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Abstracts of the 2019 Meeting of Argentine Society for Research in Neurosciences

XXXIV Annual Meeting SAN 2019
October 3–5, 2019
Villa Carlos Paz, Córdoba, Argentina

The 2019 meeting of the Argentine Society for research in Neurosciences (SAN) was held at Villa Carlos Paz, Córdoba, Argentina, in Portal del Lago Hotel, from October 3 to 5, 2019.

There were 350 attendees among researchers, scholars, PhD students and guests from different centers and universities of Argentina and abroad from 8 countries of Latin America, North America and Europe. Our congress had a total of 4 Plenary Lectures, 6 Symposia, 2 Short Conferences, 6 Youth Conferences, 19 Oral Communications, 256 Posters covering a broad number of areas in the field of neurosciences together with 2 special activities at lunch time and a round table on "Gender and Science."

It is noteworthy that two of the Plenary Lectures were placed in honors of the pioneers of neurochemistry and neurobiology of Argentina, Drs. Ranwel Caputto and Eduardo De Robertis. This year the "Ranwel Caputto" Lecture was delivered by Prof. Belen Elgoyhen of the University of Buenos Aires (Argentina) and the "De Robertis" Lecture by Prof. Beatriz L. Caputto of the National University of Córdoba (Argentina). The "Opening Lecture" was given by Prof. Marla B. Feller, Department of Molecular and Cell Biology and Helen Wills Neuroscience Institute, University of California (USA) and the "Hector Maldonado" Lecture by Prof. Lucas Pozzo-Miller Department of Neurobiology, University of Alabama at Birmingham (USA). Short conferences were delivered by Drs. Ethan Buhr of the University of Washington in Seattle (USA), and Emilio Kropff of the Leloir Institute, Buenos Aires (Argentina).

As pre-meeting activity, the specific course for PhD students "Molecular and Cellular Neuroscience and Neurochemistry: Experimental strategies for studying the nervous system in health and disease," took place on September 30 to October 1–2, 2019 at the School of Chemical Sciences of the National University of Córdoba, Córdoba with the participation of more than 60 students.

Remarkably, all the activities organized, including the Symposia and the Young Investigator Lectures, covered a number of diverse disciplines in the field of neurosciences with the participation of outstanding invited speakers from Argentina and other countries.

Moreover, a very friendly atmosphere for discussion and data presentation was generated during the poster and oral communication sessions with the participation of 104 researchers, 139 PhD students, 64 undergrads and 34 postdocs from Argentina, Chile, Brazil, Uruguay, USA, Canada, Denmark, Germany and France.

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Short Program SAN 2019

Mon., Sept 30th - Wed., Oct 2nd	Thursday, October 3rd		Friday, October 4th	Saturday, October 5th
9:00 - 18:00 PRE-CONGRESS COURSE *"Molecular and Cellular Neuroscience and Neurochemistry: Experimental strategies for studying the nervous system in health and disease"* *Auditorio Ciencias I Facultad de Ciencias Químicas – UNC* REGISTRATION	8:30 - REGISTRATION 9:00 - 11:00 SYMPOSIUM I *"New perspectives and mechanisms underlying neurological disorders"*		8:30 - 10:30 SYMPOSIUM III *"Molecular mechanisms of epigenetics and chromatin remodeling during brain development and aging"*	8:30:00 - 10:30 SYMPOSIUM VI *"Sensory processing and integration in olfactory and tactile systems"*
	11:00 - 11:30 Coffee break		10:30 - 11:00 Coffee break	10:30 – 11:00 Coffee break
	11:30 - 12:30 OPENING LECTURE Prof. Marla Feller		11:00 - 13:00 SYMPOSIUM IV *"First impressions: New roles for perinatal factors governing brain development"*	11:00 - 12:00 Oral Communications Room Auditorio (OC 8-12) Room Lago (OC 13-18)
				12:00 - 13:00 EDUARDO DE ROBERTIS LECTURE Prof. Beatriz Caputto
	12:30 – Lunch with activities *"The 3Rs in neuroscience research"*		13:00 - Lunch with activities *"HD Foundation"*	13:00 – Farewell Lunch
	14:30 - 15:30 SHORT LECTURES Ethan Buhr Emilio Kropff	14:30 – 16:00 Oral Communications Room Lago (OC 1-7)	14:30-15:30 Young Investigator Lectures Room Auditorio (YIL 1-3) Room Lago (YIL 4-6)	
	15:30-16:00 Gender and Science Verónica de la Fuente			
	16:00 - 17:30 SYMPOSIUM II *"Advances in early diagnosis and in experimental therapy of Alzheimer´s disease"*		15:30 - 17:30 SYMPOSIUM V *"Sexual differences on development and function of CNS"*	
	17:30 - Coffee break		17:30 - Coffee break	
	17:30 - 19:30 Poster Session (Even numbers)		17:30 - 19:30 Poster Session (Odd numbers)	
	19:30 - 20:30 RANWEL CAPUTTO LECTURE Prof. Ana Belén Elgoyhen		19:30- 20:30 HÉCTOR MALDONADO PLENARY LECTURE Prof. Lucas Pozzo-Miller	
	20:30 WELCOME RECEPTION		20:30 SAN General Assembly	

