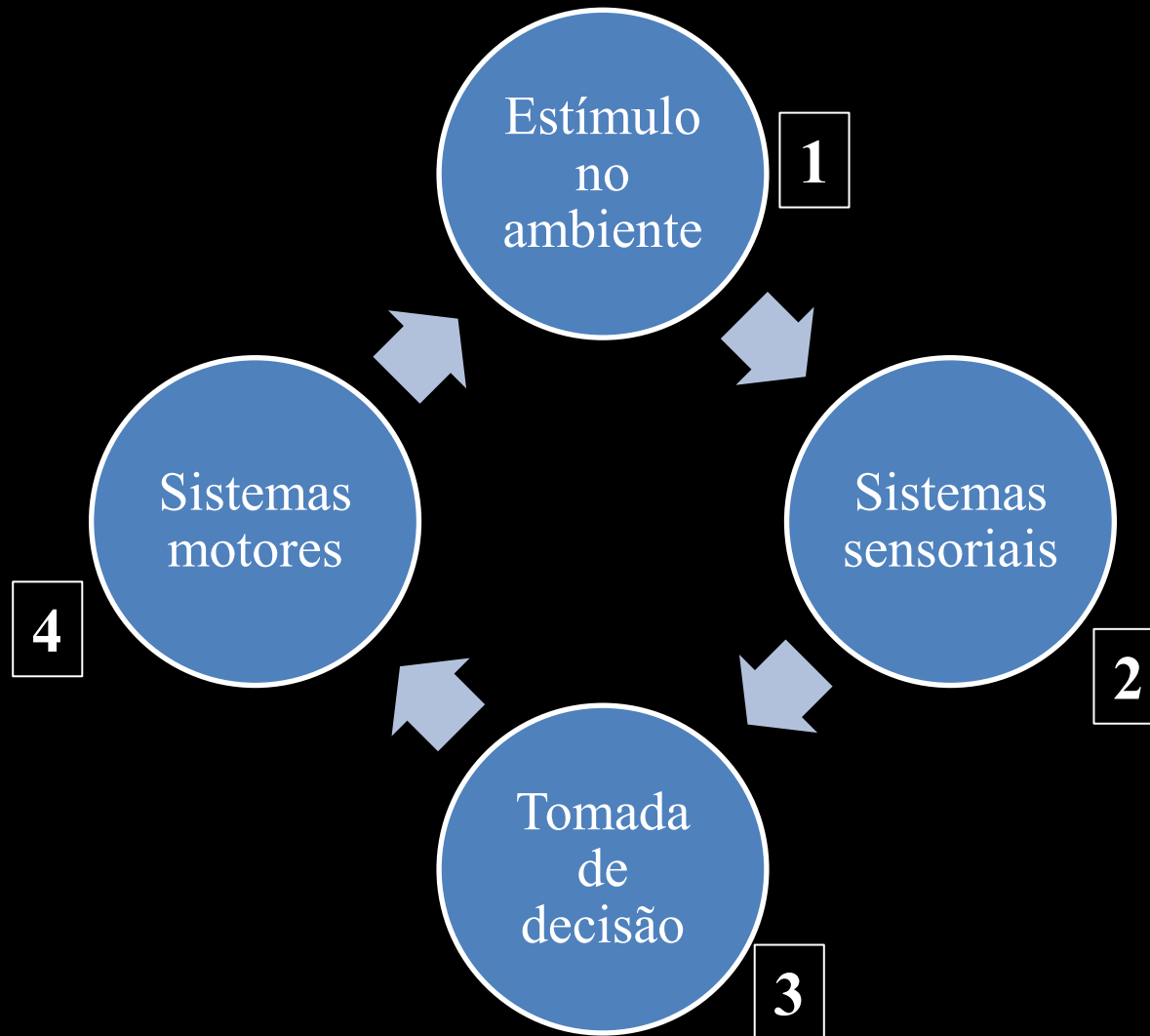


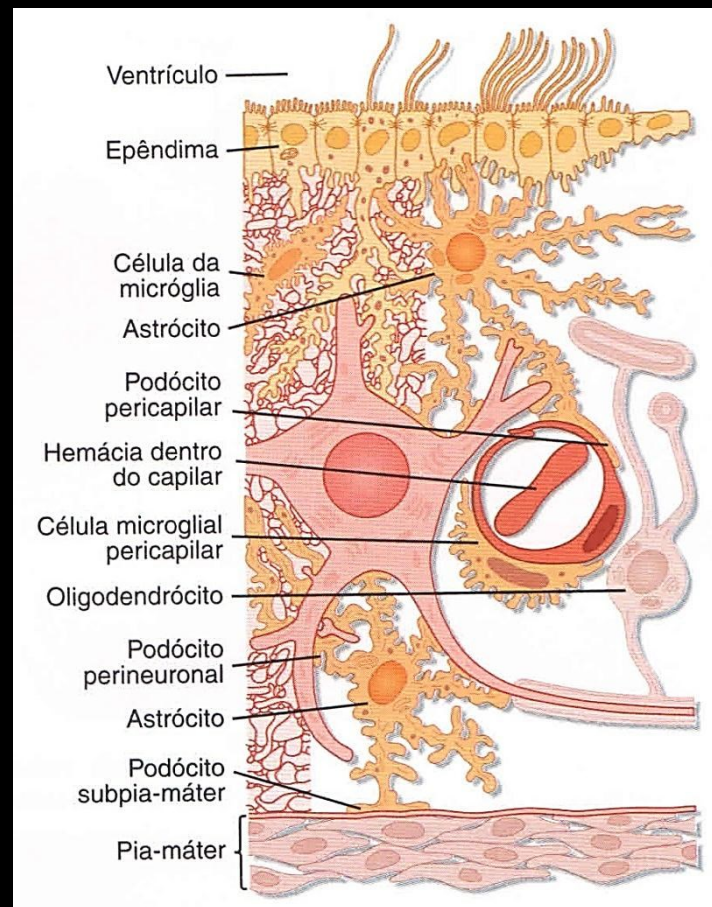
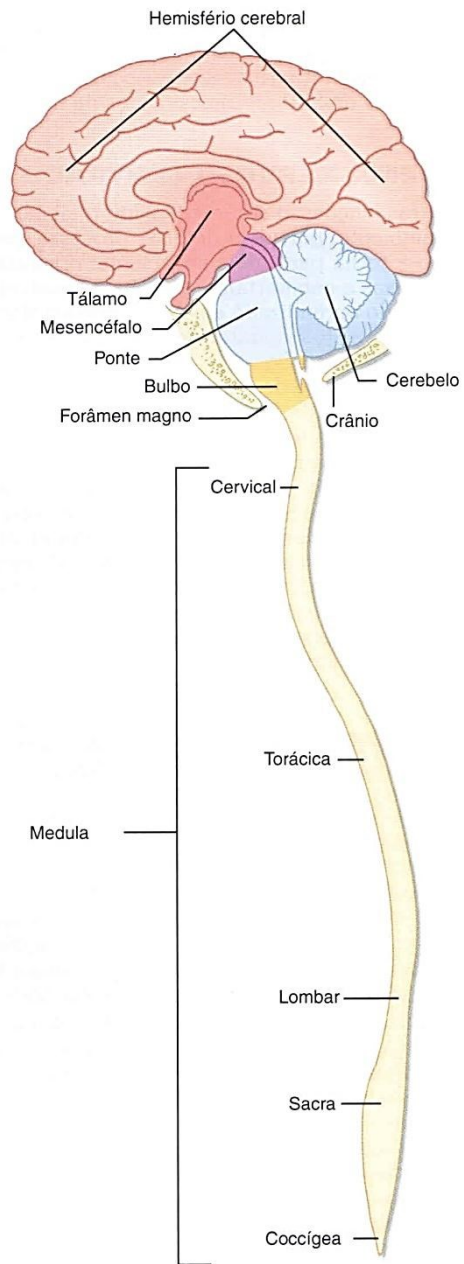
Função do Sistema Nervoso

Sistema nervoso é a parte do organismo que coordena as ações voluntárias e involuntárias e transmite sinais entre as diferentes partes do organismo.

