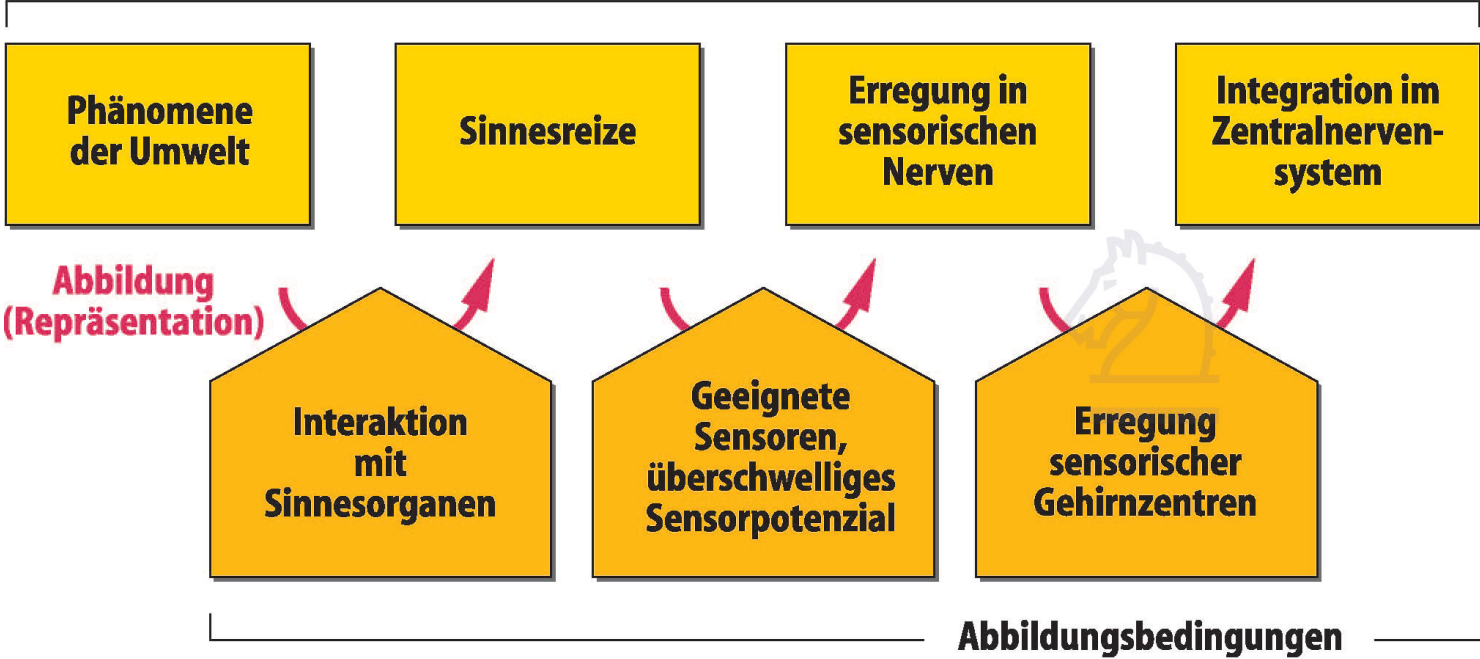


4. Vorlesung:

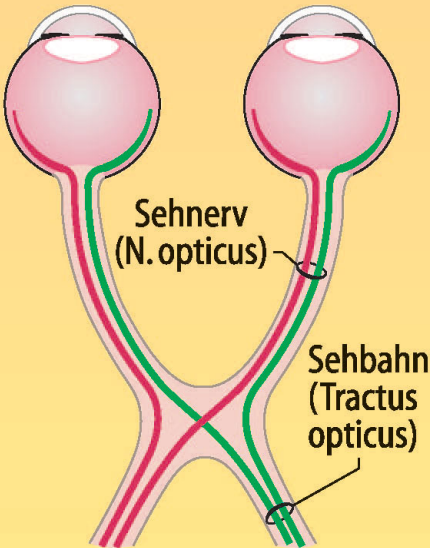
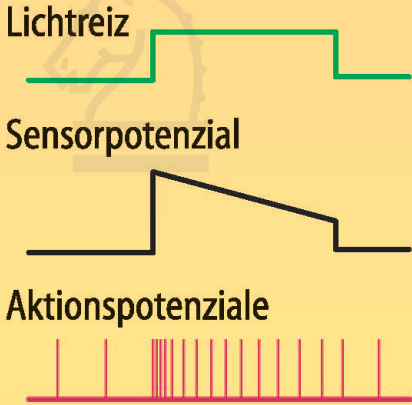
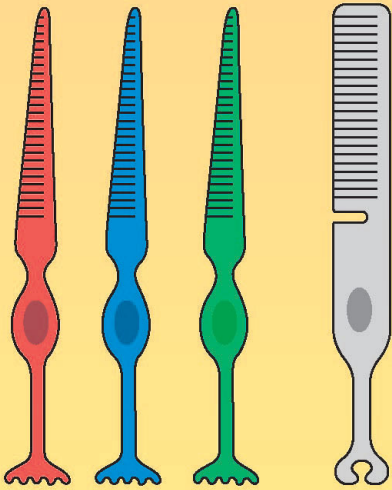
Allgemeine Sinnesphysiologie



Objektive Sinnesphysiologie

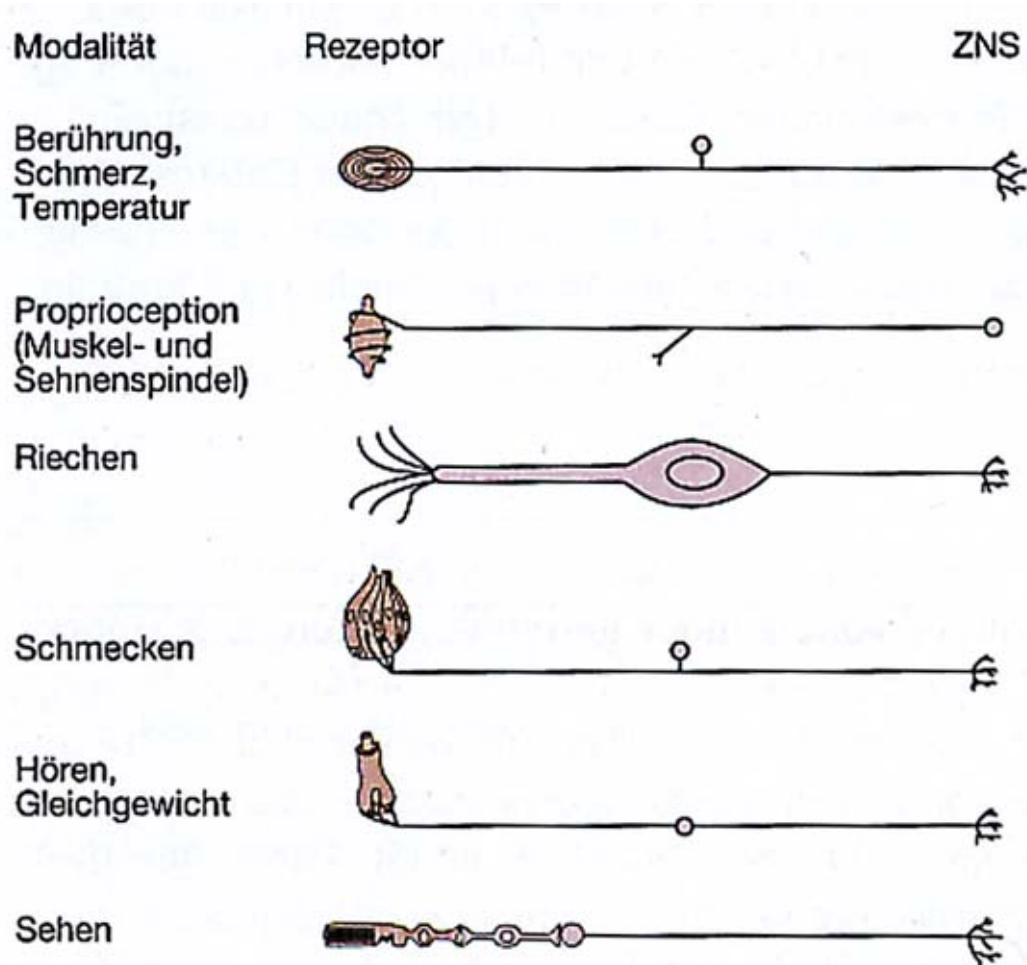


Sinne: Modalität und Qualität

<p>sinnes-physiol. Begriff</p>	<p>Modalität Gesichtssinn</p>	<p>Quantität Intensität der Lichtempfindung</p>	<p>Qualitäten Helligkeit, Rot, Grün, Blau</p>
<p>organisches Substrat</p>	<p>Auge</p>  <p>Sehnerv (N. opticus)</p> <p>Sehbahn (Tractus opticus)</p>	<p>Amplitude des Sensorpotenzials</p>  <p>Lichtreiz</p> <p>Sensorpotenzial</p> <p>Aktionspotenziale</p>	<p>Sensoren für</p> <p>Rot Blau Grün Helligkeit</p> 



