P-782 - THE ROLE OF RNA BINDING PROTEINS AND MICRORNAS IN THE REGULATION OF SYNAPTIC PLASTICITY AND NEUROPSYCHIATRIC DISORDERS

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Polyribosomes are localized within synapses and particularly in dendritic spines where neuronal activity and glutamatergic activation regulate mRNAs functions and require cis-acting sequences which are involved in mRNA transport and translation. Studies have elucidated that mRNA binding proteins (RBPs) mediate the recognition of specific cis-acting sequences and are fundamental targets of phosphorylation signals regulating local mRNA translation and transport. RBPs could have dual roles influencing neuronal development and synaptic plasticity mechanisms, first determining mRNA localization and additionally regulating mRNA translation both. A recent fascinating hypothesis suggested that small non-coding RNAs, in particular microRNAs (miRNAs), play a crucial role in the translational regulation at the synapse. miRNAs have played a fundamental role in the evolution of brain functions.
The perturbation of these intracellular mechanisms as well as impaired assembly, localization, and translational regulation of RBPs may affect important neurophysiological functions such as learning and memory, presumably playing a crucial role in the emergence of several neuropsychiatric diseases and perhaps suicidal behaviour. Particularly, miRNA mis-regulation has also been linked to a number of psychiatric disorders and neurodegenerative diseases.
Here, we performed a selective overview about recent data demonstrating the importance of RBPs and miRNAs in regulating protein synthesis involved in plastic synaptic changes as well as their putative subcellular localization and sites of action in mature neurons.

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