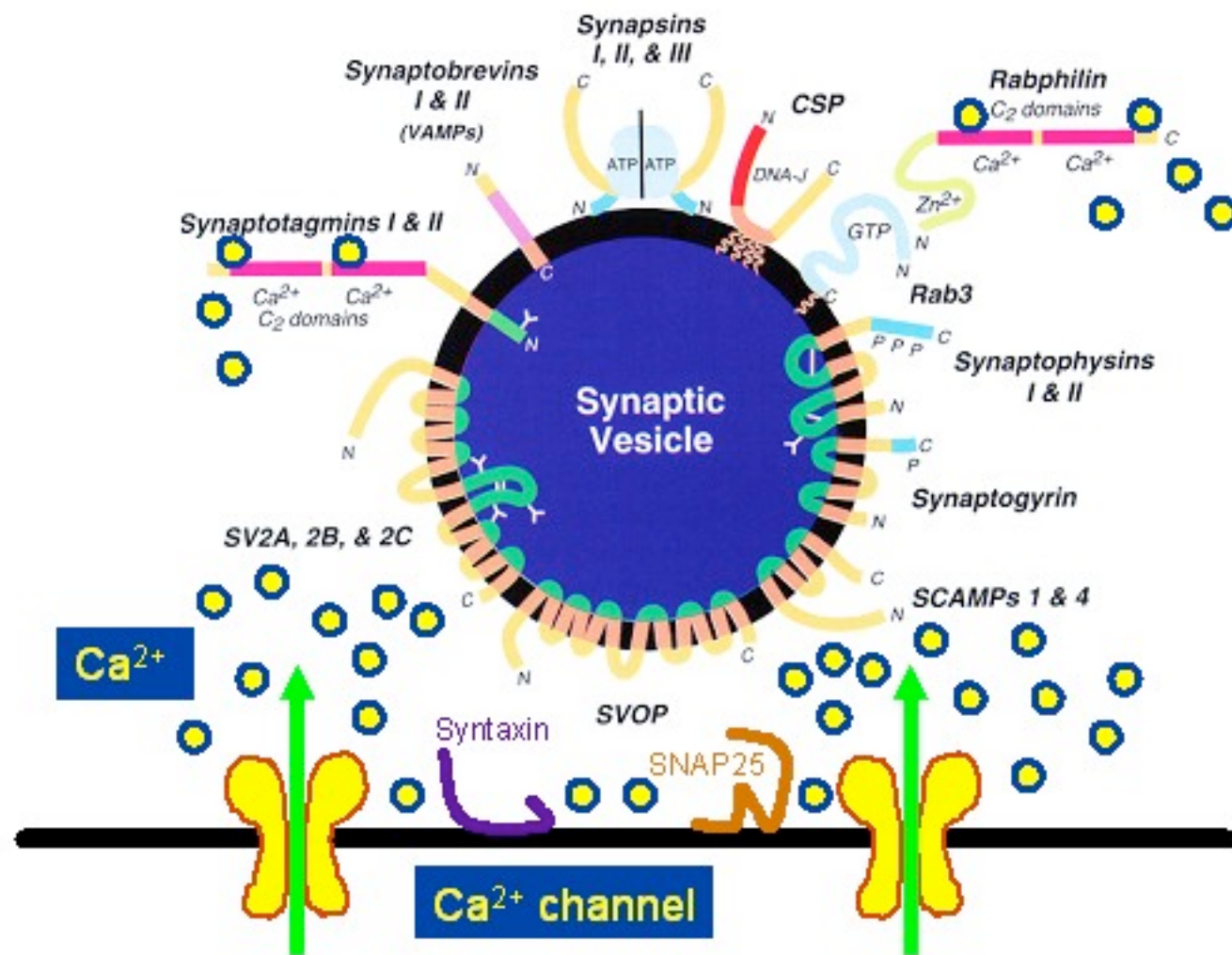
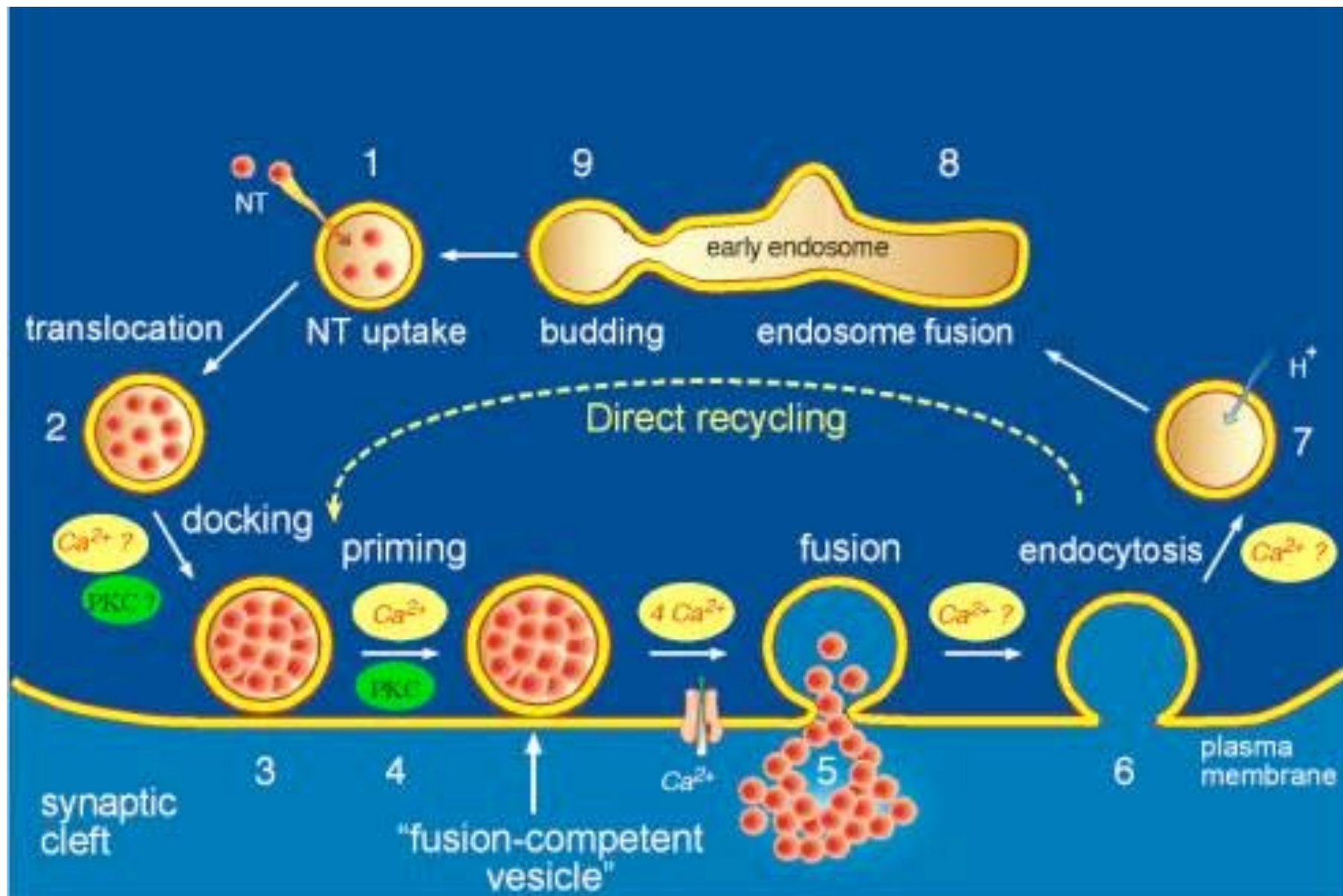
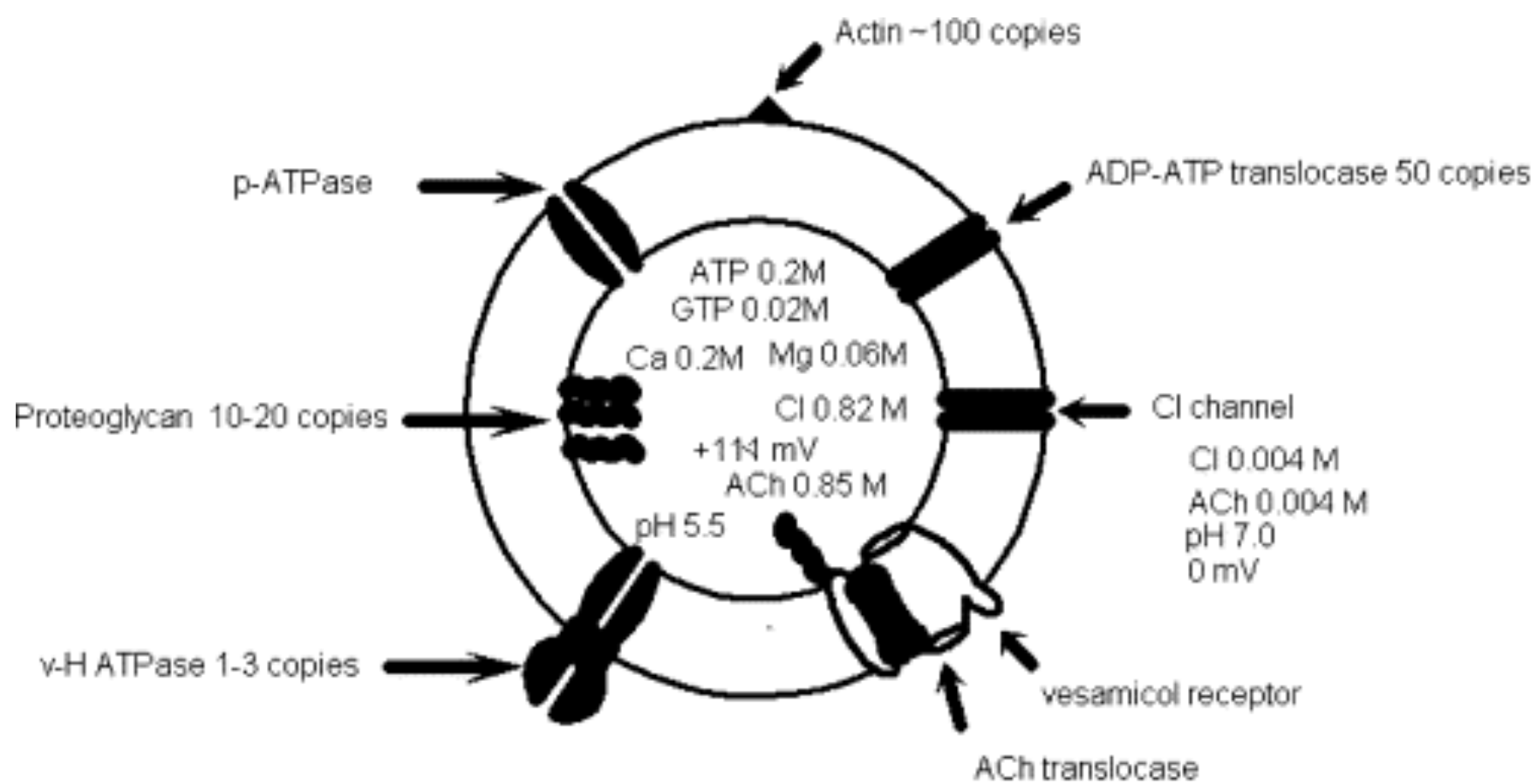