- Receber, analisar, integrar e armazenar informações do meio ambiente (ext. e int.).
- Emitir respostas adaptativas que visam manter a homeostase e garantir a sobrevivência do indivíduo e da espécie.

Sistema nervoso → permite a troca contínua de informação com o meio-ambiente





Modelo neuronal

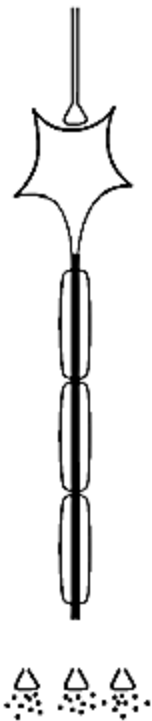
Região:

Aferente

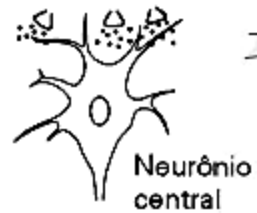
Integrativa

Conductiva

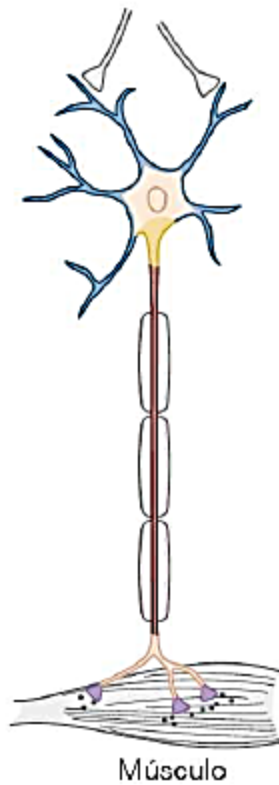
Eferente



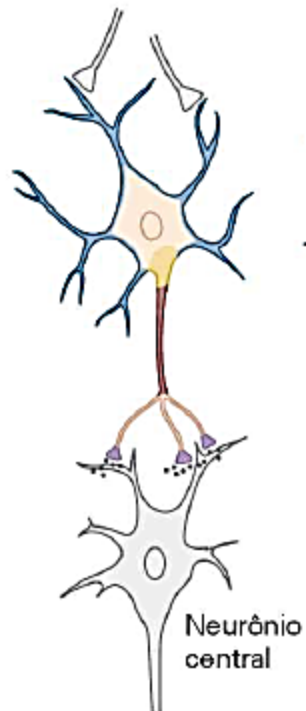
Neurônio sensorial



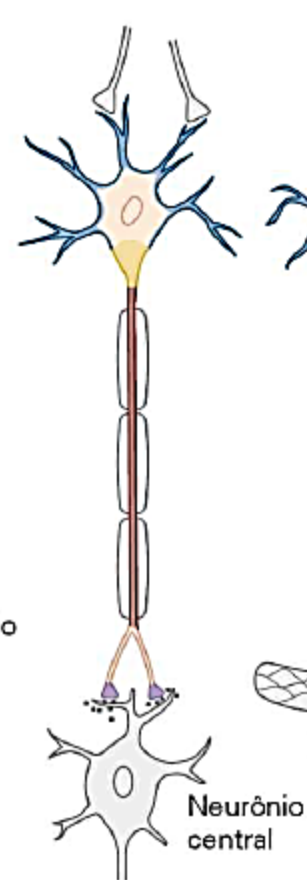
Neurônio motor



Interneurônio local



Interneurônio de projeção



Célula neuroendócrina



Neuromediadores (neurotransmissores)

Categorias

Aminoácidos

Glutamato

Ácido gama-amino-butírico
(GABA)

Glicina

Gasosos

Óxido nítrico

Óxido carbônico (CO)

Aminas

Acetilcolina

Dopamina

Adrenalina

Noradrenalina

Serotonina

Histamina

Peptídeos

Colecistocinina (CCK)

Endorfinas / Dinorfinas

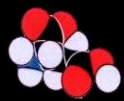
Encefalinas (ENK)

Somatostatina

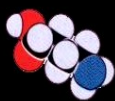
Substância P

Hormônio liberador de tireotrofina (TRH)

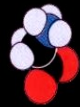
Polipeptídeo intestinal vasoativo (VIP)



Glutamato



GABA



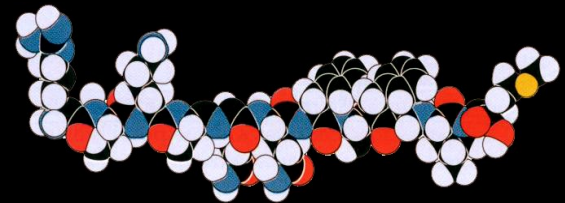
Glicina



Acetilcolina



Noradrenalina



Arg Pro Lis Pro Gln Gln Fen Fen Gli Leu Met

Substância P

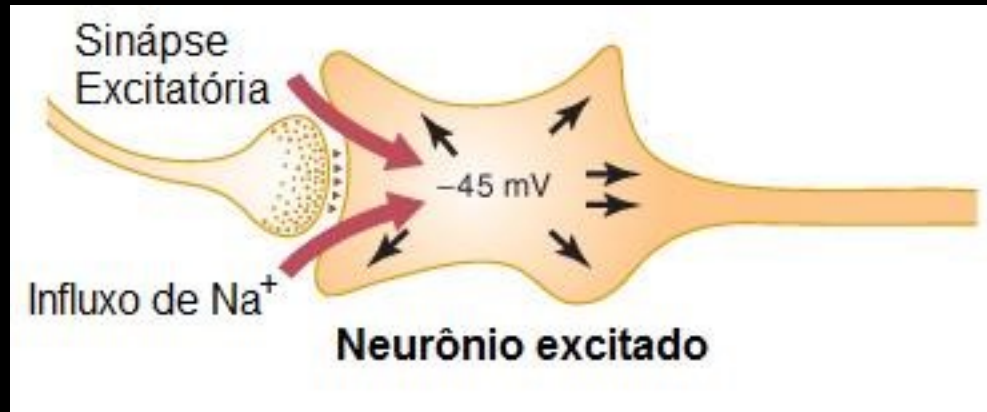
○ Carbono

● Oxigênio

● Nitrogênio

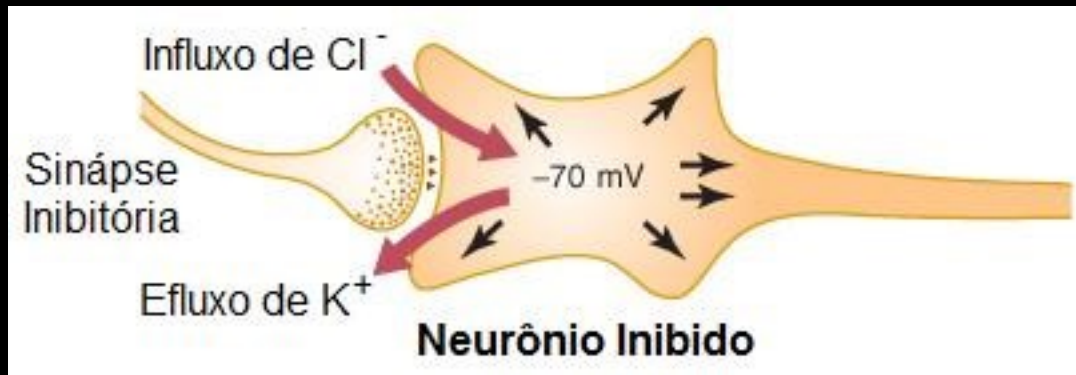
● Hidrogênio

● Enxofre



Potencial pós-sináptico
excitador (p.p.s.e.)

