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Sirtuin 6 localization at cortical brain level of young diabetic mice

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The metabolic syndrome, characterized by visceral obesity, dyslipidaemia, hyperglycaemia and hypertension, has become one of the major public-health challenges worldwide and it is strictly associated with the development of type II diabetes and neurodegenerative diseases (Alberti et al. 2005; Panza et al. 2010). Increased metabolic flux to the brain during overnutrition can orchestrate stress response, blood-brain barrier alteration, microglial cells activation and neuroinflammation (Nerurkar et al., 2011).

The protein sirtuin family is a class of nicotinamide adenine dinucleotide (NAD+)-dependent histone deacetylase that act on a variety of targets and so play a key role in central physiological regulation (Sebastian et al., 2012; Wang et al., 2012).

To assess the physiopathological significance of sirtuin6 (SIRT6) at brain cortical level, we analysed its specific expression and subcellular localization in young db/db mice, animal model of type II diabetes mellitus, and respective control lean mice. In particular, we analysed the cytoarchitecture of the brain cortex, evaluated SIRT6 expression and its localization by immunohistochemistry comparing young db/db mice to lean control mice, distinguishing among the six cortical layers and between motor and somatosensory cortex. We observed that SIRT6 is mainly localized in the nucleus of both lean and db/db mice. Diabetic mice showed few SIRT6 positive cells respect to lean control mice in all cortical layers without significant differences between motor and somatosensory cortex. No morphological alteration have been find.

In conclusion, our findings contribute to further understand SIRT6 protein expression in the early steps of type II diabetes mellitus and suggest its implication in the pathogenic processes of diabetes mellitus and diabetes–induced neurodegeneration.

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Key words
Diabete mellitus, sirtuin6, brain cortex, immunohistochemistry.