Neural Plasticity

Special Issue on

Connecting Synaptic Activity with Plasticity-Related Gene Expression: From Molecular Mechanisms to Neurological Disorders

CALL FOR PAPERS

One of the most enticing questions in neurobiology is how synapse activation can lead to the expression of certain genes that help maintain synaptic changes over time. To make these changes persistent, it is necessary to activate a series of genetic and epigenetic mechanisms that orchestrate the expression of genes encoding proteins involved in both synaptic plasticity and memory. We still understand very little about the underlying molecular mechanisms by which synaptic strength is modulated. A fragmentary picture is emerging through the identification of molecules whose loss of function interferes with the experimental expression of synaptic plasticity. These molecules represent a variety of classes of cellular functions ranging from transcription and translation to trophic signaling to cell-cell adhesion. Knowledge of the molecular mechanisms that allow such activity-dependent expression of plasticity-related genes will allow us to understand how these mechanisms can be altered in some neurological diseases, opening thus the possibility of unraveling novel therapeutic targets to restore normal neuronal function.

Potential topics include, but are not limited to:

- Cellular machinery required for transcriptional and translational activation of plasticity-related genes
- Interaction of genetic and epigenetic mechanisms involved in plasticity
- Regulatory mechanisms of plasticity-related genes mediated by DNA methylation
- Mechanisms of regulation of plasticity-related genes mediated by histone acetylation/deacetylation
- Regulation of the plasticity-related genes expression by small and long noncoding RNAs
- Mechanism of axonal and mRNA trafficking and regulation of their local expression by activity-dependent plasticity
- Cellular signaling pathways that lead to activation of plasticity-related genes
- Neurological diseases associated with alterations in the mechanisms regulating plasticity-related genes

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