

Fyziologie – nervová soustava – komentovaná prezentace

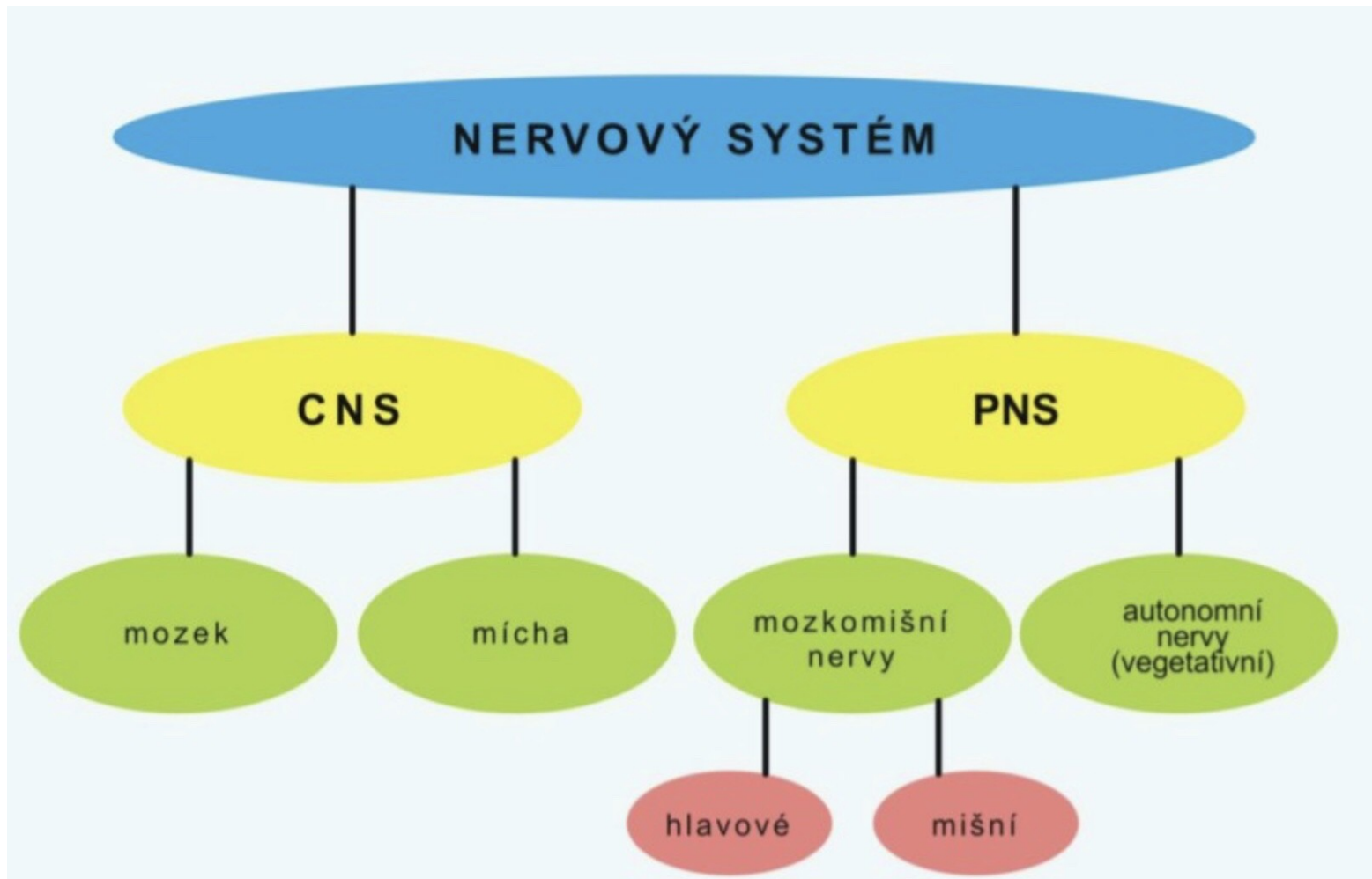
Mgr. Romana Klášterecká, Ph.D.



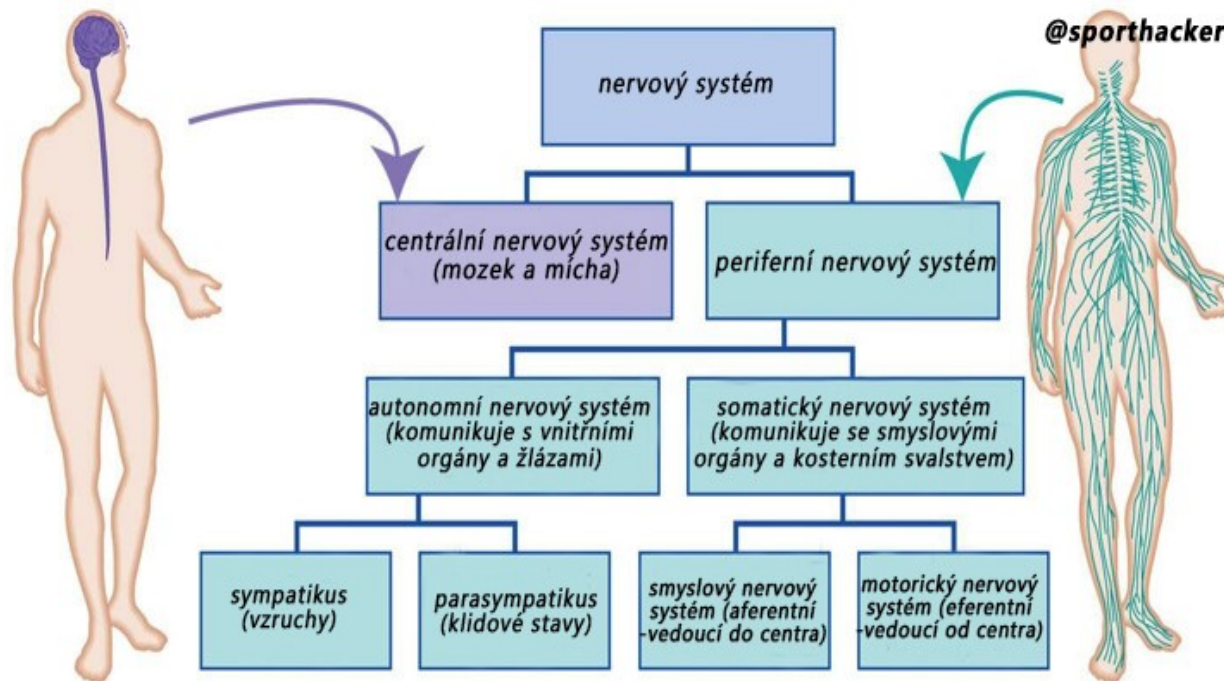
Nervový systém

- Nejvýše postavený řídicí a integrační systém
- Zasahuje do řízení a do funkce všech orgánů
- Koordinuje činnost jednotlivých orgánových systémů
- Pomáhá mu endokrinní systém
- Rychlost, jedinečnost, plasticita



