

Epilepsy and Alzheimer's disease: Challenges for Latin America

Seedings Neuroscience Workshop IBRO-LARC 2023

Proposed date of the event: October 25-28, 2023.

Place: Universidad Ignacio de Loyola. Lima, Perú.

General description of the event

It is known that the incidence of neurodegenerative disorders has augmented significantly in the world population due to an increase in life expectancy. The prevention and treatment of neurodegenerative disorders represent a significant economic burden, mainly in countries with emerging economies. Alzheimer's disease (AD), the most common form of dementia, is one of the most prevalent neurodegenerative disorders and epilepsy. It affects millions worldwide, dramatically interfering with their quality of life. Both AD and epilepsy have standard features such as neuroinflammation and excitotoxicity. The modulation of these mechanisms is considered an essential target for the design of potential therapeutic approaches. In AD, none of the designed drugs have been proven effective. Regarding epilepsy, beyond the percentage of non-responders' patients to the available antiseizure medications, the therapeutic strategy is focused on the arrest of epileptic seizures. Thus, both pathologies converge to the same framework, requiring novel therapeutic strategies.

There is a pressing need to address the current significant gaps in treating neurodegenerative disorders such as AD and epilepsy. According to our resources and ethnomedicine, we believe the multicenter collaboration in Latin America is essential to look for new and cheap strategies to control these disorders. For this reason, the workshop aims to congregate basic and clinical scientists from Iberoamerica to promote research focused on identifying common mechanisms, evaluate their potential modulation by using in vitro and pre-clinical studies, and outline new directions for research and clinical care of AD and epileptic patients.

It is crucial to indicate that the workshop is designed to promote neuroscience research in the less active countries in the region. We are organizing this "Seeding Neuroscience" workshop in Lima, Perú. This country has important institutions such as Universidad Peruana Cayetano Heredia, Universidad Nacional Mayor de San Marcos, and Universidad San Ignacio de Loyola. Perú's scientific institutions are focused on generating knowledge in different areas of interest to the country, including scientific research in biomedicine and technology transfer. Despite this, the neuroscientific groups from Perú have low participation in the different programs supported by international organizations such as IBRO and International League Against Epilepsy.

According to the geographical localization of Perú, it is expected that the organization of this "Seeding Neuroscience" workshop in Lima city will promote

the interaction of scientific groups from Centroamérica with other countries of Iberoamerica. To accomplish this, undergraduate and graduate students, basic scientists, and clinicians from Perú and surrounding nations will be invited to participate.

Target Audience

Ph.D. and medical students, basic scientists, medical doctors, nurses, physicists, neurologists, neuropsychiatrists, and neurosurgeons from Perú and countries from Centro América and South America.

Activities

The workshop will include frontal lectures focused on the presentation the state of the art of each topic.

Other important activity will be the working sessions at the end of each day focused on the development of research projects. The audience will be divided into groups of 10 attendants. Each group will include students, basic scientists, and clinicians and will work on the design of a project related to the main topic of the workshop. This activity will be carried out under the direction of the speakers. The projects will be presented and defended during the last day of the workshop.

PRELIMINARY PROGRAM

October 25, 2023

MECHANISMS INVOLVED IN ALZHEIMER DISEASE AND EPILEPSY

8:30-9:00 Introduction to the workshop. Adrián Palacios, Chair of IBRO-LARC.

9:00-9:45 Blood-brain barrier dysfunction as a potential therapeutic target for epilepsy and Alzheimer's disease. José Luis Castañeda. University of Guadalajara, México.

9:45-10:30 Central insulin resistance: the common link between epilepsy and Alzheimer's disease. Norberto Garcia-Cairasco. Ribeirão Preto School of Medicine. University of São Paulo, Brazil.

10:30-11:15 Vascular endothelial growth factor (VEGF): a double-edged sword in neuroinflammation and excitotoxicity. José Luis Castañeda. University of Guadalajara, México.

11:15-12:00 General discussion

12:00-13:00 Lunch

13:00-13:45 Hypoxia, oxidative stress, and inflammation: Three familiar faces of epilepsy and Alzheimer's disease. Alberto Lazarowski. Buenos Aires University. Argentina.

13:45-14:30 Epilepsy and hypoxia in the Andes of Peru: an introductory study. Luis Pacheco. Universidad Andina del Cusco. Peru.

