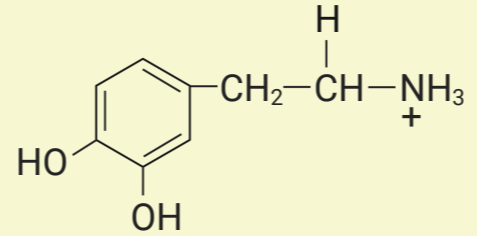
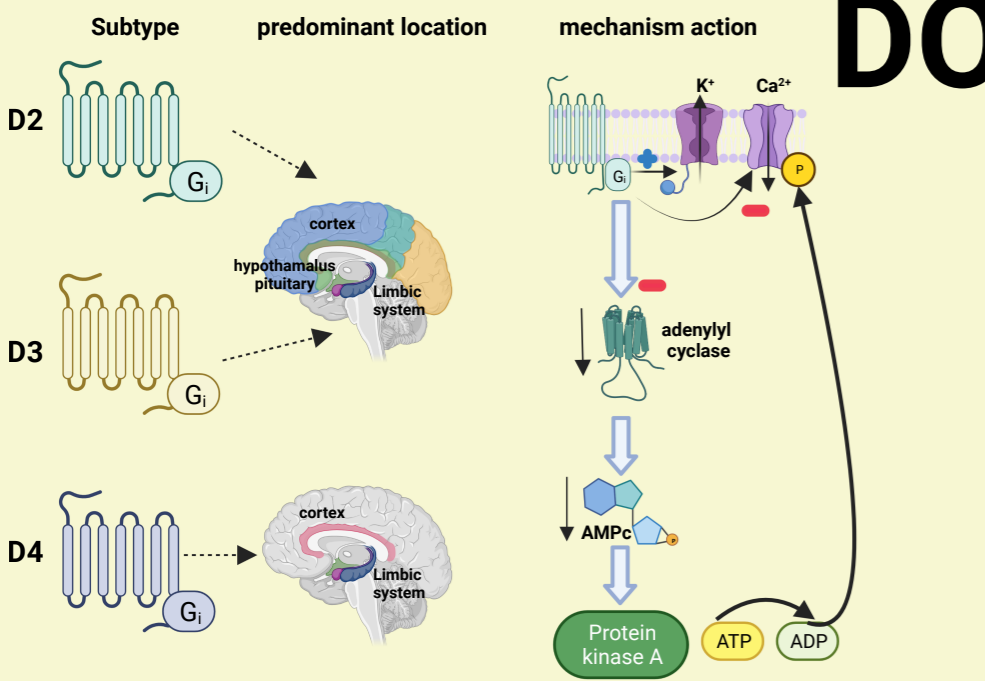


DOPAMINERGIC SYSTEM

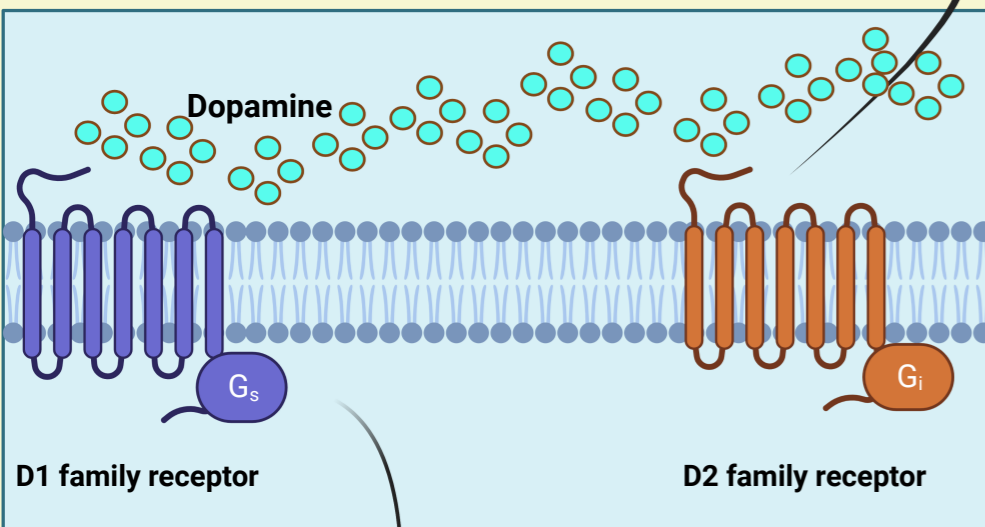


Dopamine is the major catecholamine neurotransmitter in the brain. It regulates a variety of functions including the control over voluntary action, reward, circadian rhythm, consciousness, and cognition.

