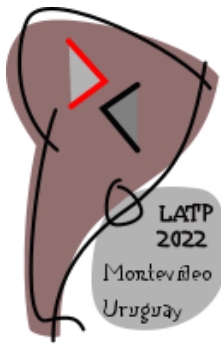
Mini-Symposium I: Neural Stem Cells and Adult Neurogenesis

09:00-09:50 | Functional integration of newborn neurons in the hippocampal circuits of the adult and aging brain. *Alejandro Schinder.*

09:50-10:40 | Connexin signaling and the awakening of the ependymal stem cell niche. *Raúl E. Russo.*

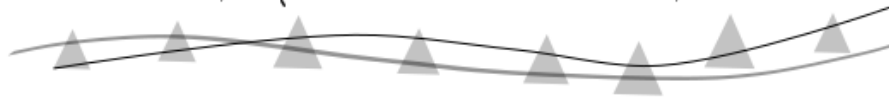
10:40-11:10 | **Coffee break**

11:10-12:00 | Scarring and repair in the central nervous system. *Christian Göritz.*



Latin American Training Program

Montevideo, September 26 - October 14, 2022



12:00-14:30 | Lunch break

Chairs: Michel Borde and Raúl E. Russo

15:00-16:00 | Presentations of Hands-on Lab activities I

MODULE II. NEURODEGENERATIVE AND NEUROPSYCHIATRIC DISORDERS: NEW EXPERIMENTAL APPROACHES AND THERAPEUTIC STRATEGIES

October 3-8, 2022

Coordination: Patricia Cassina and Cecilia Scorza

This module will focus on the neural mechanisms involved in the physiopathology of neurodegenerative (Parkinson's Disease, Amyotrophic Lateral Sclerosis), and metabolic and neuropsychiatric diseases (schizophrenia-psychosis, depression, and drug addiction). Additionally, students will have the opportunity to learn new approaches to study these pathologies, from neuronal and astrocyte cultures to behavior, using techniques such as immunohistochemistry, confocal microscopy, flow cytometry, and intracerebral *in vivo* microdialysis.

Monday October 3

Chair: Patricia Cassina

09:00-09:10 | Welcome and Opening Module II

09:10-10:00 | A role for glial cells in brain pathologies. *Luis Barbeito.*

10:00-10:50 | Microglia in health and disease. *Cintia Roodvelt.*

10:50-11:20 | Coffee break

11:20-12:00 | Oligodendrocytes in neurometabolic diseases. *Silvia Olivera.*

12:00-14:30 | Lunch break

14:30-19:00 | Introduction to hands-on activities II

Tuesday October 4

Chair: Silvia Olivera

09:00-09:50 | Neuroinflammation. *Cintia Roodvelt.*

09:50-10:40 | Glial reactivity and metabolic modulation. *Patricia Cassina.*

10:40-11:10 | Coffee break

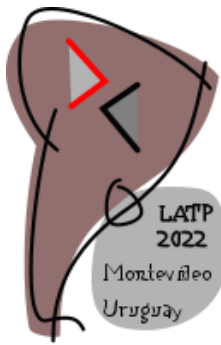
11:10-12:00 | Neuronal death mechanisms in Parkinson Disease. *Giselle Prunell.*

12:00-14:30 | Lunch break

14:30-19:00 | Hands-on

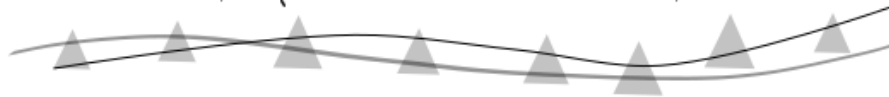
Wednesday October 5

Chair: Patricia Cassina



Latin American Training Program

Montevideo, September 26 - October 14, 2022



09:00-09:50 | Brain energy metabolism: astrocytes-neurons coupling. *Juan Pedro Bolaños.*

09:50-10:40 | Molecular mechanisms of neuronal death and survival. *Angeles Almeida.*

10:40-11:10 | **Coffee break**

11:10-12:00 | Molecular imagenology in neurodegenerative diseases. *Andrés Damian.*

12:30-14:30 | **Lunch break**

14:30-19:00 | Hands-on

Thursday October 6

Chair: Cecilia Scorza

09:00-09:50 | Neurotoxic effect of ethanol exposition. *Alicia Brusco.*

09:50-10:40 | Ketamine: a polypharmacological drug with rapid antidepressant effects. *Miguel Reyes Parada.*

10:40-11:10 | **Coffee break**

11:10-12:00 | Vasopressin and oxytocin: role in drug addiction and therapeutic potential. *Georgina Renard.*

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

20:00-21:00 | PROFESSIONAL SKILLS II "Collaborative Neuroscience". *Juan Pedro Bolaños y Angeles Almeida.*

In this activity students will have the chance to discuss with prestigious scientists their experience in establishing collaborative networks.