14:30-15:15 GABA_A receptor activation in newborns could improve GABAergic inhibition establishment in early development and reduce seizure susceptibility. Mónica Ureña. University of Guadalajara, México

15:15-15:45 Coffee break

15:45-16:30 Covid-9 and Alzheimer's. Who worsens who? Alberto Lazarowski. Buenos Aires University. Argentina.

16:30-17:15 Epilepsy associated with autoimmunity. Alejandro Escalaya Advincula. Universidad Peruana Cayetano Heredia. Lima. Peru.

17:30-19:00 Working session.

October 26, 2023

PRECLINICAL MODELS OF ALZHEIMER DISEASE AND EPILEPSY

9:00-9:45 The zebrafish is a promising tool for modeling epilepsy and Alzheimer's disease and as a cheap approach to identifying new drugs. José Ortiz. Puerto Rico University. Puerto Rico.

9:45-10:30 Kainic acid as a preclinical model of temporal lobe epilepsy and cognitive decline. Antonio Camins Espuny. University of Barcelona, Spain.

10:30-11:15 Neonatal excitotoxicity induced by monosodium glutamate triggers a degenerative process related to seizure susceptibility and learning impairment. Mónica Ureña. University of Guadalajara, México

11:15-12:00 Alzheimer's disease and strategies for neural plasticity and functional recovery. Adrián Palacios. Universidad de Valparaiso, Chile.

12:00-13:00 Lunch

THERAPEUTIC STRATEGIES FOR ALZHEIMER DISEASE AND EPILEPSY: I

13:00-13:45 Basic model of functional food studies in neurodegenerative diseases: approximations of Amazonian fruits. Luis Aguilar Mendoza. Universidad San Ignacio de Loyola. Lima. Peru.

13:45-14:30 Diet-microbiota interaction in epilepsy and Alzheimer's disease approach. José Ortiz. Puerto Rico University. Puerto Rico.

14:30-15:15 Alzheimer's disease: why don't drugs work? Miren Ettcheto. University of Barcelona, Spain.

15:15-15:45 Coffee break

15:45-16:30 Combinatorial drug therapy for the treatment of Alzheimer's disease. Antonio Camins Espuny. University of Barcelona, Spain.

16:30-17:15 Natural products: a new alternative to deal with Alzheimer's disease. Miren Ettcheto. University of Barcelona, Spain.

17:15-19:00 Working session.

October 27, 2023

THERAPEUTIC STRATEGIES FOR ALZHEIMER DISEASE AND EPILEPSY: II

9:00-9:45 Cannabinoid-based treatments for epilepsy syndromes and associated comorbidities. Norberto Garcia-Cairasco. Ribeirão Preto School of Medicine. University of São Paulo, Brazil.

9:45-10:30 Cannabinoids as therapy for drug-resistant epilepsy. Luisa Rocha. Center for Research and Advanced Studies. México.

10:30-11:15 Role of genetic variants of metabolizing enzymes in the therapeutic response to cannabidiol in patients with drug-resistant epilepsy. Sandra Orozco-Suárez. Mexican Institute of Social Security, México.

11:15-12:00 General discussion

12:00-13:00 Lunch

13:00-13:45 Multi-target drugs for addressing complex disorders: epilepsy and Alzheimer's disease examples. Alan Talevi. University of la Plata, Argentina.

13:45-14:30 Traumatic brain injury as a trigger of epilepsy and Alzheimer's disease: how could we prevent them? Luisa Rocha. Center for Research and Advanced Studies. México.

14:30-15:15 Nutritional regulation of miRNAs: new possibilities for managing neurodegenerative diseases. Mónica Bulló. University of Barcelona, Spain.

15:15-15:45 Coffee break

15:45-16:30 Anti-inflammatory strategies against neurodegeneration. Sandra Orozco-Suárez. Mexican Institute of Social Security, México.

16:30-17:15 Virtual screening for CNS disorders: specific considerations. Alan Talevi. University of la Plata, Argentina.

17:15-18:00 Omic markers for diagnosing, prognosis and potential treatment of neurodegenerative diseases: advances in precision medicine. Mónica Bulló. University of Barcelona, Spain.

18:00-19:00 Working session.

October 28, 2023

Presentation of the different projects designed during the workshop. The projects will be presented and defended during the last day of the workshop. The organizers of the first, second and third best projects will receive a diploma.