

Role of Mitochondria in Alzheimer's Disease

Genaro Genaro Gabriel Ortiz^{1,2}

¹Lab. Estrés Oxidativo-Mitocondria & Enfermedad. Centro de Investigación Biomédica de Occidente (CIBO). Instituto mexicano del seguro Social (IMSS). Guadalajara, Jalisco, México.

²División de Ciencias de la Salud-Escuela de Medicina, Tecnológico de Monterrey, Campus Guadalajara. Zapopan, Jalisco, México.

1. Introduction

Alzheimer's disease is the most common neurodegenerative disorder worldwide, characterized by considerable atrophy and an enlargement and coarsening of the amyloid formation in neuritic plaques and brain vessels (amyloid angiopathy), neurofibrillary tangles, and neuronal loss, particularly in the limbic and association cortices. In addition, deficits in cholinergic transmission and associated loss of cholinergic cells, granulovacuolar degeneration and rod-shaped eosinophilic inclusions (Hirano bodies) are common in Alzheimer's disease patients. Clinical symptoms are characterized by progressive worsening of memory, and cognitive impairment accompanied by other neurological symptoms: aphasia, apraxia, agnosia and disorders in the executive function (Selkoe, 2004).

The pathophysiological mechanisms that underlie the neurodegenerative characteristics of Alzheimer's disease are yet to be completely understood, although many factors in the pathogenesis have been identified, and several theories have emerged. In the last decades, mitochondrial dysfunction has been considered as a potential factor implicated in the early stage of the pathogenic process (Anandatheerthavarada et al., 2003; Sullivan & Brody, 2005).

*Fermín Pacheco-Moisés³, José de Jesús García-Trejo⁴, Rocío E. González-Castañeda⁵, Miguel A. Macías-Islas⁶, José A. Cruz-Ramos¹, Irma E. Velázquez-Brizuela¹, Elva D. Árias Merino¹, Alfredo Célis de la Rosa⁷

¹Lab. Estrés Oxidativo-Mitocondria & Enfermedad. Centro de Investigación Biomédica de Occidente (CIBO). Instituto mexicano del seguro Social (IMSS). Guadalajara, Jalisco, México.

²División de Ciencias de la Salud-Escuela de Medicina, Tecnológico de Monterrey, Campus Guadalajara, Jalisco, México.

³Departamento de Química. Centro Universitario de Ciencias Exactas e Ingenierías. Universidad de Guadalajara, Jalisco, México.

⁴Departamento de Biología. Facultad de Química. Universidad Nacional Autónoma de México, México.

⁵Departamento de Neurociencias. Centro Universitario de Ciencias de la Salud. Universidad de Guadalajara, Jalisco, México.