CONFERENCIAS / LECTURES

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RESOLUTION PHARMACOLOGY – FROM CHRONIC INFLAMMATION TO INFECTION. Farmacología de la Resolución -desde inflamación crónica a infección.

Resúmen:
Inflammation is elicited by the host in response to microbes, and is believed to be essential for protection against infection. In contrast, chronic and uncontrolled inflammation may cause tissue damage and is implicated in the pathogenesis of various chronic diseases in humans. When infection is controlled or an initiating stimulus is removed, the inflammatory response is followed by a resolution phase and return to homeostasis. In the last few years, a significant amount of research has revealed that the resolution of inflammation is an active process driven by pro-resolving molecules which trigger a series of actions in tissues that results in return to homeostasis. I will review the major pro-resolving molecules, the biological responses triggered by these mediators and their potential impact on chronic inflammation. Recent proof of concept studies and the clinical use of steroids during COVID-19 have provided major evidence to show that targeting inflammation may be beneficial during infection. I will review our studies showing that pro-resolving molecules are beneficial in the context of viral and bacterial infection and may serve as valuable adjunct therapies alongside antimicrobial agents in treating infectious diseases.

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THE AMAZING MOLECULAR DIVERSITY OF HYPOTHALAMIC NEURONS: TACKLING MECHANISMS ONE NEURON AT A TIME. La asombrosa diversidad molecular de las neuronas hipotalámicas: abordando los mecanismos una neurona a la vez.

Resúmen:
Abstract: The hypothalamus maintains whole-body homeostasis by integrating information from circulating hormones, nutrients and signaling molecules. Distinct neuronal subpopulations that express and secrete unique neuropeptides execute the individual functions of the hypothalamus, including, but not limited to, the regulation of energy homeostasis, reproduction, and circadian rhythms. Alterations at the hypothalamic level can lead to a myriad of diseases, such as type 2 diabetes mellitus, obesity, and infertility. The excessive consumption of saturated fatty acids can induce neuroinflammation, endoplasmic reticulum stress, and resistance to peripheral signals, ultimately leading to hyperphagia, obesity, impaired reproductive function, and disturbed circadian rhythms. This lecture focuses on the how the changes in the underlying molecular mechanisms caused by palmitate exposure, the most commonly consumed saturated fatty acid, and the potential involvement of microRNAs, a class of non-coding RNA molecules that regulate gene expression post- transcriptionally, can result in detrimental alterations in protein expression and content. Studying the involvement of microRNAs in hypothalamic function holds immense potential, as these molecular markers are quickly proving to be valuable tools in the diagnosis and treatment of metabolic disease.

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DEMYSTIFYING PUBLISHING IN PHARMACOLOGY: A CONVERSATION WITH THE EDITOR. desmitificando la publicación en farmacología: una conversación con el editor.

Resúmen:
This talk is designed to guide researchers in enhancing their chances of publication in high quality Pharmacological journals, with a especial focus on the Pharmacological Research family (Elsevier). The participants will benefit from an insider perspective on how to shape their submissions for success, focusing on crucial elements like robust experimental design, clear novelty, and comprehensive in vitro and in vivo validation. Through direct guidance and open discussion, the editor will address common challenges that lead to desk rejections and offer tips on crafting compelling abstracts, choosing effective titles, and responding to reviewerfeedback. Attendees will gain a clearer understanding of the journal's commitment to transparent and author-friendly practices. Additionally, we will discuss the concept of sound-science and its relevance for building a reliable knowledge base and advancing scientific understanding in a systematic and reproducible way. Overall, this session aims to empower participants seeking opportunities to communicate their findings to a broad and highly qualified audience especialized in pharmacological research.

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SEX SPECIFIC EFFECTS OF STRESS ON HIPPOCAMPUS: NEW OPPORTUNITIES OF PHARMACOLOGICAL INTERVENTIONS. Efectos sexo específicos del estrés en el hipocampo: nuevas oportunidades de intervenciones farmacológicas.

Resúmen:
The research highlights significant sex differences in the prevalence and severity of psychiatric disorders, particularly anxiety and depression, which are more common in women and linked to psychosocial stress. The primary aim is to investigate how these sex differences in rats influence the effects of chronic stress on synaptic function in the hippocampus, a brain region crucial for memory and emotional regulation. The studies have identified key factors that regulate hippocampal function and the varying responses of susceptibility and resilience to stress. By exploring the molecular basis of these differences, the research seeks to uncover potential molecular targets for developing more effective therapies for mood disorders. Preliminary findings indicate that the hippocampal transcriptome exhibits differential responses to stress based on biological sex, with ongoing studies focusing on local transcriptomic changes in somatic and dendritic regions of the dorsal hippocampus in male and female rats.

