

**P35. CONSUMPTION OF FAT RICH DIET AFFECTS MITOCHONDRIAL FUNCTIONS IN BRAIN CORTEX AND CORTICAL SYNAPTIC REGION OF MICE**

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The consumption of high-fat diet (HFD), widely diffused in industrialized countries, is implicated in several metabolic pathologies, which can be risk factors for the development of neurological and neurodegenerative diseases. Therefore, it is particularly interesting to investigate the molecular mechanism underlying the HFD effect on altered neuronal plasticity. Synaptic-located mitochondria (synaptosomal mitochondria) play a key role in providing energy to support synaptic functions and plasticity. Thus, the impairment of their functions, following HFD consumption, may contribute to neurodegenerative diseases. Our project aims to analyse the dysfunctions of brain cortex mitochondria and synaptosomal mitochondria in a mouse model of diet induced obesity. Male C57Bl/6 mice were divided into two groups fed a standard diet or HFD for 12 weeks, and it was observed that HFD induces inflammation, oxidative stress and mitochondrial dysfunctions not only in brain cortex, but also in synaptosomal fraction. In conclusion, our results indicate that HFD, negatively affecting mitochondrial activity at synaptic level, alters the synaptic energy supply, leading to synaptic failures that could be an early event in neurodegenerative diseases.