Neural Circuit Physiology

P207.-Early Ethanol Preexposure Modifies Expression of the 5HT2A Receptor Promoting Long-Term Breathing Plasticity in Neonate Rats

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EtOH's effects upon respiration are attributed to central respiratory network disruptions, especially in the medullary serotonin (5HT) system. 5HT2A/2C receptors are involved in the reduction of the phrenic nerve activity and breathing depression. We hypothesize that early EtOH preexposure alters neonatal respiration through the 5HT systeḿs plasticity. Here, we evaluated breathing rates and the relative expression of 5HT 2 A and 2 C receptors in the brainstem as a function of EtOH preexposure in neonates. Pups received i.g administrations of 2.0 or 0.0 g/kg EtOH at postnatal days (PD) 3, 5 and 7. At PD 9, breathing frequencies were recorded under normoxia or hypoxia. Brainstems were collected to quantified relative mRNA expression of 5HT 2 A and 2 C receptors by qPCR. Under normoxia, EtOH preexposed pups (preEtOH) exhibited high 5HT2A expression levels and breathing depressions. An opposite phenomenon was observed in preEtOH pups tested under hypoxia. An exacerbated hyperventilation associated with low 5HT2A expression levels was found. No significant differences were found in 5HT2C expression levels. These results together with our previous findings that show changes in the raphe obscurus activation patterns, suggest that a brief EtOH preexposure is enough to induce 5HT system's plasticity, disturbing neonatal breathing. The 5HT components mismatch may be associated with breathing disruptions commonly observed in human neonates, such as Sudden Infant Death Syndrome.

Neural Circuit Physiology

P208.-Neuronal Correlates for the Timely Execution of Actions in the Dorsal Striatum

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The selection and the appropriate execution of sequences of movements is essential to survival. Striatal activity has been shown to signal the initiation and termination of behavior and it is also involved in the selection of future actions. Here we studied the neuronal activity of the dorsal striatum of adult rats that were trained to obtain water by emitting a sequence of 8 licks following a visual cue. Trials were self-initiated by the animal by entering into the nose-poke following a 2.5 s inter-trial interval (ITI). We found a modulation of the neuronal activity related to different events in the task such as the execution of the action sequence, reward delivery and at the boundaries of the trials (nose poke entry and exit). In particular, firing rate modulation previous to the beginning of the trials was larger for longer waiting times. This anticipatory activity did not merely reflect elapsed time nor the motor plan to be executed so, to assess if it was related to reward expectancy, rats were trained to initiate trials in a restricted time-window (ITI 2.5–5 s). Results show thatactivity modulation for long waiting times differed between both versions of the task: when the ITI was long and had no reward associated to it, the amplitude of the modulation decayed, whereas rewarded long ITIs had an increasing anticipatory activity. We hypothesize this striatal activity reflects the animals' subjective valuation of timing and is key for the timely execution of actions.

