P-780 - THE ABUNDANCE AND DISTRIBUTION OF MELANOPSIN (OPN4) PROTEIN IN HUMAN BRAIN

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Introduction: OPN4 (Melanopsin) is extravisual opsinreceptor sensing light outside of visual system. Earlier literature has described OPN4 in entraining circadian rhythms via retinohypothalamic track in human brain.
Objectives: To investigate whether OPN4 protein is present also outside the retinohypothalamic track.
Aims: To study the distribution on OPN4 protein in functionally central areas of human brain.
Methods: The localization of OPN4 protein in human brain and peripheral tissues was assessed by immunohistochemical staining using polyclonal antibody against OPN4. OPN4 protein content was measured using Western blotting and SDS-PAGE. The samples from altogether nine cadavers were assessed during forensic examination and their tissues prepared. Samples were cut into sections and stained with fluorescent dye labeled antibody before confocal laser scanning microscopy. The specificity of labeling and immununoreaction was verified by primary antibody omitting and immunizing peptide blocking.
Results: We found OPN4 protein abundant in Human brain, but not in periphery or in negative controls. Neuronal OPN4 was present in granular pattern intracellularly altogether in all eighteen examined sites, including numerous cerebral cortical areas, cerebellar cortex and several nuclei in phylogenetically old regions. Immunoreaction expressed mostly in neuronal soma, but not in nuclei.
Conclusions: Previously OPN4 has been known to be present only in non-image forming visual system mediating circadian timing properties of light to the pacemaker (Zeitgeber). However, our findings of abundant presense of OPN4 protein in neurons of human brain call further studies of effects on direct photic stimuli to brain.

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