

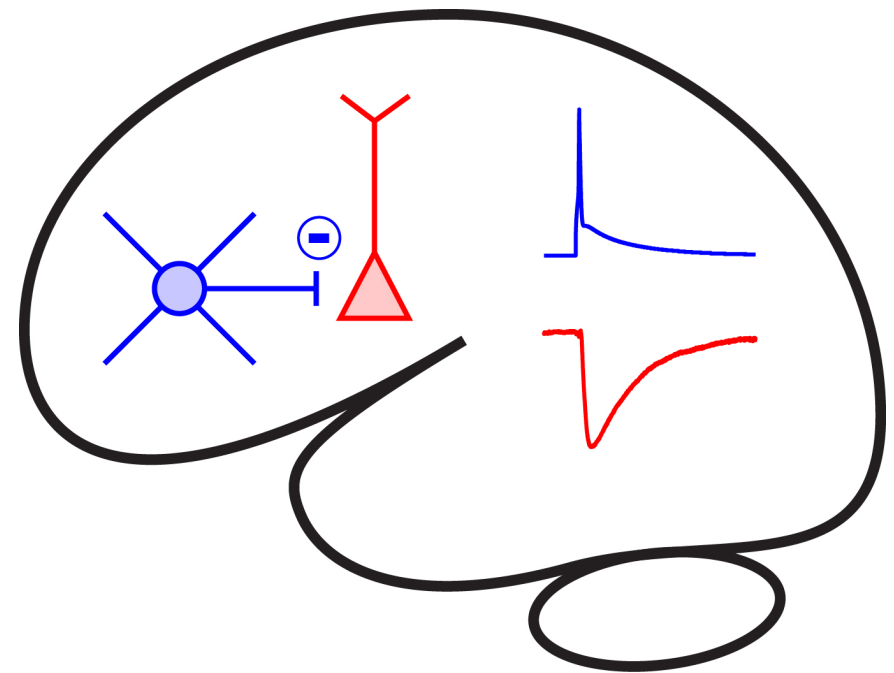
5.2 Inhibitory synaptic conductances

Cellular Mechanisms of Brain Function

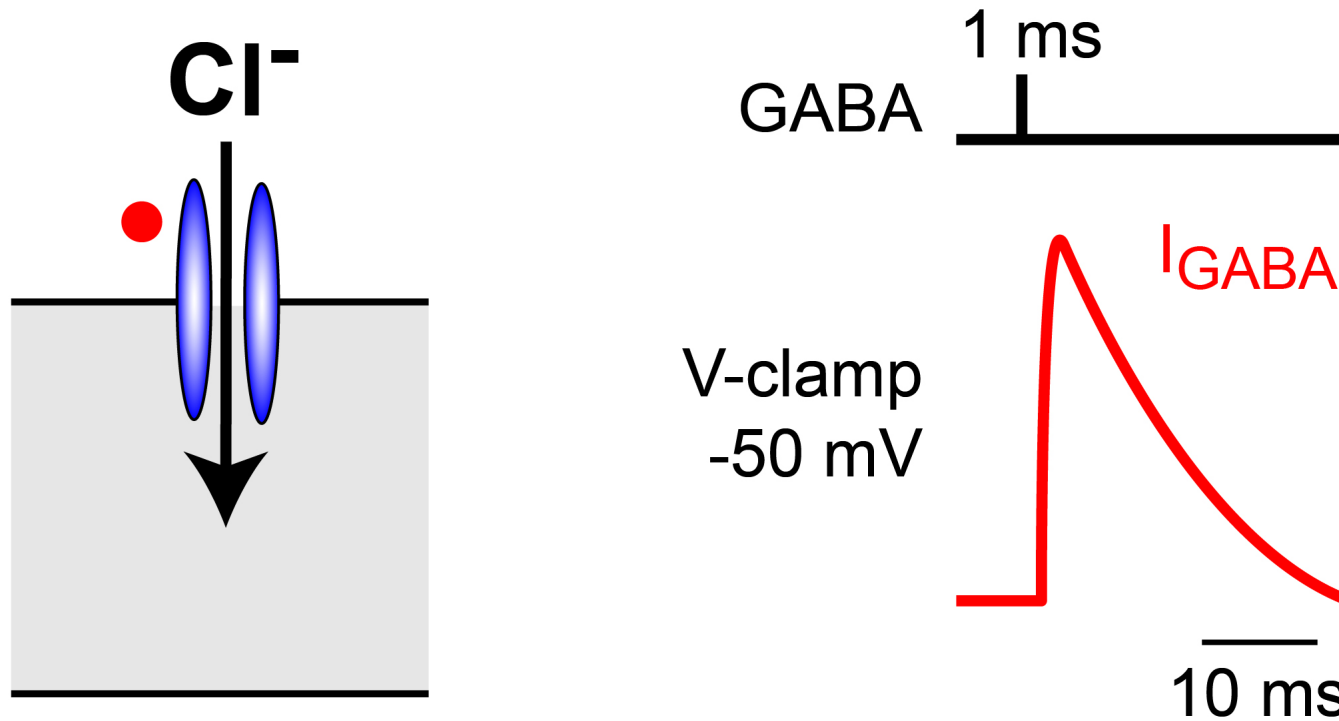
Prof. Carl Petersen

GABAergic inhibitory postsynaptic conductances

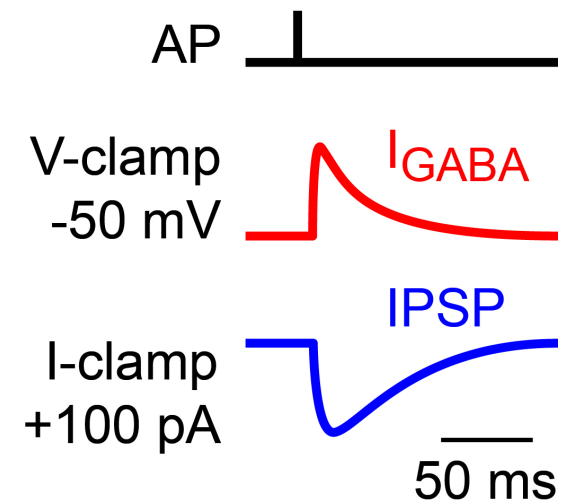
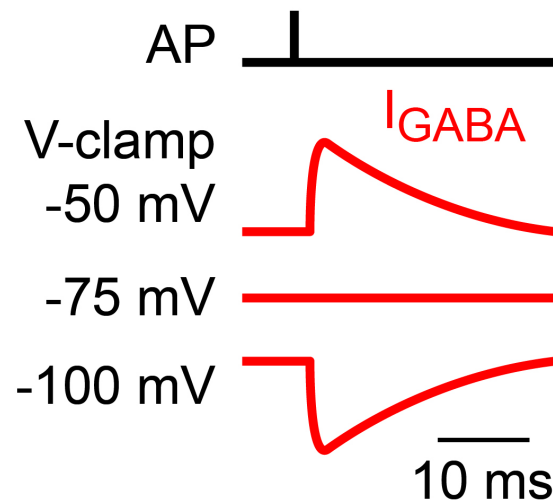
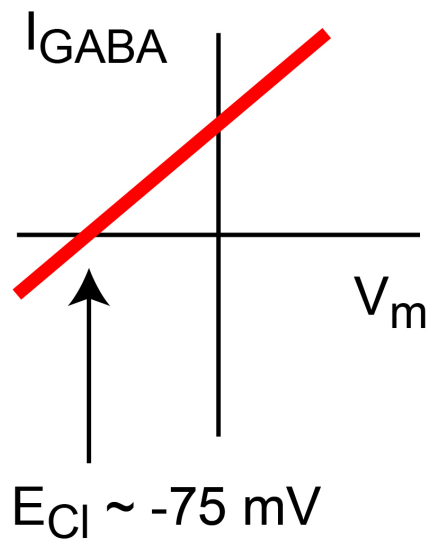
GABAergic inhibitory postsynaptic potentials



The GABA_A receptor is a fast ligand-gated channel

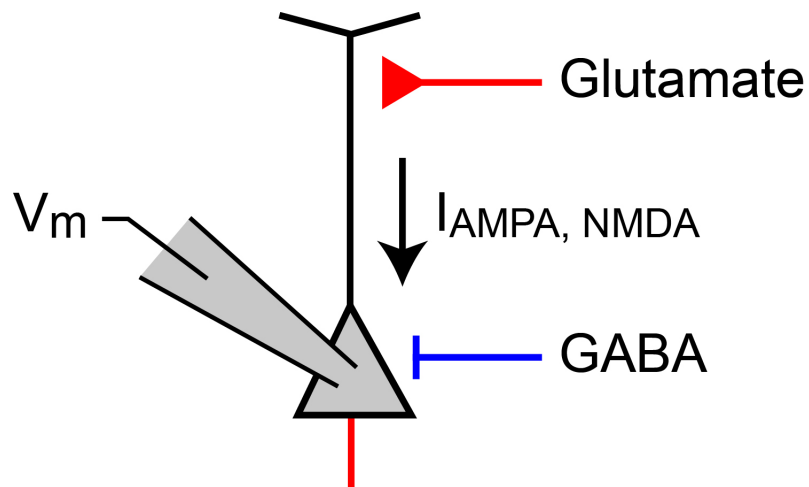


Inhibitory postsynaptic potentials - IPSPs



Shunting inhibition

The resting V_m is often close to the chloride reversal potential.
If $V_m = E_{Cl}$, then there is no flow of current and therefore no IPSP, but there is nonetheless a conductance, which changes the input resistance.



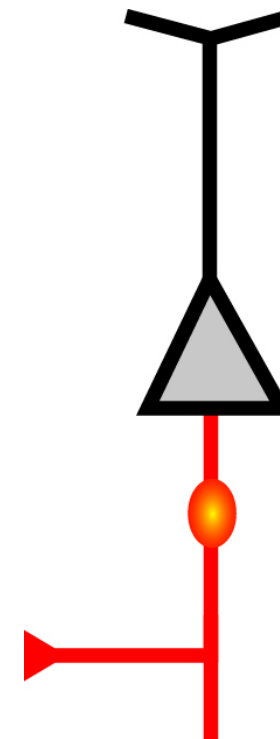
Target structures of GABAergic inhibition



Dendrites

Soma

Axon (AIS)



GABAergic synaptic conductances

- Synaptic GABA_A conductances last ~10 ms, reversing ~-75 mV.
- GABA_A synaptic input causes hyperpolarising inhibition when V_m is depolarised.
- GABA_A synaptic input also causes shunting inhibition due to decreased membrane resistance.