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E-PodoFavalin-15999 (Atremorine®): A new modality of nutrigenomic intervention in Parkinson's disease

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E-PodoFavalin-15999 (Atremorine®) is a novel biopharmaceutical compound, obtained by means of non-denaturing biotechnological processes from structural components of *Vicia faba* L., for the prevention and treatment of Parkinson's disease (PD). Preclinical studies (in vitro) revealed that Atremorine is a powerful neuroprotectant in cell cultures of human neuroblastoma SH-SY5Y cells, hippocampal slices in conditions of oxygen and glucose deprivation and striatal slices under conditions of neurotoxicity induced by 6-OHDA. In vivo studies showed that Atremorine protects against 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-induced dopaminergic neurodegeneration, inhibits MPTP induced microglia activation and neurotoxicity in substantia nigra and improves motor function in mice with MPTP-induced neurodegeneration. Clinical studies have been performed in 3 groups of patients: NP: Naive drug free patients with PD (never treated with anti-parkinsonian drugs), AP: Parkinsonian patients chronically treated with L-Dopa and MX: A heterogenous sample of patients with Parkinsonian disorders. 30-60 minutes after a single dose (5 g) of Atremorine, plasma levels of dopamine increased from 16.71 ± 14.38 pg/mL to 2286 ± 4218 pg/mL ($p < 0.001$) in NP, from 4149 ± 7062 pg/mL to 13539 ± 12408 pg/mL ($p < 0.001$) in AP and from 860 ± 3445 pg/mL to 4583 ± 8084 pg/mL ($p < 0.001$) in MX patients with a parallel clinical improvement lasting for 3-6 hours. Atremorine administration also increased the plasma levels of noradrenaline in NP ($p < 0.008$) and MX ($p < 0.04$) with no changes in AP. Atremorine induced significant decreases in prolactin levels in NP and MX and in growth hormone levels in NP and MX. Changes in the levels of monoamines and hormones were genotype-specific. Pharmacogenetic studies indicate that the therapeutic response induced by atremorine in PD is associated with the pharmacogenetic profile of each patient. This is the first study on the biopharmaceutical properties and pharmacogenetics of Atremorine in PD after patent application.

Biography

Ramon Cacabelos is a Professor and Chairman of Genomic Medicine at Camilo Jose Cela University, Madrid and President of the EuroEspes Biomedical Research Center, Institute of Medical Science and Genomic Medicine, Spain. He has received his MD from Oviedo University, PhD from Santiago de Compostela University and DMSci in Psychiatry from Osaka University Medical School, Japan. After a decade at the Department of Psychiatry in Osaka, he returned to Spain and focused his research activity on the genomics and pharmacogenomics of Alzheimer's disease, neurodegenerative disorders and neuropsychiatric pathology. He has published over 600 papers, 400 chapters and 24 books. One of his major contributions is the first World Guide for Drug Use and Pharmacogenomics (2012). He is the Editor-in-Chief and Member of the Editorial Board of several international journals, Member of over 30 scientific societies and President of the Spanish Society of Genomic Medicine and the World Association of Genomic Medicine.

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