Exemplo de neurotransmissor:
Glutamato
Acetilcolina



Potencial pós-sináptico
inibidor (p.p.s.i.)

Exemplo de neurotransmissor:
Ácido gama-aminobutírico
(GABA)
Glicina

AMINAS BIOGÊNICAS

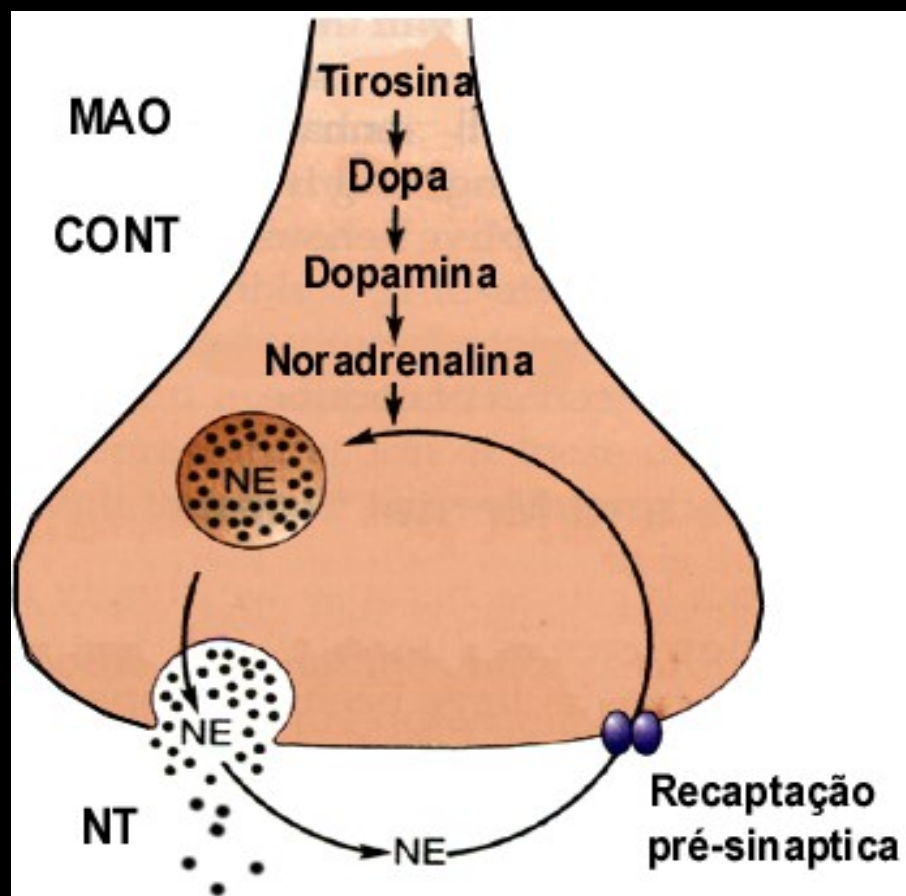
Tirosina → Dopamina
Noradrenalina
Adrenalina

Triptofano → Serotonina

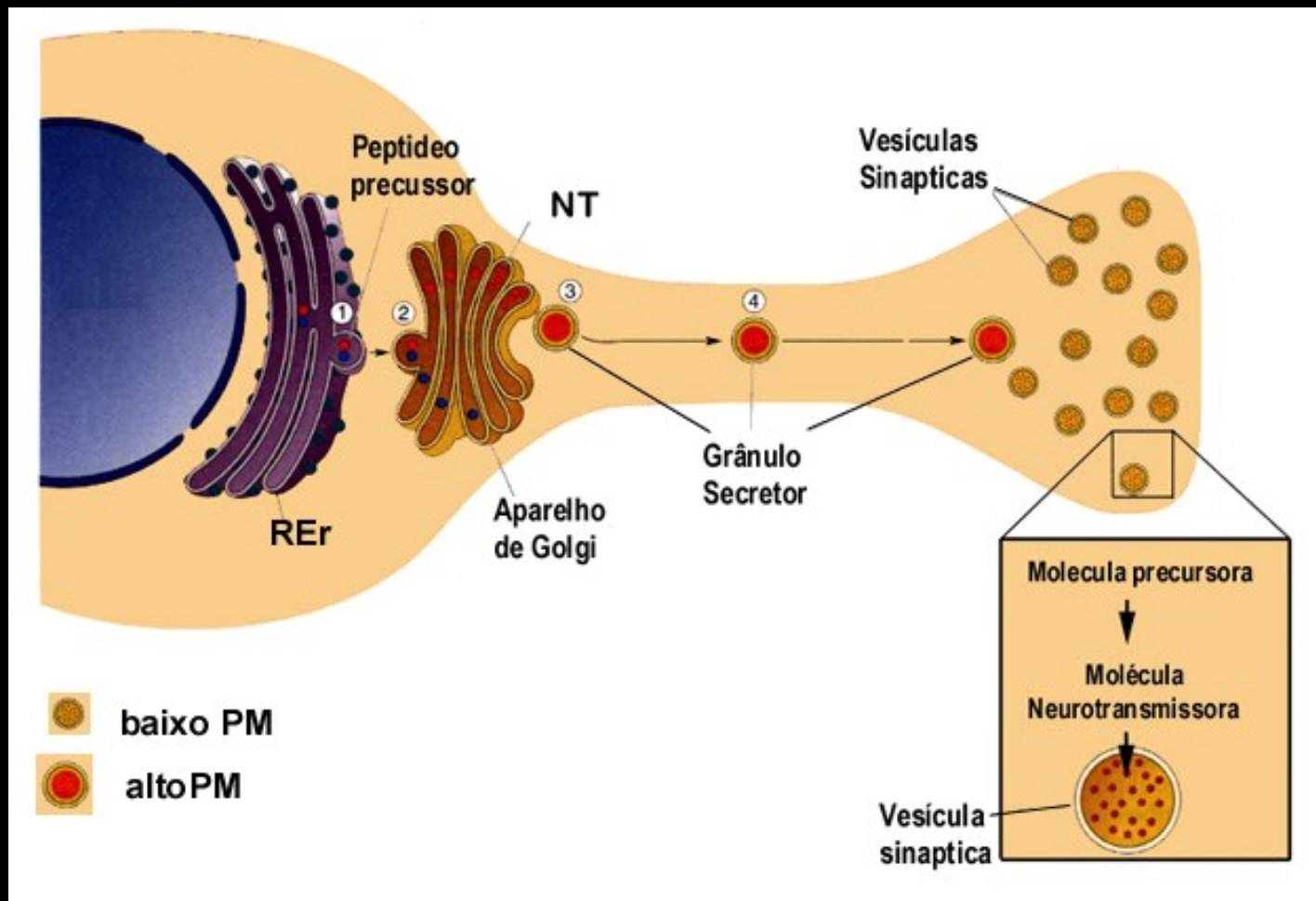
Acetil-Coa + Colina → Acetilcolina

Histidina → Histamina

Catecolaminas: compartilham a mesma via de biossíntese que começa com a tirosina.



A maquinaria neuronal realiza suas funções metabólicas e sintetiza substâncias químicas específicas = neurotransmissores, que são armazenadas em vesículas. As vesículas são transportadas e armazenadas nos terminais nervosos de onde são secretadas.



