ABSTRACT BOOK
AAFE 2024

LVI REUNIÓN ANUAL DE LA ASOCIACIÓN ARGENTINA DE FARMACOLOGÍA EXPERIMENTAL

23-24 de octubre de 2024

UNIVERSIDAD NACIONAL DEL SUR

Bahía Blanca, Argentina

AAFE

Asociación Argentina de Farmacología Experimental
Abstract book AAFE 2024. - 1a ed - Bahía Blanca : Asociación Argentina de Farmacología Experimental - AAFE, 2024.
Libro digital, PDF

Archivo Digital: descarga y online
ISBN 978-631-90806-0-5

1. Farmacología. I. Título
CDD 615

Neuroscience and Neuropharmacology
Chairs: Nora Mariel Marder and Susana Gorzalczany

78. EXPLORING THE α7 NICOTINIC RECEPTOR IN HUMAN RETINAL PIGMENT EPITHELIUM CELLS AS A NOVEL THERAPEUTIC TARGET

Julieta Ailen Mader, María Florencia Fernández Delias, Juan Facundo Chrestia, María del Carmen Esandi, Cecilia Bouzat

Instituto de Investigaciones Bioquímicas de Bahía Blanca, Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur (UNS)-CONICET, 8000 Bahía Blanca, Argentina.

The α7 nicotinic acetylcholine receptor is highly expressed in the brain and is also present in non-neuronal cells, including immune and epithelial cells. It is involved in cognition, memory, pain, neuroprotection and inflammation and its potentiation has emerged as a therapeutic strategy for neurological, neurodegenerative, and inflammatory disorders. Given that the increase in oxidative stress in retinal pigment epithelial cells contributes to the development of age-related macular degeneration and that α7 activation exerts cell protective effects, we explored the presence and functional relevance of α7 in D407 retinal pigment epithelium cells, a model system for various retinal diseases. By real time PCR, and indirect immunofluorescence using confocal microscopy and flow cytometry we demonstrated the presence of α7 in these epithelial cells. To determine the presence of functional receptors, we measured the movement of intracellular calcium levels triggered by the activation of α7. A pulse of ACh together with an α7 positive allosteric modulator revealed a 3-fold increase in intracellular calcium measured with the fluo-3AM probe. To mimic the events occurring in age-related macular degeneration, we treated cells with ferric ammonium citrate (FAC) to induce stress damage and measured reactive oxygen species (ROS) with the fluorescent probe DCFH-DA. FAC treatment resulted in a significant increase in ROS levels with respect to the control. To determine if α7 protects against oxidative damage, we exposed cells to a specific α7 agonist, PNU-282987, before the FAC treatment. Notably, PNU-282987 exhibited protective effects against the damage, leading to a reduction in ROS levels compared to the treated cells. Overall, by identifying for the first time the presence of α7 in the D407 cell line and revealing its protective role against oxidative damage, we propose α7 as a promising therapeutic target for retinal neurodegenerative disorders.