Neural Circuit Physiology

P209.-Adult Born Dentate Granule Cells Evoke CA3 Activity With a Gain That Increases Along Maturation

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Hippocampal granule cells (GCs) are among the few neurons that are born throughout mammalian lifespan. It has been shown that young adult born GCs (4 weeks old) are transiently hyperplastic and excitable compared to mature ones (8 weeks old). While their inputs are well characterized, only a few studies address the maturation of GCs outputs. Here we aim to investigate the influence of developing adult born GCs on CA3, its main target. We hypothesize that evoked activity in CA3 reflects transient properties of young GCs. To explore this possibility, we performed optical stimulation of a cohort of adult born GCs expressing channelrhodopsin-2 in awake behaving mice while recording neuronal activity in CA3. We used different frequencies of stimulation at variable laser intensities to stimulate young and mature GCs. We found that mature GCs recruit more CA3 single unit activity, with frequency dependent facilitation. Evoked local field potentials followed a similar pattern. Interestingly, a small subset of putative pyramidal CA3 cells presented significantly high spiking levels as long as 50 ms after the light pulse. Only mature GCs were able to evoke this sustained activity. Is this persistent excitability caused by attractor dynamics? Do adult born neurons reshape de architecture of recurrent CA3 networks? These results open new challenges regarding the function of adult hippocampal neurogenesis and mnemonic networks dynamics dependent on the neurogenic niche.

Neural Circuit Physiology

P210.-Lower Density of Perisomatic GABAergic Boutons Containing α1 Subunit and Excitation/Inhibition Imbalance in a Mouse Model of Schizophrenia

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Schizophrenia in characterized by cognitive symptoms that are present before the onset of psychosis. Cognitive processes correlate with synchronous activity, which at the neuronal level is represented by membrane potential oscillations, critical for neuron firing and produced by excitatory and inhibitory inputs. Importantly the excitation (E) is balanced by inhibition (I), i.e., when E increases, I proportionally increases and is maintained in each cycle in a wide range of synaptic conductance. Parvalbumin interneuron (PVI) activity seems crucial for the E/I balance, and also, PV dysfunction may lead to cognitive deficits. Thus, PVI function deficits may produce a new E/I steady state or an altered dynamic range of E/I balance, and thus alter the circuit function. We used a model of PVI dysfunction by selectively ablating the NMDAR in corticolimbic PVIs to test if the E/I balance in the adult mPFC is altered by a PV dysfunction early. The results show that KO mice show altered E/I balance at the functional connectivity level that can be compensated only under low network activity. Here we propose to find a structural correlate to the E/I changes in the KO mice by estimating the GABA synapses in the mPFC. We found that mPFC neurons of KO mice have less α1 subunit perisomatic GABA synapses, whereas there is no change in those containing the α2 subunit or PV. Finally, we found differences in the frequency of I inputs vs. the number of perisomatic α1 GABAergic synapses correlation.

Neural Circuit Physiology

P211.-Exploring the Influence of Higher Order Brain Regions on the Piriform Cortex Neuronal Activity

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The Piriform cortex (PC), the main region of the olfactory cortex, receives afferent (bottom-up) sensory inputs from the olfactory bulb (OB) and extensive (top-down) inputs from higher-order areas such as the basolateral amygdala (BLA) and the lateral entorhinal cortex (LEC). To understand the contribution of the BLA and LEC to the processing of odors we study their functional connectivity to the posterior PC (pPC). We infected the BLA and the LEC with adeno-associated virus to express channelrhodopsin (ChR2-AAV) in either excitatory neurons (under CamKIIa promoter) or inhibitory Parvalbumin interneurons (using PV-Cre mice). We recorded then, in acute brain slices, postsynaptic currents and spiking in different principal neurons of the pPC in response to photostimulation. We found that both excitatory and inhibitory long range projections coming from the BLA synapse preferentially onto pyramidal neurons of the deep layers of pPC and do not contact semilunar neurons of the superficial layer. Moreover, we discover that inputs from both BLA and LEC can modulate the output of pPC neurons in response to stimulation of OB afferents. The LEC and BLA inputs could provide contextual and valence information associated to odors. To investigate the role of those regions in the processing of odors in vivo, we are conducting experiments to photoinactivate them alternatively during an associative odor-context-reward