NT de baixo PM: sintetizados e armazenados nos terminais nervosos

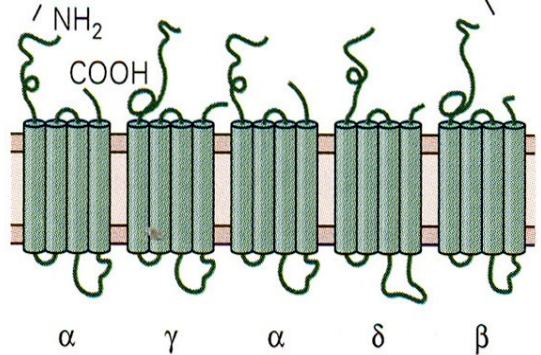
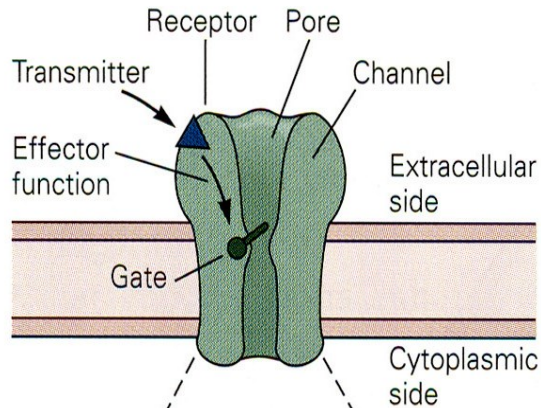
NT de alto PM: sintetizados no corpo celular, transportados para os terminais onde são armazenados

SINAPSE QUÍMICA

Receptores

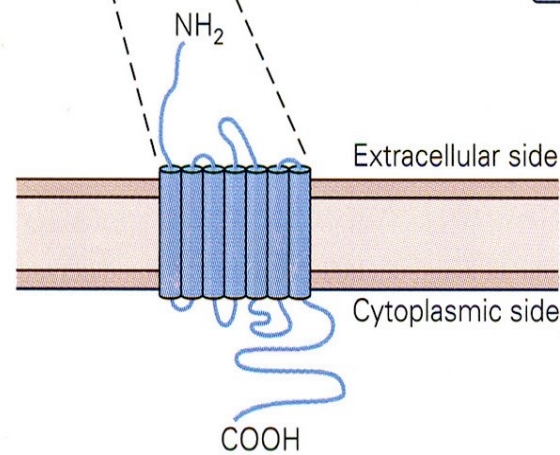
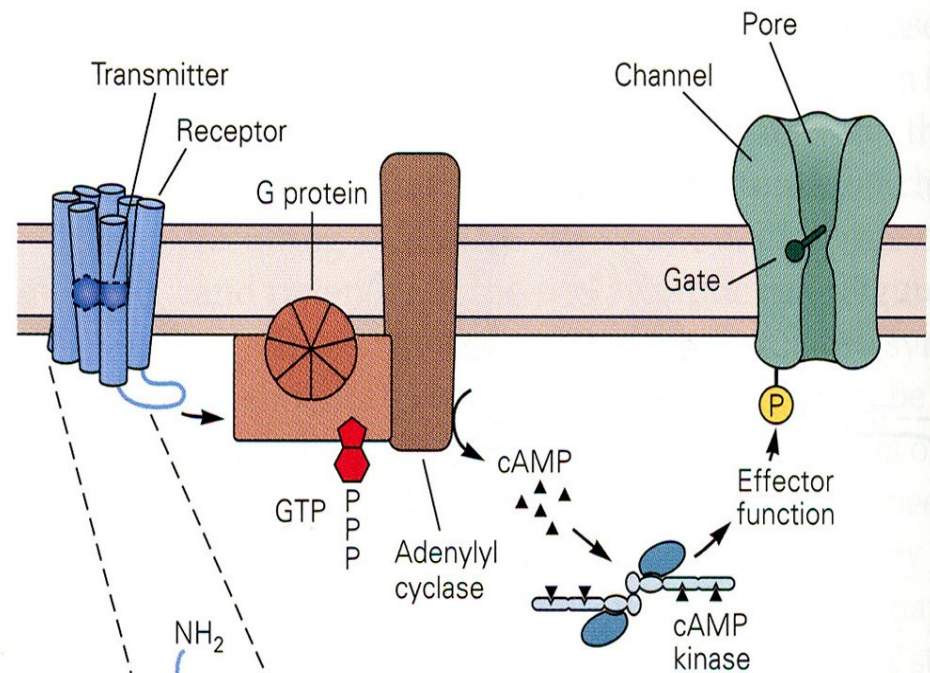
Receptor Ionotrópico