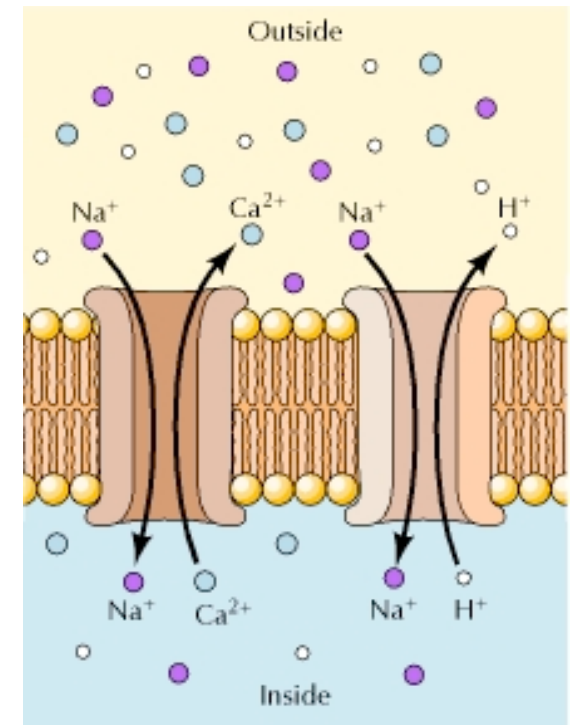
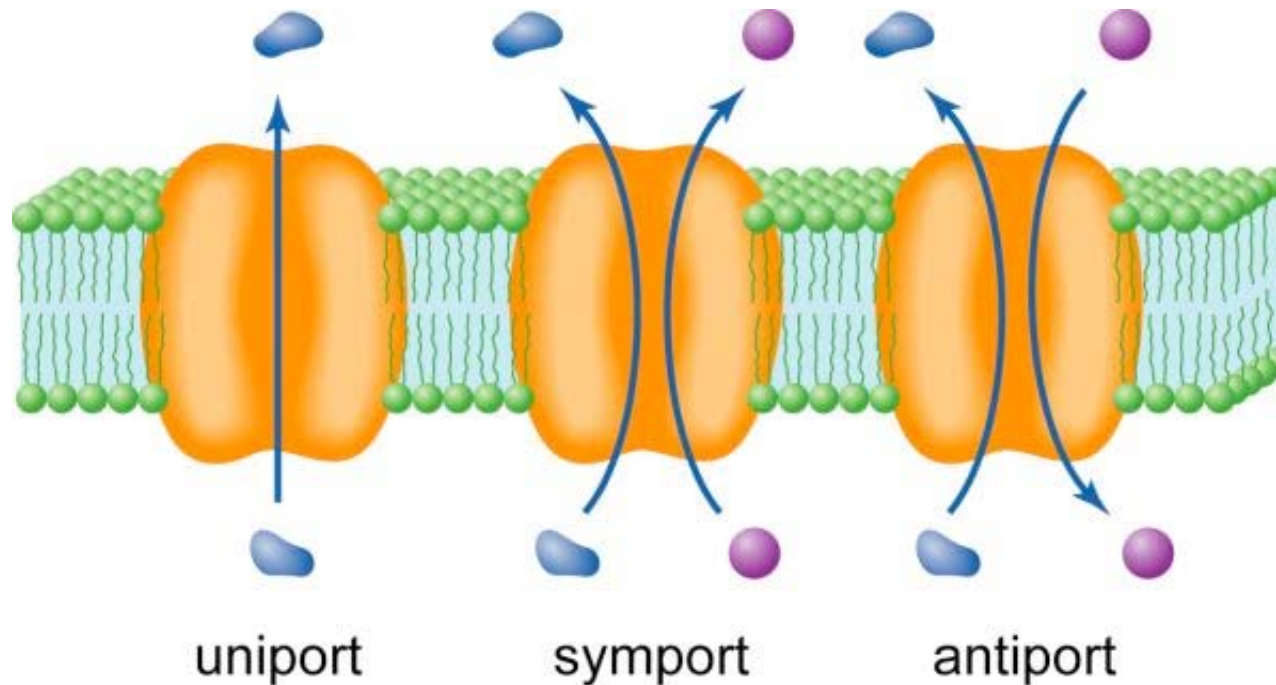