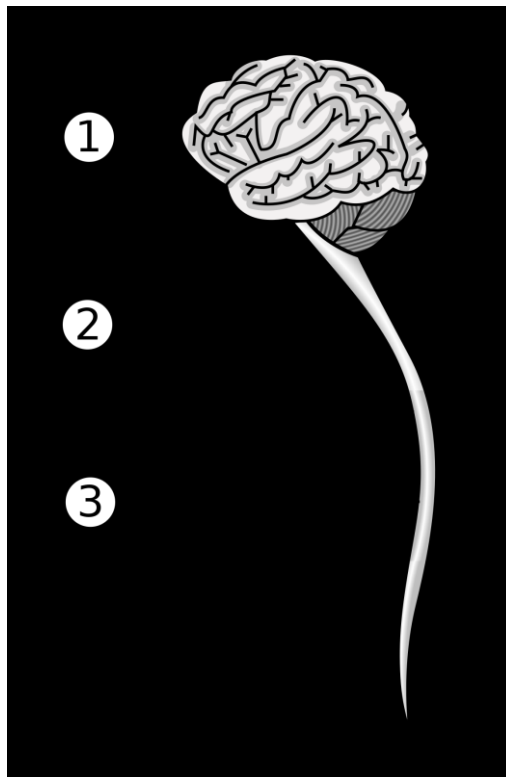


ORGANIZACE NERVOVÉHO SYSTÉMU

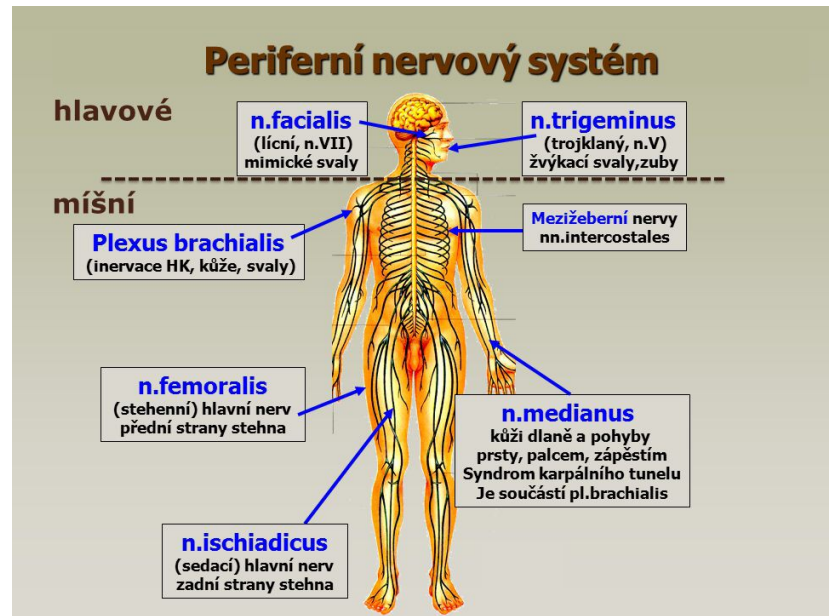


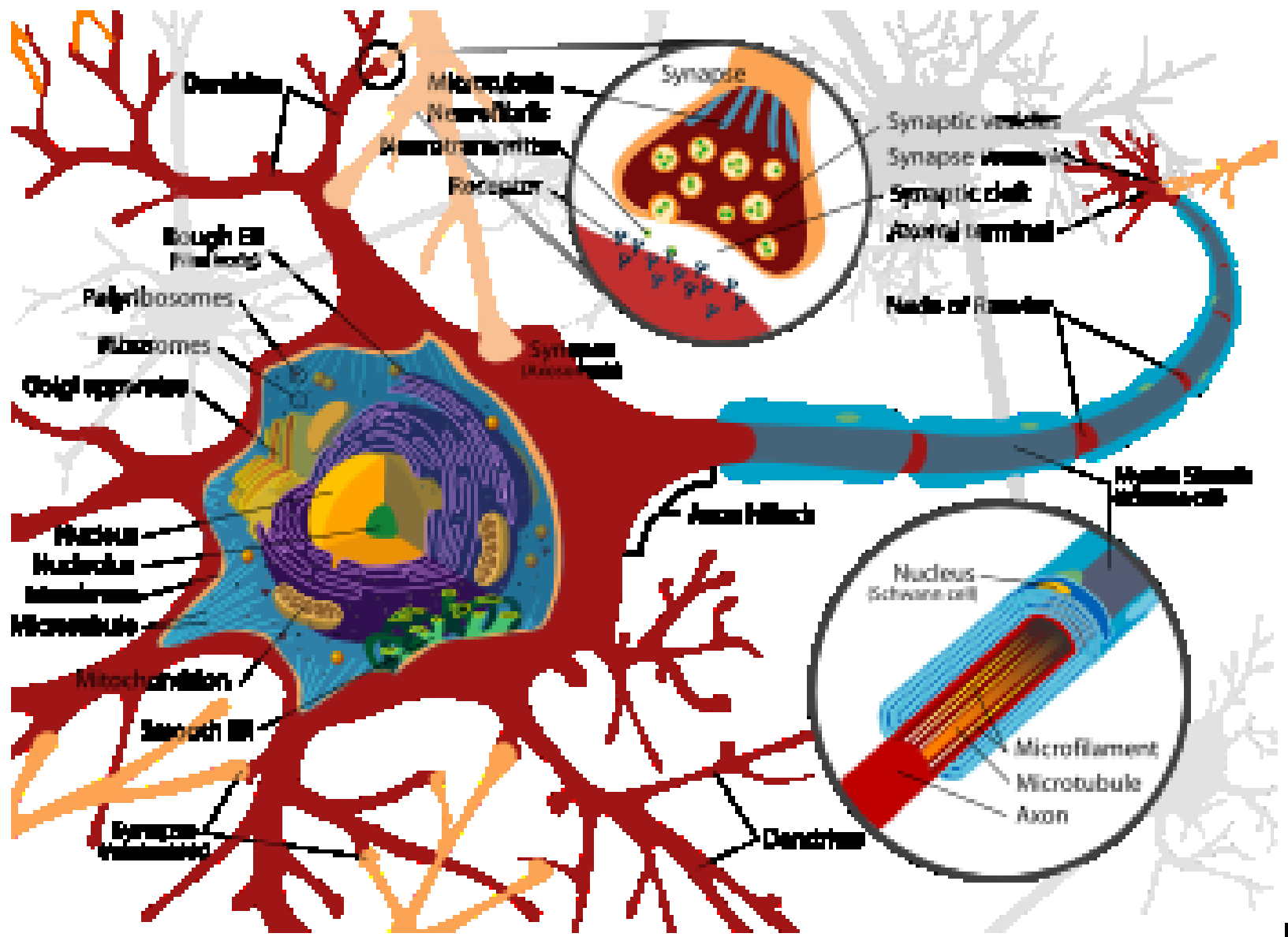
Nervová soustava

Centrální nervový systém

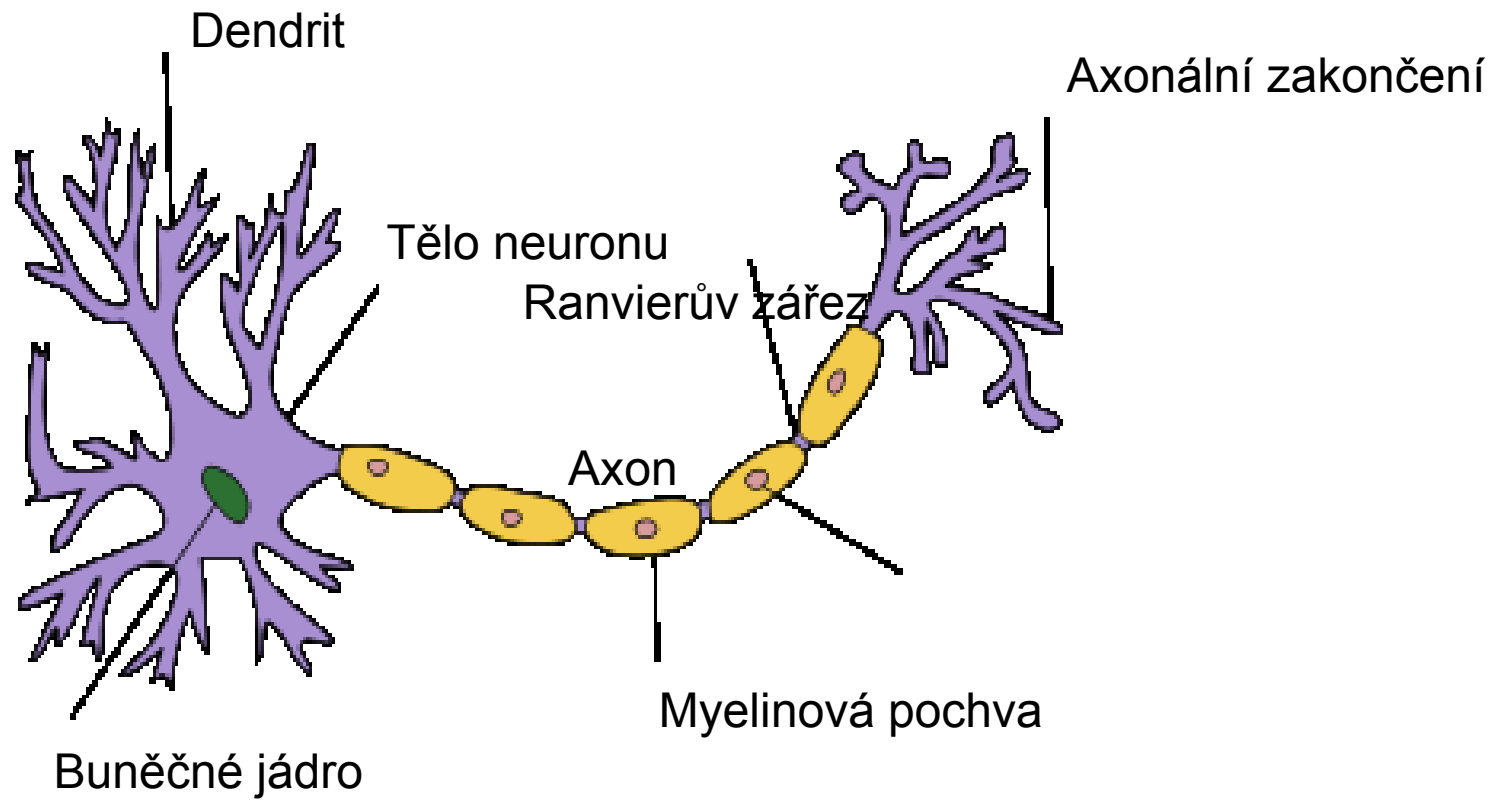


Periferní nervový systém





NEURON



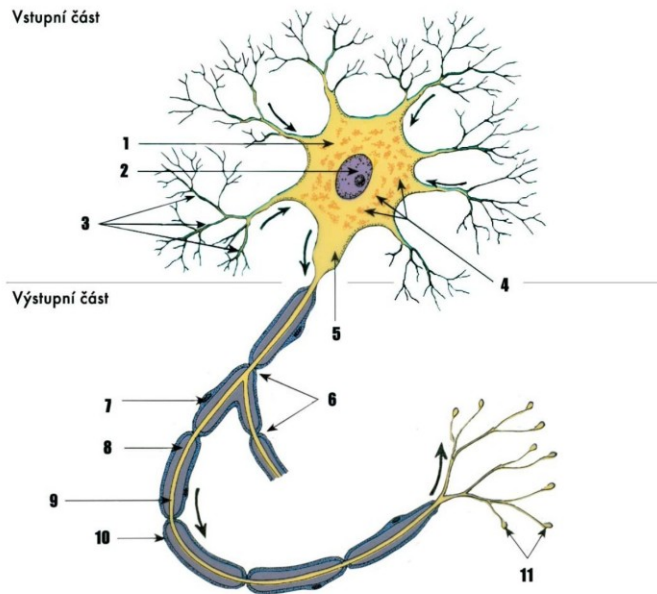
NEURON

Nervová buňka

(neuron)

Obrázek č. 2

Vstupní část

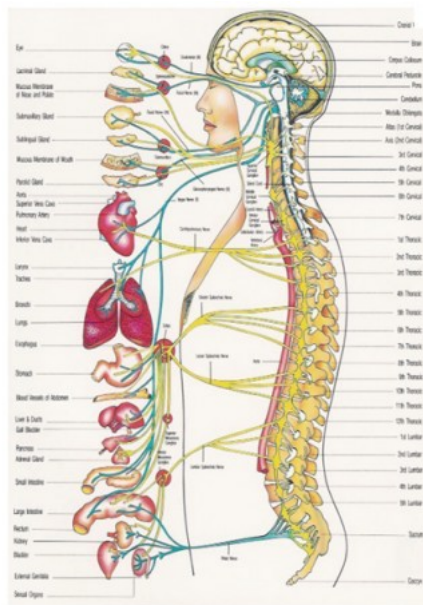


1. Buněčné tělo
2. Buněčné jádro
3. Dendrity
4. Nisslova substance
5. Axonový výběžek
6. Ranvierovy zářezy
7. Buněčná jádra Schwannových buněk
8. Myelinová vrstva myelinové pochvy
9. Axon
10. Myelinová pochva (neurolema)
11. Presynaptická knoflíková zakončení

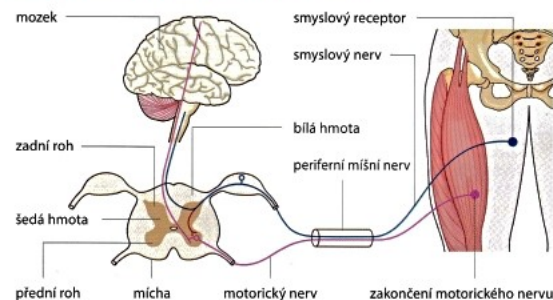


Dělení neuronů podle funkce

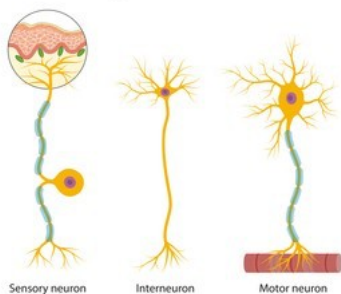
- Senzitivní
- Motorické
- Autonomní
- Internurony



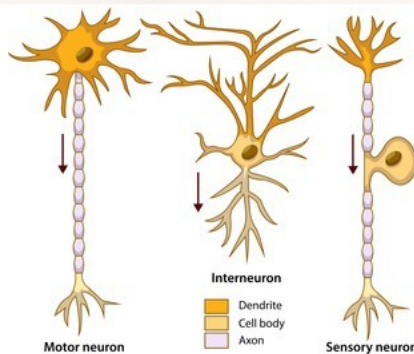
OBR. 2 – PRŮŘEZ MÍCHOU A MOTORICKÁ DRÁHA



Types of neurons



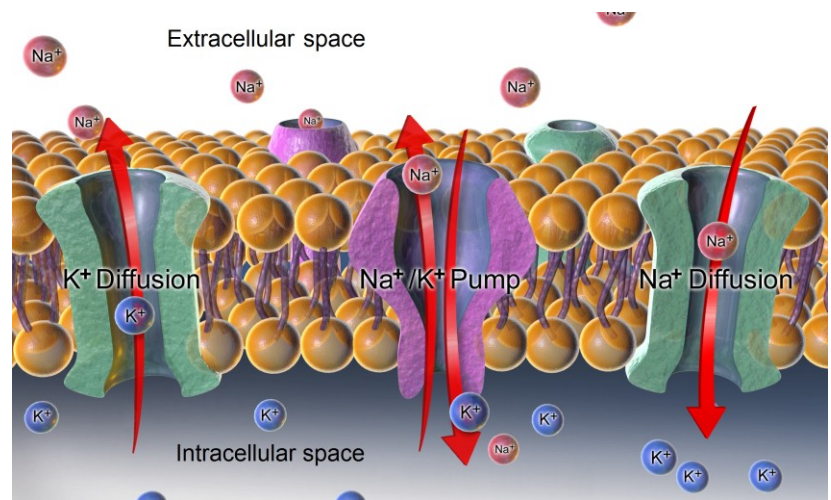
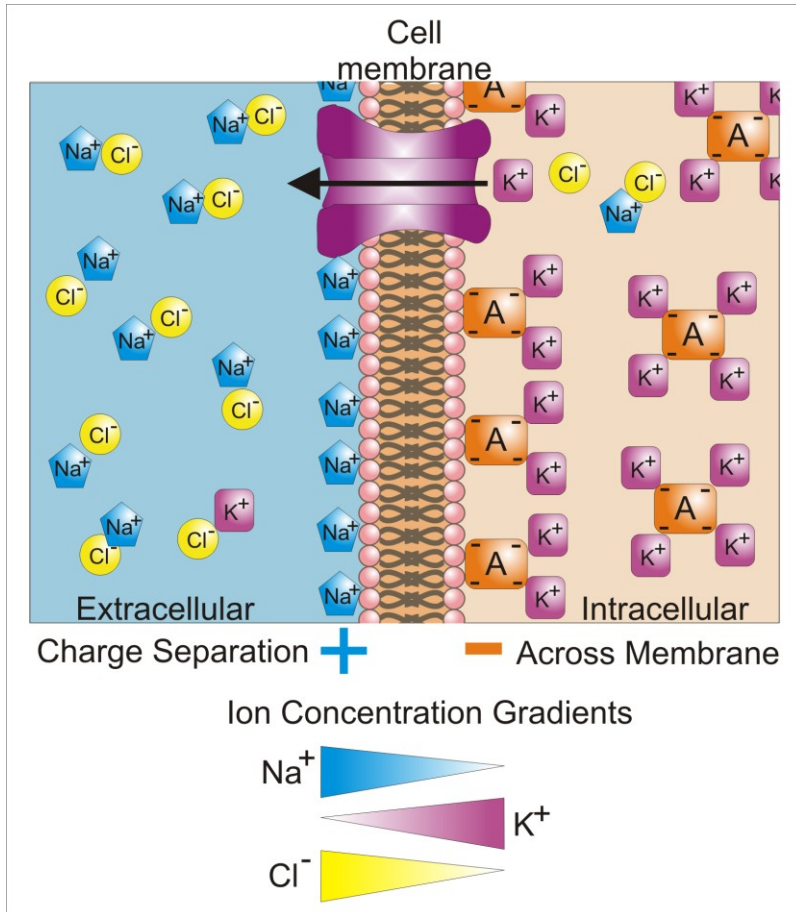
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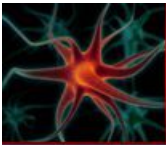


shutterstock.com · 765092974

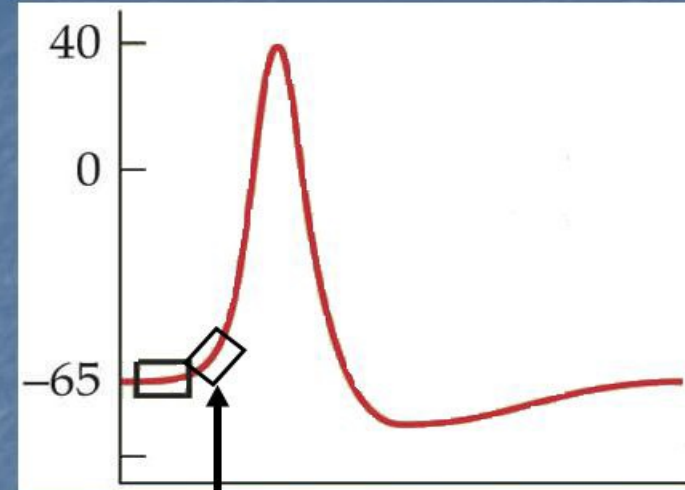
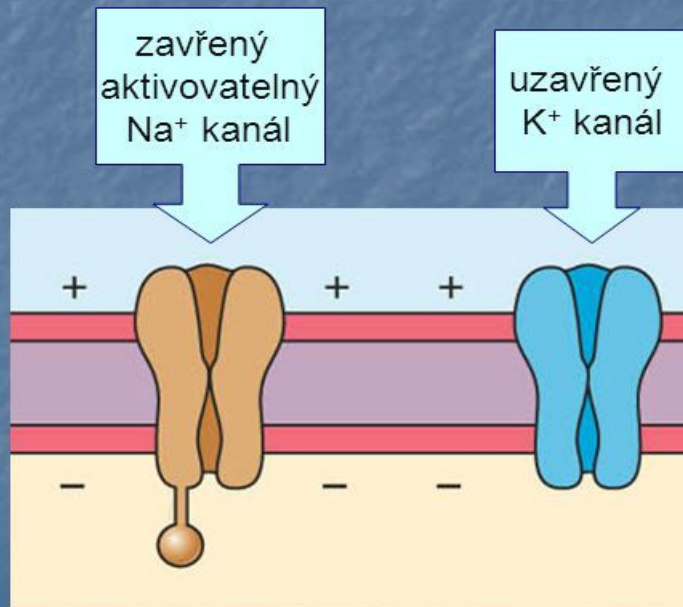