Friday October 7

Chair: Giselle Prunell

09:00-09:50 | Psychotic-like effects induced by NMDA-R antagonists: role of GluNR2C. *Cecilia Scorza.*

09:50-10:40 | High frequency oscillations of the EEG in animal models of psychosis. *Pablo Torterolo.*

10:40-11:10 | **Coffee break**

11:10-12:00 | Psychedelic drugs. *Ignacio Carrera.*

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

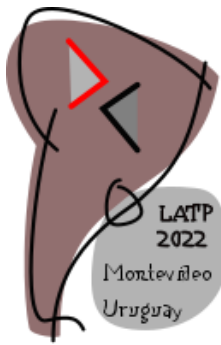
20:00-21:00 | Meet the PIs (Optional)

Saturday October 8 - Location IIBCE

Chairs: Patricia Cassina and Cecilia Scorza

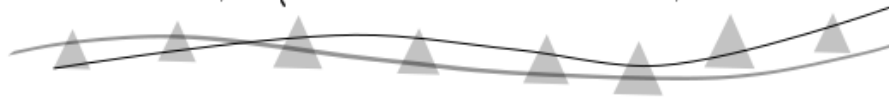
11:00-12:00 | Presentations of Hands-on Lab activities II

12:00-13:30 | **Lunch break**



Latin American Training Program

Montevideo, September 26 - October 14, 2022



14:00-15:30 | Poster blitz (3 min)

15:30-16:00 | **Coffee break**

16:00-18:00 | Poster session

MODULE III: NEURAL SYSTEMS, COGNITION, GENOMICS & BEHAVIOR.

October 10-14, 2022

Coordination: Leonel Gómez and Ana Silva

This module will focus on neural circuits solving problems integrating computational and behavioral perspectives. The neural and molecular mechanisms underlying behavior, perception, and cognition will be explored in iconic vertebrate model systems. We will combine multi-level experimental approaches with theoretical modeling and bioinformatics processing to highlight general strategies of neural computing across evolution.

Monday October 10

Chairs: Leonel Gómez and Ana Silva

09:00-09:10 | Welcome and Opening Module III

09:10-09:50 | Neural Circuits. *Leonel Gómez - Ana Silva*

09:50-10:40 | Neuronal Networks. *Ruben Coen-Cagli*

10:40-11:10 | **Coffee break**

11:10-12:00 | Genomics of Behavior. *José Sotelo Silveira*

12:00-14:30 | **Lunch break**

14:30-19:00 | Introduction to hands-on lab activities III

Tuesday October 11

Chair: Leonel Gómez

09:00-09:50 | *Cognitive and computational approaches to perception. Nature and challenges of perception. Leonel Gómez*

09:50-10:40 | *Cognitive and computational approaches to perception. Neural basis of early visual processing. Ruben Coen-Cagli*

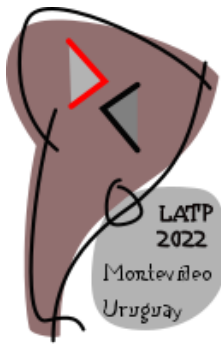
10:40-11:10 | **Coffee break**

11:10-12:00 | *Cognitive and computational approaches to perception. Computing with auditory circuits. José Luis Peña*

12:00-14:30 | **Lunch break**

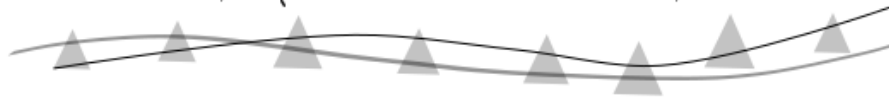
14:30-19:00 | Hands-on

Wednesday October 12



Latin American Training Program

Montevideo, September 26 - October 14, 2022



Chair: José Luis Peña

09:00-09:50 | *Neural bases of perception. Auditory computation in the frog brain. Kim Hoke*

09:50-10:40 | *Neural bases of perception. The electromotor-electrosensory loop of pulse gymnotiformes. Angel Caputi*

10:40-11:10 | **Coffee break**

11:10-12:00 | *Neural bases of perception. Adaptive command for orienting behavior in premotor brainstem neurons of barn owls. José Luis Peña*

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

20:00-21:00 | PROFESSIONAL SKILLS III "Women in Latin American Neuroscience". *Verónica Amarante, ECLAC-IBRO LARC.*

Thursday October 13

Chair: Laura Quintana

09:00-09:50 | *Neural and molecular bases of social behavior. Neuroendocrinological modulation of communication signals. Vielka Salazar*

09:50-10:40 | *Neural and molecular bases of social behavior. Seasonal plasticity and sex differences. Laura Quintana*

10:40-11:10 | **Coffee break**

11:10-12:00 | *Neural circuits and molecular bases of social behavior. Anita Autry*

12:00-14:30 | **Lunch break**

14:30-19:00 | Hands-on

20:00-21:00 | Meet the PIs (Optional)

Friday October 14

Chair: Ana Silva

09:00-09:50 | *Neural and molecular bases of social behavior. Agonistic behavior. Ana Silva*

09:50-10:40 | *Neural and molecular bases of social behavior. Neuroendocrinological bases of maternal care in mammals. Natalia Uriarte*