A Direct gating



Receptor Metabotrópico

B Indirect gating

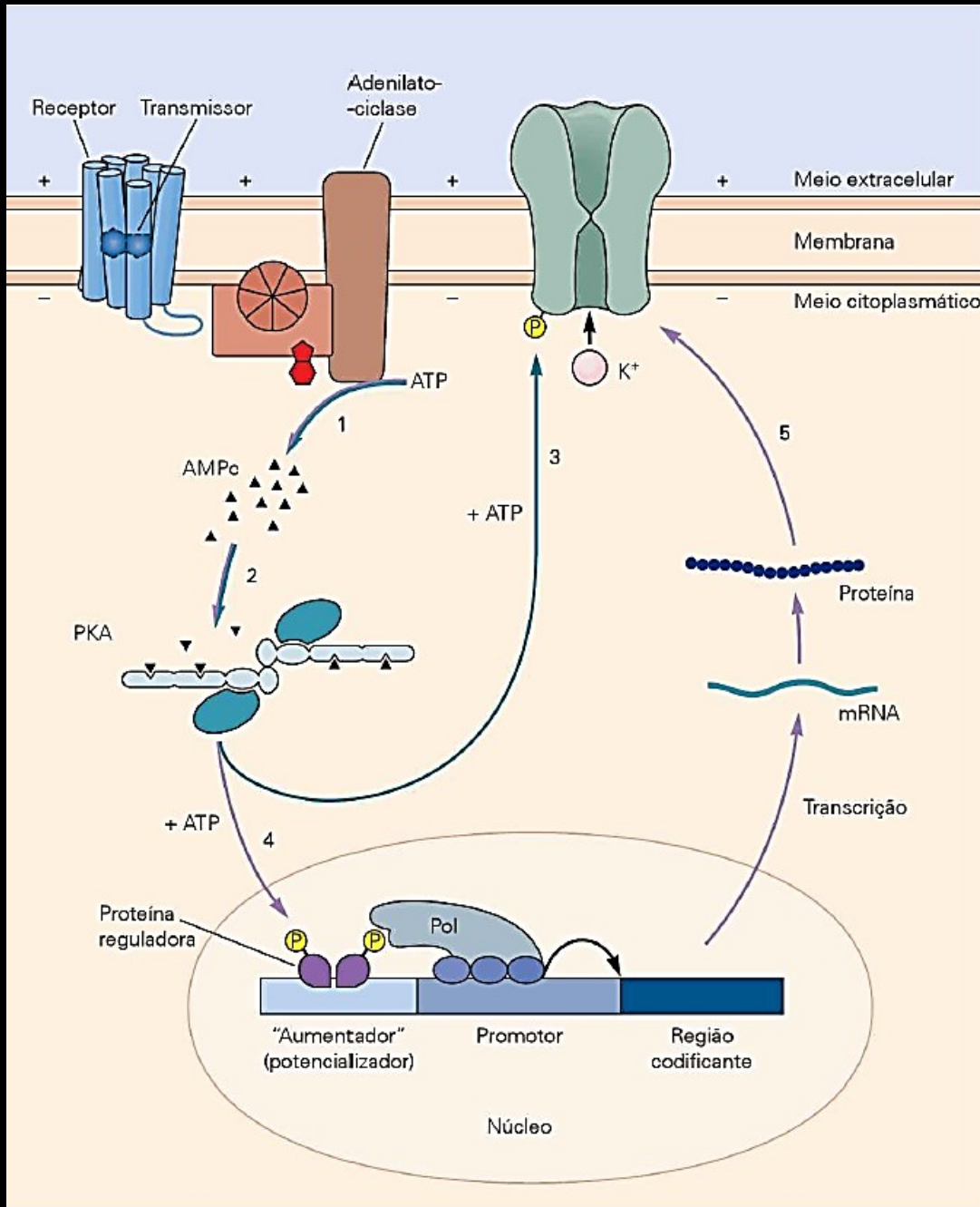


Receptores metabotrópicos

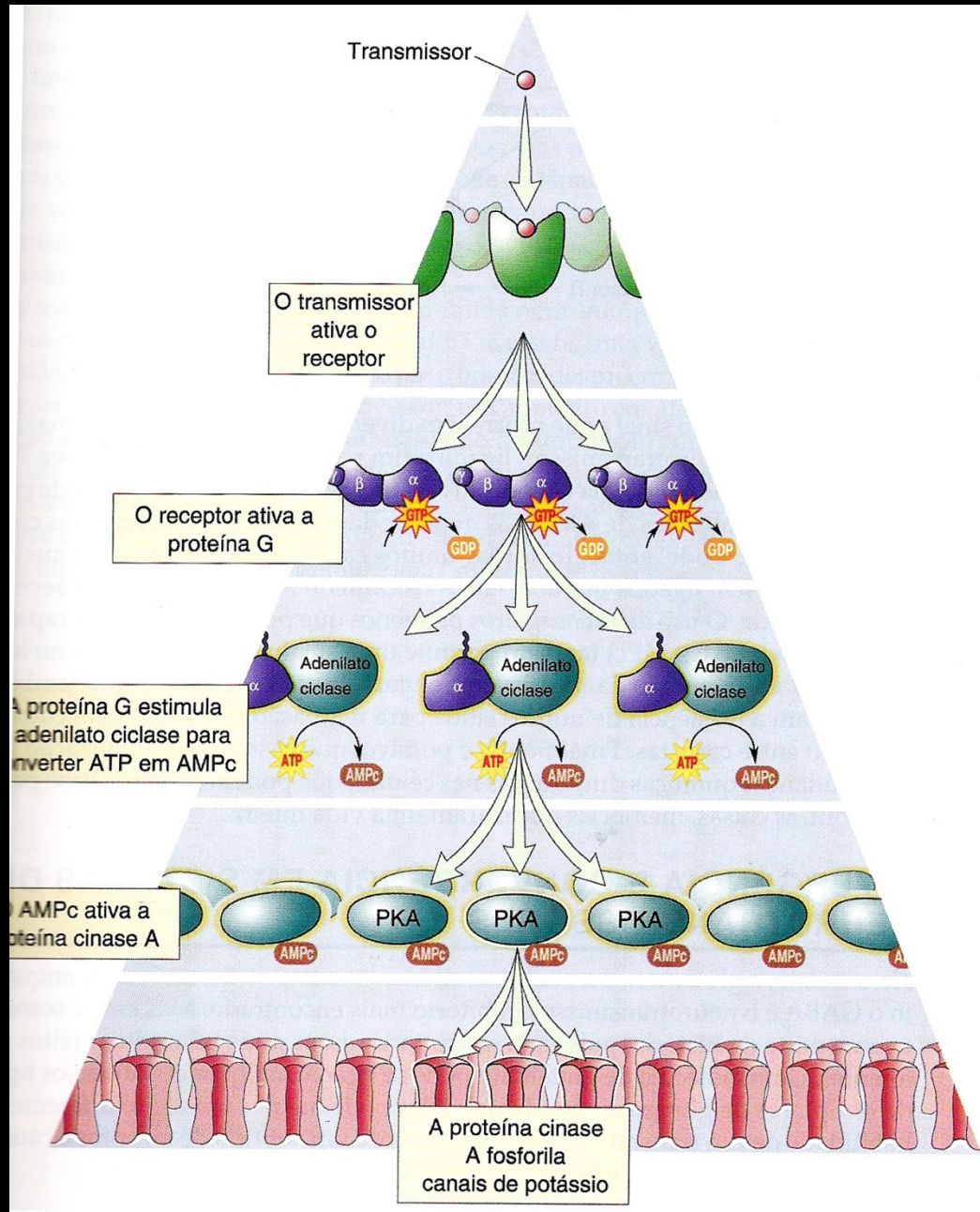
Ações de neurotransmissores em receptores acoplados a proteínas G

Consequências:

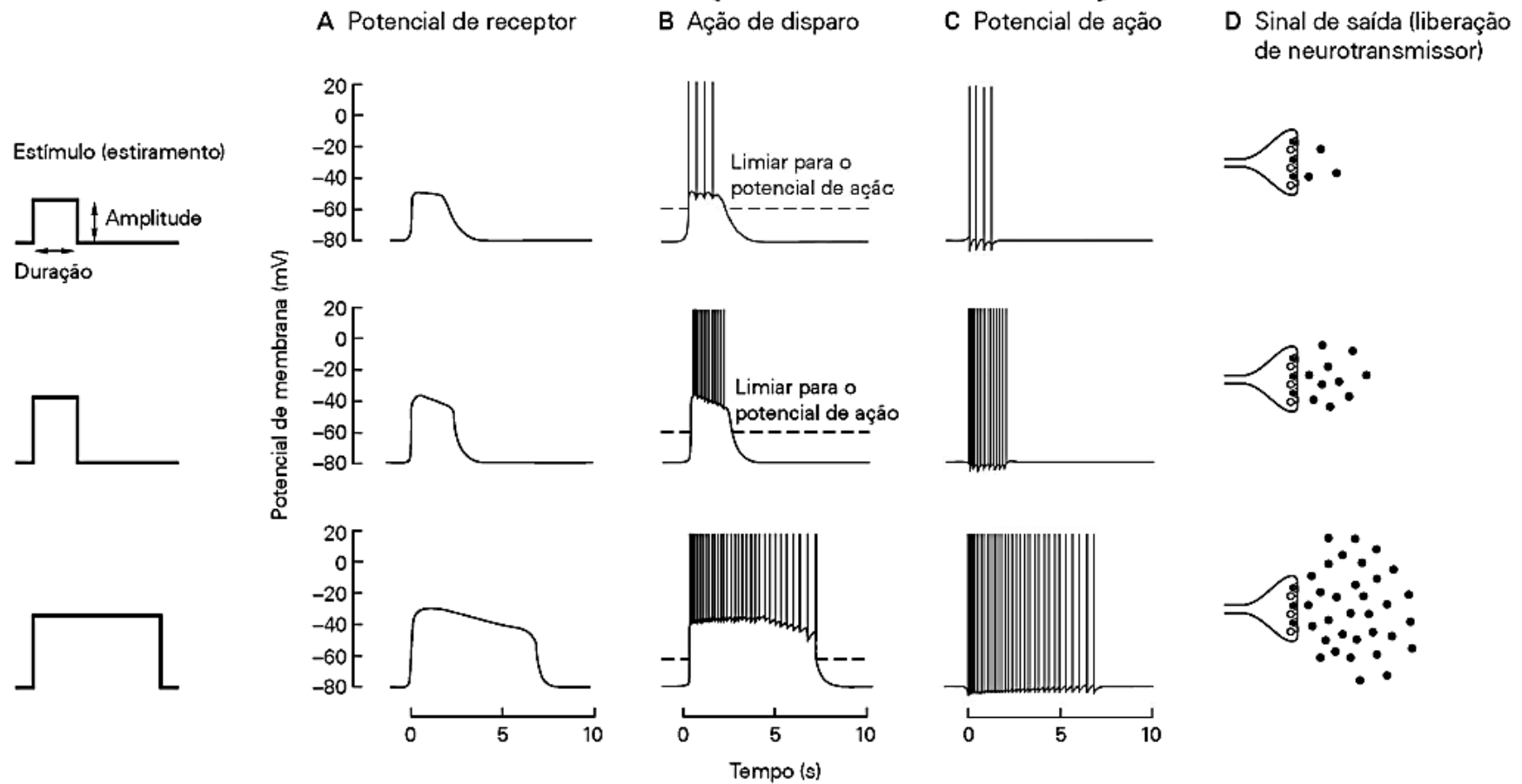
- Ativação de cascatas de sinalização celular
- Alteração de canais iônicos
- Alteração na atividade enzimática celular
- Mudança na expressão gênica