Klidový membránový potenciál





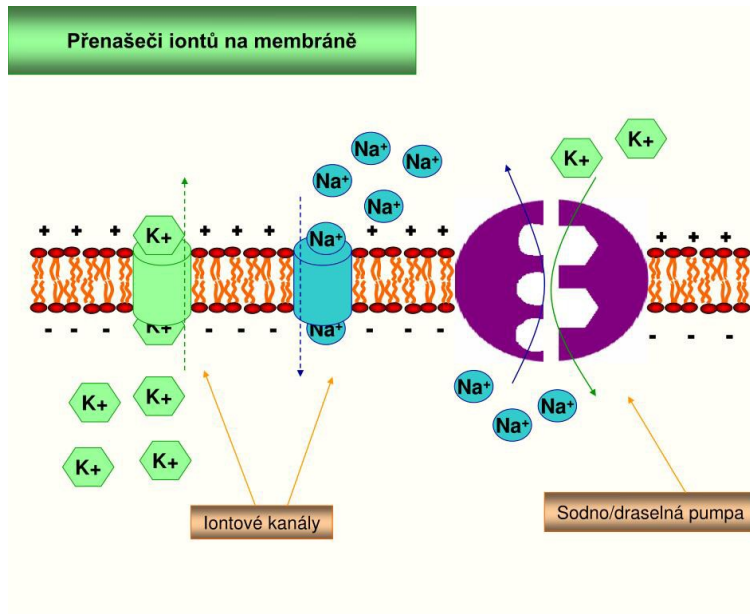
Klidový membránový potenciál



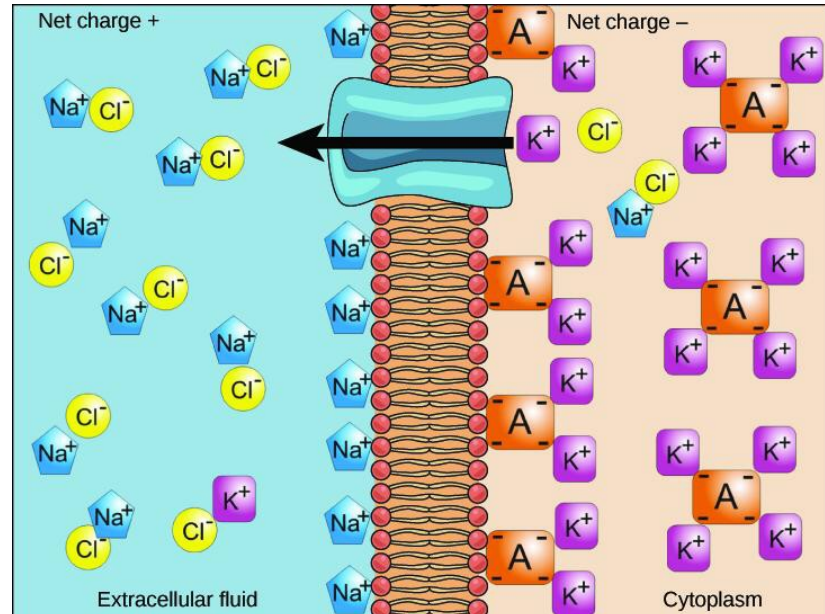
Prahové napětí – podnět otevře některé Na⁺ kanály. Pokud vtok Na⁺ dosáhne prahových hodnot, otevřou se aktivací brány pro Na⁺ a způsobí tak AP.

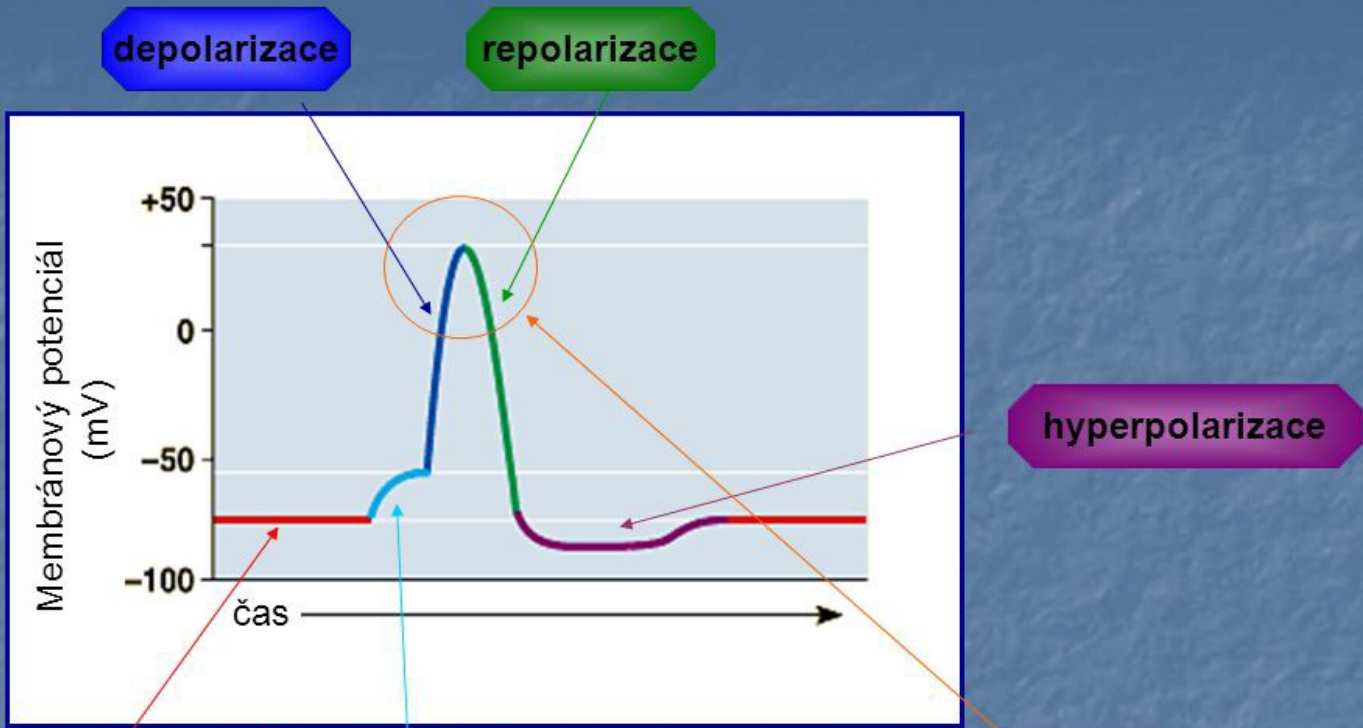


Akční membránový potenciál



K-17



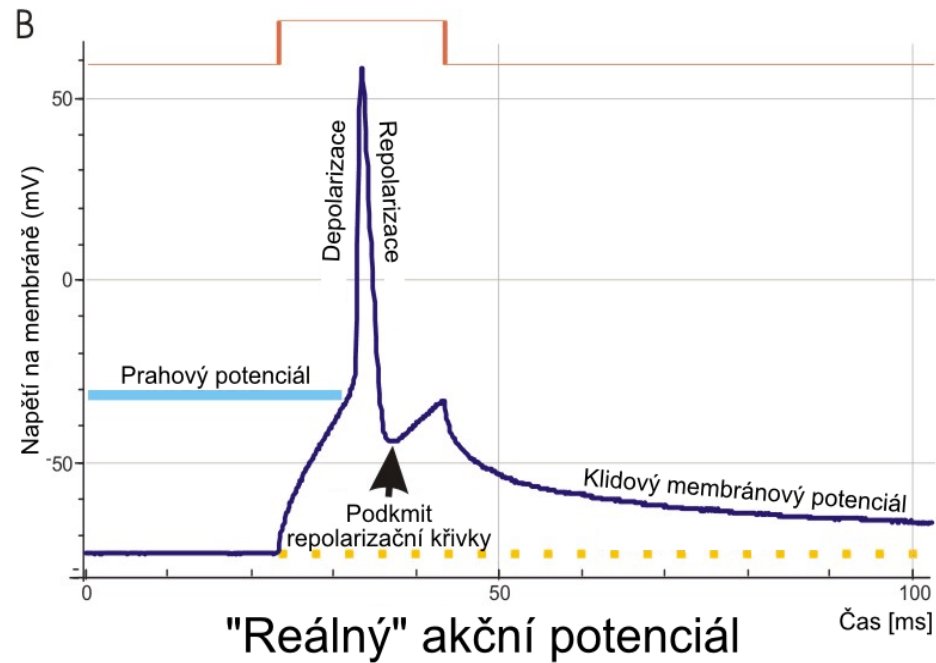
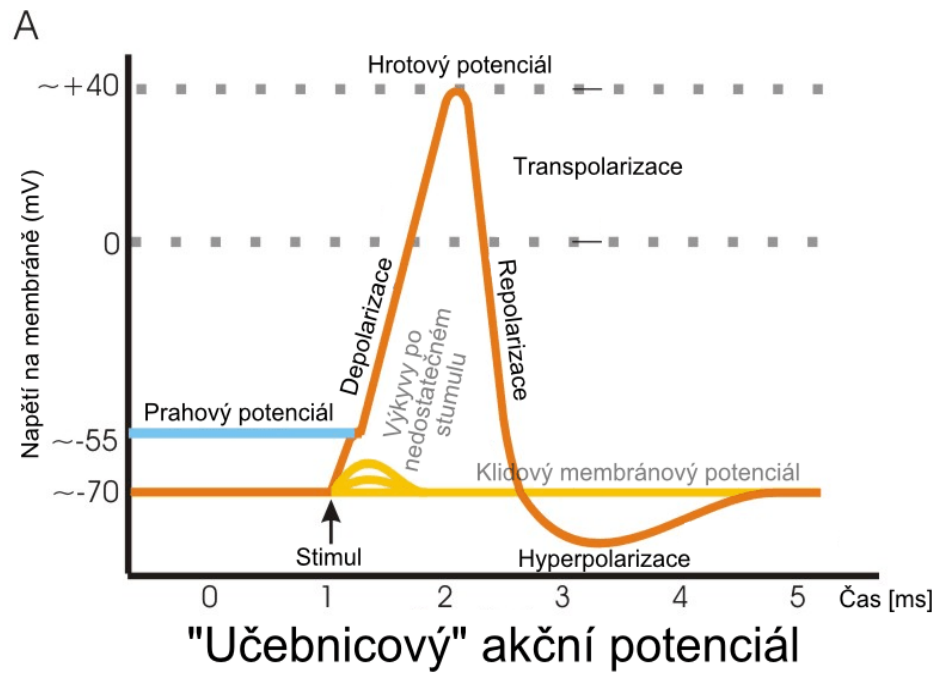


