

9<sup>th</sup> International Conference on

# Neonatology and Pediatric Neurology

November 28-30, 2016 Valencia, Spain

## Zinc/cPLA2 associated autophagy and CaMK II pathway contributed to neurobehavioral deficits and hippocampal MFs sprouting following neonatal seizures and its intervention by chronic leptin treatment

**Ni Hong**

Children's Hospital of Soochow University, China

Because leptin was affecting expression of brain energy metabolism-related genes and because zinc/lipid metabolism signals and its associated autophagy stress were also found to be involved in energy depletion, we hypothesized that leptin might exert its neuroprotective action via zinc/lipid and autophagic metabolism signaling. Here, we tested this hypothesis by examining the long-term expression of zinc transporter ZnT1 and ZIP7, lipid membrane injury-related cPLA2, its downstream autophagy marker Beclin-1, LC3, bcl2 and Cathepsin-E, as well as its execution molecule CaMK II following neonatal seizures and chronic leptin treatment. On postnatal day 6 (P6), 40 Sprague-Dawley rats were randomly assigned to two groups: Flurothyl-induced recurrent seizures group and control group. On P13, they were further randomly divided into the seizure group without leptin (RS), seizure plus leptin (RS+Leptin, 2 mg/kg/day, consecutive 10 days), the control group without leptin (Control), and the control plus leptin (Leptin, 2 mg/kg/day, consecutive 10 days). Neurological behavioral parameters of brain damage (negative geotaxis reaction reflex, plane righting reflex, cliff avoidance reflex, forelimb suspension reflex and open field test) were observed from P23 to P30. Morris water maze test was performed during P27-P32. Then hippocampal mossy fiber sprouting and the protein levels were detected by Timm staining and Western blot analysis, respectively. Flurothyl-induced RS rats show a long-term lower amount of CaMK II alpha, and higher amount of ZnT1, ZIP7, cPLA2, Beclin-1/bcl2, LC3II/LC3I and Cathepsin-E which are in parallel with hippocampal mossy fiber sprouting and neurobehavioral and cognitive deficits. Furthermore, chronic leptin treatment (RS+Leptin) is effective in restoring these molecular, neuropathological and cognitive changes. The results imply that a zinc/lipid metabolism-associated membrane peroxidation and autophagy pathway is involved in the aberrant hippocampal mossy fiber sprouting and neurobehavioral deficits following neonatal seizures, which might be a potential target of leptin for the treatment of neonatal seizure-induced brain damage.

### Biography

Ni Hong has completed his PhD from Zhejiang University and Post-doctoral studies from Peking University School of Medicine. He is the Director of Neurology Laboratory of Children's Hospital Affiliated to Soochow University and Deputy Director of the Institute for Pediatric Research, Soochow University.

nhdoctor@163.com

**Notes:**