



### Role of Dopamine Receptor D3 in Depression and Anxiety

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#### Abstract

Dopamine (DA) is one of the main catecholamines in the brain and is crucial for movement coordination, endocrine function, reward, mood, memory and emotions. The dopaminergic system is the primary therapeutic target in the treatment of Parkinson's disease (PD), drug addiction and schizophrenia. Notwithstanding, dysfunction of central dopaminergic neurotransmission has also been associated to depression, which has been linked to dysregulation of DA release or alterations in dopamine receptors expression or function. studies in humans indicated that the efficacy of dopamine receptor agonists with high binding affinity to D3R compared to D2R, including aripiprazole, cariprazine and pramipexole, a drug commonly used for the treatment of motor symptoms in PD but also effective for the treatment of major depression. Furthermore, reduction of DA release at synapses leads to increased D2R/D3R binding in temporal cortex of depressive patients. Similarly, the treatment of animal models with antidepressant drugs increase the density of D2R/D3R binding sites in the nucleus accumbens without altering the density of binding sites for D1-like receptor. Interestingly, expression of D3R significantly increased in the shell of nucleus accumbens, when is used chronic administration of classical antidepressants and repeated electroconvulsive therapy in rats. This data suggested that D3R may play an important role in the pathophysiology of depression.

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