klidový potenciál

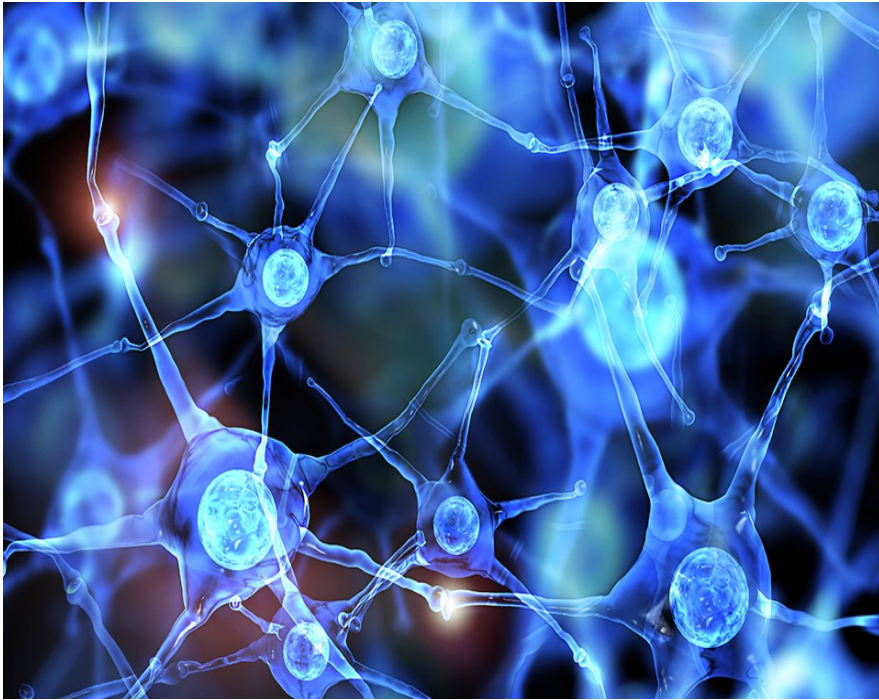
práh

Akční potenciál

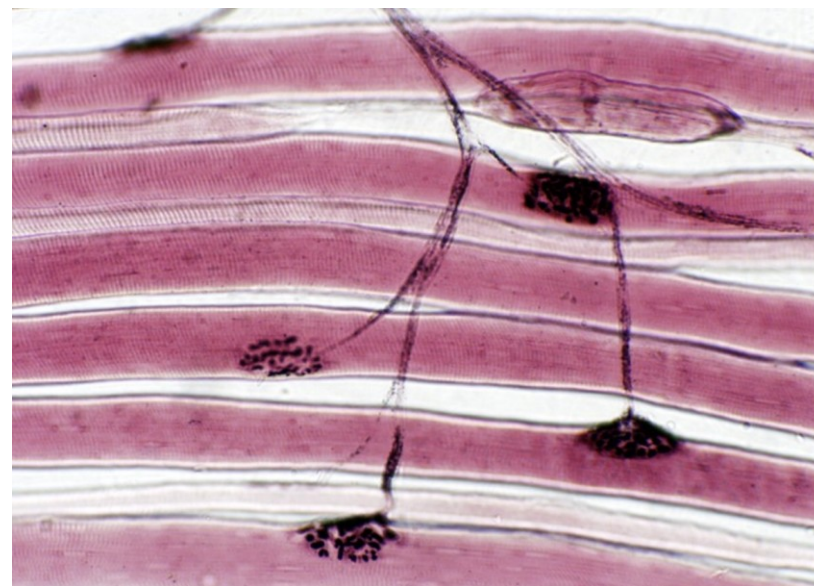
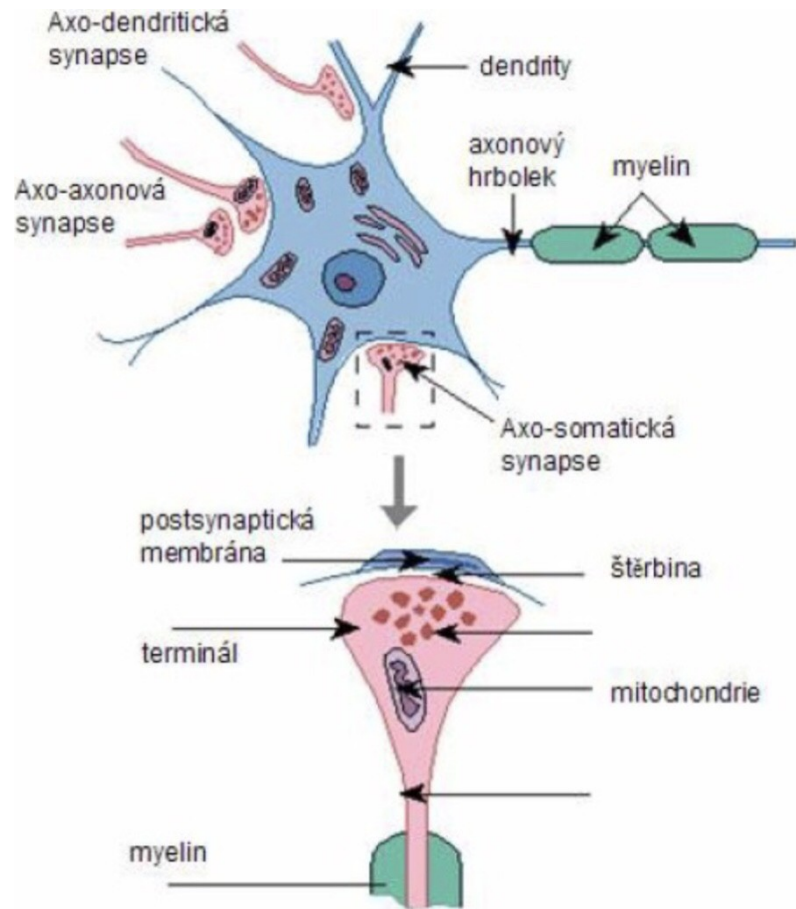