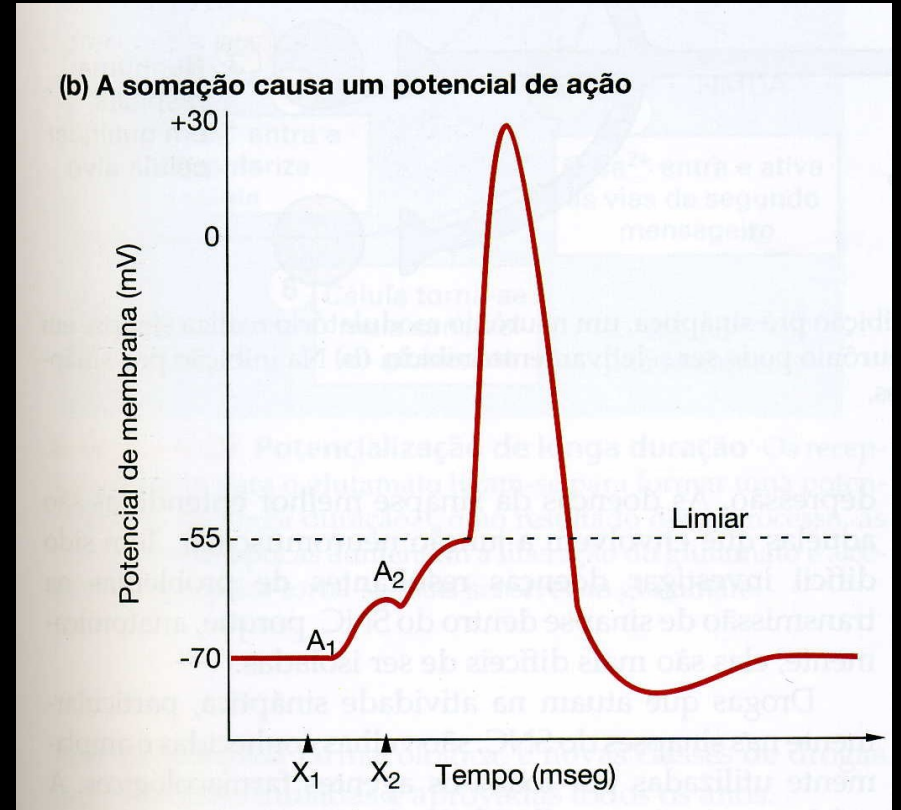
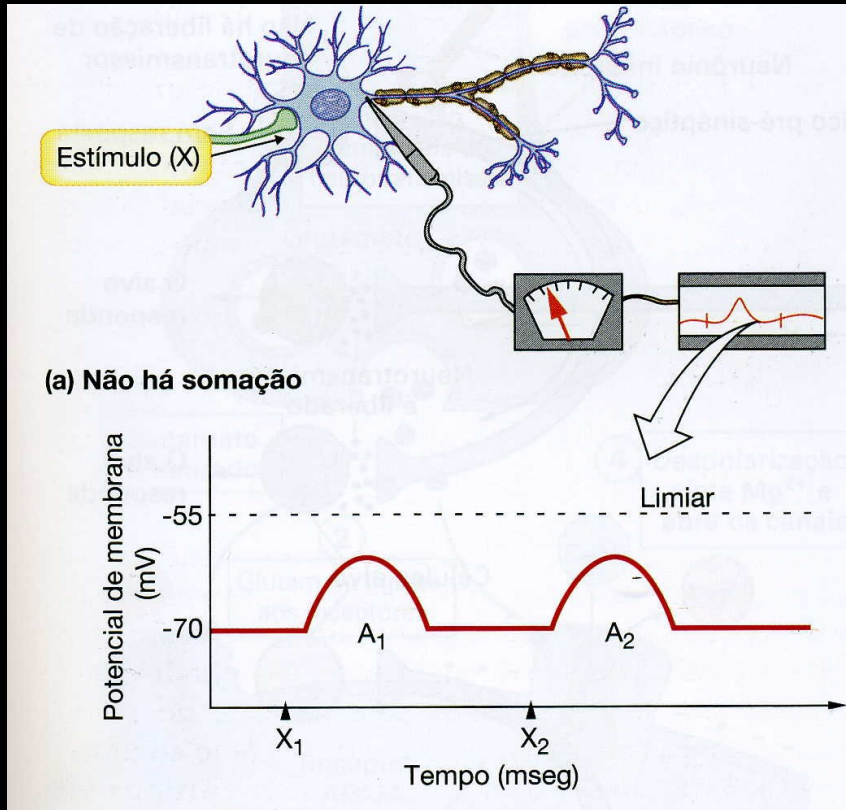
Cascatas de segundos mensageiros:



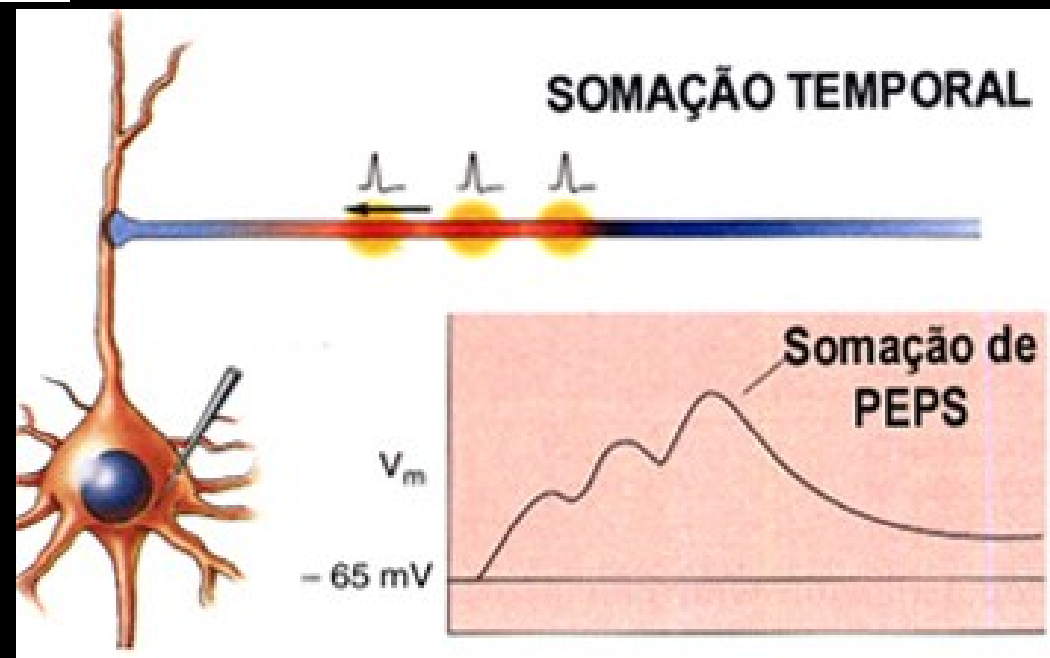
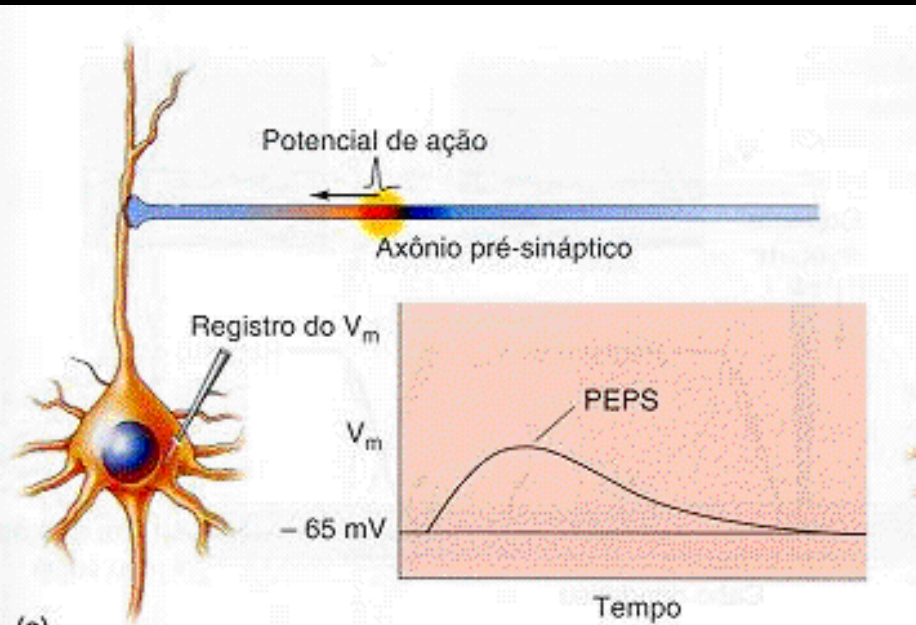
INTEGRAÇÃO SINÁPTICA