10:40-11:10 | **Coffee break**

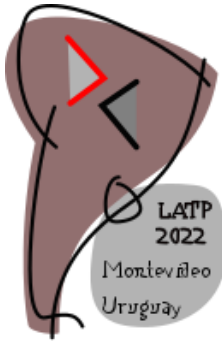
11:10-12:00 | *Neural and molecular bases of social behavior. Functional circuits shaping parental behavior. Anita Autry*

12:00-14:30 | **Lunch break**

15:30-17:30 | Lab work student presentations III

17:30-18:00 | **BREAK**

18:00-19:00 | Closure Ceremony



Latin American Training Program

Montevideo, September 26 - October 14, 2022

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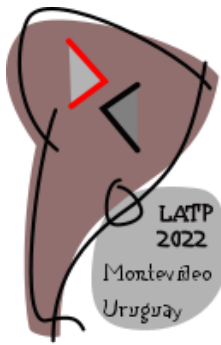
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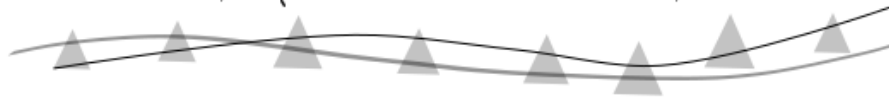
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Latin American Training Program

Montevideo, September 26 - October 14, 2022



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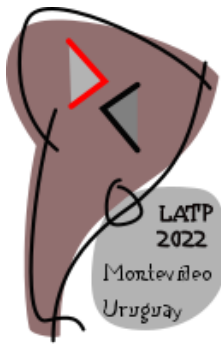
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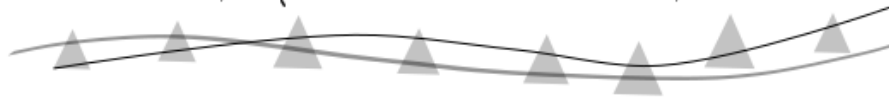
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Latin American Training Program

Montevideo, September 26 - October 14, 2022



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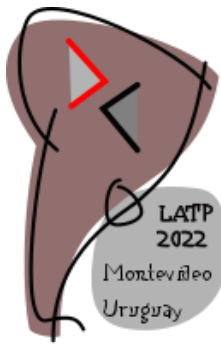
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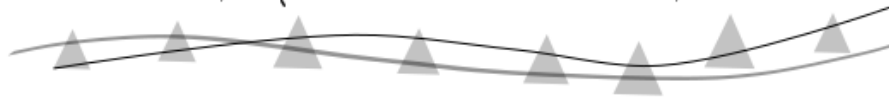
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Latin American Training Program

Montevideo, September 26 - October 14, 2022



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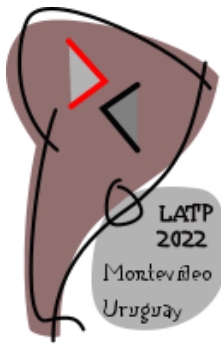
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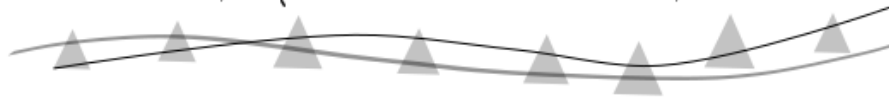
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Montevideo, September 26 - October 14, 2022



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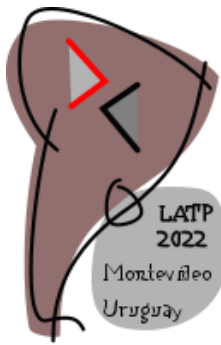
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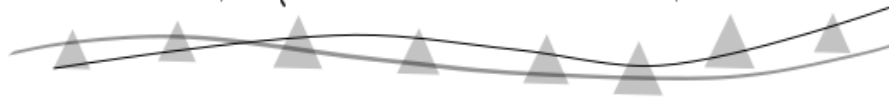
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Latin American Training Program

Montevideo, September 26 - October 14, 2022



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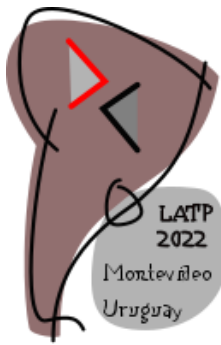
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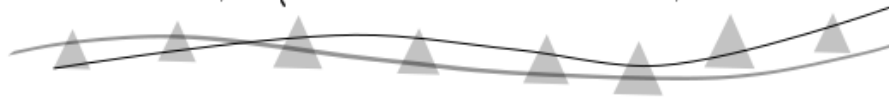
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Latin American Training Program

Montevideo, September 26 - October 14, 2022



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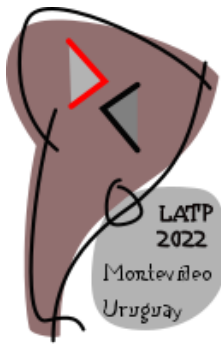
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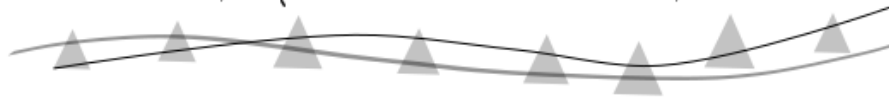
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