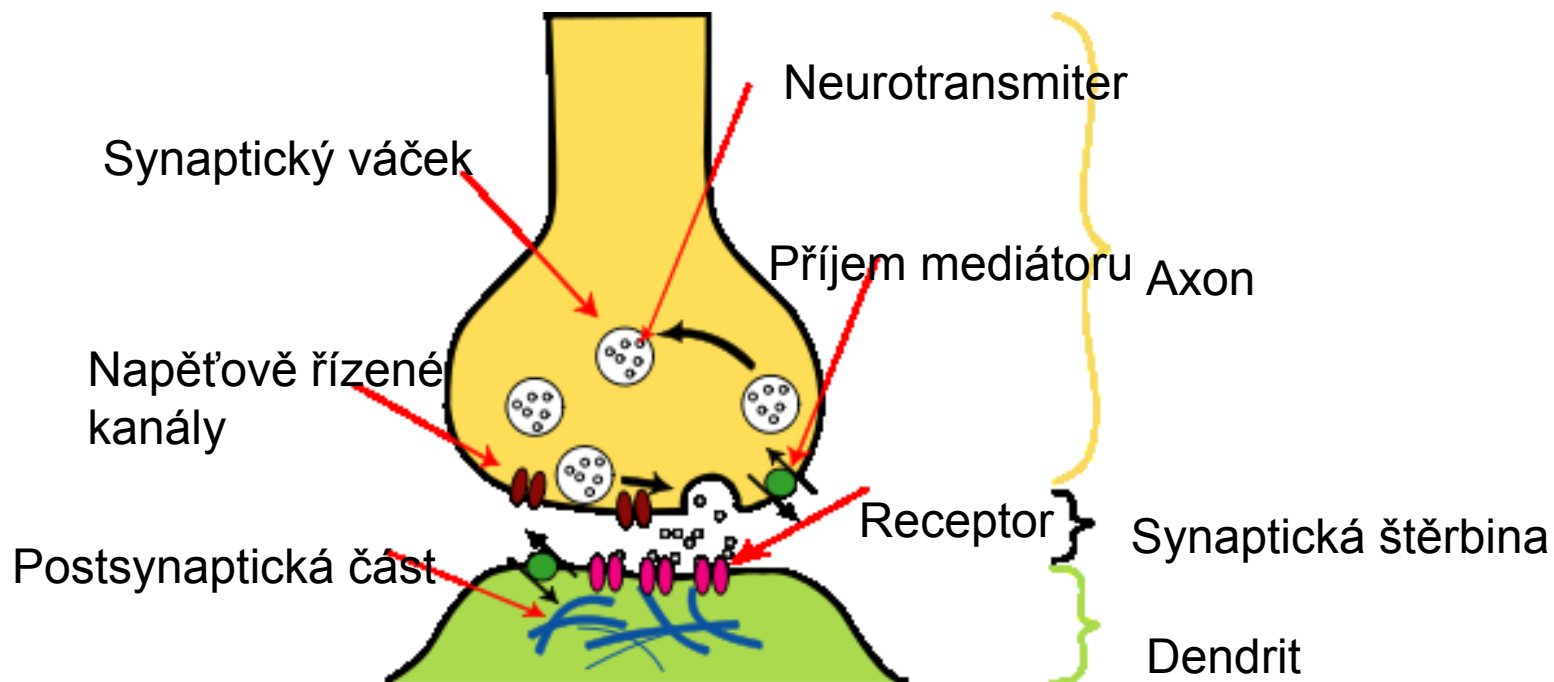
SYNAPSE



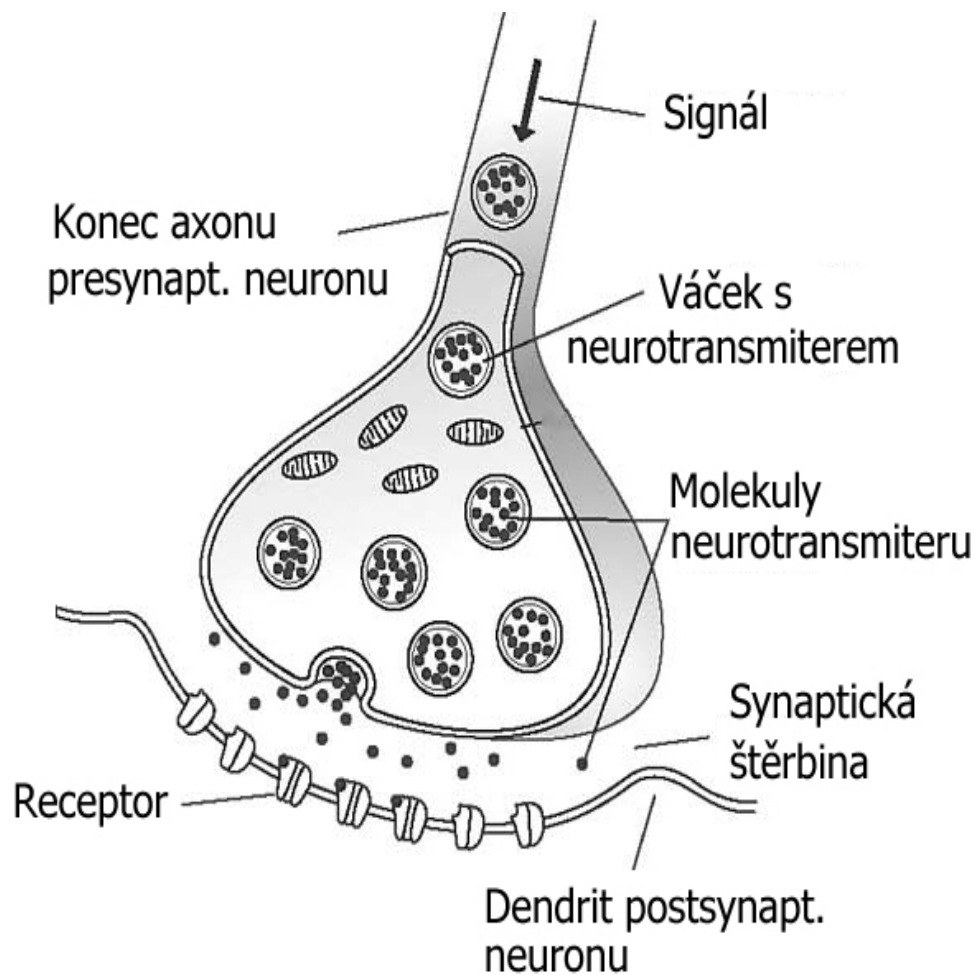
SYNAPSE



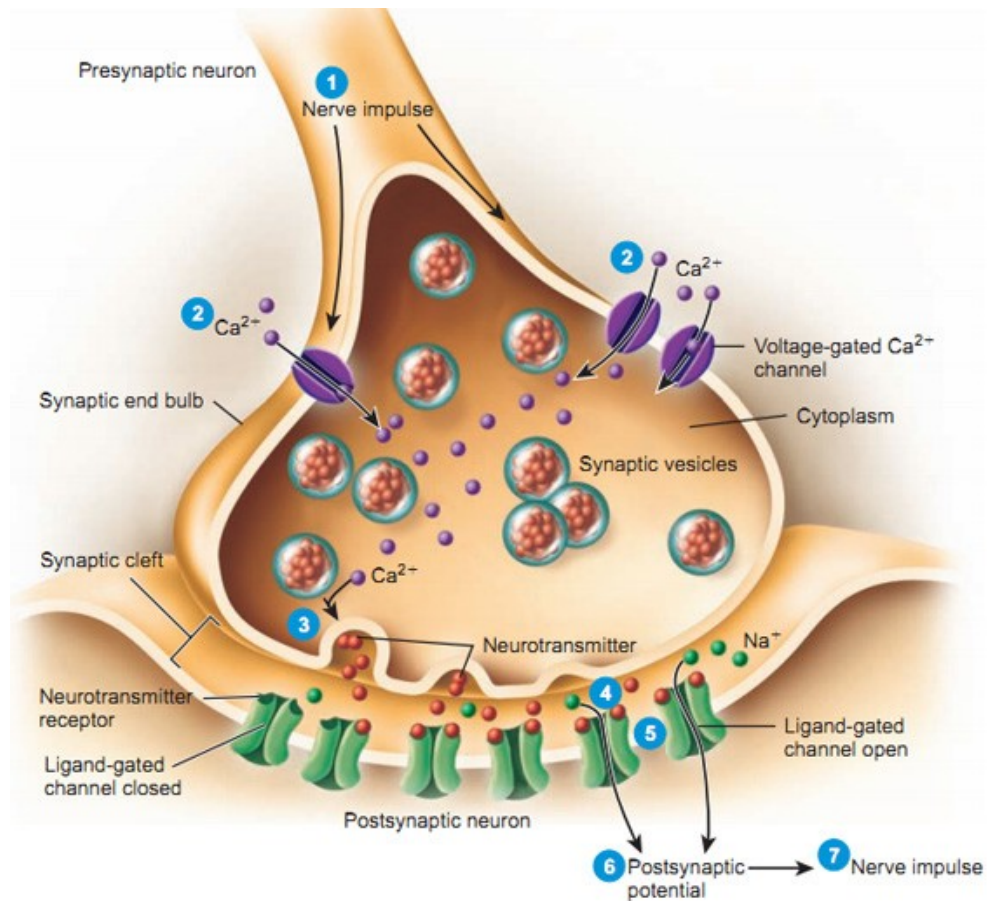
SYNAPSE



Synapse



SYNAPSE

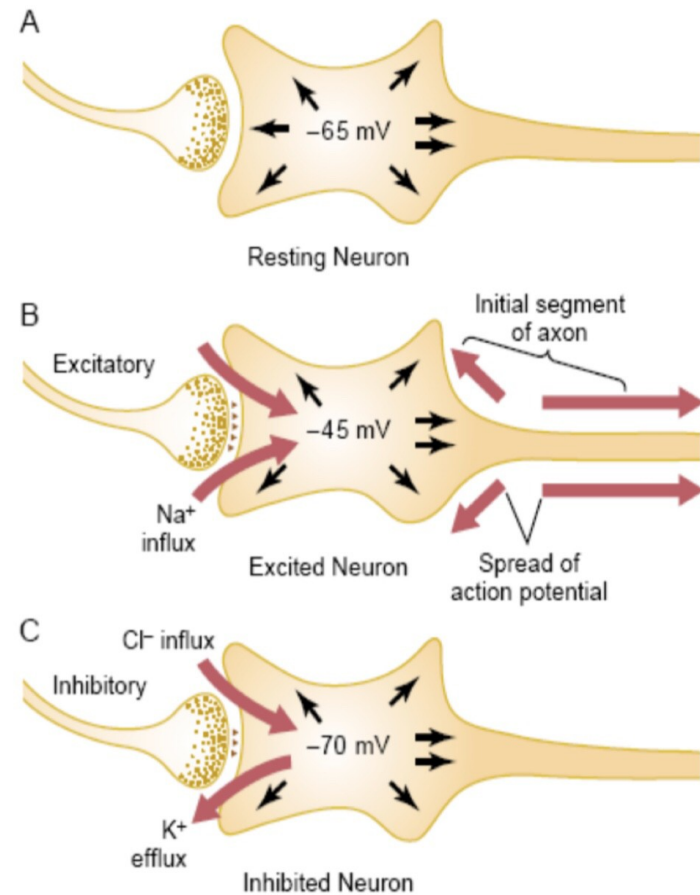


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SYNAPSE

- Excitační synapse, excitační postsynaptický potenciál (EPSP)
- Inhibiční synapse, inhibiční postsynaptický potenciál (IPSP)



SYNAPSE

Konvergence

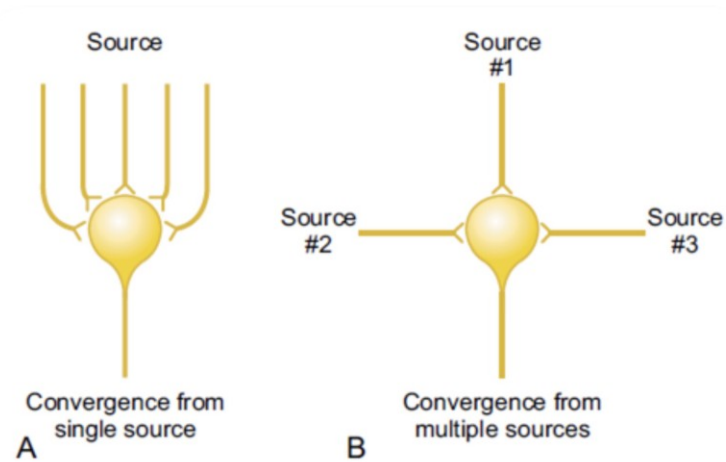


Figure 46-12

"Convergence" of multiple input fibers onto a single neuron. *A*, Multiple input fibers from a single source. *B*, Input fibers from multiple separate sources.

Divergence

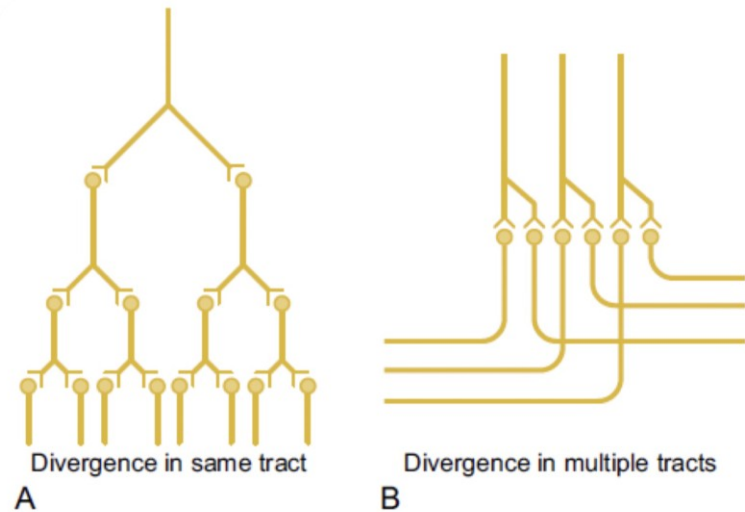
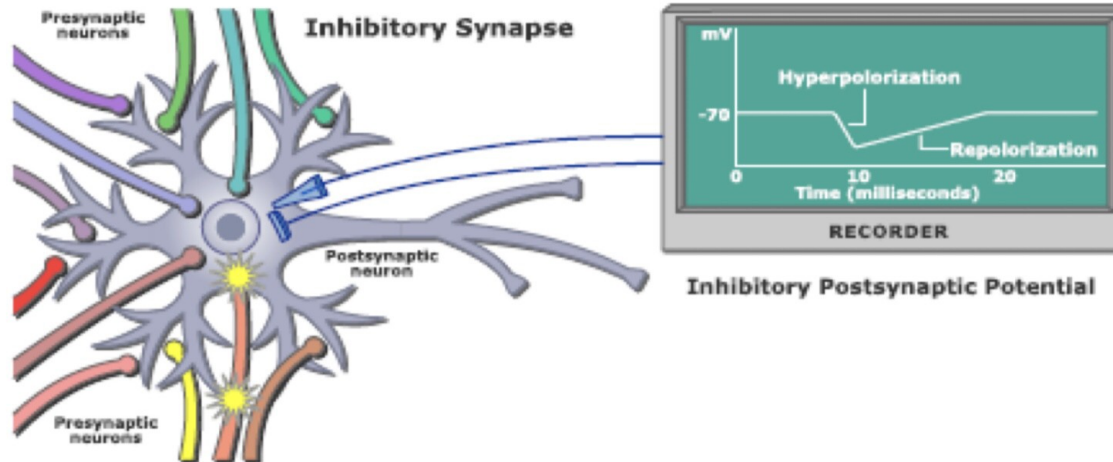
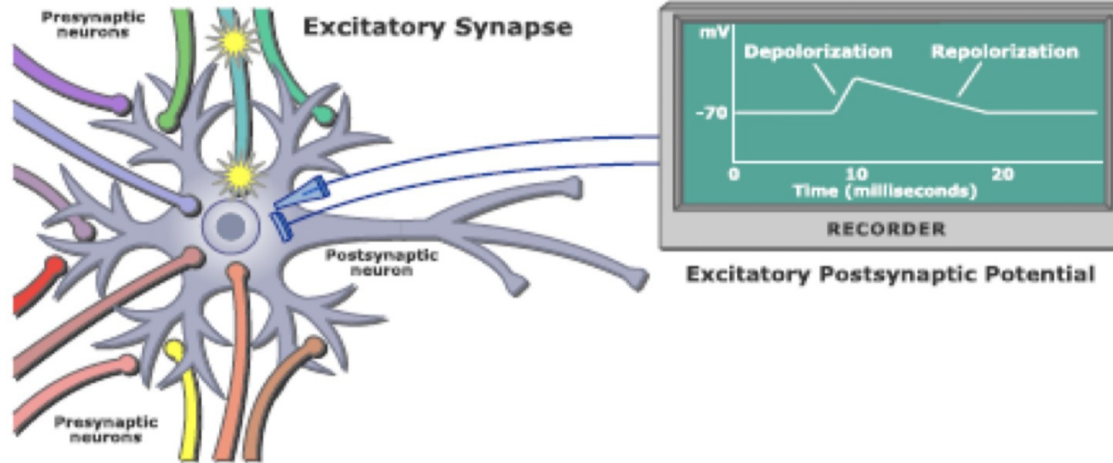


Figure 46-11

"Divergence" in neuronal pathways. *A*, Divergence within a pathway to cause "amplification" of the signal. *B*, Divergence into multiple tracts to transmit the signal to separate areas.



SYNAPSE



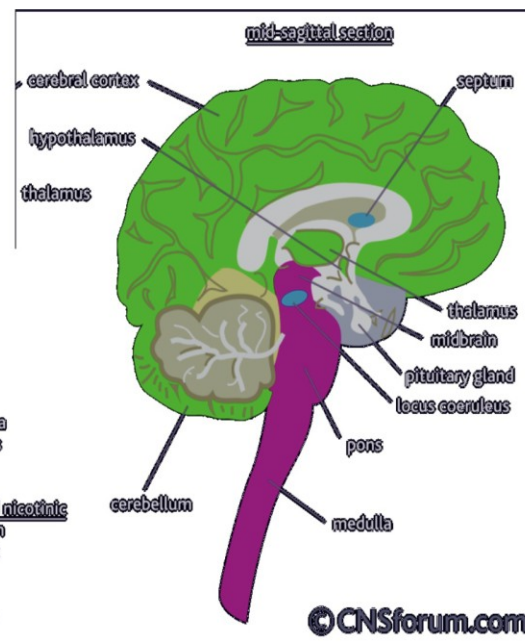
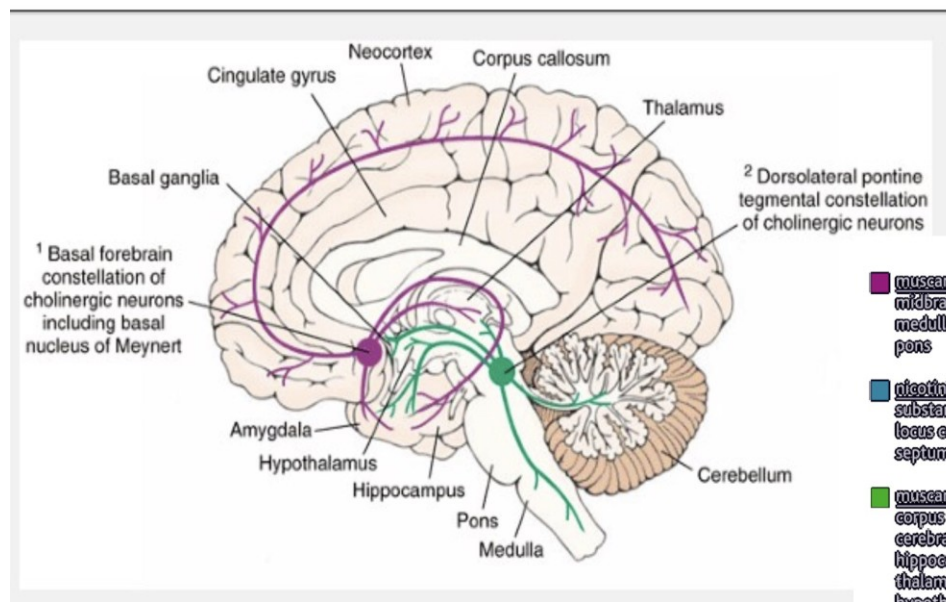
SYNAPSE

- Elektrická – obousměrný přenos
- Chemická – jednosměrný přenos pomocí mediátorů
- Acetylcholin
- Noradrenalin, adrenalin
- Dopamin
- Serotonin



