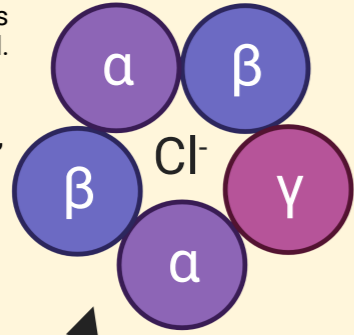
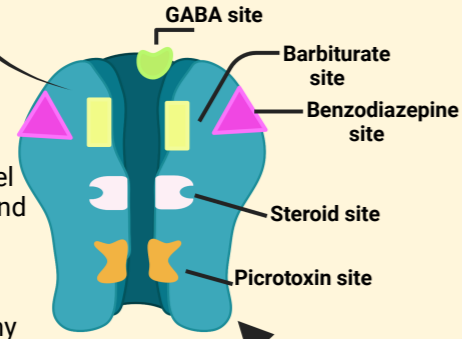


GABAergic System

The complexity of GABA_A receptors lies in the number of subunits they contain, and in the different combinations in which they are assembled. To date, six subunits have been characterized in humans: α(α1-α6), β(β1-β3), δ(δ1-δ3), ε, π, and θ, giving this receptor a high degree of heterogeneity



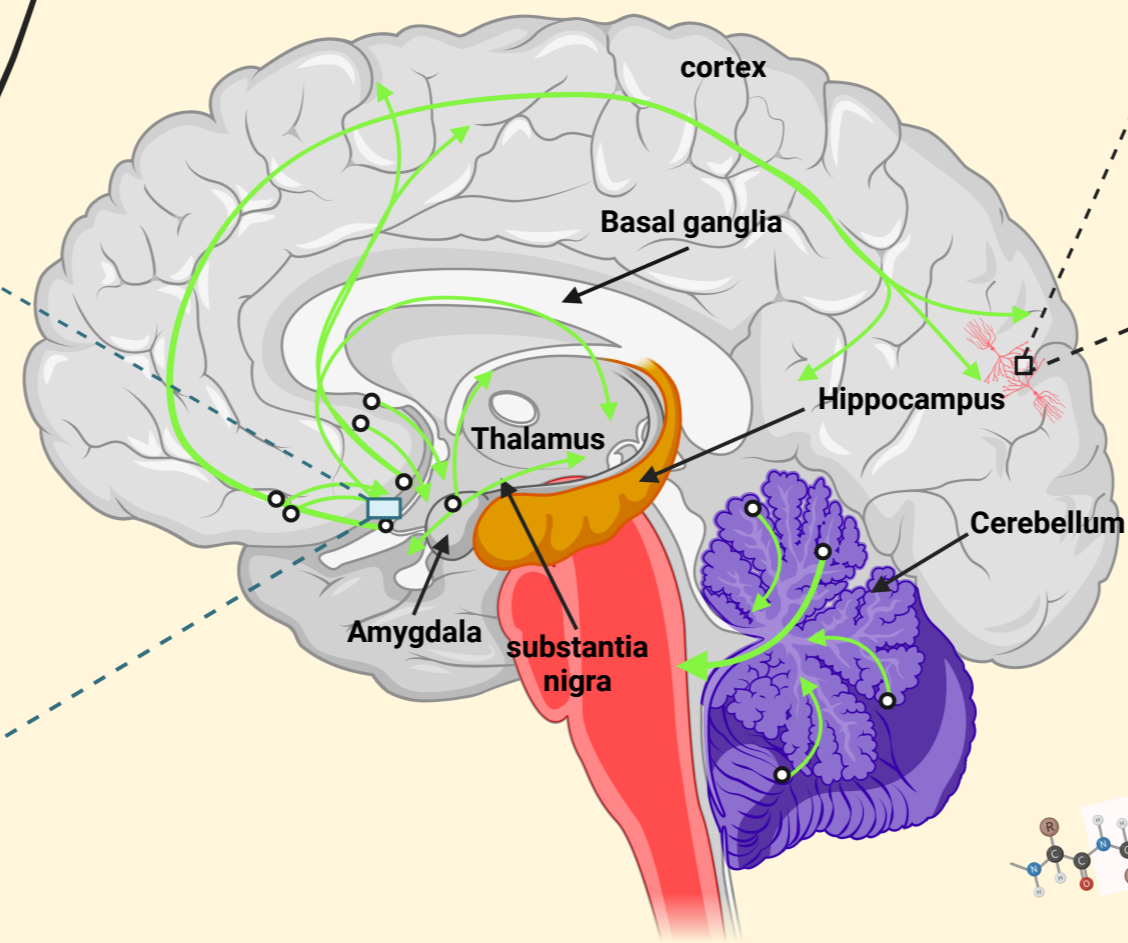
The GABA-binding site is directly responsible for opening the Cl⁻ channel. A variety of agonists bind to this site and elicit GABA-like responses. The GABA_A receptor is the major molecular target for the action of many drugs in the brain.