Verarbeitung von Sinnesreizen: Rezeptortypen

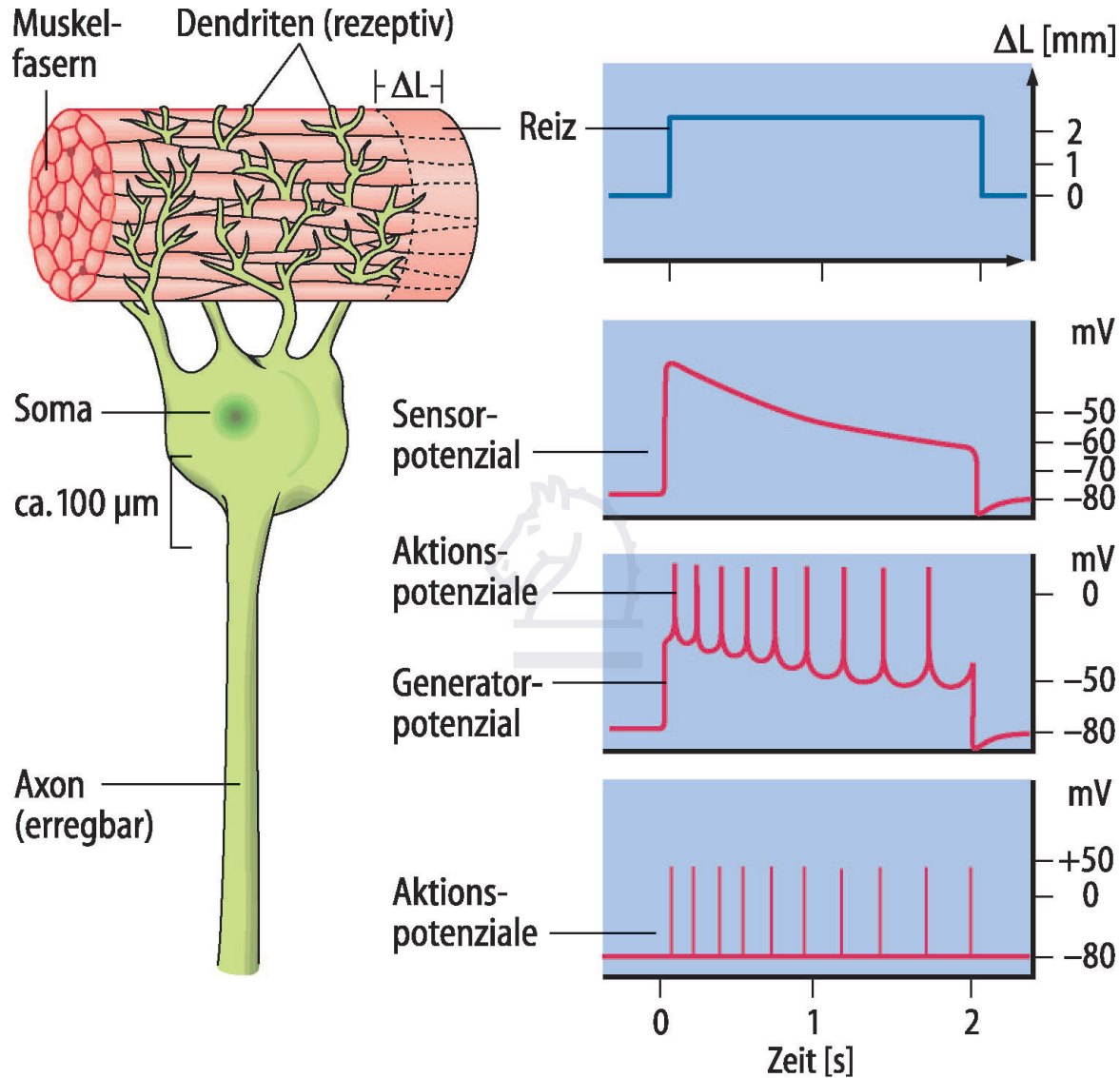


Rezeptoren:

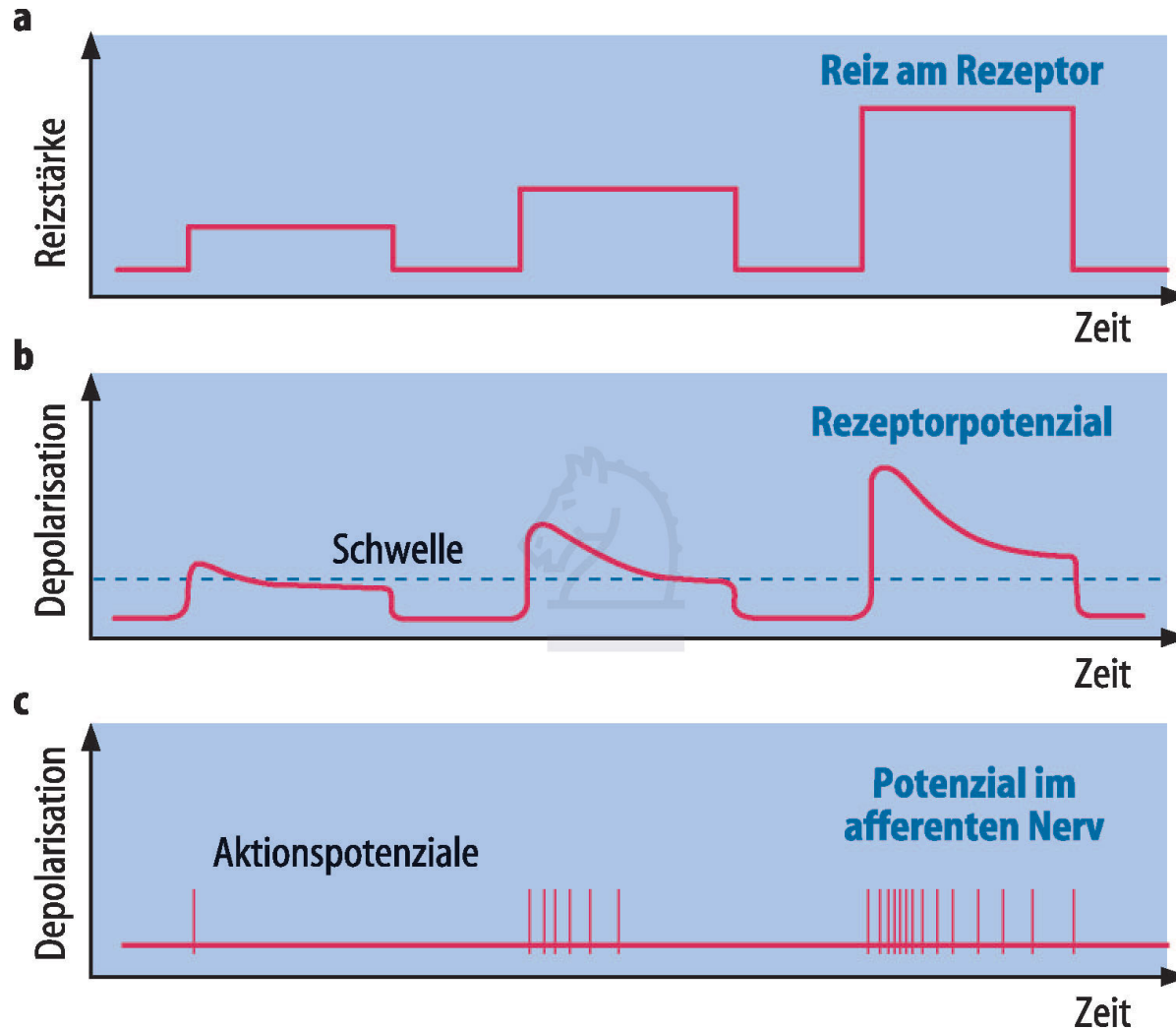
- Exterozeptoren
- Propriozeptoren
- Enterozeptoren