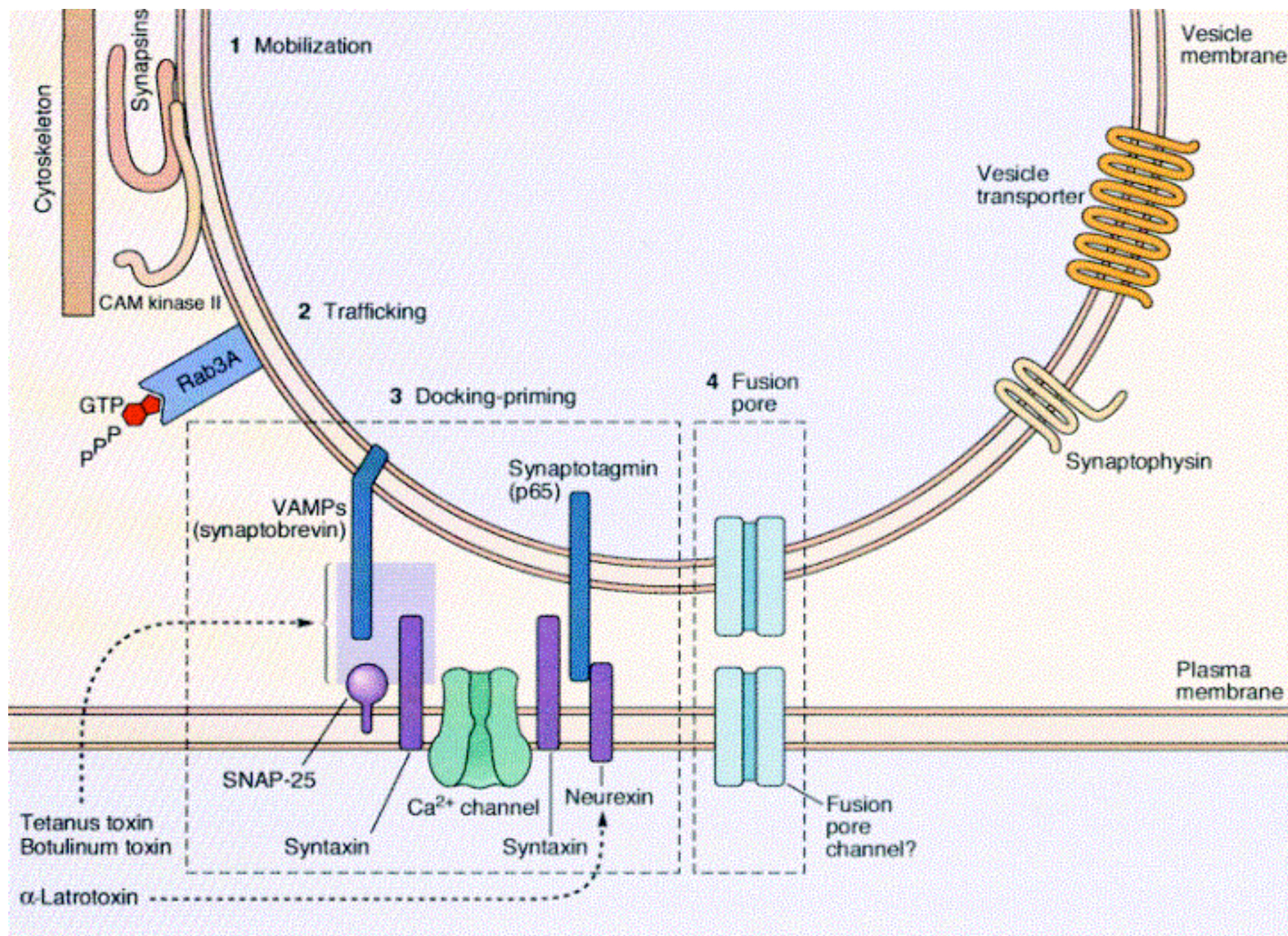
Modified from Sudhof, 1995

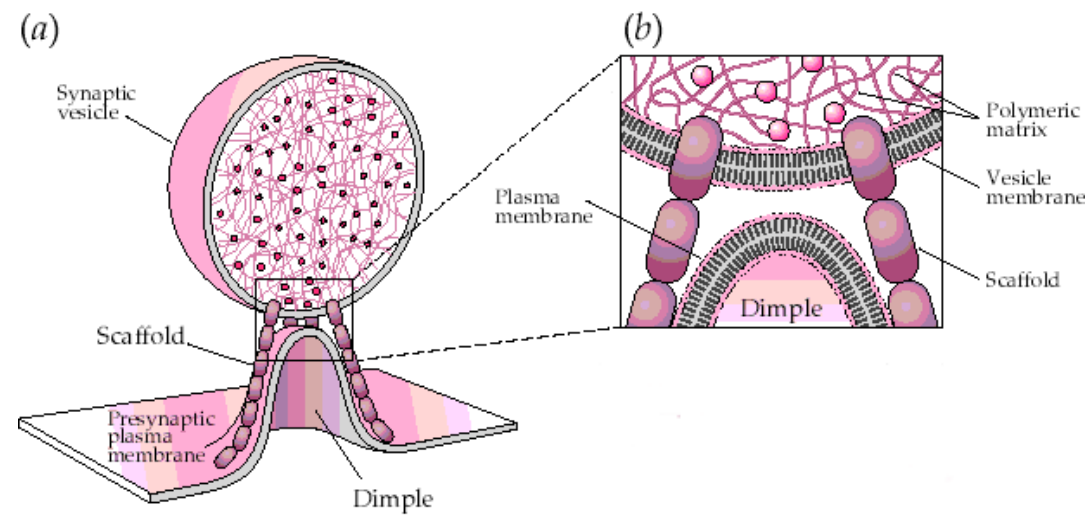
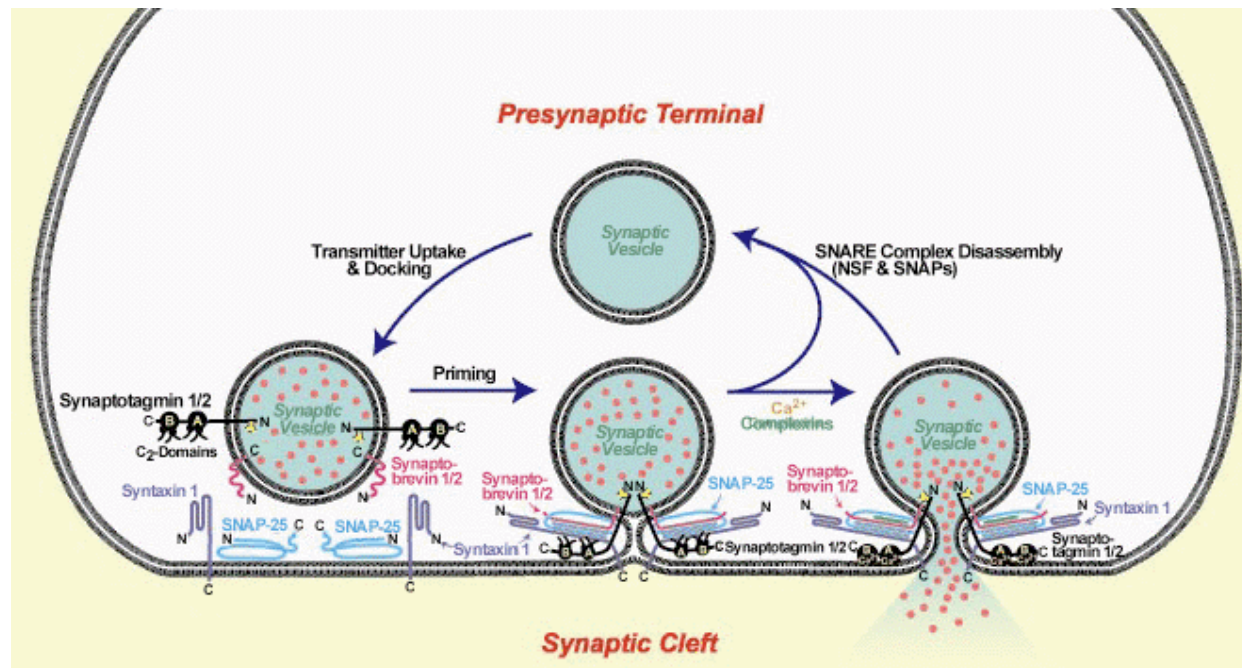


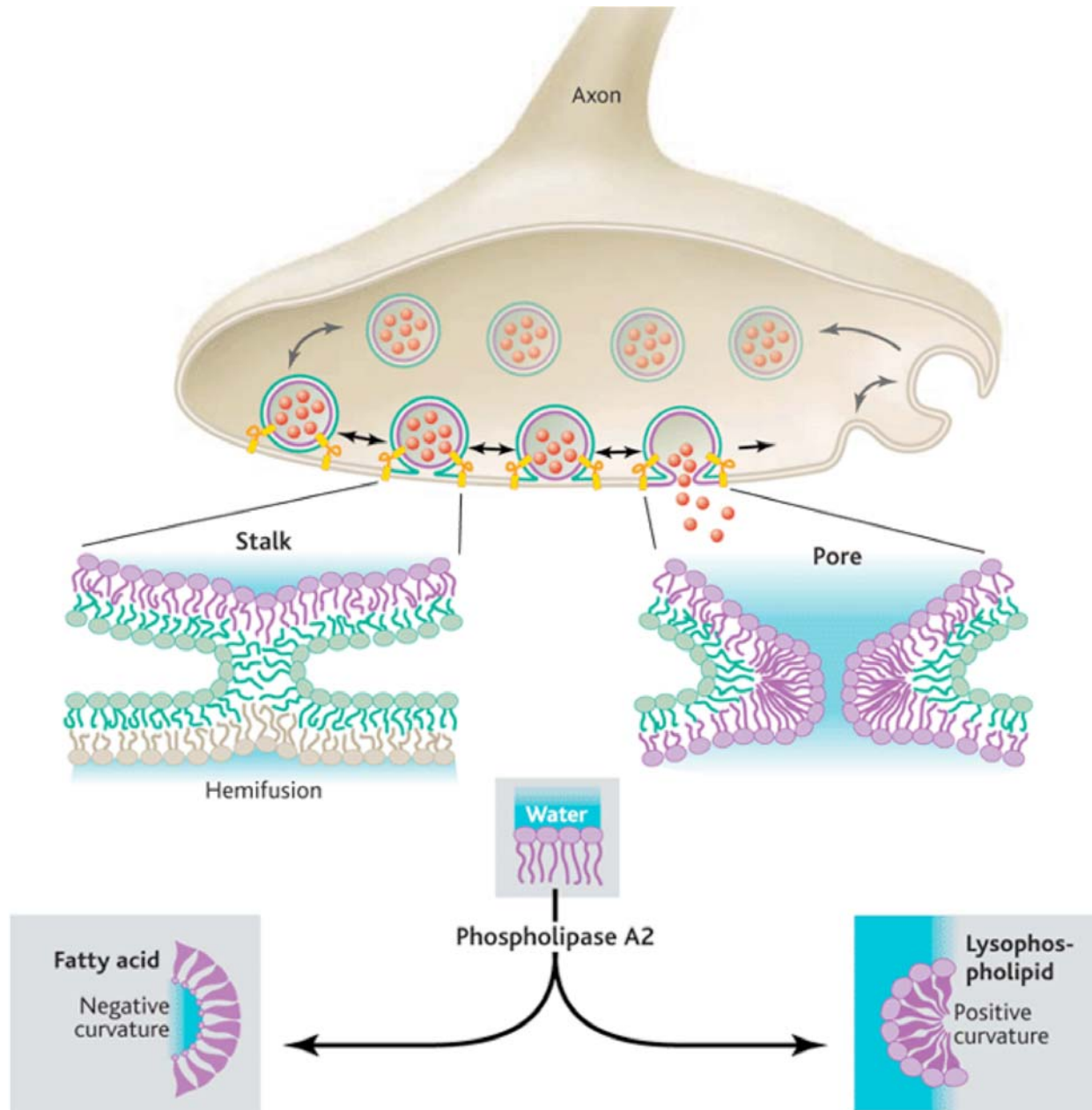


**An antiport is an integral membrane transport protein that simultaneously transports two different molecules, in opposite directions, across the membrane**

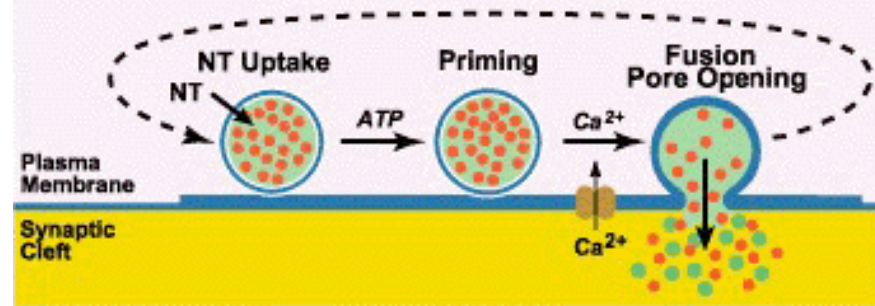




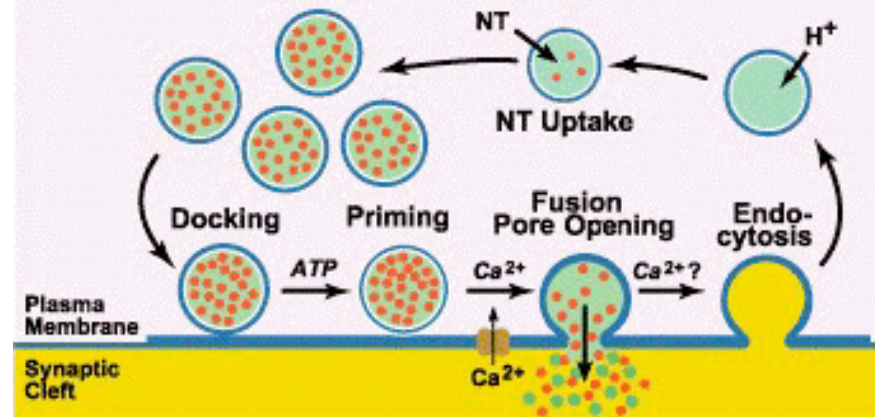




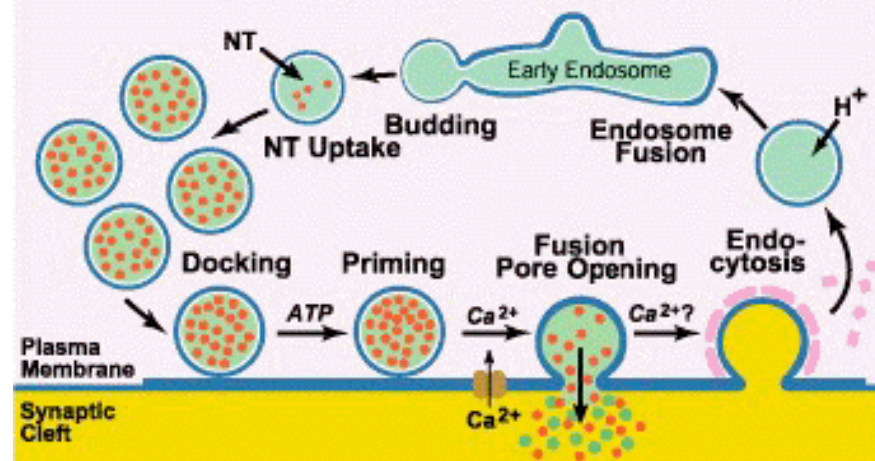
## Reuse ("kiss-and-stay")