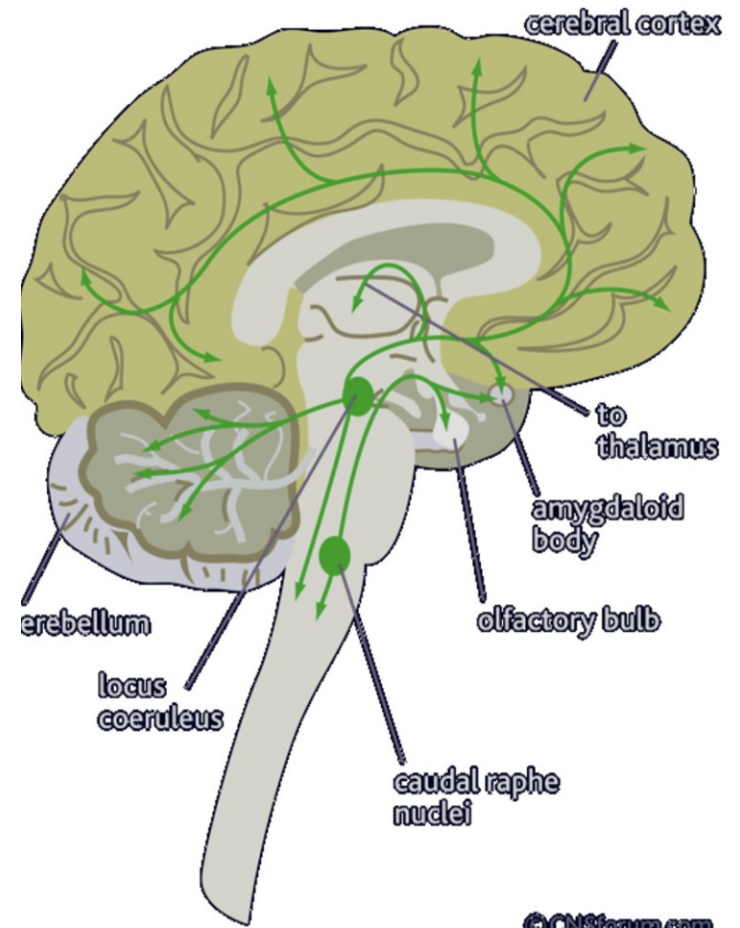
ACETYLCHOLIN

- Regulace spánku/bdění
- Kognitivní funkce
- Chování
- Emoce



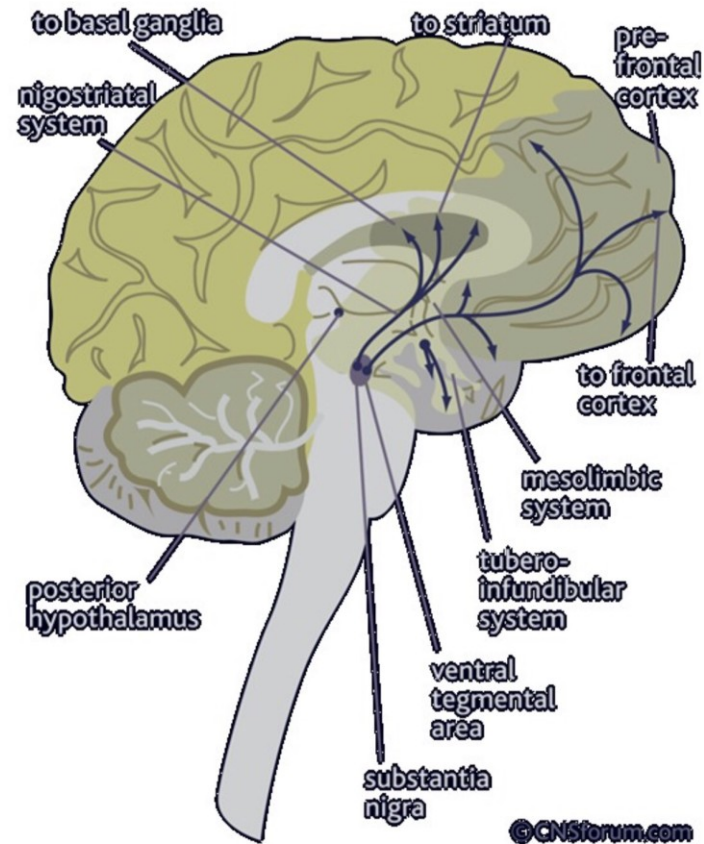
NORADRENALIN

- Bdělost
- Paměť
- Učení



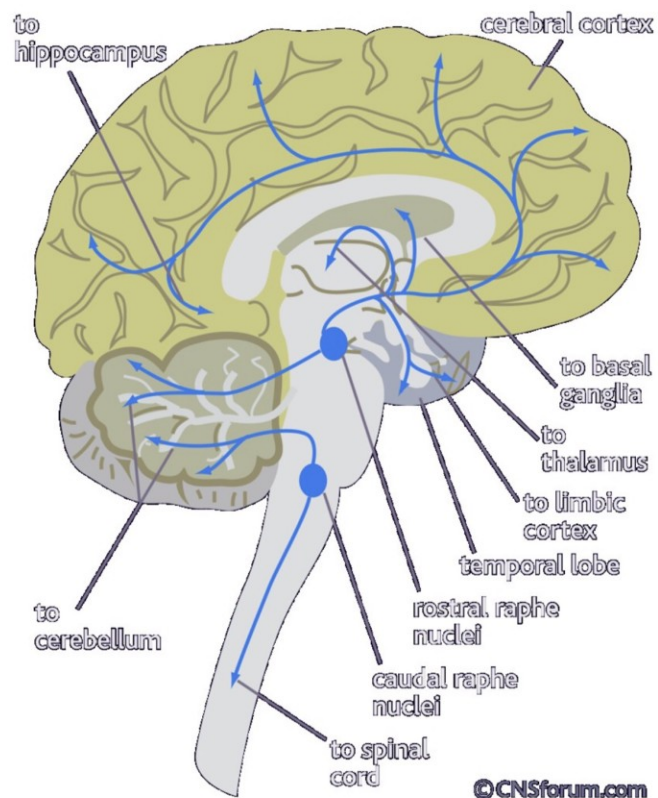
DOPAMIN

- Pohyb
- Senzorika
- Kognitivní funkce
- Emoční chování
- Regulace

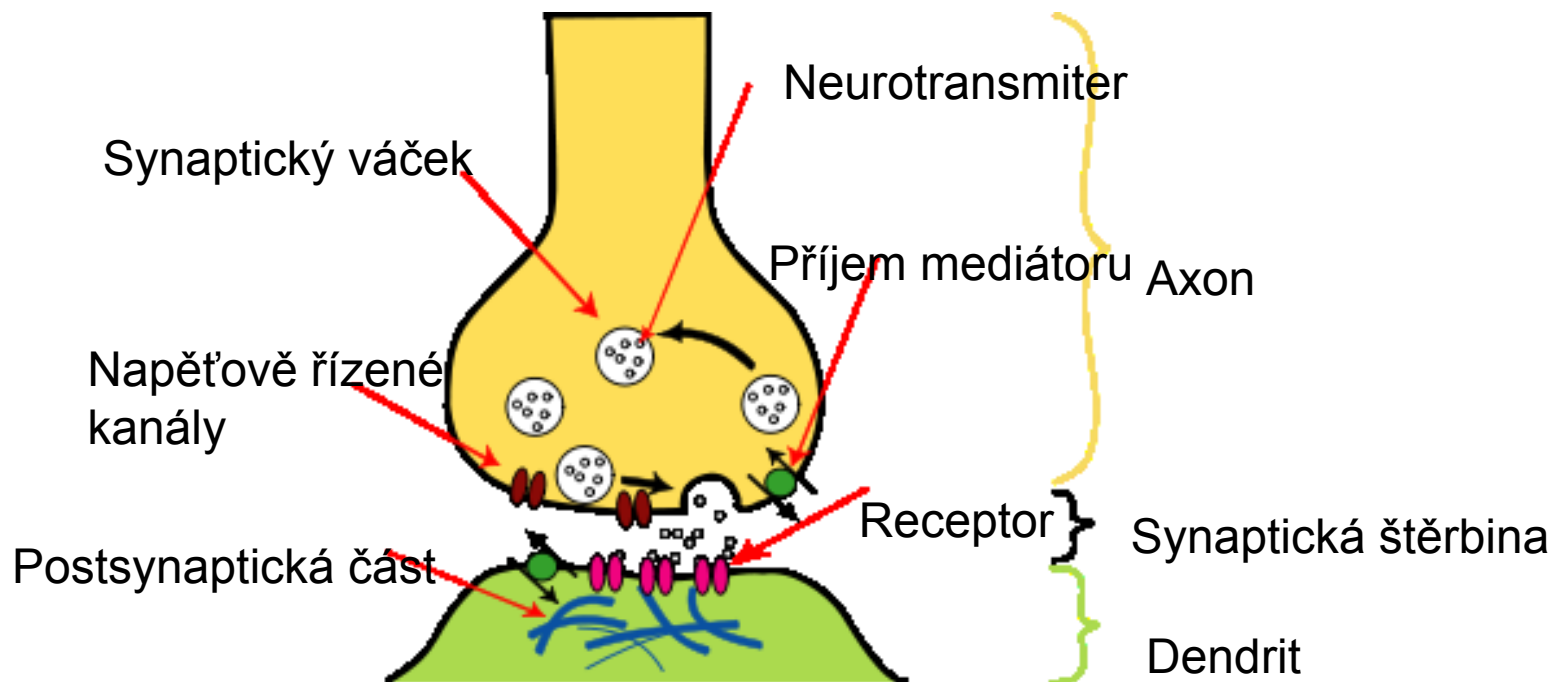


SEROTONIN

- Regulace nálad
- Úzkost/relaxace
- spánek

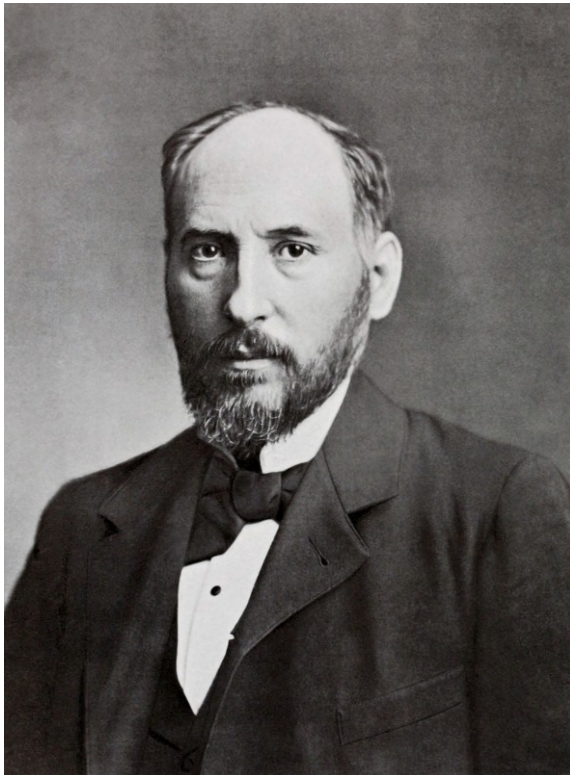


SYNAPSE

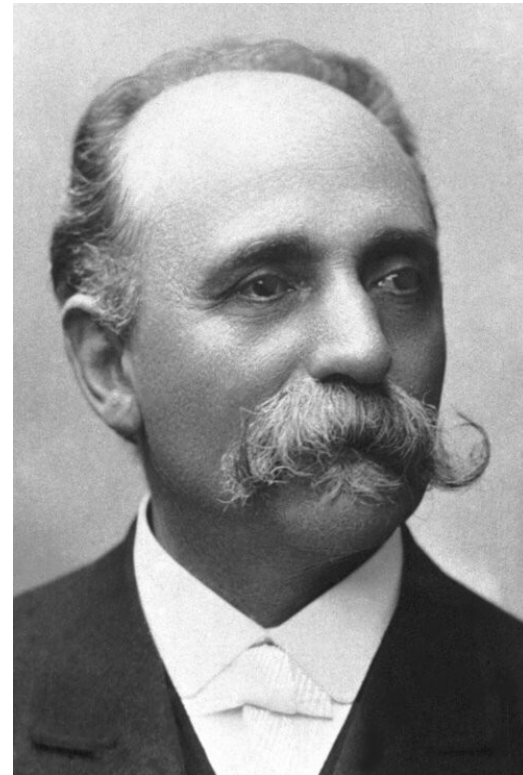


NOBELOVA CENA - 1906

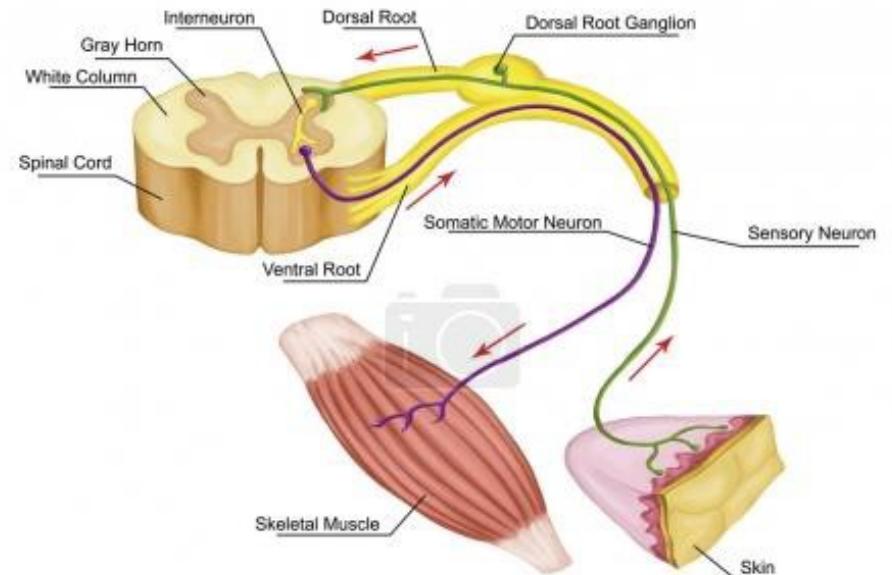
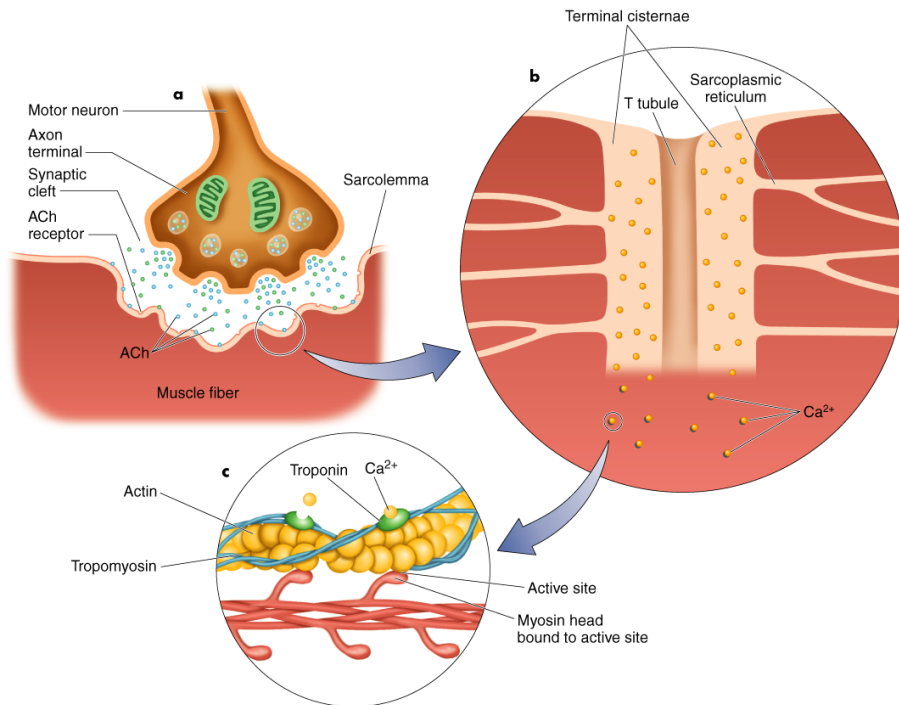
Ramón Cajal (1852-1934)