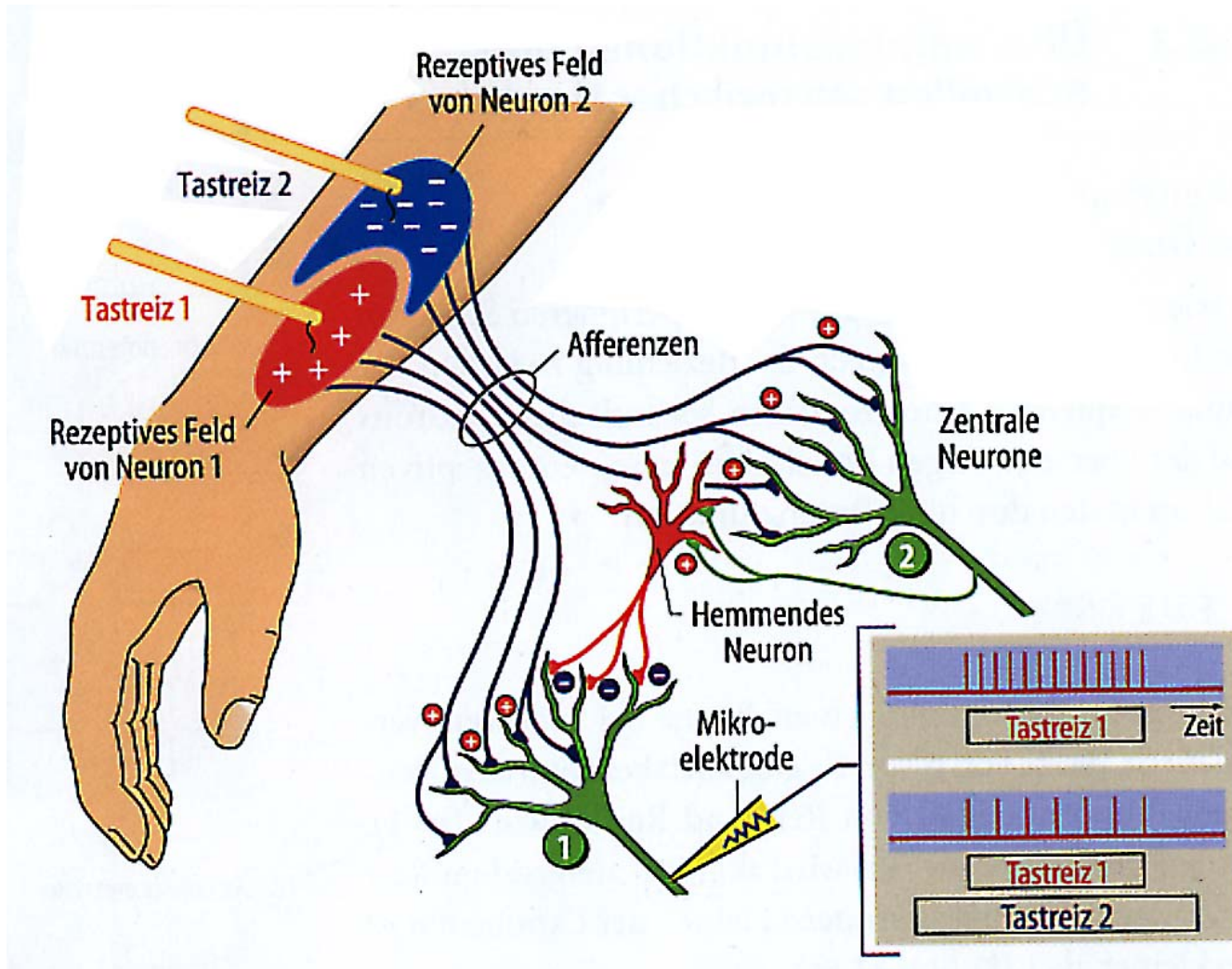
Transduktion - Transformation



Digitalisierung des Rezeptorpotenzials

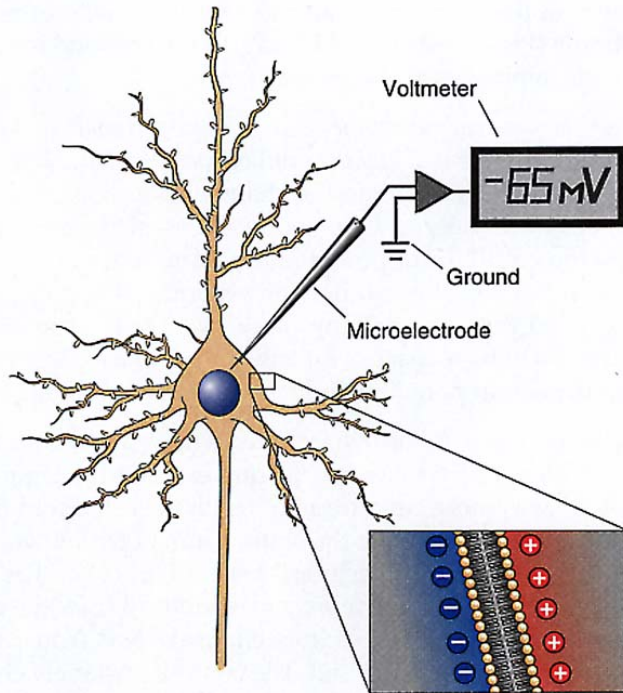


Rezeptives Feld: Konvergenz des Signals

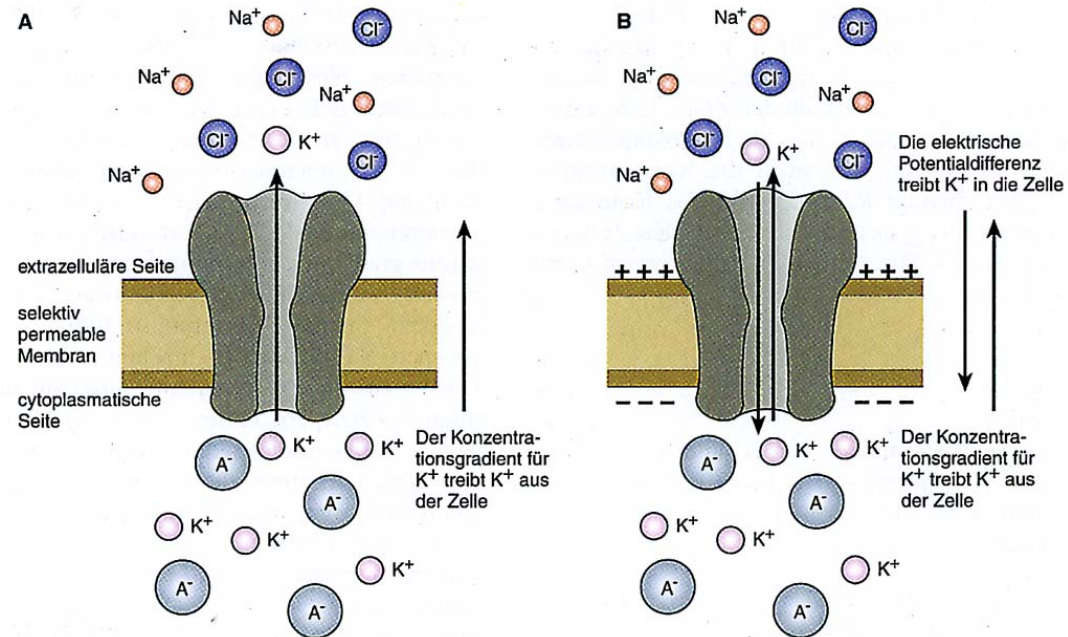


Membranruhepotential

Messung des Ruhemembranpotential

