Cortico basal ganglia thalamo cortical loop

The cortico-basal ganglia-thalamo-cortical loop (CBGTC) is a system of neural circuits in the brain that primarily consists of modulatory dopaminergic projections from the pars compacta of the substantia nigra, and ventral tegmental area as well as excitatory glutamatergic projections from the cortex to the striatum, where these projections form synapses with excitatory and inhibitory pathways that relay back to the cortex. The loop was originally proposed as a part of a model of the basal ganglia called the parallel processing model, which has been criticized and modified into another model called the center surround model.

The loop is of particular relevance to hyper- and hypo-kinetic movement disorders, such as Parkinson's disease and Huntington's disease, as well as to psychiatric disorders of control, such as ADHD, OCD, and Tourette syndrome.

Current organization schemes characterize cortico-basal ganglia interactions as segregated parallel processing, meaning there is little convergence of distinct cortical areas in the basal ganglia. This is thought to explain the topographically organized functionality of the striatum.[5] The striatum is organized on a rostro-caudal axis, with the rostral putamen and caudate serving associative and cognitive functions and the caudal areas serving sensorimotor function.