

## **METHYLPHENIDATE ALTERS NCS-1 EXPRESSION IN RAT BRAIN**

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Methylphenidate (MPH) has been used as an effective treatment for attention deficit hyperactivity disorder (ADHD). MPH blocks dopamine and norepinephrine transporters causing an increase in extracellular levels. Neuronal calcium sensor 1 was identified as a dopaminergic receptor interacting protein. When expressed in mammalian cells, neuronal calcium sensor 1 attenuates dopamine-induced D2 receptor internalization by a mechanism that involves a reduction in D2 receptor phosphorylation. Neuronal calcium sensor 1 appears to play a pivotal role in regulating D2 receptor function, it will be important to determine if there are alterations in neuronal calcium sensor 1 in neuropathologies associated with deregulation in dopaminergic signaling. Then, we investigated if MPH could alter neuronal calcium sensor 1 expression in five brain regions (striatum, hippocampus, prefrontal cortex, cortex and cerebellum) in young and adult rats. These regions were chosen because some are located in brain circuits related with ADHD. Our results showed changes in neuronal calcium sensor 1 expression in hippocampus, prefrontal cortex and cerebellum mainly in adult rats. The demonstration that MPH induces changes in neuronal calcium sensor 1 levels in rat brain may help to understand sensitization mechanisms as well as MPH therapeutic effects to improve ADHD symptoms.

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