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GATHERING CHEMISTRY, PHYSICS, BIOLOGY AND PHARMACOLOGY AROUND POLYMERIC BIOMATERIALS FOR WOUND HEALING. La reunión de la química, la física, la biología y la farmacología alrededor de los biomateriales poliméricos para la cicatrización de heridas

Resúmen:
Introduction. Wound healing is a process that might be hindered by sustained inflammation, which may be multifactorial, including underlying chronic diseases and bacterial infection. Tissue engineering, a discipline that gathers chemistry, physics, biology, and pharmacology around polymeric materials searches for solutions to this problem. Aim. The aim of this talk is to show several polymeric tissue engineering devices we have developed and their physicochemical, biological, and pharmacodynamic properties. Methods. The scaffolds were produced by freeze-drying raw materials solutions of chitosan, hyaluronic acid, gelatin, and/or grounded Durvillaea Antarctica with or without crosslinking. The scaffolds were seeded with mesenchymal stem cells, Buddleja globosa Hope extract or Pannexin inhibitors (PNX inhs). The evaluated outcomes included bending resistance, humidity and swelling capacity. In addition, biocompatibility with dermal human fibroblasts through the resarzurin assay, determination of trophic factors secretion by ELISA, antibacterial and antibiofilm activities against pathogenic microorganisms and fibroblasts migration assays were determined. Also, some scaffolds were evaluated for their in vivo performance in ischemic and normal full-thickness wounds. Results. Most of the scaffolds exhibit mechanical resistance, humidity and noticeable water absorption capacity. All of the scaffolds were biocompatible and secrete VEGF. The incorporation of Buddleja globose extract was associated with antibacterial and pro-regenerative activities, both in vitro and in vivo. PNX inhs-constructed devices promoted both in vitro and in vivo healing and showed pain-relieving capacity in an ischemic aged rat wound healing model. Finally, scaffolds made of gelatin/ Durvillaea Antarctica showed promising in vitro wound healing properties. Discussion and Conclusion. Wound healing is an unsolved medical need. We have developed several platforms that might be used for wound heal.

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A SIGHTSEEING TOUR ALONG A LIFE DEVOTED TO PHARMACOLOGY: HARD WORK, OUTSTANDING TEACHERS, SOME HIGHLIGHTS AND MANY FRIENDS. Un recorrido turístico por una vida dedicada a la farmacología: trabajo duro, profesores destacados, algunos momentos destacados y muchos amigos.

Resúmen:
While staying in Bratislava in1973, I was invited to apply for an academic career leading to a PhD, fulfilled in 1978, letting me to apply for a scholarship at the Karolinska Institutet (KI), Stockholm, received by Urban Ungerstedt, Dept. of Histology, just before he was nominated Professor at the Dept. of Pharmacology, KI, 1978. A lucky, but challenging opportunity, to start again, but now from the bottom in a top-class Lab, pioneering research on the pharmacology of dopamine and other neurotransmitters. The decision implied hard work, to be integrated into a highly demanding scientific and technological environment, also an opportunity to meet outstanding scientists. The hard work was rewarded by finishing a Doctoral Thesis, defended on June 5th, 1986, demonstrating the heterogeneity of basal ganglia regarding dopamine receptors, conveying the neuronal flow through D1 and D2 pathways. The studies led to a functional characterization of monoamine, aminoacid and neuropeptide pathways, a topic for several thesis. Awarded by the Swedish Medical Research Council, I spent a Sabbatical period at the Dept. of Anatomy & Neurobiology, UT, Memphis, USA, learning about organotypic cultures, a model that I transferred to the KI and then to Chile. At the KI, we developed and characterised an experimental model for studying perinatal asphyxia (PA), a relevant clinical issue. This line of research involved a wide international network of collaboration, leading to several thesis, in Europe and in Chile. We are now studying the effect of PA on mitochondrial metabolism, using a Seahorse platform. The studies have revealed long-term mitochondrial impairments induced by PA, affecting oxygen consumption (OCR) and extracellular acidification (ECAR) rate.

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