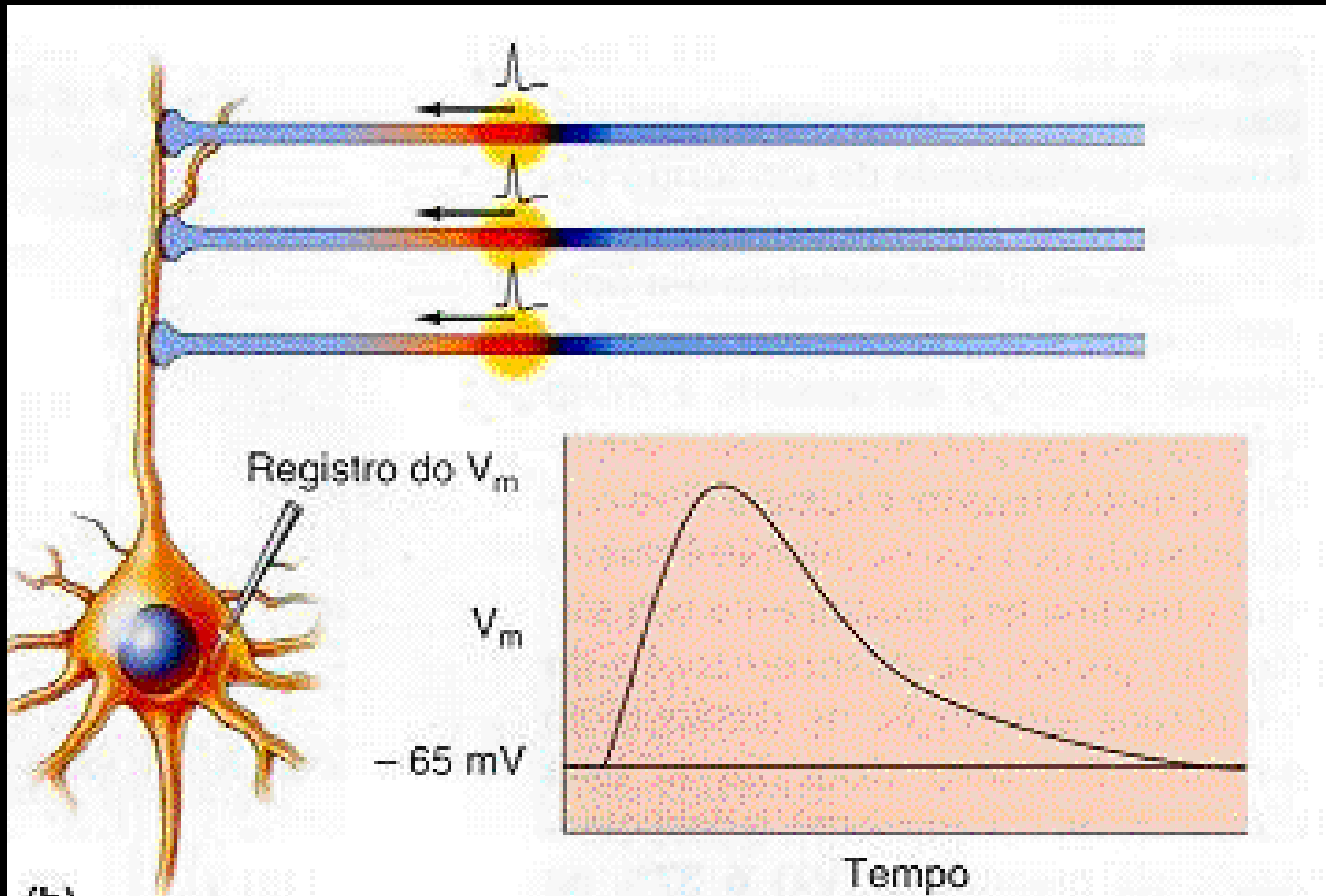
Somação Temporal

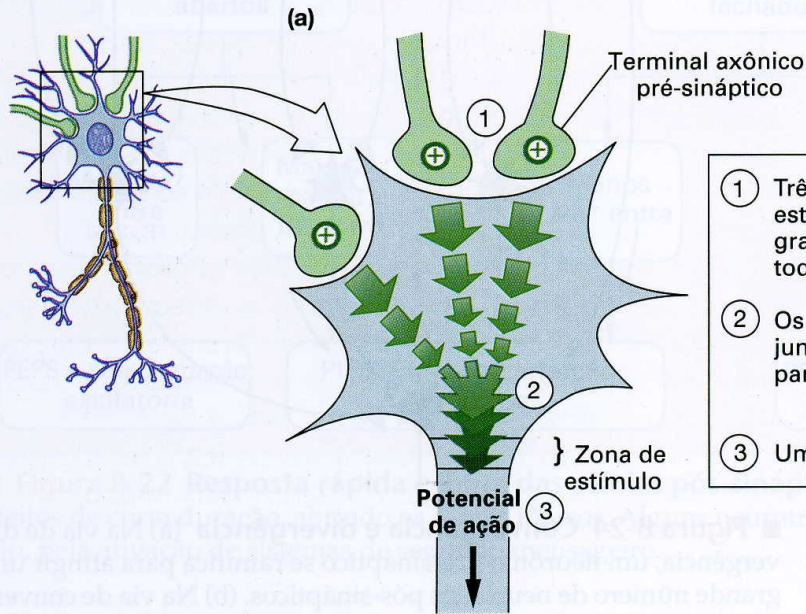


Somação Temporal

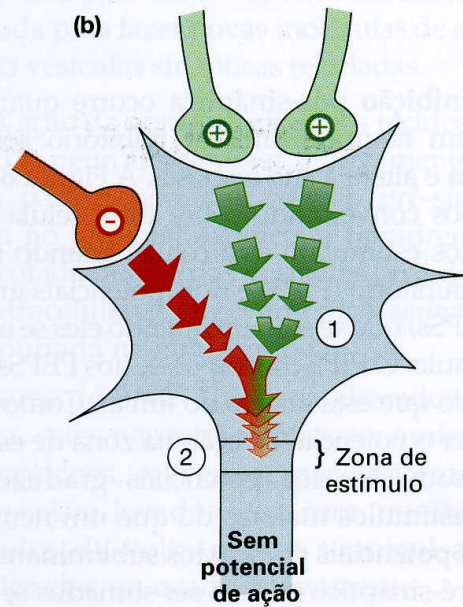


Somação espacial



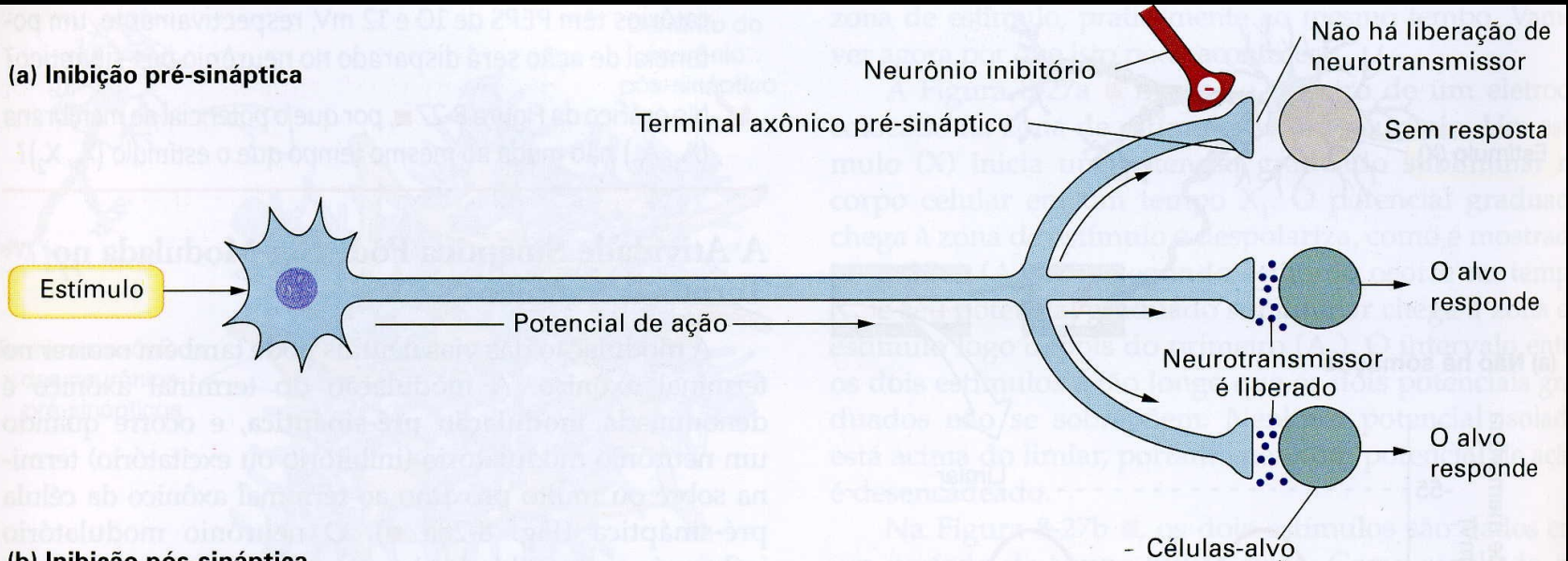


- 1 Três neurônios excitatórios são estimulados. Seus potenciais graduados, separadamente, estão todos abaixo do limiar.
- 2 Os potenciais graduados chegam juntos à zona de estímulo e somam-se para gerar um sinal supraliminar.
