**GABA**
- Main inhibitory neurotransmitter
- Formed by the decarboxylation of glutamate, by the aptly-named glutamate decarboxylase
- Catabolised into succinate (and plugged into the citric acid cycle) by GABA Transaminase

**GABA RECEPTORS:** 3 types, and they all hyperpolarize neurons

- **GABA-A**
  - Ligand-gated chloride channels
  - The targets of BENZODIAZEPINES

- **GABA-B**
  - Metabotropic- coupled to G-proteins; the effect is to increase potassium channel conductance and to decrease Ca++ influx

- **GABA-C**
  - Ligand-gated chloride channels
  - Found exclusively in the retina in adult vertebrates

**Glycine**
- Both excitatory and inhibitory effects in the CNS
- Has a job sensitizing NMDA receptors
- Seems to spill out of the synapse into the extracellular fluid
- Like GABA it increases chloride conductance of membranes
- **ANTAGONISED BY STRYCHNINE-** this causes a post-synaptic disinhibition, and thus convulsions

**Neuropeptides**

**Substance P and the Tachykinins**
- Mediator of the first synapse in the dorsal horn of the spinal cord; involved in pain transmission
- Receptors are G-protein-coupled
- Activation of its receptor leads to activation of phospolipase C, as well as IP$_3$ and DAG

**Opioid peptides**
- The endogenous peptides are the ENKEPHALINS and ENDORPHINS
- 3 main forms of receptors: mu, kappa and delta
  - **Mu:** analgesia, respiratory depression, constipation, euphoria, miosis,
    - Increase K+ conductance; bind only endorphins
  - **Kappa:** analgesia, diuresis, sedation, miosis
    - Closes Ca++ channels
  - **Delta:** analgesia
    - Closes Ca++ channels
- All three are G-protein coupled receptors which inhibit adenylyl cyclase

**Other polypeptides and random substances**
- SOMATOSTATIN
- VASOPRESSIN
- OXYTOCIN
- ADENOSINE – receptors blocked by caffeine
- CANNABINOIDS
- NITROUS OXIDE
- PROSTAGLANDINS
- Sex hormones and corticosteroids penetrate the brain easily

*References: Ganong Review of Medical physiology, 23rd ed, chapter 6*