## Reuse ("kiss-and-run")



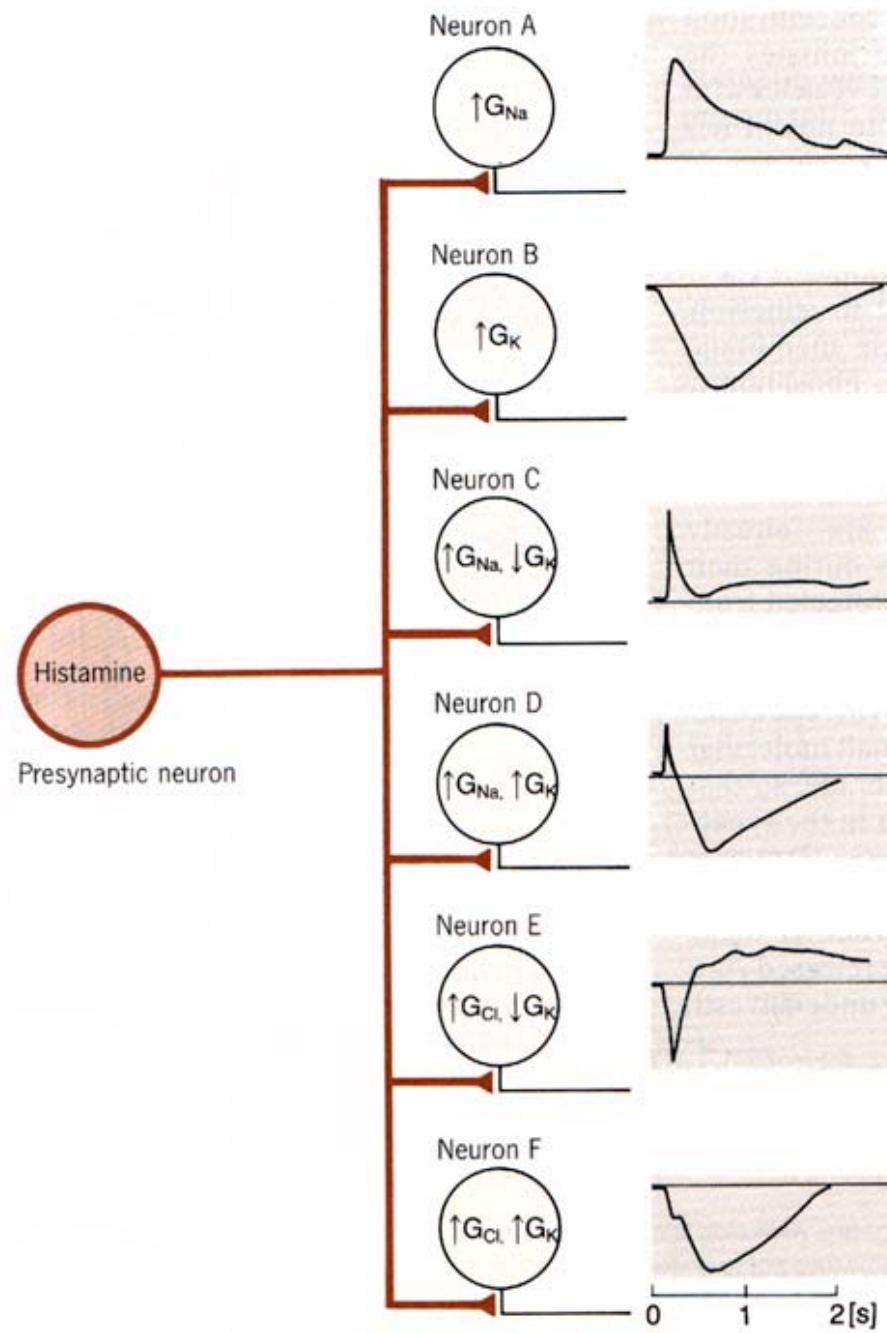
## Endosomal Recycling



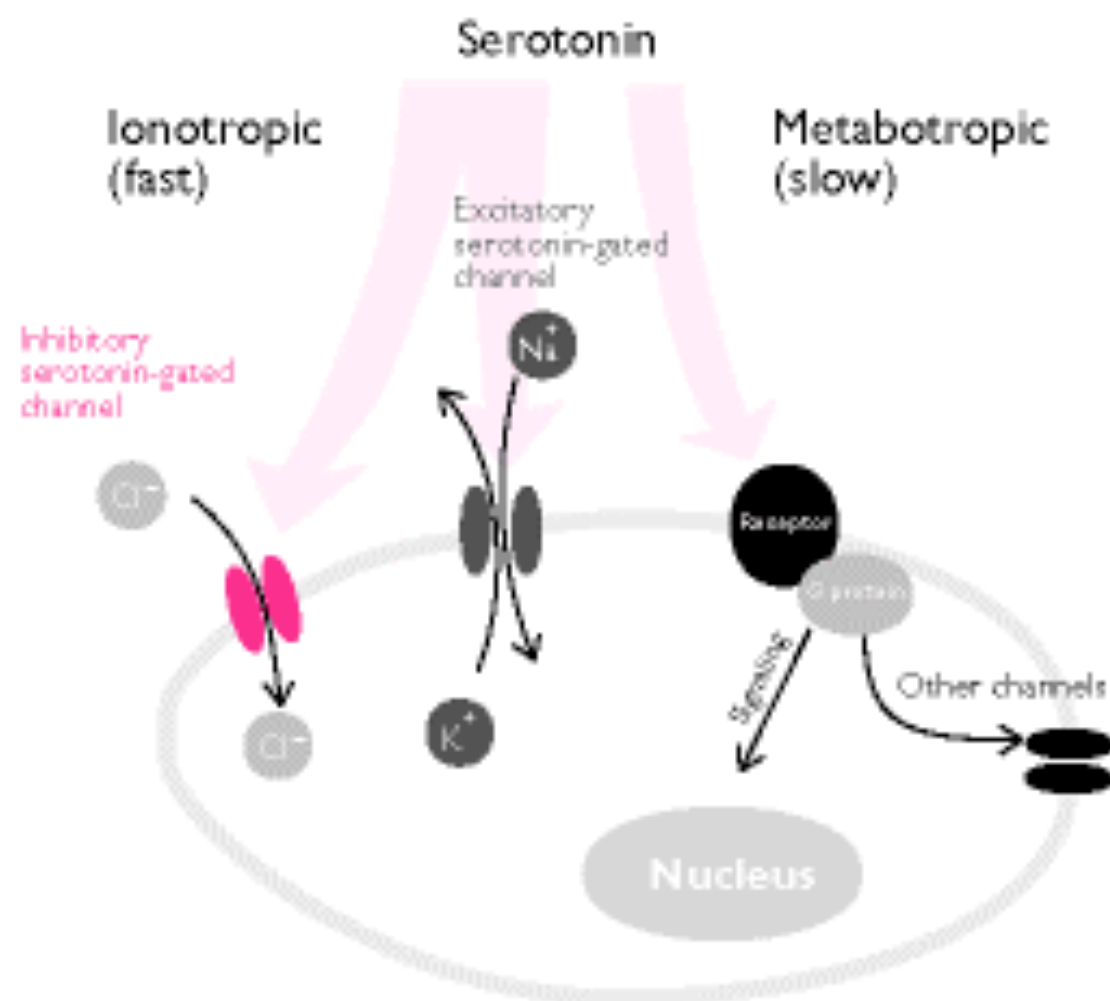
COSA DOBBIAMO RICORDARE:  
8. SINAPSI ELETTRICHE E CHIMICHE

1. Differenze strutturali e fisiologiche tra sinapsi chimiche e elettriche
2. Generalità delle sinapsi elettriche: i connessioni
3. Generalità delle sinapsi chimiche: trasformazione del segnale elettrico in segnale chimico.
4. Modalità di spegnimento del segnale: ricaptazione o idrolisi del neuromediatore.
5. Il principio della esocitosi regolata e il rilascio vescicolare
6. La vescicola sinaptica
7. Il ciclo della vescicola nella presinapsi: pool rilasciabile e di riserva: il concetto di non esauribilità sinaptica
8. Il riempimento della vescicola
9. L'ancoraggio della vescicola nella zona attiva
10. Calcio e fusione vescicolare: concetto di rapidità del rilascio

