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Keywords

Metals (zinc) and Alzheimer Disease - Oxidative Stress



Science

Abnormal homeostasis of heavy metals is a well-documented physiopathological mechanism in Alzheimer's disease (AD). An exacerbation of these abnormalities is best illustrated in the amyloid plaques in Alzheimer's disease brain tissue^{1,3}, in which ionic zinc reaches concentration of 1 mM. This elevated and miscompartmentalization of zinc is a factor that participate to the activation of the inflammatory process and ROS generation. We are particularly interested in the role of zinc on the phosphorylation of tau protein, the other hallmark in AD. Our results suggest that high concentrations of zinc induce increased tau phosphorylation² and conformational modifications of tau, typical of early changes in neurons developing neurofibrillary tangles. In view of these previous results and to assess the deleterious impact of zinc on tau pathology we are now developing on transgenic mice models of AD an approach based on stereotaxic brain injection of zinc.

Selected publications

Sylvain Bohic, Jean-François Ghersi-Egea, Julien Gibon, Pierre Paoletti, Josiane Arnaud, Stéphane Hunot, H  l  ne Puccio, **Alain Boom**, Fran  ois Berger, Alexandre Bouron. Biological Roles of Metals in the Brain *Revue Neurologique* (Organe Officiel de la Soci  t   Fran  aise de Neurologie) *in press* (2010).

Alain Boom, Authelet M, Dedecker R, Fr  d  rick C, Van Heurck R, Daubie V, Leroy K, Pochet R, Brion JP. Bimodal modulation of tau protein phosphorylation and conformation by extracellular Zn(2+) in human-tau transfected cells. *BBA Molecular Research* 1793(6) :1058-67, 2009.

Alain Boom, R Pochet, M Authelet, L Pradier, P Borghgraef, F Van Leuven, CW Heizmann, JP Brion. Astrocytic calcium/zinc binding protein S100A6 over expression in Alzheimer's disease and in PS1/APP transgenic mice models. *Biochim Biophys Acta* 1742: 161-8, 2004.