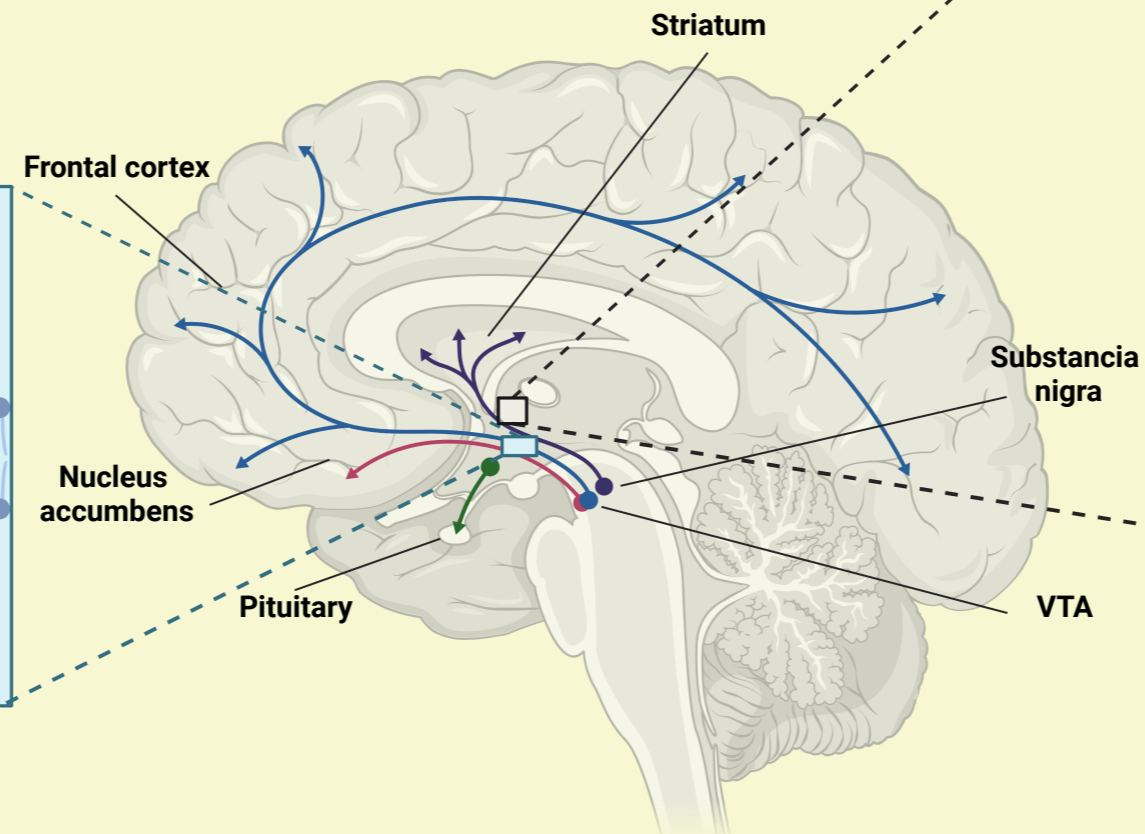
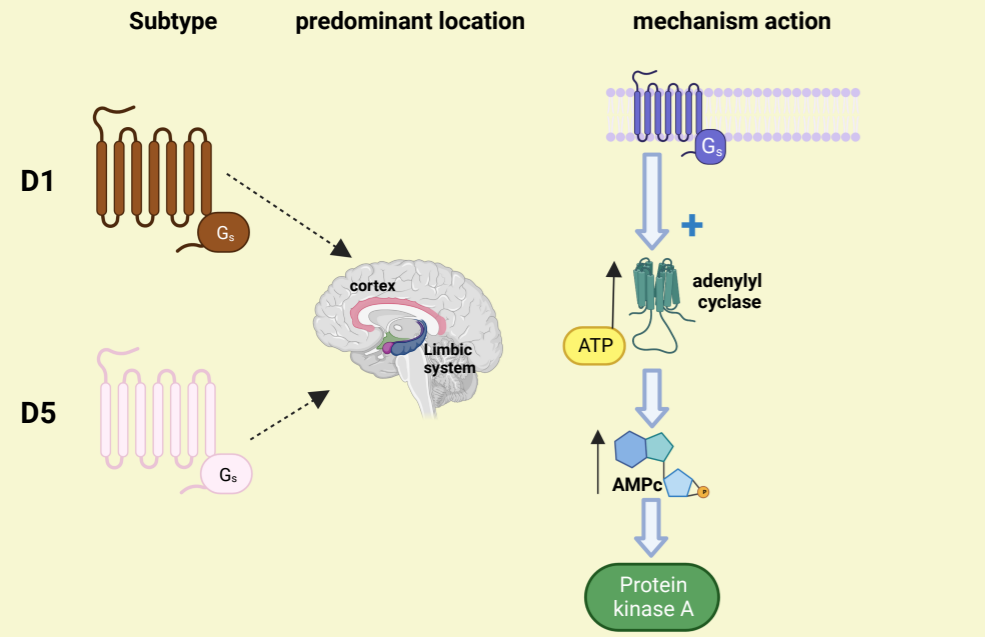
The classical pathway of DA biosynthesis involves two events, first the hydroxylation of L-tyrosine to dihydroxyphenylalanine (L-DOPA) catalyzed by tyrosine hydroxylase (TH) in the presence of tetrahydrobiopterin, O₂ and iron (Fe²⁺) as cofactors. Furthermore, DOPA is decarboxylated to DA by aromatic amino acid decarboxylase (AADC), where pyridoxal phosphate (PP) is present as a cofactor. After synthesis, DA is readily sequestered within synaptic vesicles via the vesicular monoamine transporter 2 (VMAT-2), dopamine transporters (DATs) remove excess dopamine from the synapse, as well as catechol O-methyltransferase (COMT), which is one of several enzymes that degrades DA.



