Nucleus Accumbens Encyclopedia Article

Nucleus Accumbens

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Nucleus Accumbens

The nucleus accumbens is a group of NEURONS that is part of the limbic system and located near the midline in the frontal region, beneath the frontal lobe. Anatomically, it has been divided into the shell and core, with the shell perhaps being more important for the actions of drugs of abuse. It is one of the most important structures in the brain for studies of drug addiction because it is believed to be involved in reward, reinforcement, and unpredictably positive experiences. Nucleus accumbens is known to include neurons that contain GABA and acetylcholine and other neurotransmitters. It receives important input from dopaminergic neurons located in the ventral midbrain that are also involved in reward and reinforcement. It has output projections back to the ventral midbrain and other areas.

This nucleus is thought to be involved in the action of many different drugs of abuse, especially psychostimulants whose actions on the nucleus accumbens have been well studied. Destruction of neurons in this structure or its inputs disrupts psychostimulant self-administration by rodents, and psychostimulants and other drugs of abuse cause an efflux of dopamine from this structure. Because of its small size, it has been difficult to study, and, at this time, it is being studied in humans and nonhuman primates to determine its relevance to human drug and stimulant abuse.