

Research project
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Neuroprotection in the Central Nervous System (CNS).

Neuroprotective role of Taurine in the CNS

Taurine (2-amino-ethane-sulfonic acid) is one of the most abundant free aminoacids detected in the mammalian brain. Our research group has been using an experimental model based on kainic acid as inductor of seizures and anatomic hippocampal alterations. This model recapitulates the effects observed in patients with temporal lobe epilepsy, one of the most frequent epilepsies in humans. We have demonstrated that injections of taurine prior to kainic acid leads to either a reduction or even a complete abolishment of phenotypic and molecular effects induced by the kainic acid

Our current interest is to unravel the mechanism(s) of action of taurine as a neuroprotector during epilepsy and in neurodegenerative diseases in general. To reach this goal, a pleiotropy of approaches, mostly complementary, and including expression profiling analyses using microarrays, HPLC purifications and quantifications, pulse-chase experiments using tritiated taurine, as well as primary cell cultures are being used in combination with Immunohistochemistry and immunocytochemistry.

Group members

Principal Investigator

Carme Auladell

PhD Students

Juana Utrera

Maria Luisa de Lemos Machado

Graduate Students

Alba Redo

The work is being done in collaboration with the research group of Drs. Camins and Pallás from the “Departament de Farmacologia i química terapèutica” from the “Unitat de Farmacologia i Farmacognòsia”.

Doctoral and Master thesis

Maria Luísa de Lemos Machado (2009). Estudio de la biosíntesis, captación y liberación de la taurina en astrocitos. ***Practicum del Master en Neurociencias.***

Felix Junyent (2008). La Taurina en cervell de ratolí: Implicacions en l'epilèpsia. ***Tesi Doctoral. Universitat de Barcelona.***

Publications:

Junyent, F., Utrera, J., Romero, R., Pallas, M., Camins, A., Duque, D., and Auladell, C. (2008). Prevention of epilepsy by taurine treatments in mice experimental model. *J Neurosci Res*.

Franco-Pons, N., Tomas, J., Roig, B., Auladell, C., Martorell, L., and Vilella, E. (2008). Discoidin Domain Receptor 1, a Tyrosine Kinase Receptor, is Upregulated in an Experimental Model of Remyelination and During Oligodendrocyte Differentiation In Vitro. *J Mol Neurosci*.

Junyent, F., Utrera, J., and Auladell, C. (2006). Axonal retraction and regeneration induced by N,N-diethylthiocarbamate (DEDTC) in the central nervous system. *Eur J Neurosci* 24, 3163-3173.

Valente, T., Junyent, F., and Auladell, C. (2005). Zac1 is expressed in progenitor/stem cells of the neuroectoderm and mesoderm during embryogenesis: differential phenotype of the Zac1-expressing cells during development. *Dev Dyn* 233, 667-679.

Valente, T., Dominguez, M.I., Bellmann, A., Journot, L., Ferrer, I., and Auladell, C. (2004). Zac1 is up-regulated in neural cells of the limbic system of mouse brain following seizures that provoke strong cell activation. *Neuroscience* 128, 323-336.

Valente T., Dominguez M., Bellmann A., Journot L., Ferrer I. and Auladell C. (2004).

Lima, L., Obregon, F., Rousso, T., Quintal, M., Benzo, Z., and Auladell, C. (2004). Content and concentration of taurine, hypotaurine, and zinc in the retina, the hippocampus, and the dentate gyrus of the rat at various postnatal days. *Neurochem Res* 29, 247-255.