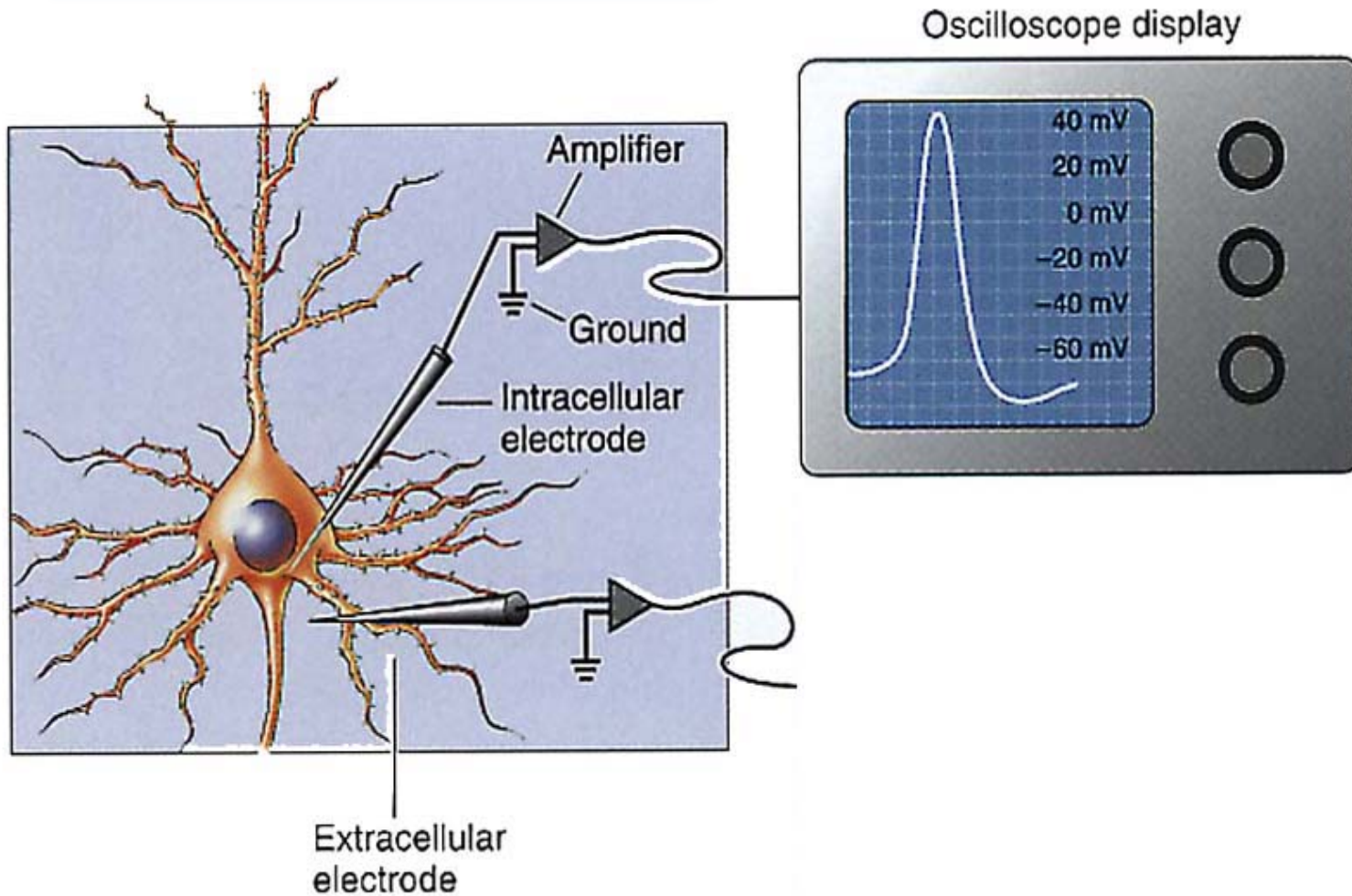


Ionenverteilung

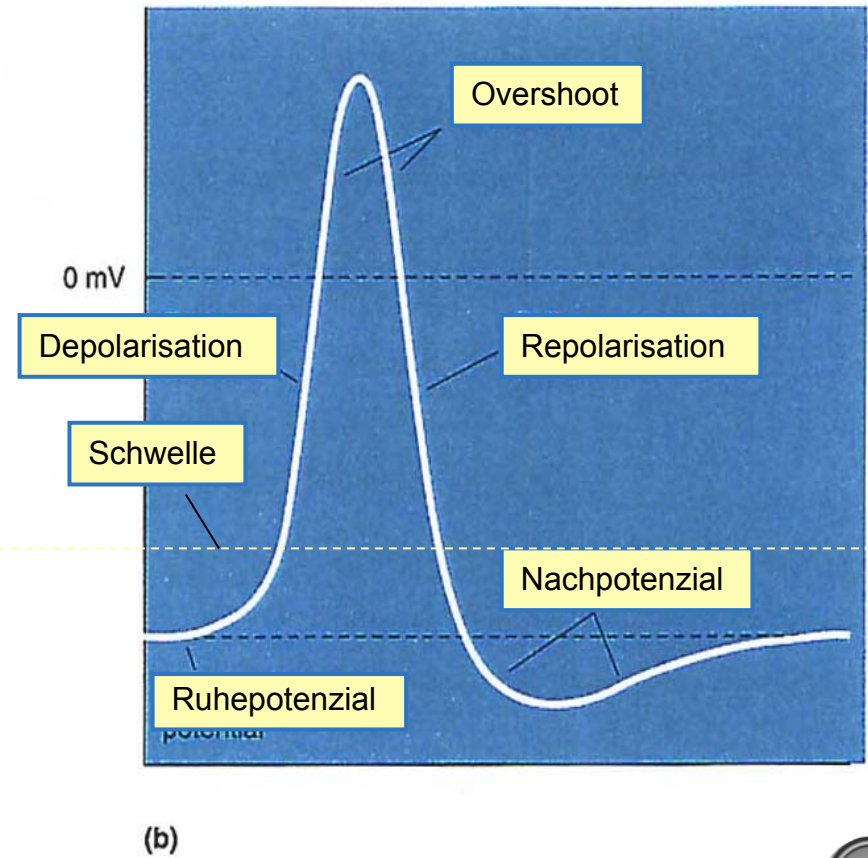
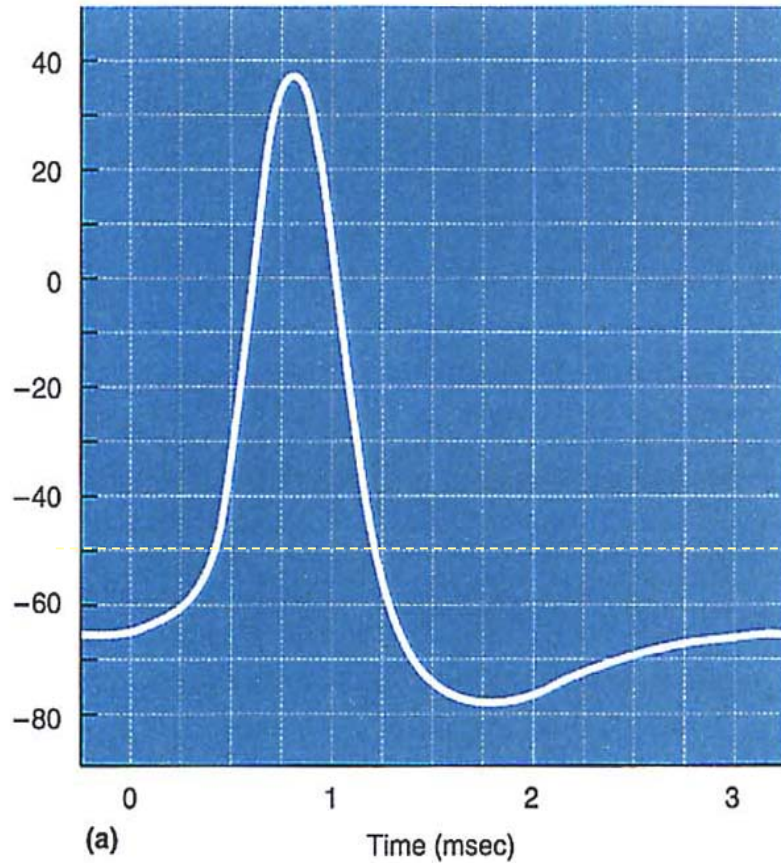


Messung von Aktionspotenzialen

Messung eines Aktionspotenzials

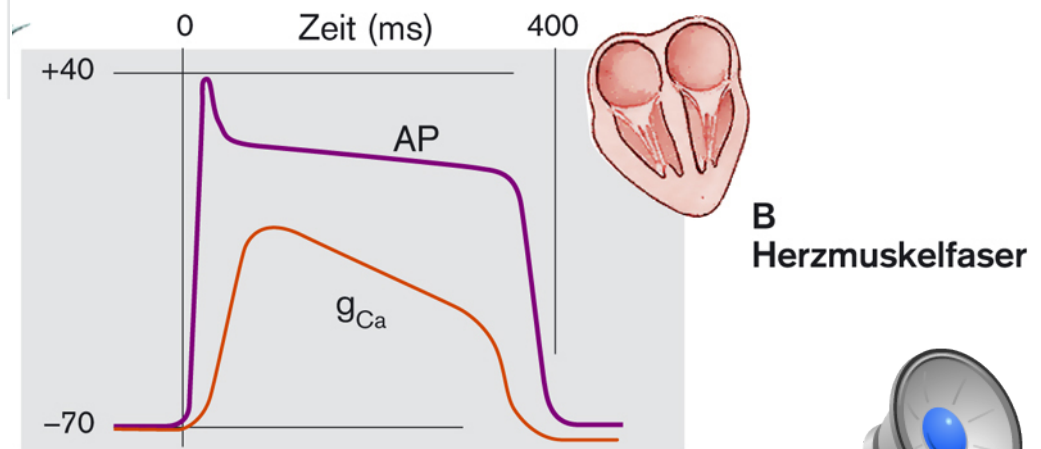
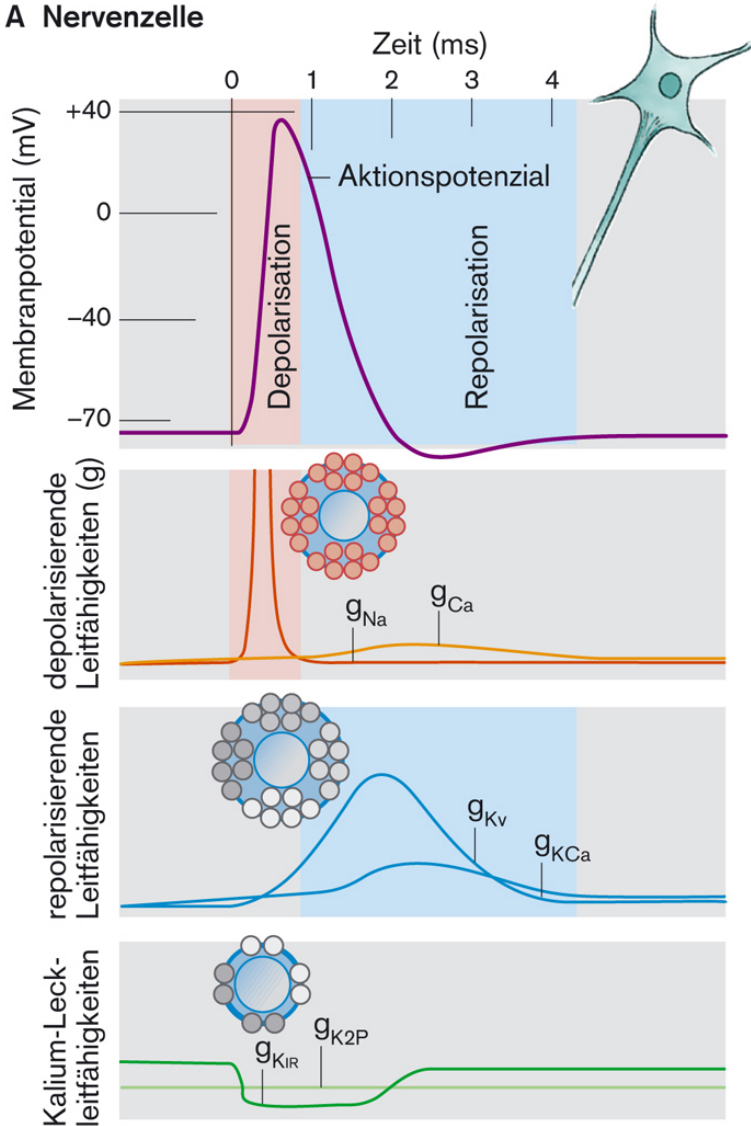