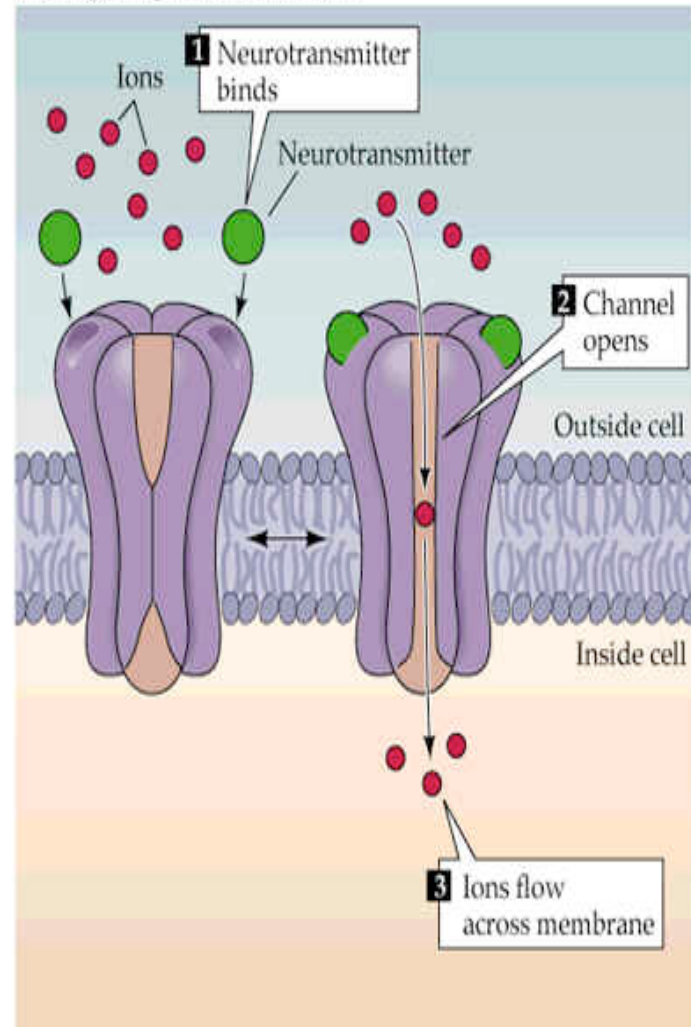
| TABELLA 8-4 Principali sostanze neurocrine |                                                     |                                                            |                                                                 |                                                                  |
|--------------------------------------------|-----------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------|
| SOSTANZA NEUROCRINA                        | RECETTORE                                           | TIPO                                                       | LOCALIZZAZIONE DEL RECETTORE                                    | PRINCIPALI AGONISTI, ANTAGONISTI E POTENZIATORI*                 |
| Acetilcolina (ACh)                         | Colinergici                                         |                                                            |                                                                 |                                                                  |
|                                            | Nicotinici                                          | ICR** (Na <sup>+</sup> , K <sup>+</sup> )                  | Muscolo scheletrico, neuroni autonomi, SNC                      | Nicotina (agonista)<br>Curaro, α-bungarotossina (antagonisti)    |
|                                            | Muscarinici                                         | GPCR                                                       | Muscolo cardiaco e liscio, ghiandole endocrine ed esocrine, SNC | Muscarina (agonista)<br>Atropina (antagonista)                   |
| Amine                                      |                                                     |                                                            |                                                                 |                                                                  |
| Noradrenalina (NA)                         | Adrenergici (α, β)                                  | GPCR                                                       | Muscolo cardiaco e liscio, ghiandole endocrine ed esocrine, SNC | Prazosin (α antagonista)<br>Propranololo (β antagonista)         |
| Dopamina (DA)                              | Dopaminergici (D)                                   | GPCR                                                       | SNC                                                             | Farmaci antipsicotici (antagonisti)<br>Bromocriptina (agonista)  |
| Serotonina (5-idrossitriptamina o 5-HT)    | Serotoninergici (5-HT)                              | ICR (Na <sup>+</sup> , K <sup>+</sup> )                    | SNC                                                             | Sumatropina (agonista)<br>LSD (antagonista)                      |
| Istamina                                   | Istaminergici (H)                                   | GPCR                                                       | SNC                                                             | Ranitidina (Zantac®) e Cimetidina (Tagamet®) (antagonisti)       |
| Aminoacidi                                 |                                                     |                                                            |                                                                 |                                                                  |
| Glutammato                                 | Glutamatergici ionotropi                            |                                                            |                                                                 |                                                                  |
|                                            | AMPA                                                | ICR (Na <sup>+</sup> , K <sup>+</sup> )                    | SNC                                                             |                                                                  |
|                                            | NMDA                                                | ICR (Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> ) | SNC                                                             |                                                                  |
|                                            | Glutamatergici metabotropi                          | GPCR                                                       | SNC                                                             | Glicina (potenziatore)                                           |
| GABA (acido gamma-aminobutirrico)          | GABAergici (GABA <sub>A</sub> , GABA <sub>B</sub> ) | ICR (Cl <sup>-</sup> )<br>GPCR                             | SNC                                                             | Picrotossina (antagonista)<br>Alcol e barbiturici (potenziatori) |
| Glicina                                    | Glicinergici                                        | ICR (Cl <sup>-</sup> )                                     | SNC                                                             | Stricnina (antagonista)                                          |
| Purine                                     |                                                     |                                                            |                                                                 |                                                                  |
| Adenosina                                  | Purinergici (P)                                     | GPCR                                                       | SNC                                                             |                                                                  |
| Gas                                        |                                                     |                                                            |                                                                 |                                                                  |
| Monossido d'azoto (NO)                     | Nessuno                                             | —                                                          | —                                                               |                                                                  |