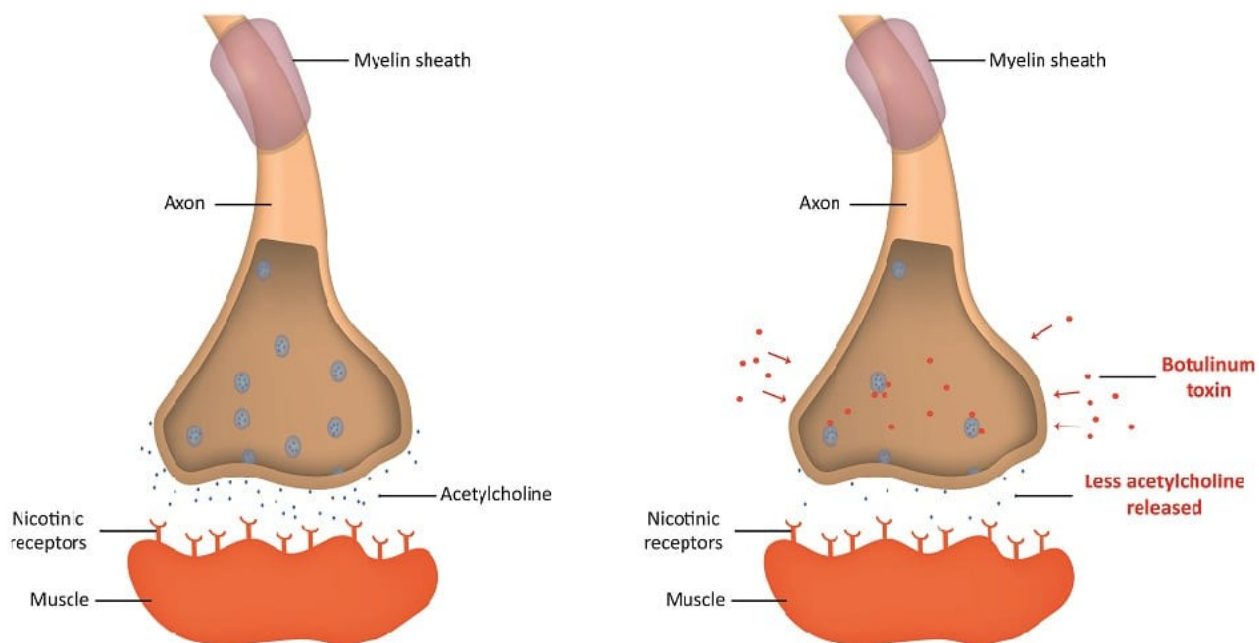
Camillo Golgi (1843-1926)



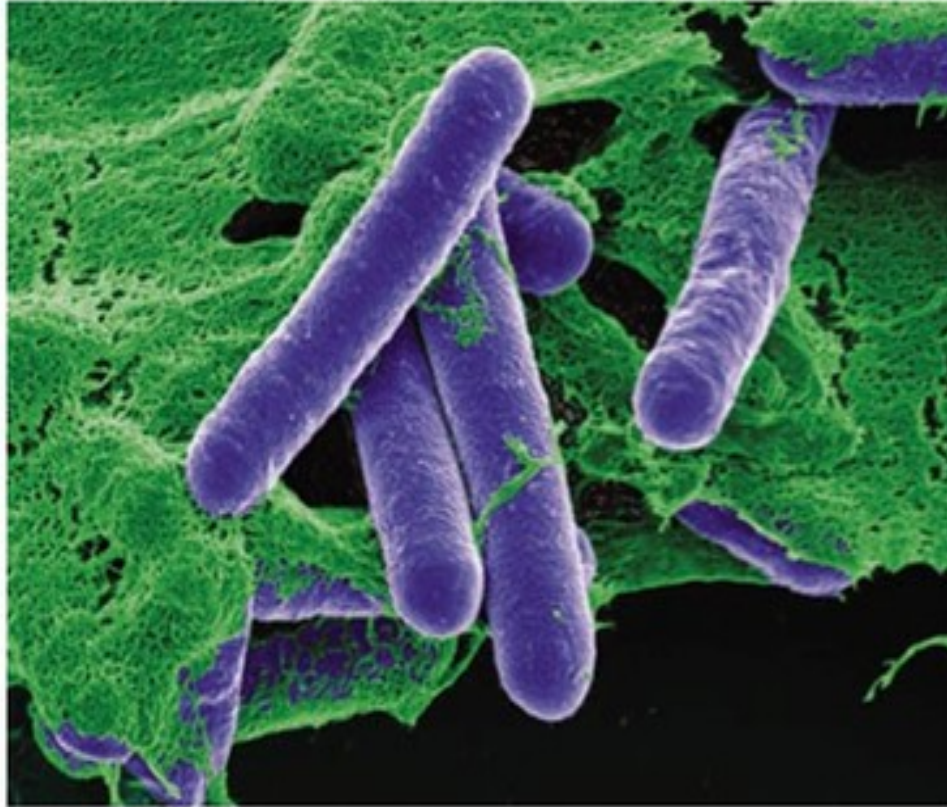
Nervosvalové spojení



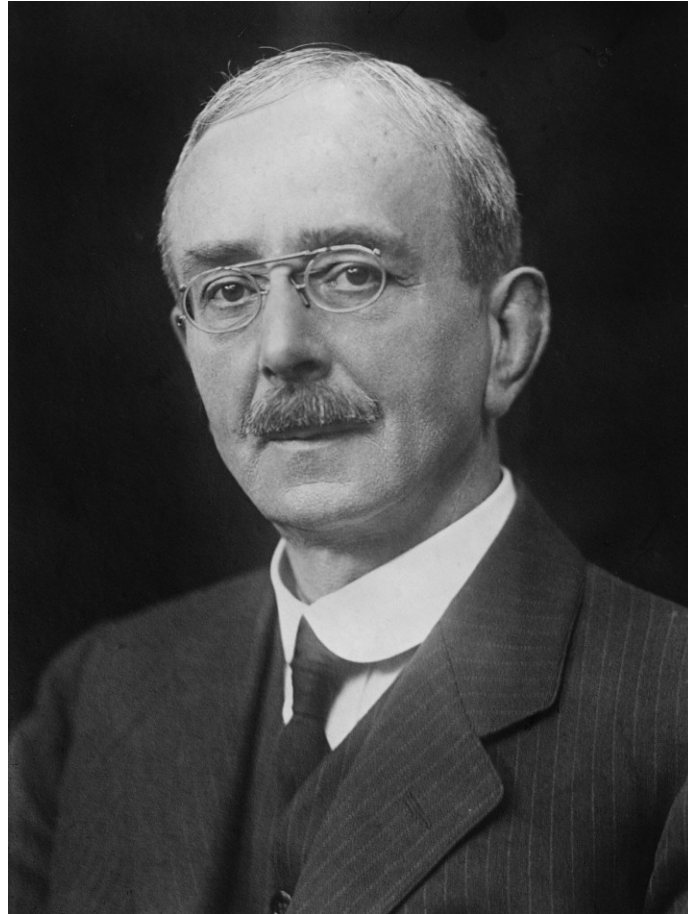
Nervosvalové spojení



Botulotoxin, clostridium botulinum

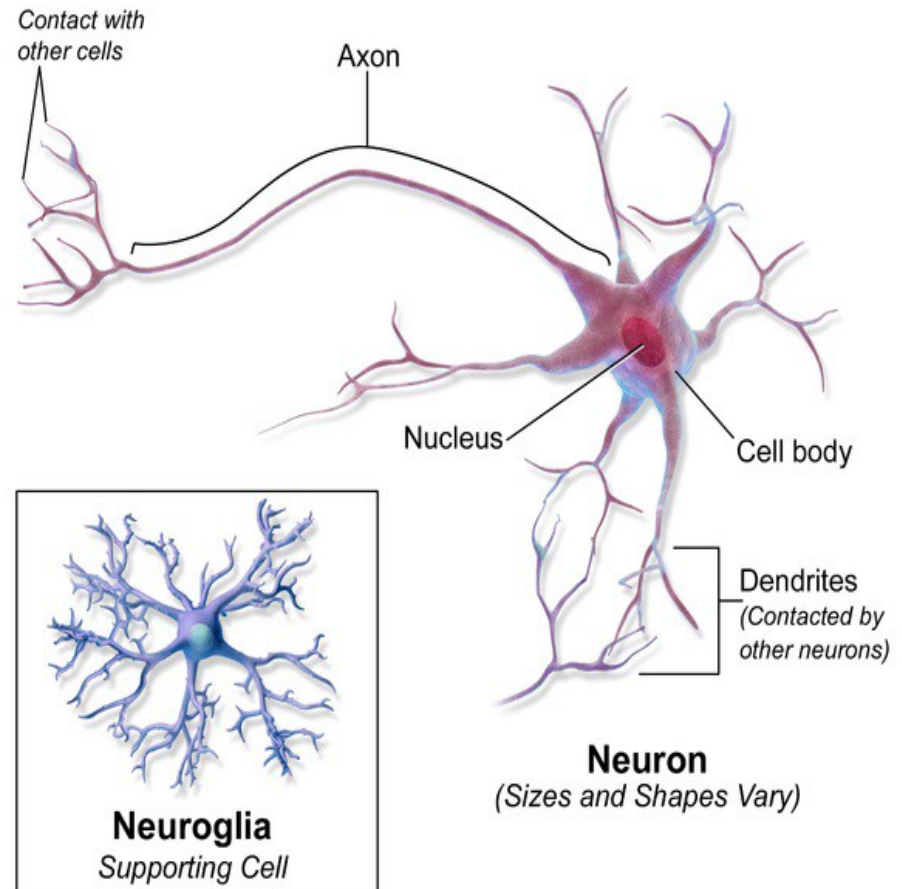


Charles Scott Sherington (1857-1952)



Neuroglie

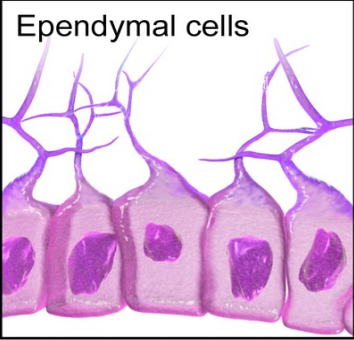
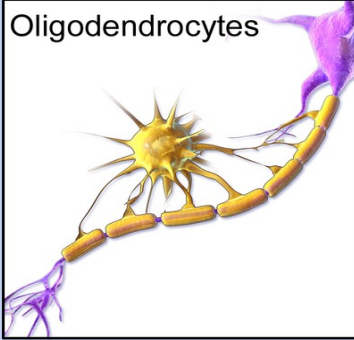
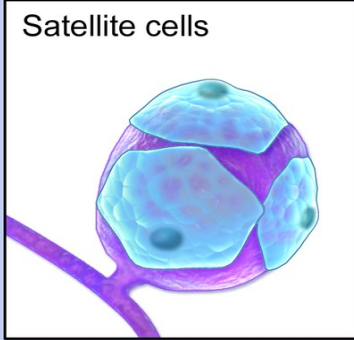
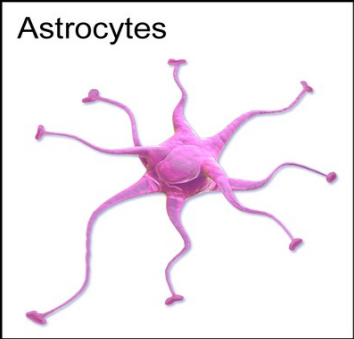
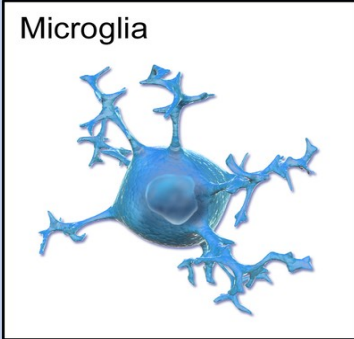
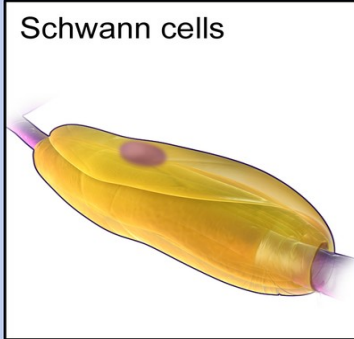
- Funkce
- Podpůrné
- Nutritivní
- Fagocytární
- Ochranná