Phasen des Aktionspotenzials

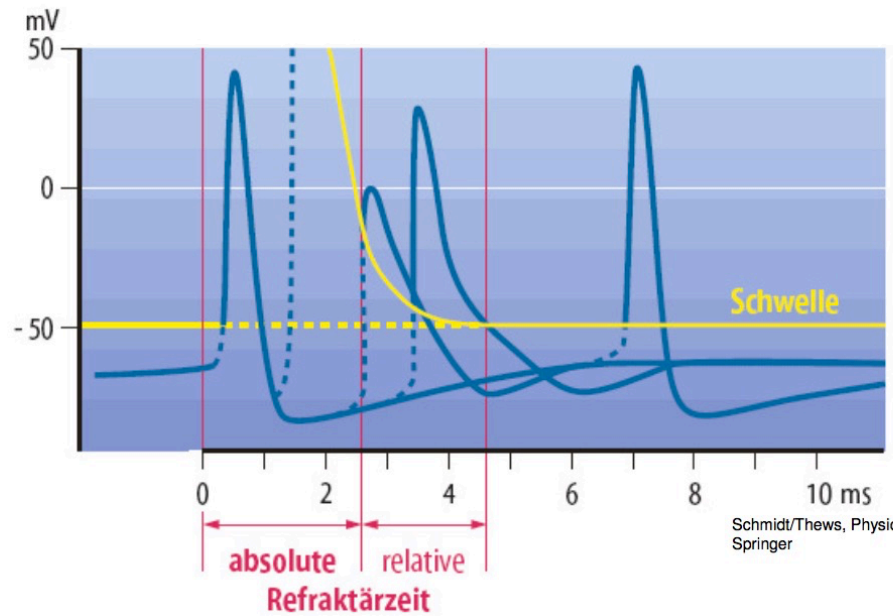
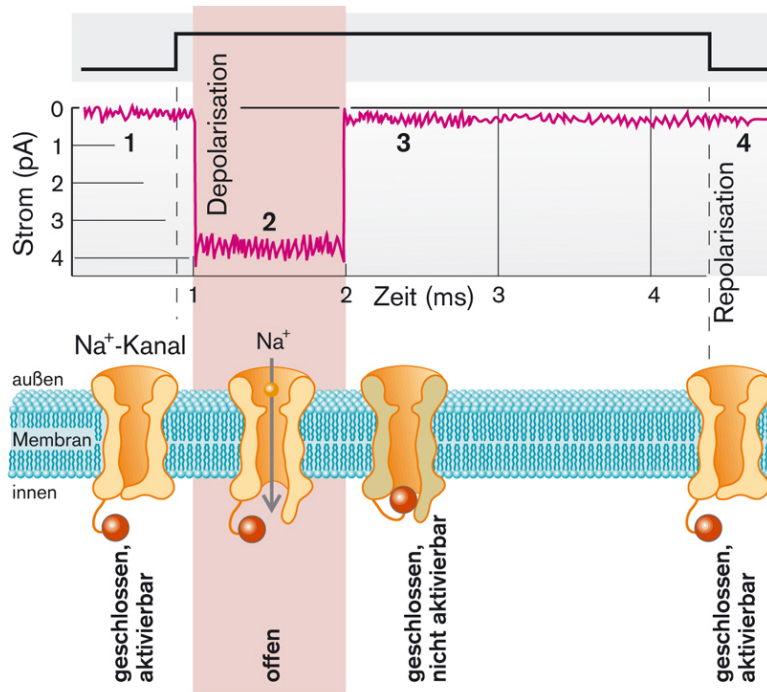


