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Neurotransmitter interactions and cognitive function

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Abstrak

The brain is an organ of communication. Neurons within the brain connect in networks that communicate with each other to provide behavioral function. This network organization is particularly evident with regard to cognitive function, from simple sensorimotor plasticity to attentional, learning and memory processes. Cognitive function involves the participation of diverse brain areas including parts of the limbic system, such as the hippocampus and the amygdala, as well as the frontal cortex, portions of the thalamus and the basal forebrain cholinergic and midbrain monoaminergic nuclei, which project to the more dorsal and rostral brain regions. The interactions of these systems can be characterized by the different neurotransmitters used to communicate between the different brain regions and neuronal types. A variety of drugs are available which more or less selectively stimulate or block receptors for these transmitters, which can be used to manipulate the activity of these systems to discover their functional interactions. Studying the interactions among these drugs can provide a window through which neural communication underlying cognitive function can be studied and new therapeutic treatments for cognitive dysfunction can be developed.