



Role of Dopamine in Anxiety Behavior

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Abstract

The mesolimbic dopamine (DA) system contains both D1-like and D2-like receptors, has been connected to control of locomotor behavior. An apparent role for D1 and D2 receptors throughout the mesolimbic system in the alteration of locomotor behavior has been demonstrated in pharmacological studies. The nucleus accumbens (NAc) is comprised of a core and a shell subregion, which is a component of the mesolimbic DA system, and has been specifically implicated in locomotor behavior. Intra-NAc injections of D1 and D2 agonists have been found to increase locomotor activity. The DA system also plays a role in regulating anxiety-like and fear behavior. Pharmacological studies have shown that D1 and D2 receptors are involved in anxiety-like behavior. Findings seem to be dictated by a number of factors, including strain, route of administration, ligand selected and behavioral test. Fear behavior may often be indiscernible from anxiety-like behavior in animal models though the anatomical aspects may be different. Fear cues have been shown to decrease DA transmission in the NAc core, but increase transmission in the shell. Dopamine release in the NAc also appears to assist in encoding cues that predict punishment avoidance. These data suggest a role between fear and DA transmission and suggest that there may also be a role of accumbal DA in anxiety-like behavior.

Keywords: Dopamine, Anxiety, Locomotion, Nucleus Accumbens.

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