## Serotonin Is Gatekeeper of New Fast Receptor

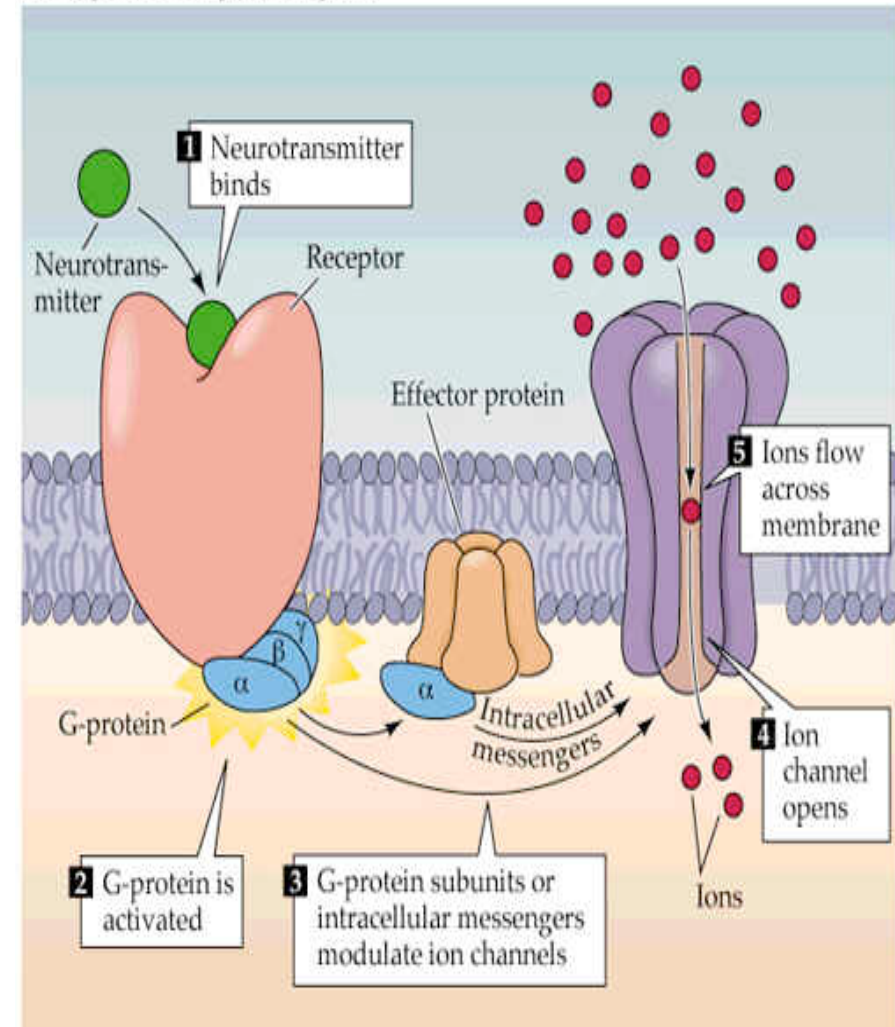


(A) Ligand-gated ion channels

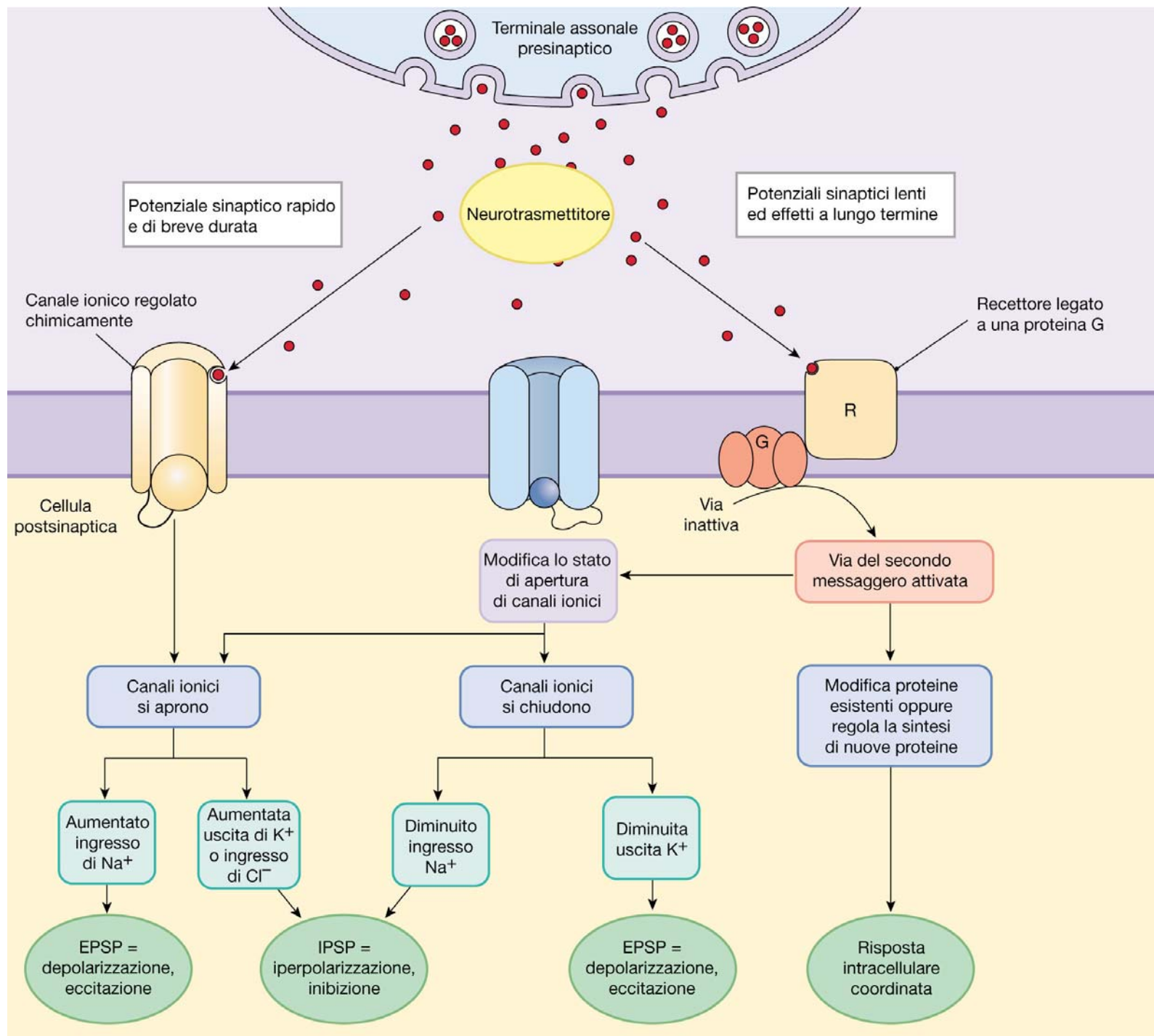


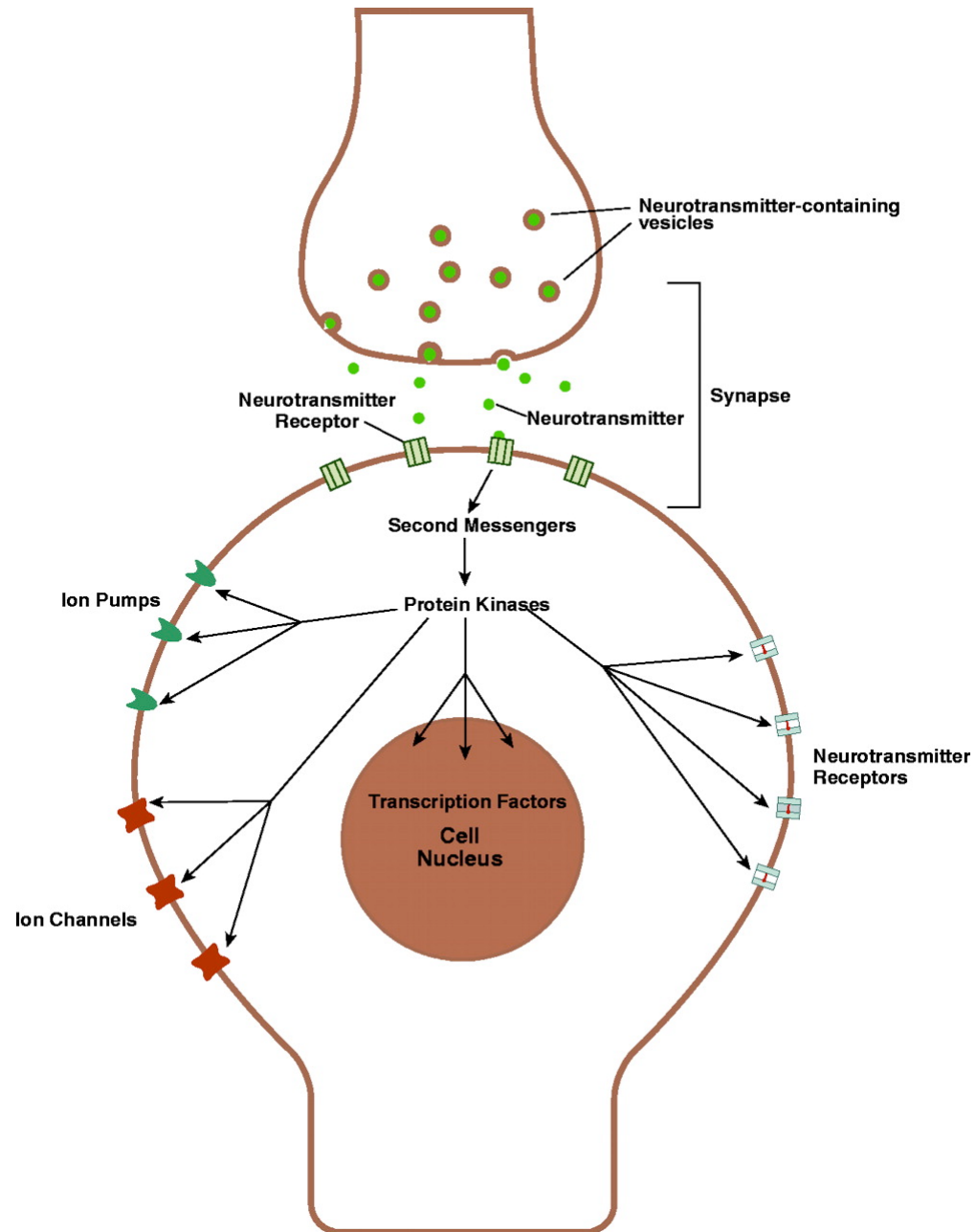
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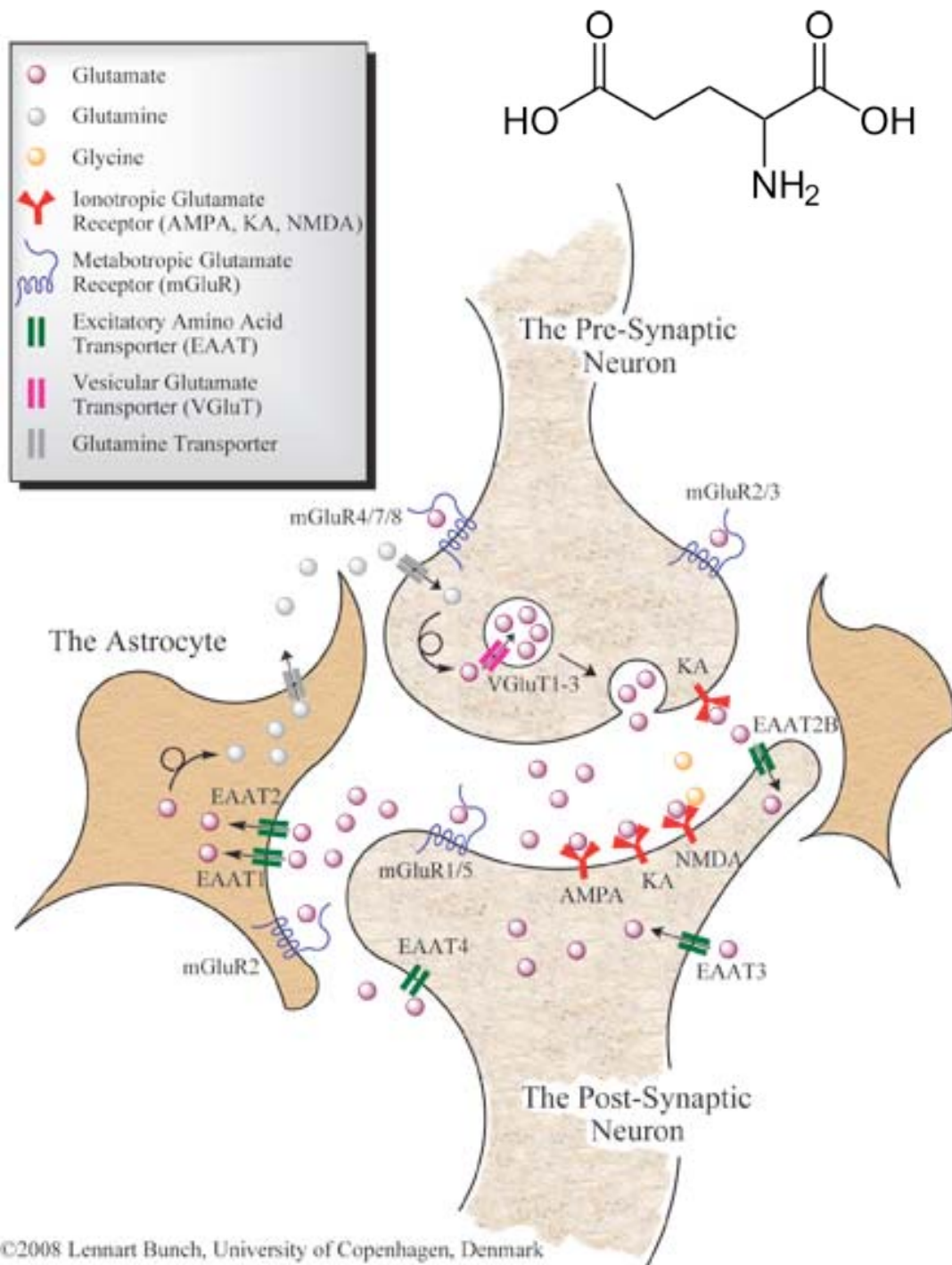
(B) G-protein-coupled receptors



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## Ionotropic Glutamate Receptors

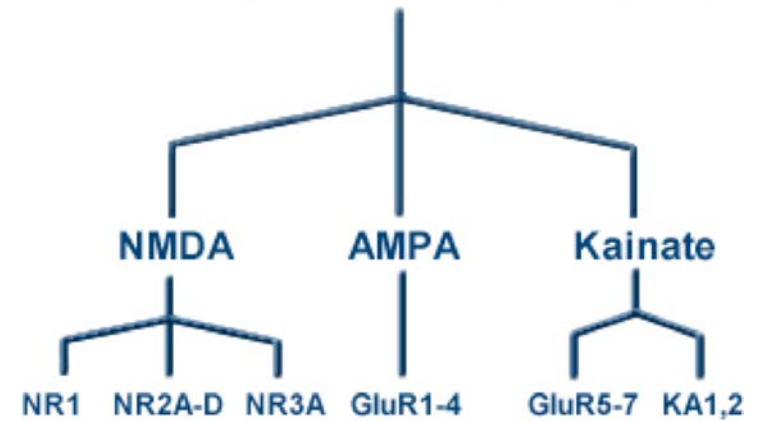


Figure 1. Classification of the ionotropic glutamate receptors.