The main inhibitory neurotransmitter of CNS and of the most abundant neurotransmitters in mammals

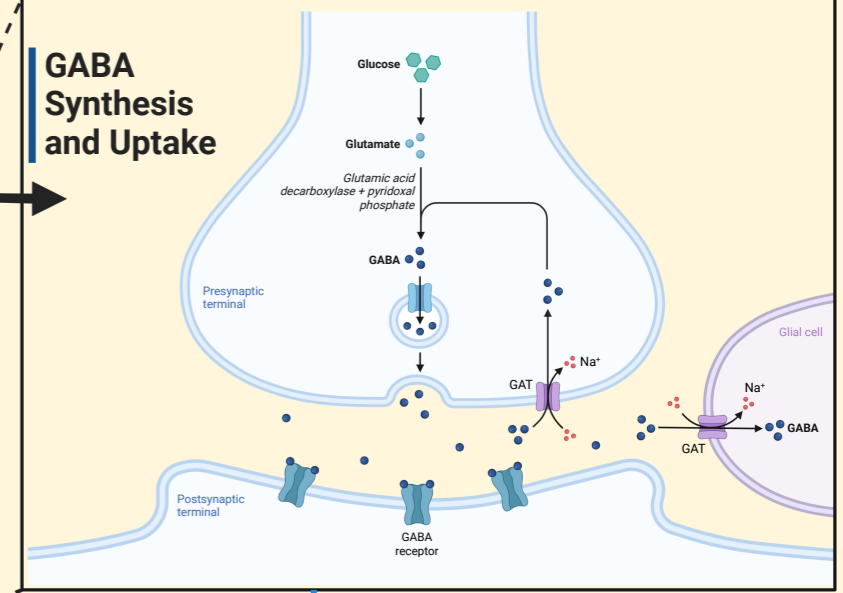
The action is mediated by two types of receptors

Origination → destination



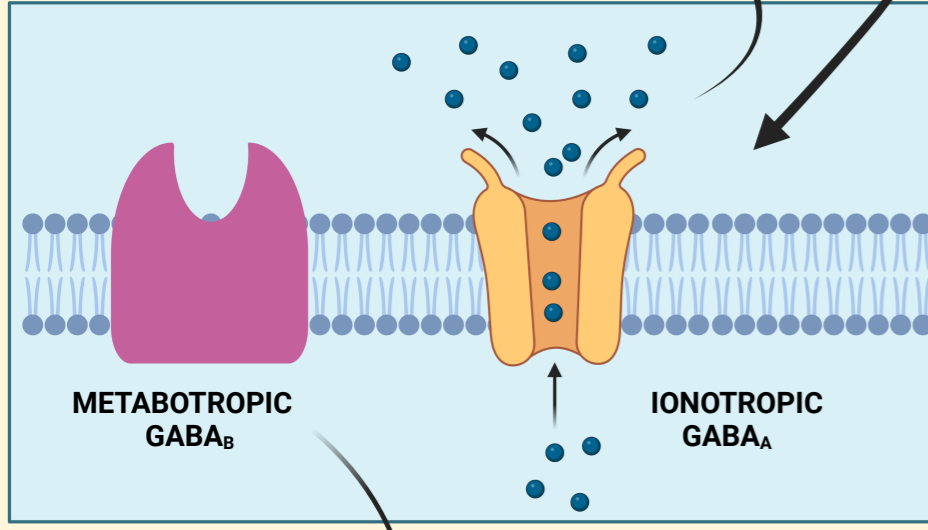
GABAergic interneuron projections in the brain. These interneurons run throughout the amygdala, hippocampus, hypothalamus, prefrontal cortex, olfactory bulb, including the spinal cord, cerebellum, and even the retina. This broad expression of GABAergic cells indicates the key role of this inhibitory neurotransmitter in CNS functions, such as memory, motor control, mood, sleep, among others.

GABA is produced in the CNS, through the decarboxylation of glutamic acid, by glutamic acid decarboxylase (GAD). In general, the enzymatic activity of GAD is regulated by its expression levels and the degree of association with the cofactor pyridoxal phosphate (PLP)

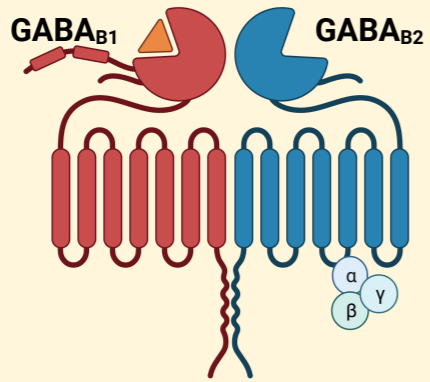


- GABAERGIC SYSTEM ALTERATIONS**
- SLEEP DISORDERS
 - EPILEPSY DISEASE
 - ALCOHOLISM
 - PREMENSTRUAL SYNDROME
 - DEPRESSION
 - ANXIETY DISORDERS
 - SCHIZOPHRENIA

Transmission or expression errors



The G proteins modulate K⁺ and Ca²⁺ channels



At the post-synaptic level, receptor activation induces a K⁺ conductance increase, which is responsible for the "slow" inhibitory events of GABA in the CNS. The activation of this K⁺ conductance, coupled with negative regulation of Ca²⁺ influx at the presynaptic level, decreases the release of GABA