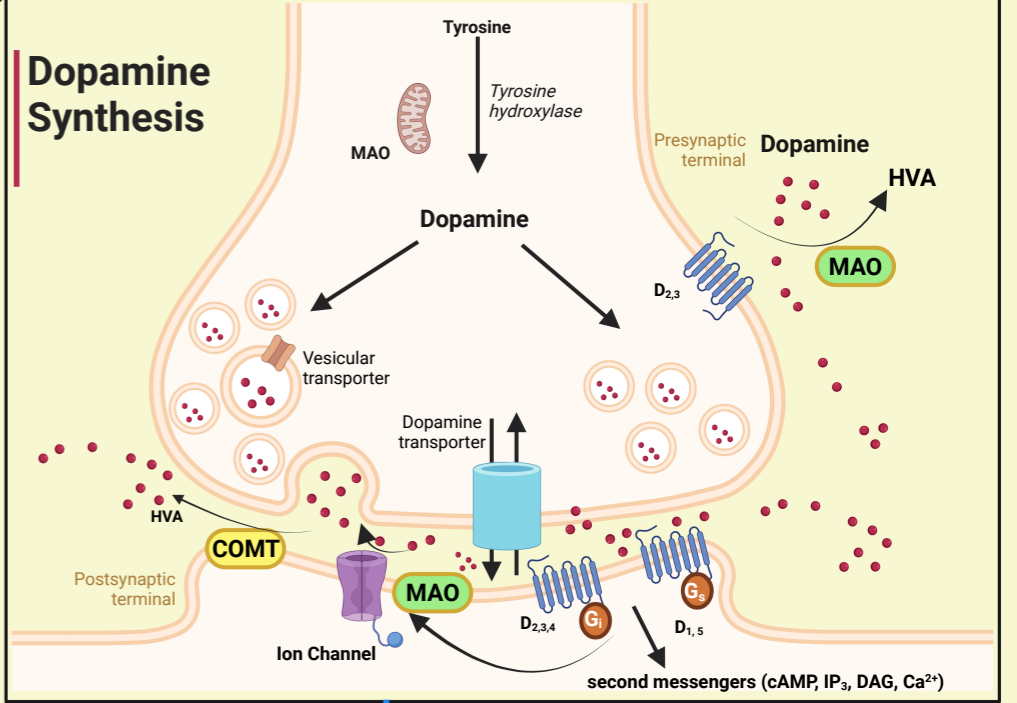
This family of receptors includes subtypes D2, D3, and D4



This family of receptors includes subtypes D1 and D5



The four main dopaminergic projections in the CNS.
 (1) The mesocortical pathway that connects VTA with the cerebral cortex: This pathway is related to cognition. (2) The mesostriatal (or nigrostriatal) pathway: the substantia nigra pars compacta (SNc) projects into the dorsal striatum; this is the pathway that degenerates in Parkinson's disease. (3) The ventral tegmental area (VTA) projects to the ventral striatum (nucleus accumbens), olfactory bulb, amygdala, hippocampus, orbital and medial prefrontal cortex, and cingulate gyrus. (4) The arcuate nucleus of the hypothalamus projects via the tuberoinfundibular pathway into the hypothalamus, from where dopamine is delivered to the anterior pituitary and prolactin secretion is regulated.



- DOPAMINERGIC SYSTEM ALTERATIONS**
- Schizophrenia
 - Depression
 - dementia
 - Parkinson's disease
 - Bipolar disorder
 - Hyperprolactinemia

Pharmacological intervention can modulate the neurological diseases

