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Inflammation and oxidative stress in transgenic app/preseniline 1 mice

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One of the hallmarks in Alzheimer's disease (AD) is accumulation of beta-amyloid (Aβ) around neurons and the glial cell activation. Many lines of evidence have suggested that transient receptor potential (TRP) channels consisting of six main subfamilies termed the TRPC (canonical), TRPV (vanilloid), TRPM (melastatin), TRPP (polycystin), TRPML (mucolipin), and TRPA (ankyrin) are involved in (Ca2+) homeostasis disruption. Thus, emerging evidence of the pathophysiological role of TRP channels has yielded promising candidates for molecular entities mediating (Ca2+) homeostasis disruption in AD. Abnormalities in calcium (Ca2+) regulation in astrocytes have been documented in studies of experimental models of AD, suggesting contributions of these alterations and neuro-toxic factors including reactive oxygen species (ROS), nitric oxide (NO), and cytokines on neuronal dysfunction and cell death in AD. TRPV1 is also found in astrocytes and accumulating evidence in the literature indicates that TRPV1 have many functions inside the brain, some neuro-protective or neuro-toxic. It has been implicated in neurodegeneration, because can initiate calcium-dependent apoptosis of neuronal and glial cell types, also it can be activated by phyto and endo cannabinoids such as THC, CBD, CBN, anandamine, and others including temperatures above 43ºC, low pH, and the active ingredients in hot peppers. Here, we incubated astrocytes in primary culture with 5 μM Aβ40–1 (C), 5 μM Aβ1–42 (Aβ), 10 μM WIN 55, 212-2 (Win) and 10 μM WIN 55, 212-2 + 5 μM Aβ1–42 (Win+Aβ) for 24 hr..We measured the protein expression levels of TRPV1 by Western-blot technique. A representative immuno-blot of each protein is shown and α-tubuline was used as control protein. Here we determined the action of cannabinoids on TRPV1 in astrocytes in culture. Data show that perturbed cellular calcium homeostasis plays a prominent role in the pathogenesis of AD, suggesting potential benefits of therapeutic strategies that stabilize cellular calcium homeostasis, maybe using cannabinoides.

Biography

Soraya L Valles graduated in Biological Science from the University of Valencia in 1990 and remained there to undertake a PhD under the supervision of Consuelo Guerri at Research Institution (Instituto de Investigaciones Citológicas), which she completed in 1996. In 2000 she returned to Spain at Department of Physiology, Medicine Faculty of Valencia. University of Valencia and were she was appointed to a part-time position as Lectureship. In 2004 she was appointed to a fixed-term position as permanent University Lecturer at this department in the University of Valencia. During that time she was involved in the mechanisms of oxidative stress in the generation of Alzheimer's disease with Jose Vina's group. Also at that time she developed my lectures with Luis Such's group with who she learned a lot about physiology and how to do a correct lecturer to pupils in my our department.

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