Neural Tissue



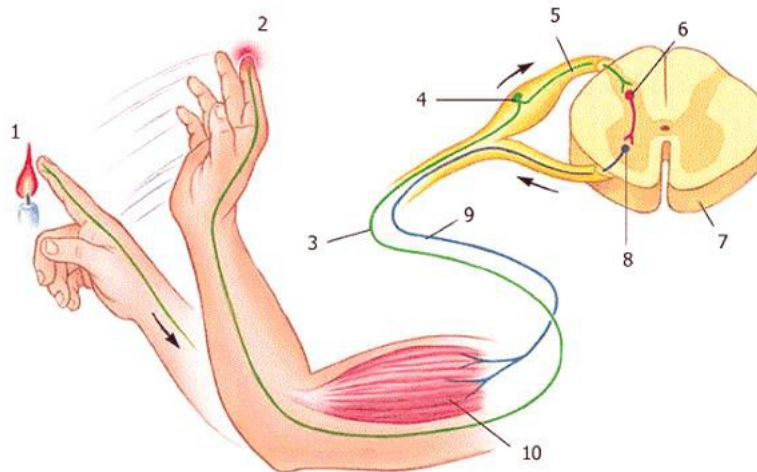
Neuroglie

Types of Neuroglia		
Central Nervous System		Peripheral Nervous System
<p>Ependymal cells</p> 	<p>Oligodendrocytes</p> 	<p>Satellite cells</p> 
<p>Astrocytes</p> 	<p>Microglia</p> 	<p>Schwann cells</p> 

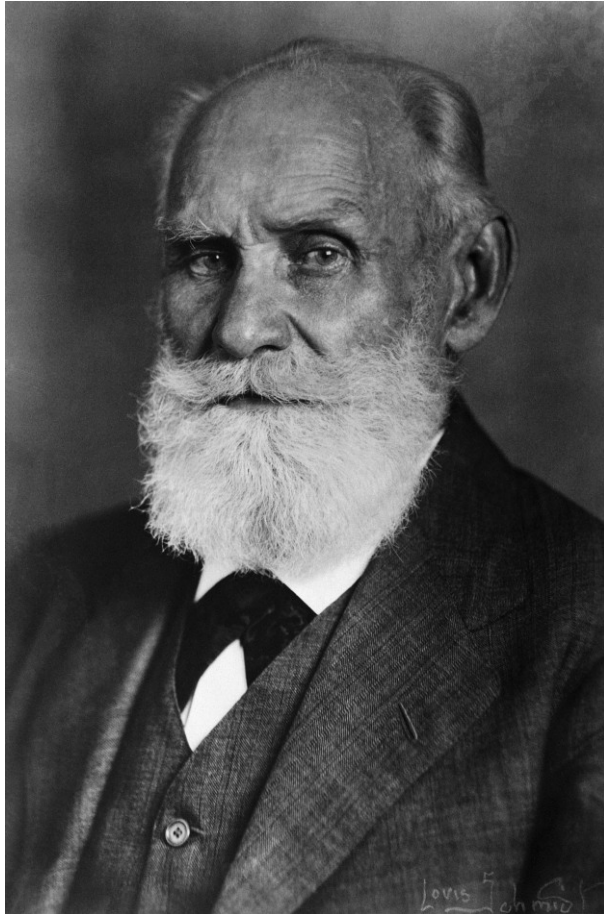


Reflexy

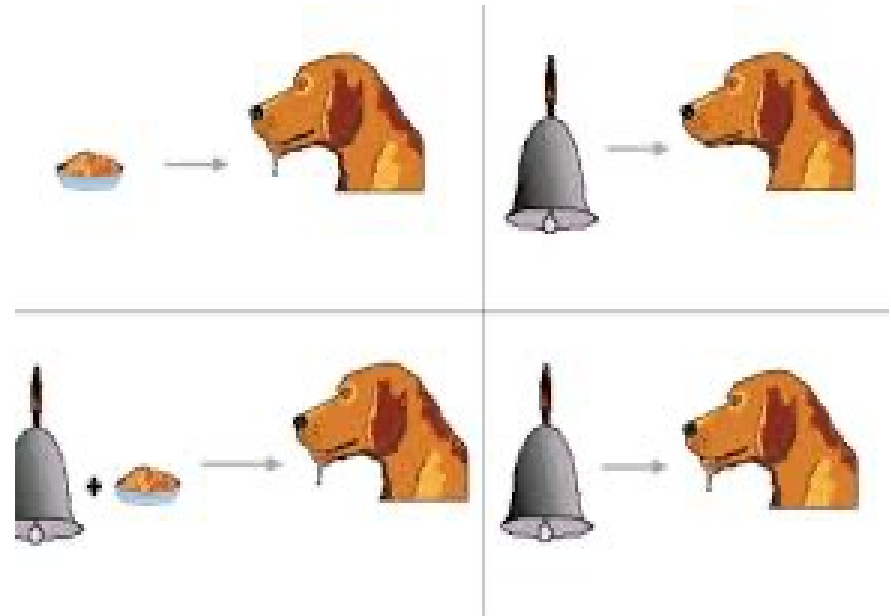
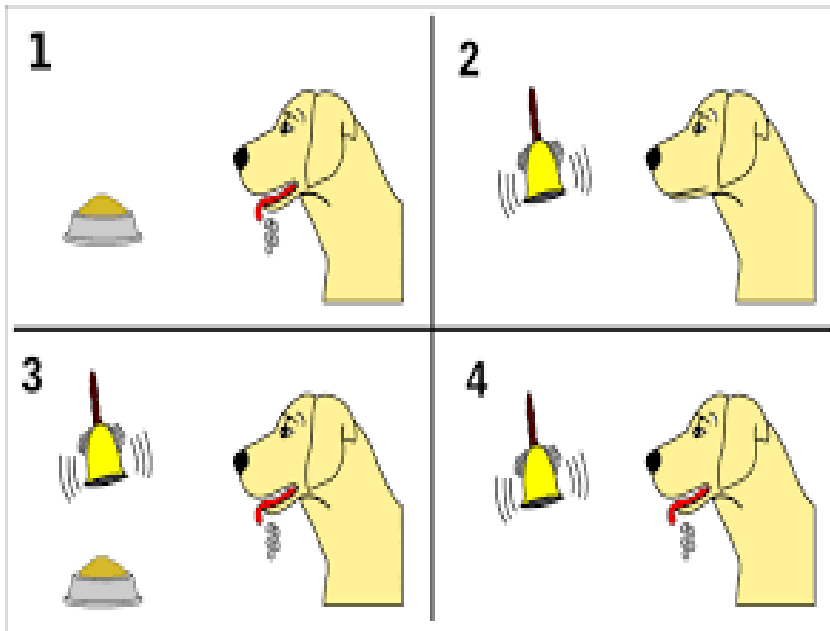
- Nepodmíněný reflex – vrozený, automatická reakce, stereotypní odpověď na nepodmíněný podnět
- Podmíněný reflex – vzniká na základě zkušenosti (učení), dočasná odpověď (nutné posilování) na podmíněný podnět, vyhasínání reflexi při absenci podnětu.



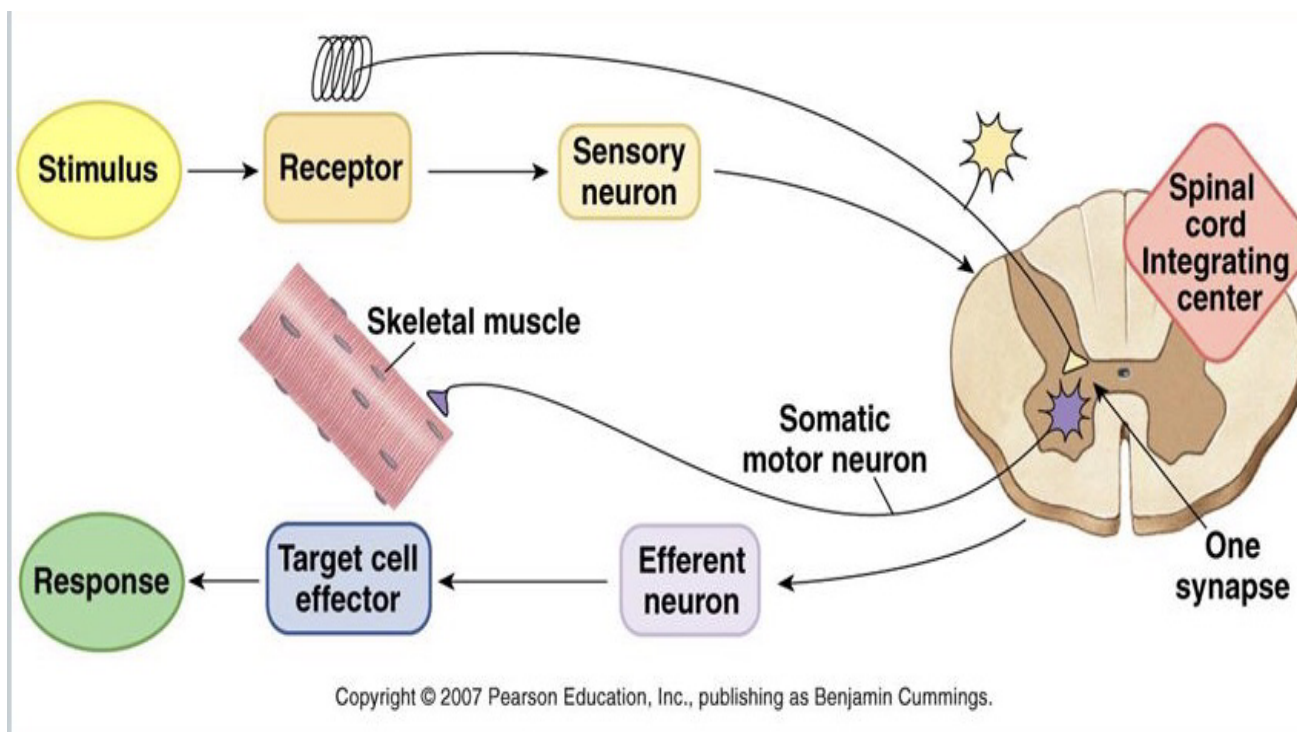
Ivan Petrovič Pavlov (1849-1936)



Klasické podmiňování



Reflexní oblouk



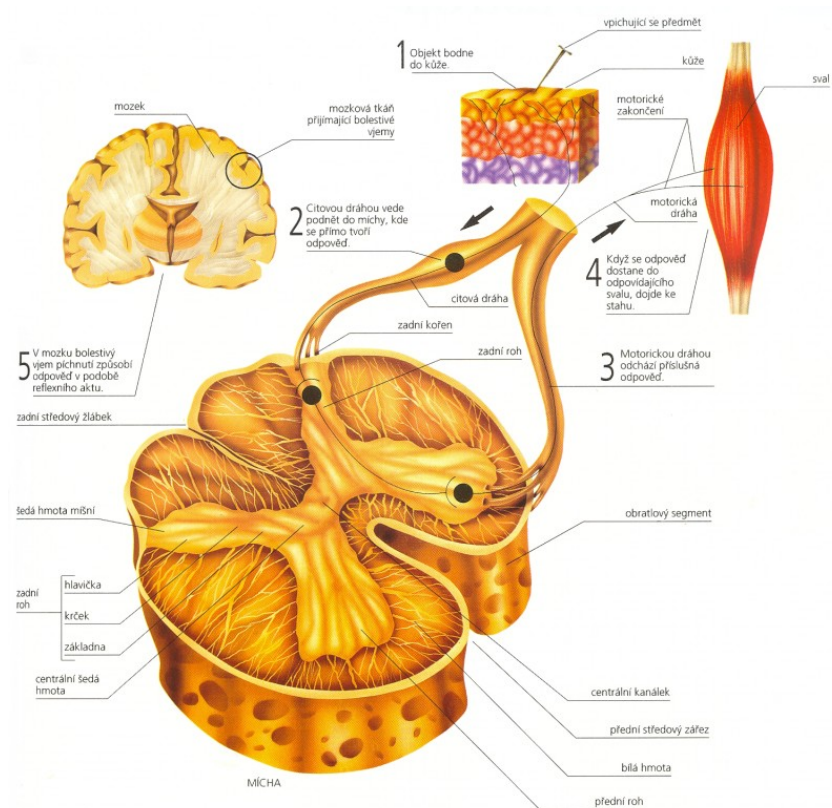
Reflexní oblouk

- Receptor
- Dostředivá dráha
- Centrum
- Odstředivá dráha
- Efektor

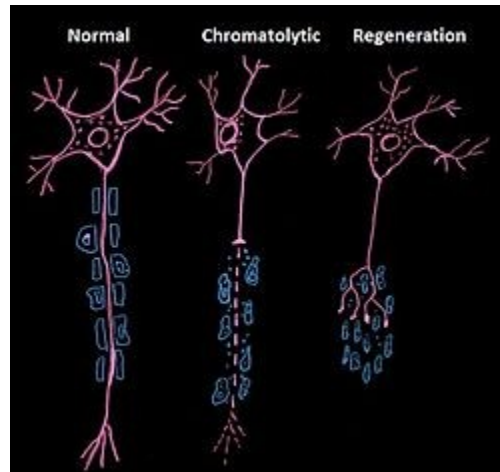


TYPY REFLEXŮ

- REFLEXY PROPRIOCEPTIVNÍ
- REFLEXY EXTEROCEPTIVNÍ
- REFLEXY INTEROCEPTIVNÍ



Wallerova degenerace a regenerace



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