## Metabotropic Glutamate Receptors

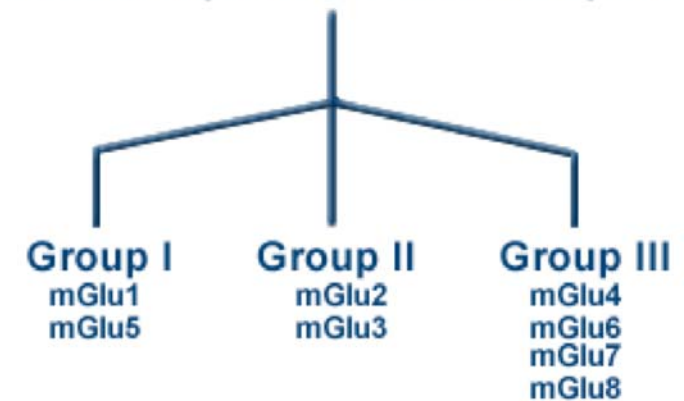
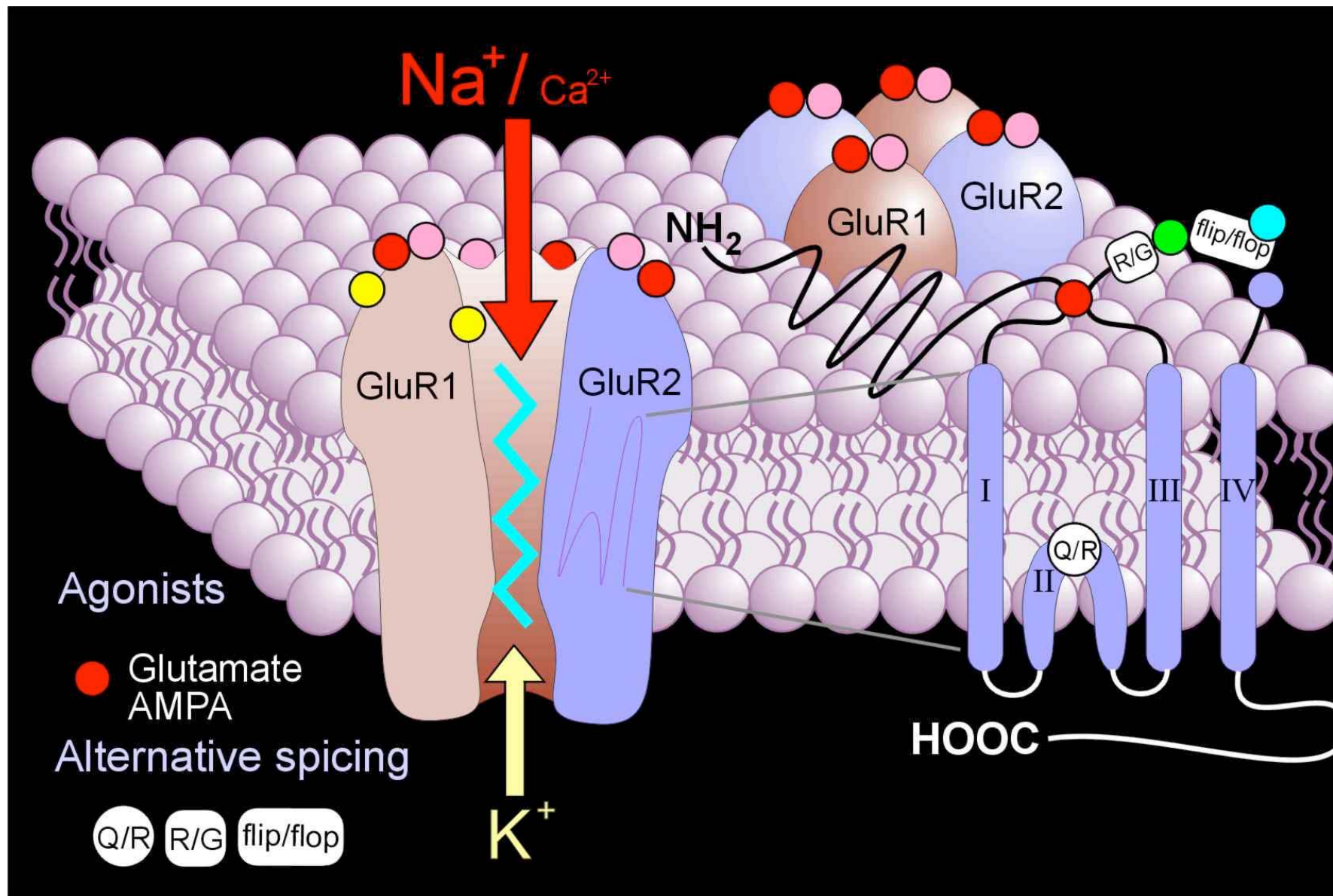
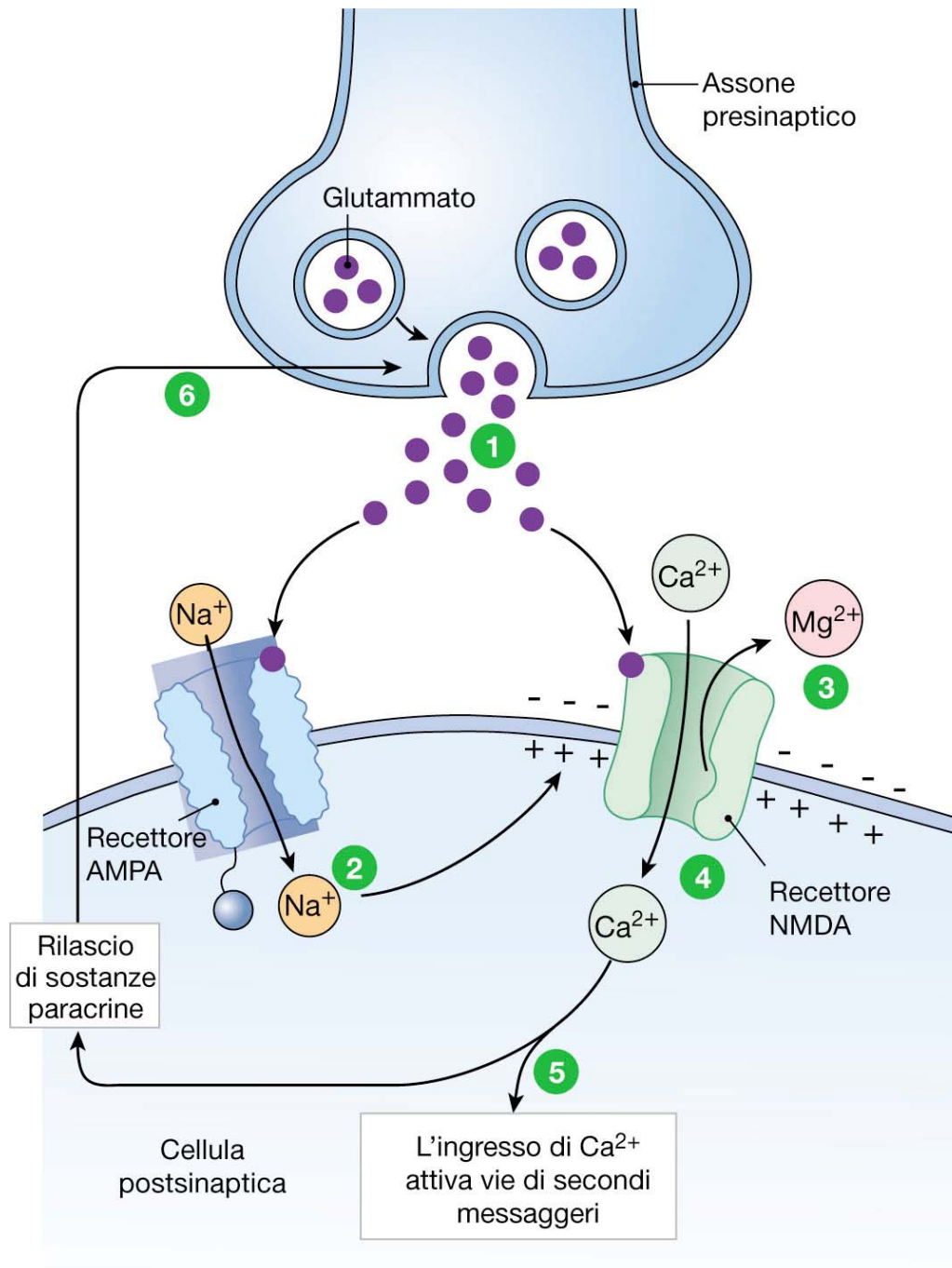
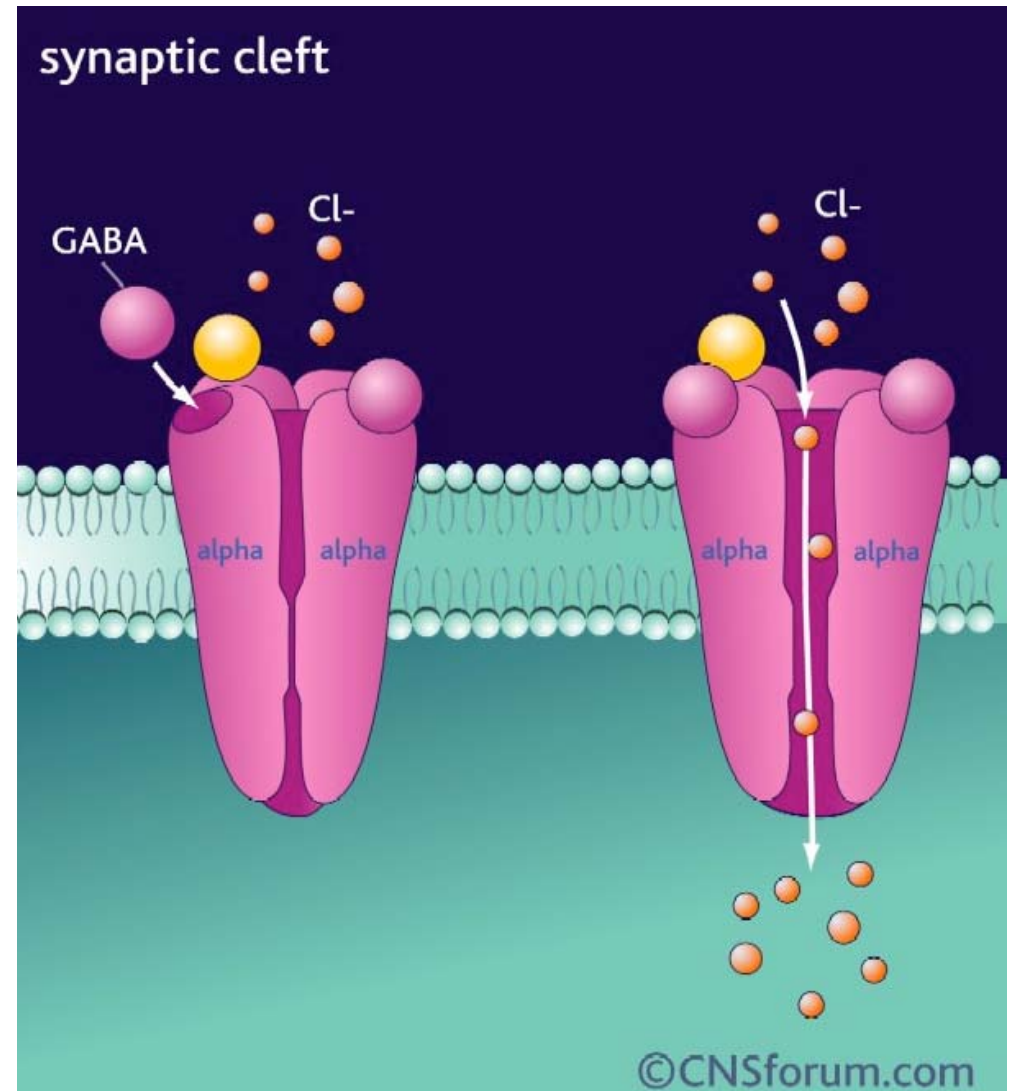
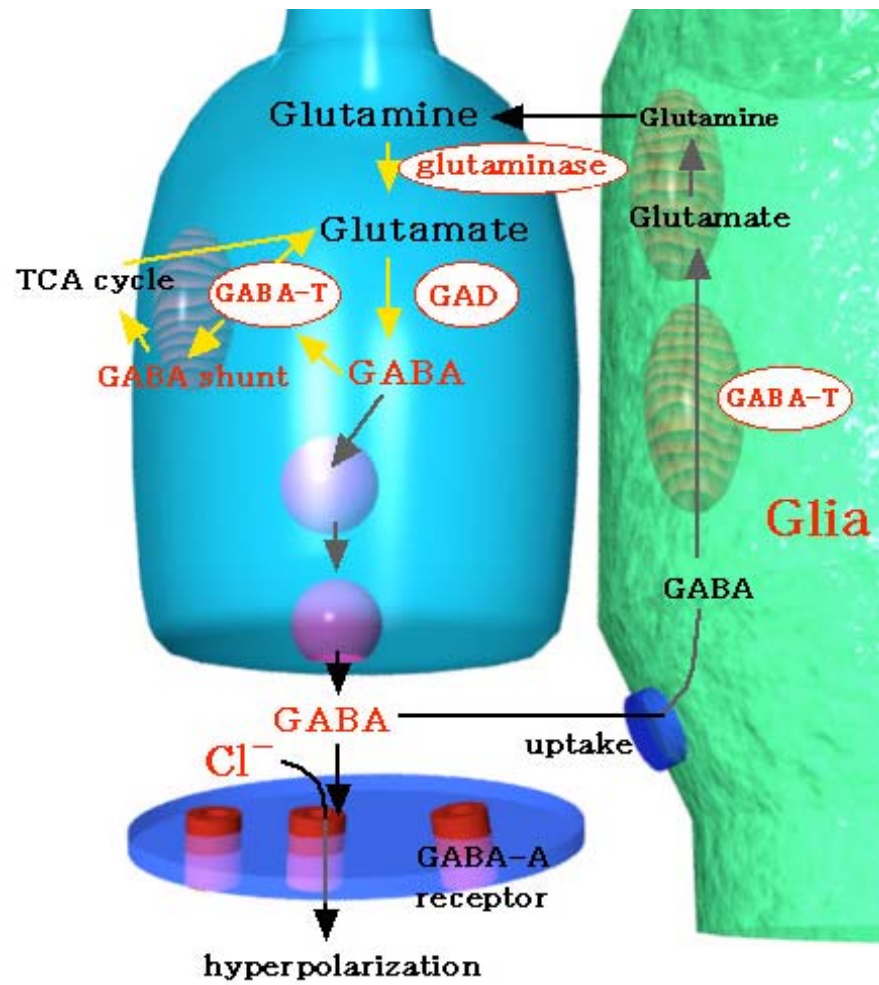
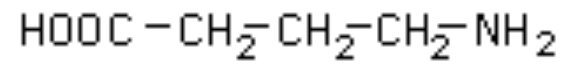


