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Polyphenols regulate signaling cascades in neuronal cells in cultures

Martin Aldasoro, Dolores Mauricio, Diana Aguirre-Rueda and Soraya L. Valles
University of Valencia, Spain

Abstract

Polyphenols, such as curcumin, stevia, genistein and resveratrol, have been demonstrated to be effective to promote anti-oxidant and anti-inflammatory properties. We report that polyphenols induce cell shrinkage, chromatin condensation, DNA fragmentation, and cytochrome C induction, characteristics of apoptosis, in neurons and astrocytes in primary culture after induction with Alzheimer's disease. Many cellular and biochemical effects of polyphenols in mouse transgenic APP/ Preseniline cells have been reported, such as inhibition of protein kinase C (PKC) activity induced by phorbol 12-myristate 13-acetate treatment, inhibition of tyrosine protein kinase activity, and inhibition of arachidonic acid (AA) metabolism. Our data indicate that phenolic compounds can trigger signal transduction pathways linked to apoptosis, such as caspases, p53, and bcl-2 genes. This programmed-cell death may be considered actually one of the important targets in a preventive approach against Alzheimer's disease. How flavonoids do regulate and control the intracellular signaling cascades considered as relevant targets in neurodegenerative preventive approach remains to be elucidated. The results suggest that in neural cells, blocking the cellular signal transduction might trigger the induction of apoptosis and also polyphenols can regulate signaling cascades to stop conversion of a normal cell to an affected one by compounds in Alzheimer's disease.

Biography

Martin Aldasoro has Ph.D. studies in Physiology in Faculty of Medicine, University of Valencia in 1990. Also he is a M.D. by the Faculty of Medicine, University of Navarra in 1980. Actually is chief-lab on vascular research group and he has researched and academic duties such as Assistant Professor at Department of Physiology, School of Medicine, and University of Valencia. He is a member of the Physiology Society, Spanish and International Society. He is a Professor in "Physiology" at University of Valencia. He is currently interested in neurodegeneration and neurogenesis in vascular diseases.