

Ventral Tegmental Area Encyclopedia Article

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Ventral Tegmental Area

The ventral tegmental area, (VTA), is a very important brain area in the field of drug abuse. It is one of only two main areas that contain DOPAMINE cell bodies. The MESOLIMBIC DOPAMINE pathway originates in the VTA. Dopamine neurons in the VTA project to areas of the brain associated with emotion and motivation, the so-called limbic areas. However, the projection to the NUCLEUS ACCUMBENS is the most important in understanding the action of drugs of abuse, especially psychostimulants. In addition, neurons in the nucleus accumbens and other limbic areas project to the VTA, providing the substrate for many neurochemicals to modulate the dopa-mine cells in the VTA.

There are two main experimental paradigms used in animals to assess the effects of drugs and endogenous neurotransmitters, such as DYNORPHIN, on these dopaminergic cells at the level of the VTA. Chemicals can be injected directly into the VTA in order to study their effects. Conditioned place preference is a method, which allows the animal to be tested for the REINFORCING properties of a chemical in a drug free state. In addition, increases in locomotor activity can be measured, psychomotor stimulants in addition to being rewarding increase locomotor activity, and one substrate underlying this increase is the VTA.

The most extensively studied drugs of abuse, psychostimulants and opiates, both interact with the mesolimbic dopamine system. Future studies fully elucidating the modulation of VTA dopamine neurons will greatly contribute to the understanding of the mechanism of action of drugs of abuse, and may lead to the development of medications to treat drug abusers.