Aktionspotenzial – veränderte Leitfähigkeiten

A Nervenzelle



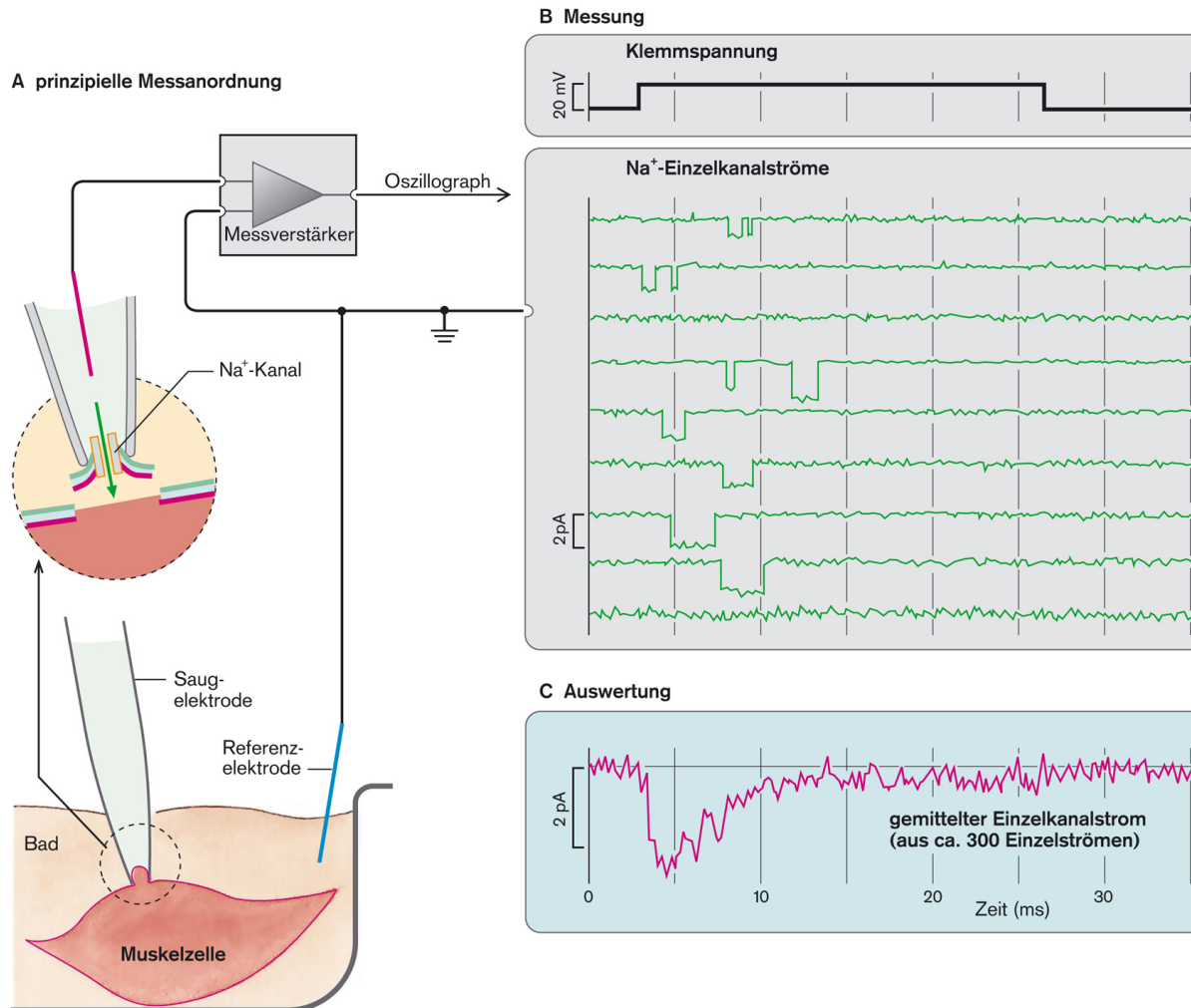
Na-System - Refraktärzeit



Schmidt/Thews, Physiologie des Menschen, Springer

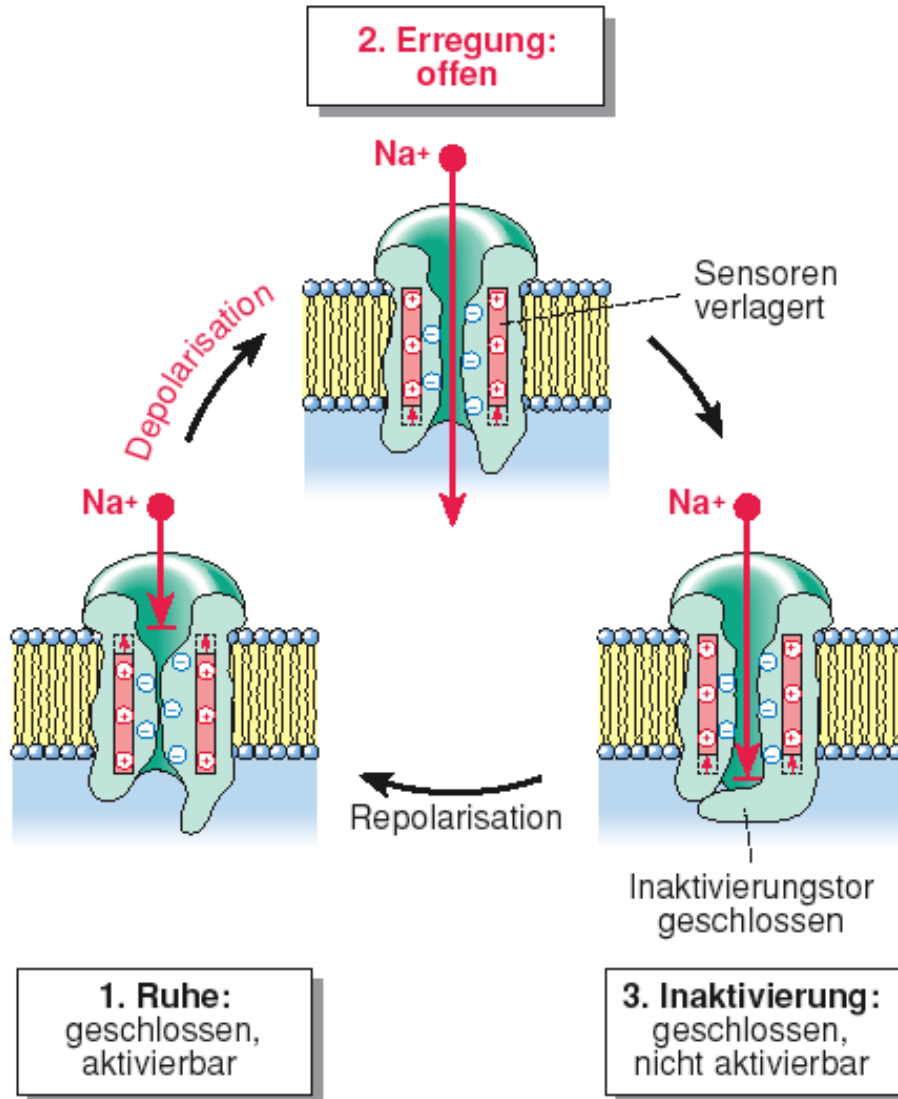


Addition der Einzelströme - Gesamtströme



Na⁺-Kanal: Spannungssteuerung

B. Zyklus der Kanalzustände

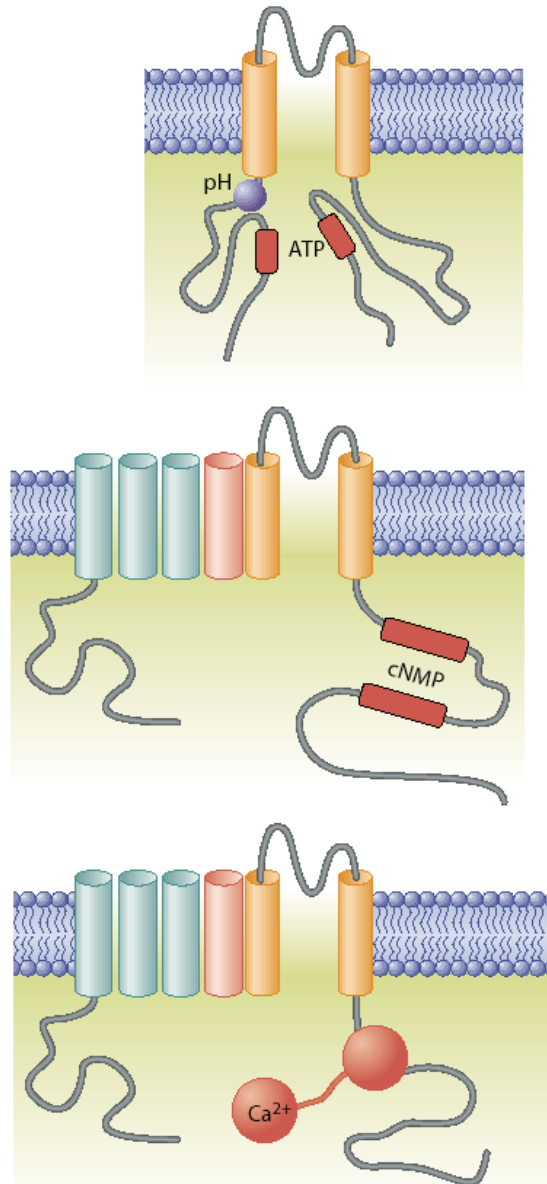


Absolute Refraktärzeit: das gesamte Na-System ist im inaktiven Zustand (bei einem Membranpotenzial > -30 mV)

Relative Refraktärzeit: ein Teil des Na-Systems ist wieder aktivierbar



Ligandensteuerung

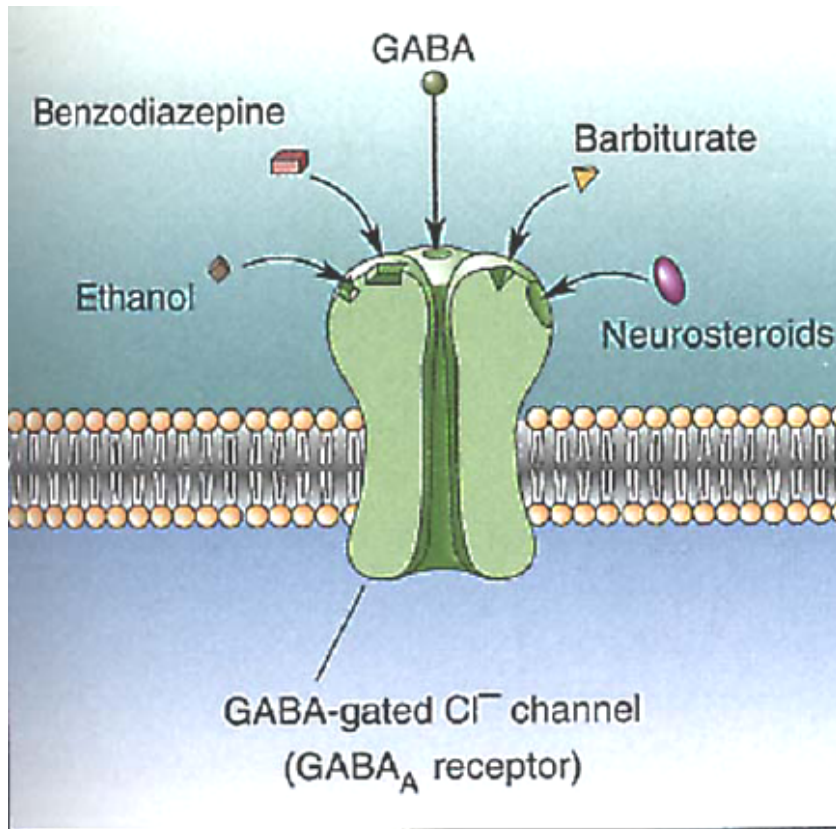


Ligandensteuerung:

ein Kanal kann durch intrazelluläre Liganden gesteuert sein:

- ATP
- cAMP, cGMP
- Ca²⁺
- pH

Ligandengesteuerter Ionenkanal :GABA-Rezeptor



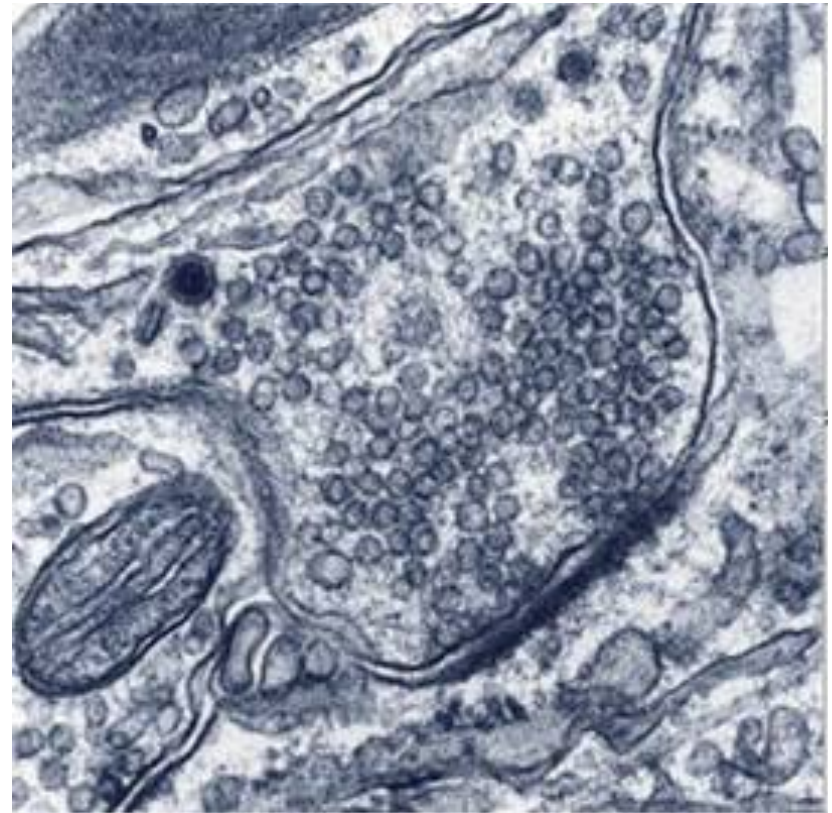
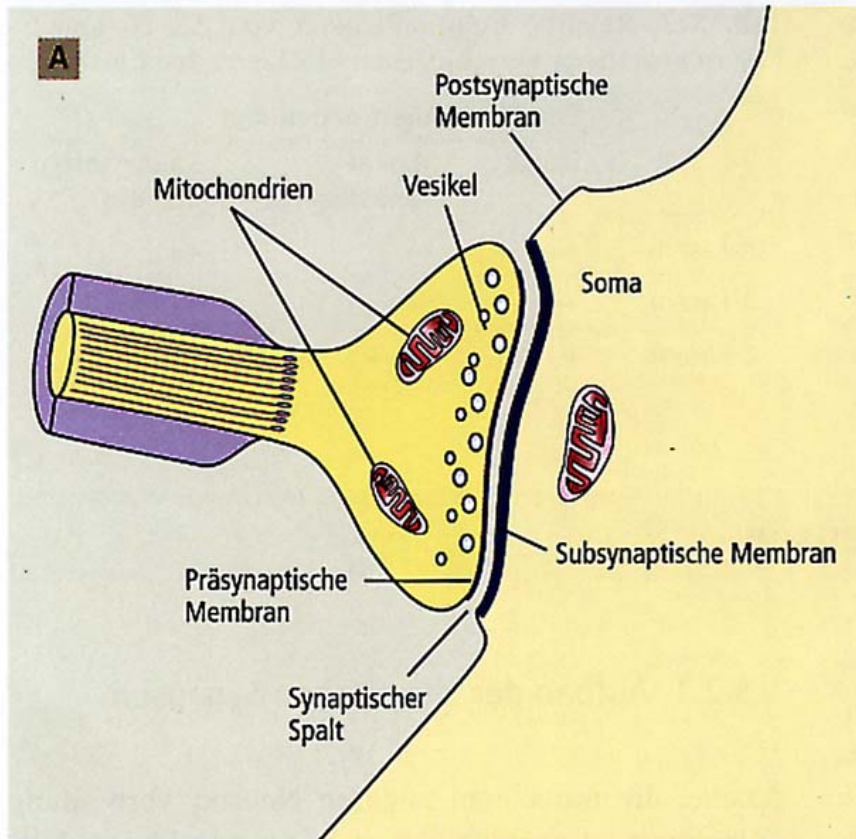
Bindungsstellen am GABA Rezeptor:

GABA
Benzodiazepine
Barbiturate
Ethanol
Neurosteroid

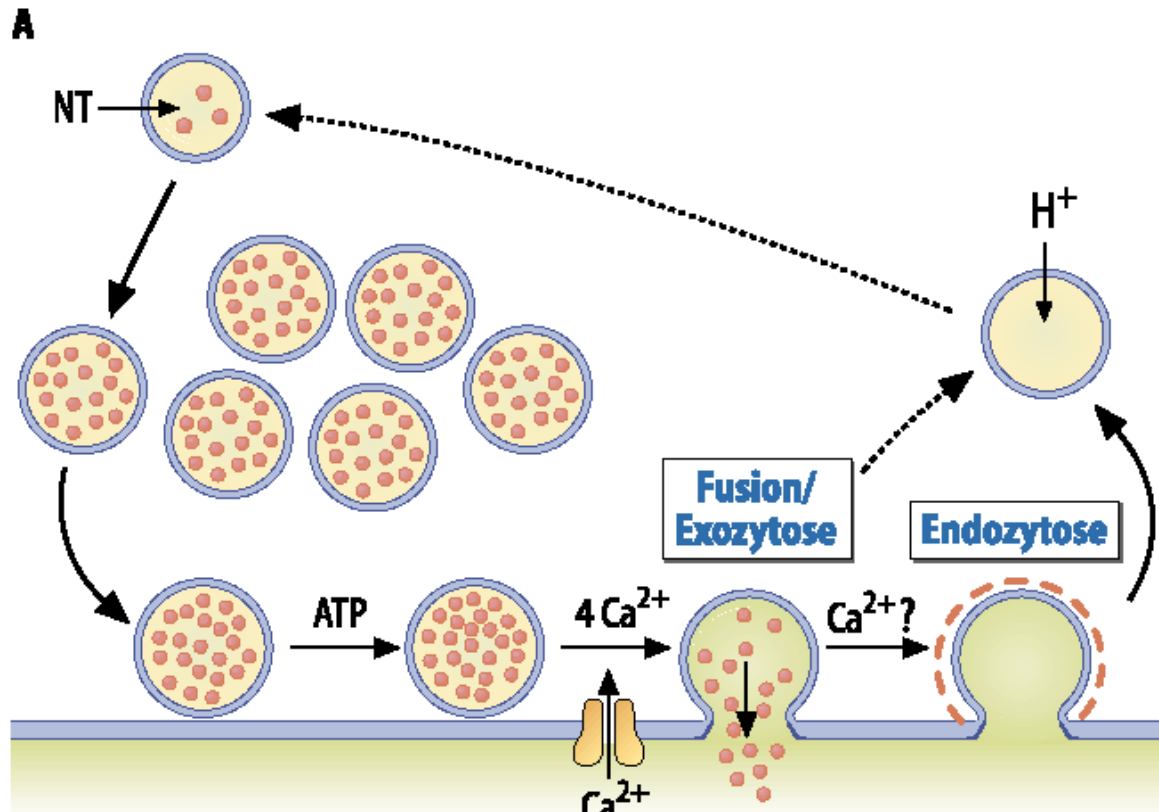
Chemische Synapse

Chemische Synapse

Morphologie der Synapse



Vesikelfreisetzung



Phasen der Exozytose

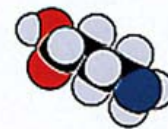
1. Vesikelanlagerung
2. Ca^{++} Einstrom
3. Transmitterfreisetzung
4. Vesikelrecycling

Neurotransmitter

Aminosäuren



Glu



GABA



Gly

Acetylcholin



ACh

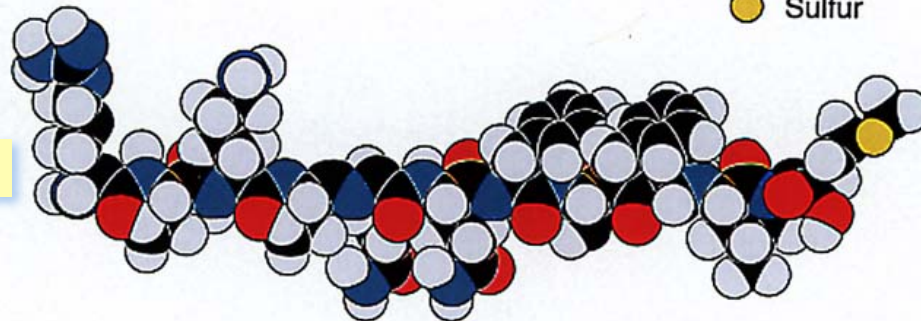
Amine



NE

- Carbon
- Oxygen
- Nitrogen
- Hydrogen
- Sulfur

Peptide



Arg Pro Lys Pro Gln Gln Phe Phe Gly Leu Met

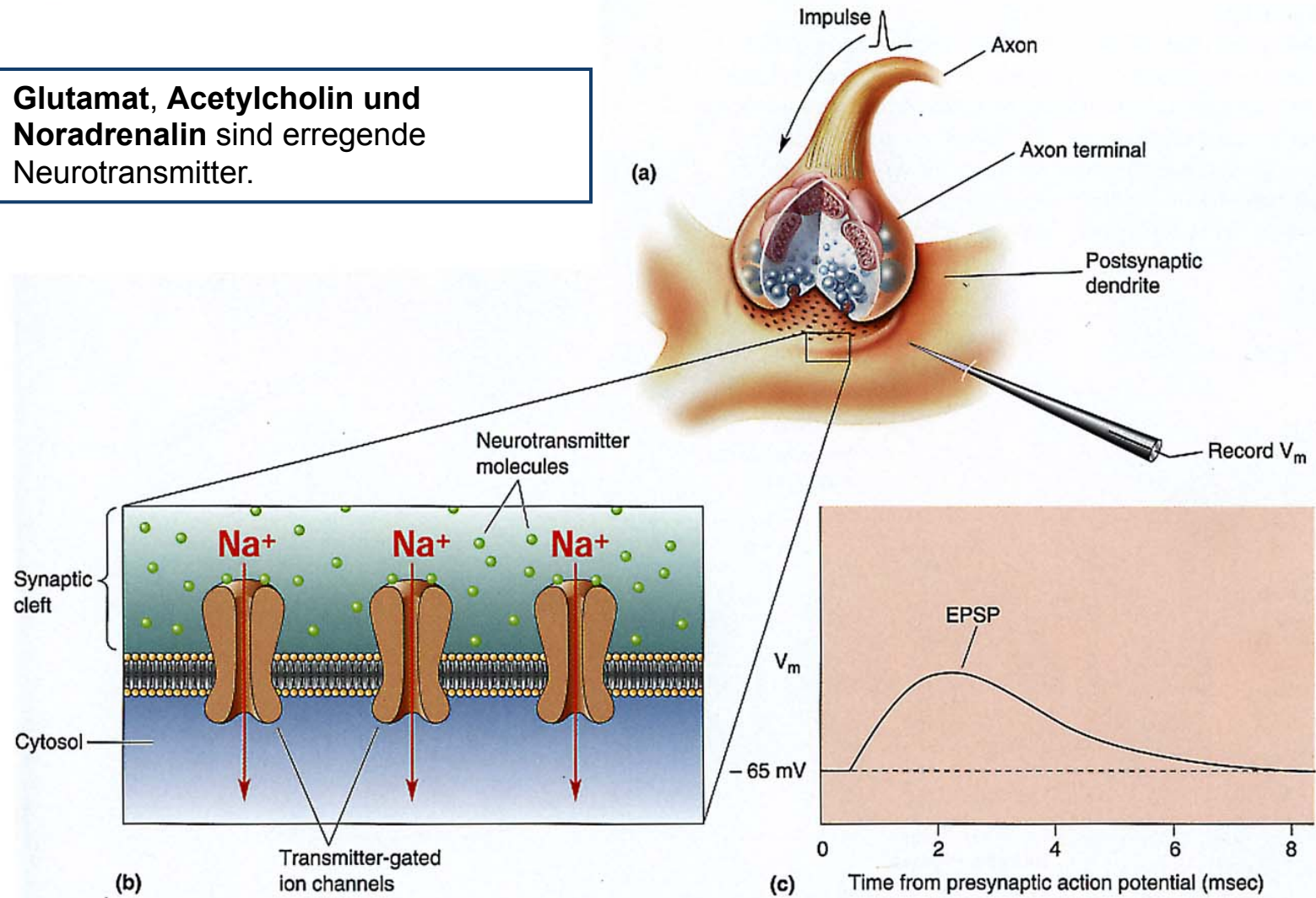
Lösliche Gase

Substance P

Stickstoffmonoxid (NO)