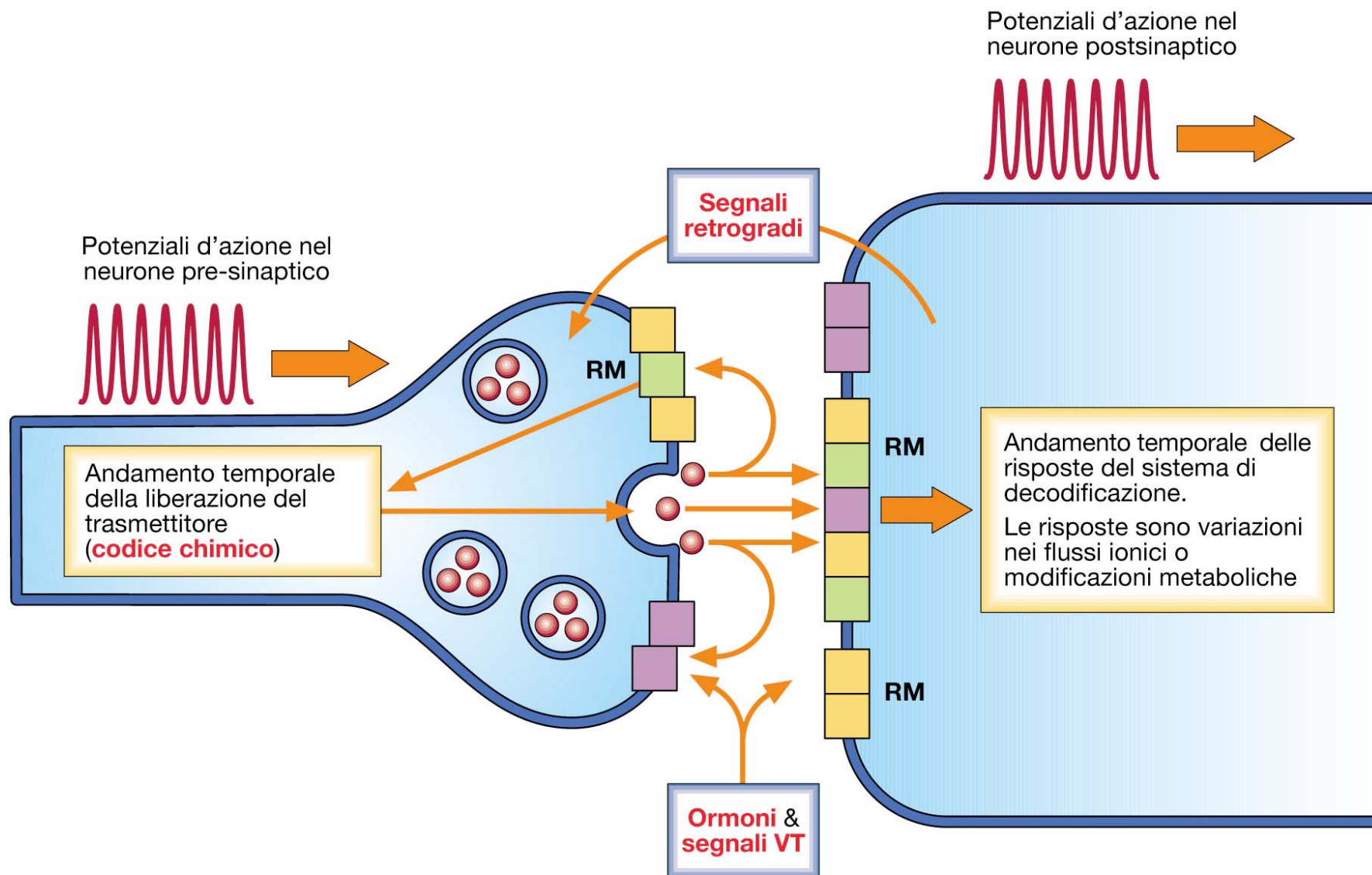
Figure 7. Classification of the metabotropic glutamate receptors.





- 1 Viene rilasciato glutammato.
- 2 L'ingresso netto di Na<sup>+</sup> depolarizza la cellula postsinaptica.
- 3 La depolarizzazione allontana gli ioni Mg<sup>2+</sup> e apre il canale.
- 4 Entra Ca<sup>2+</sup> nel citoplasma.
- 5 La cellula diventa più sensibile al glutammato.
- 6 Sostanze paracrine rilasciate dalla cellula postsinaptica aumentano il rilascio di glutammato da parte della cellula presinaptica.





COSA DOBBIAMO RICORDARE:  
9. NEUROMEDIATORI E RECETTORI POSTSINAPTICI

1. Principali neuromediatrici del sistema nervoso
2. Il Recettore postsinaptico
3. Recettori ionotropici e metabotropici
4. Il recettore ionotropico del glutamato
5. Il recettore ionotropico del GABA
6. Apertura e chiusura dei canali e recettori metabotropici