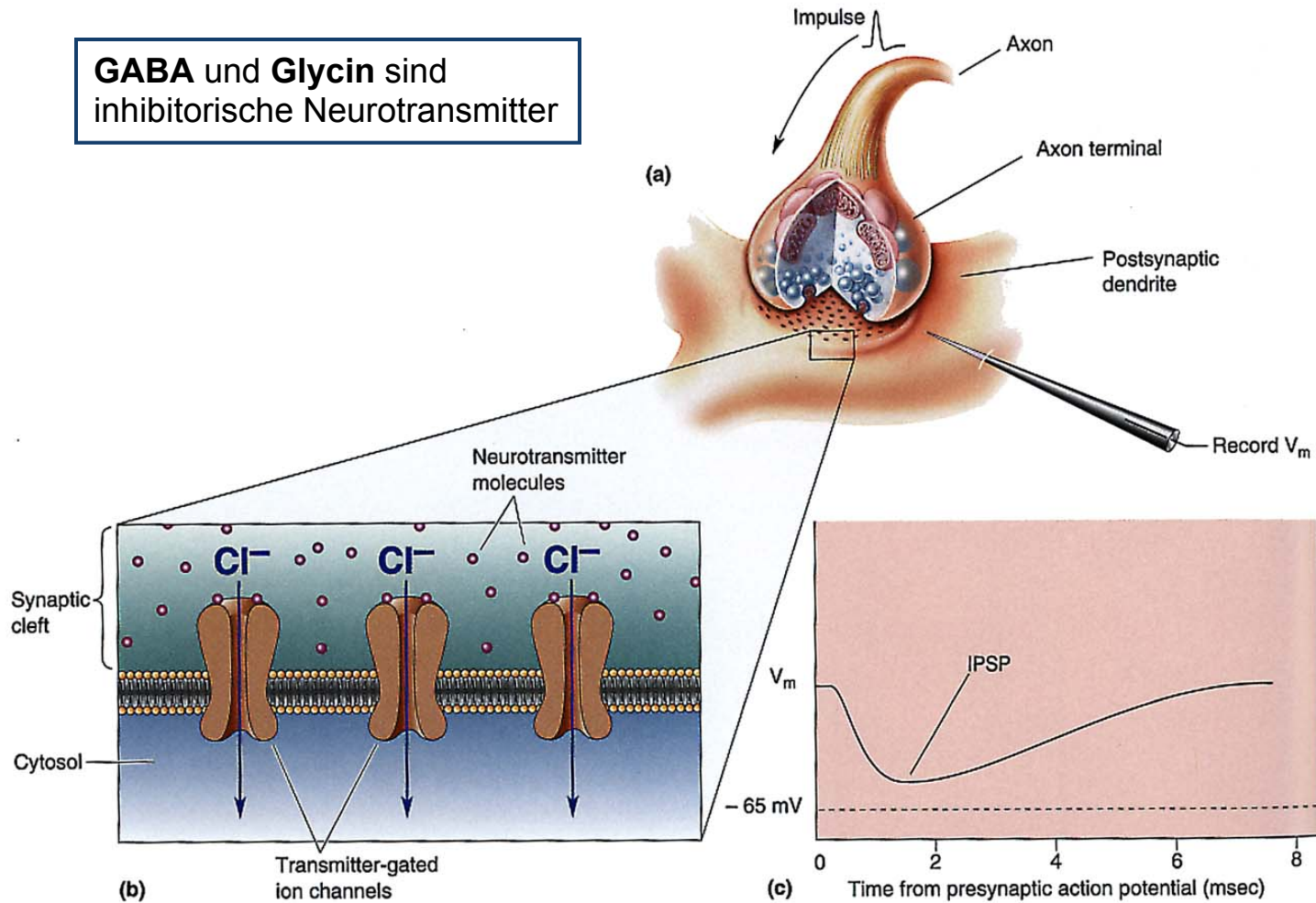
Erregendes postsynaptisches Potenzial (EPSP)

Glutamat, Acetylcholin und Noradrenalin sind erregende Neurotransmitter.

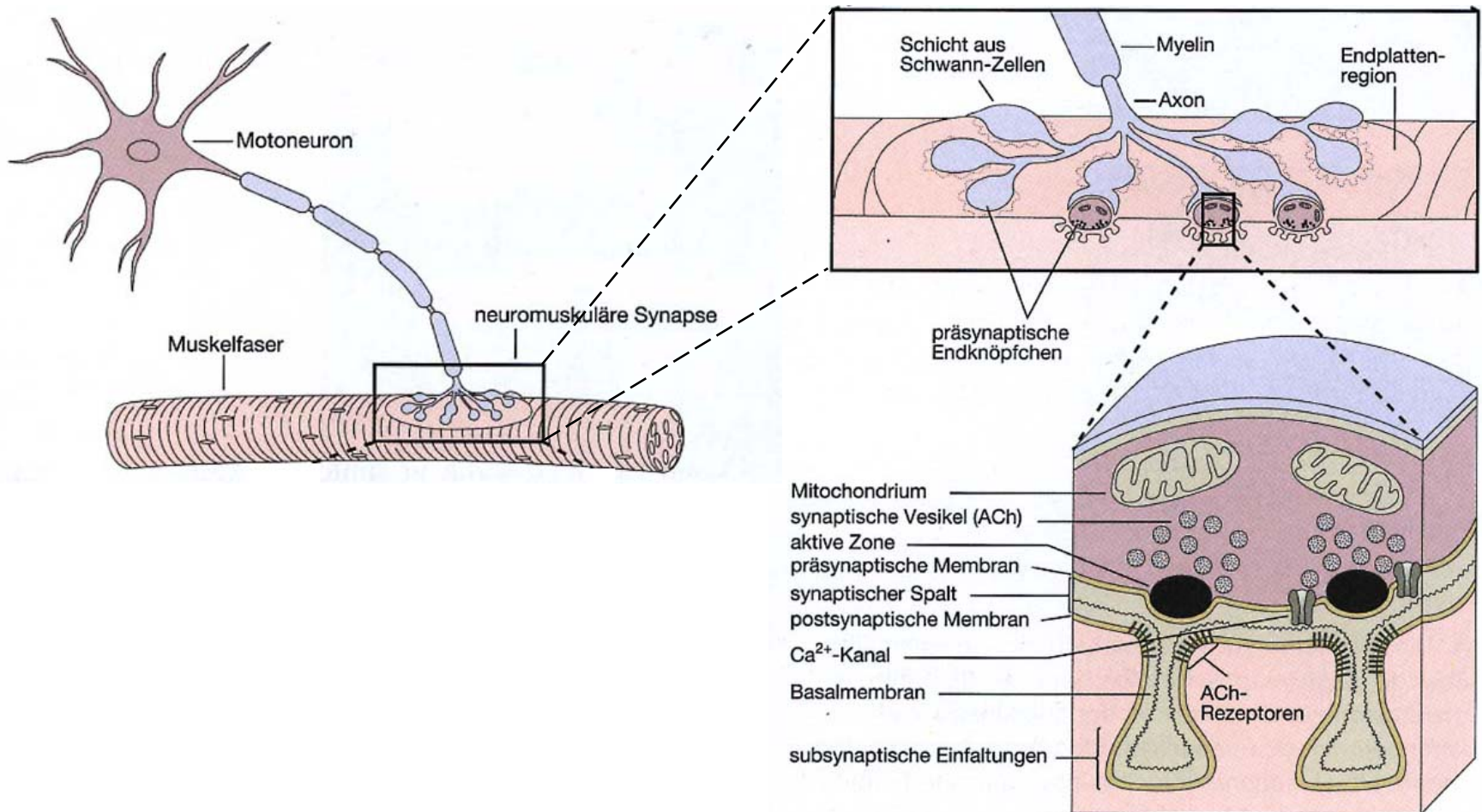


Inhibitorisches postsynaptisches Potenzial (IPSP)

GABA und **Glycin** sind inhibitorische Neurotransmitter

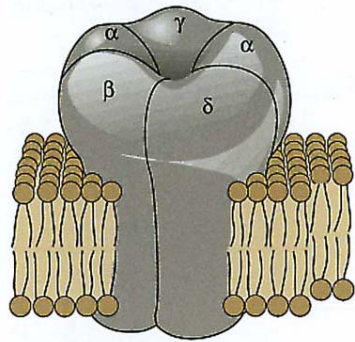


Beispiel einer chemischen Synapse: Neuromuskuläre Endplatte

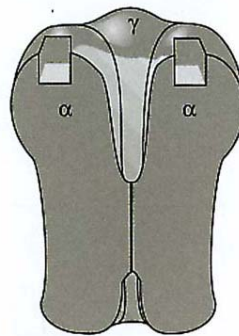


Blockade der Erregungsübertragung

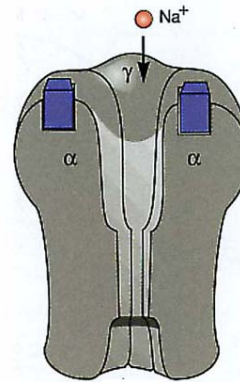
nikotinischer Acetylcholin Rezeptor



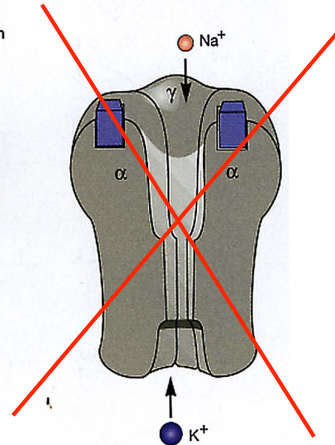
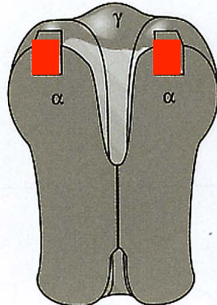
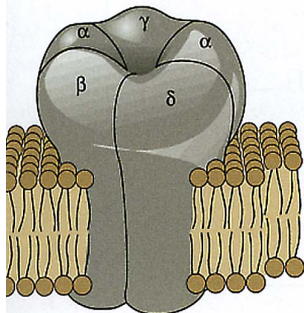
kein ACh gebunden:
Kanal geschlossen



zwei ACh-Moleküle gebunden:
Kanal geöffnet



α-Bungarotoxin



Selektive Kanalblocker