- 3 Um potencial de ação é gerado.

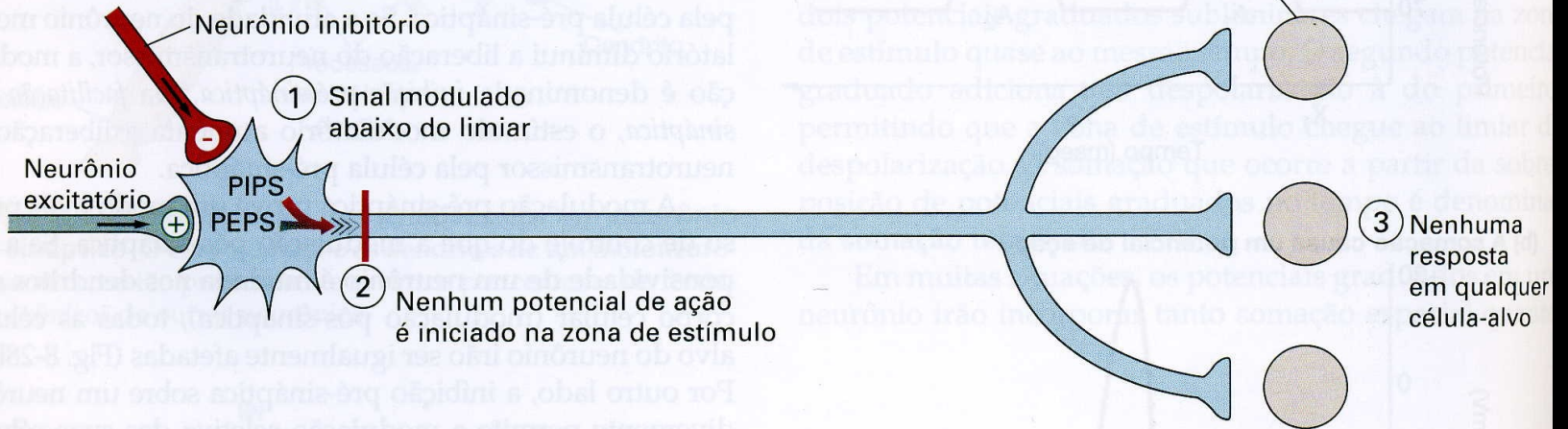


- 1 Dois potenciais de ação excitatórios são diminuídos pela somação com um potencial inibitório.
- 2 Os potenciais de ação somados estão abaixo do limiar, então, nenhum potencial de ação é gerado.

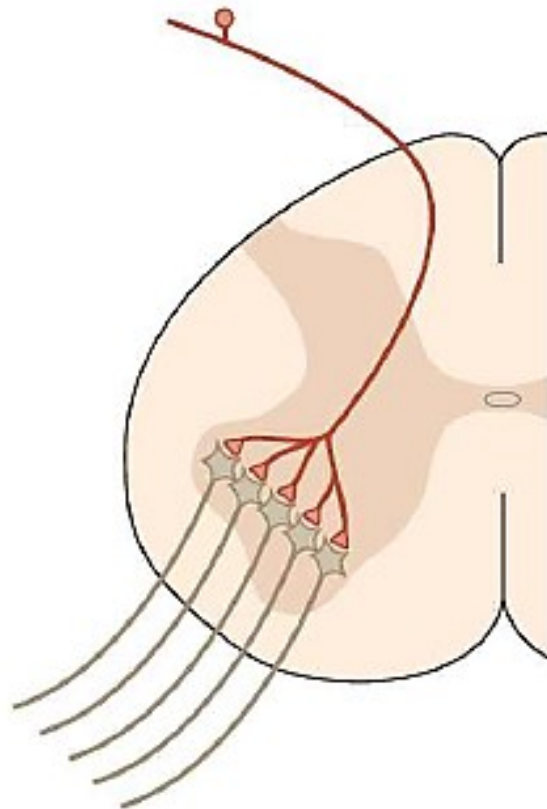
(a) Inibição pré-sináptica



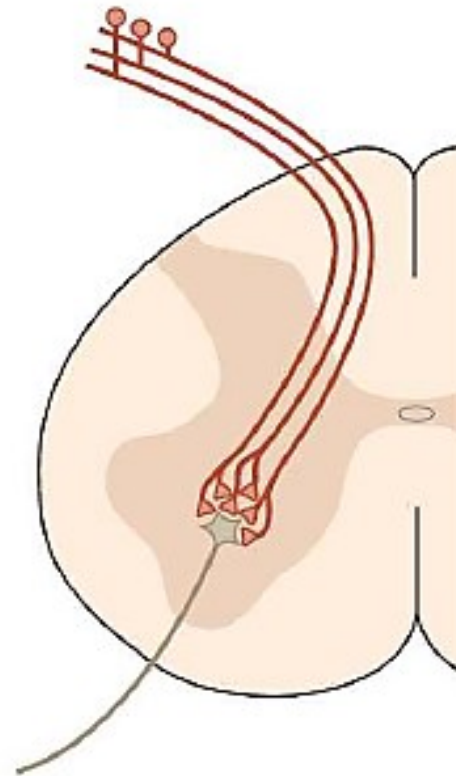
(b) Inibição pós-sináptica



A Divergência



B Convergência



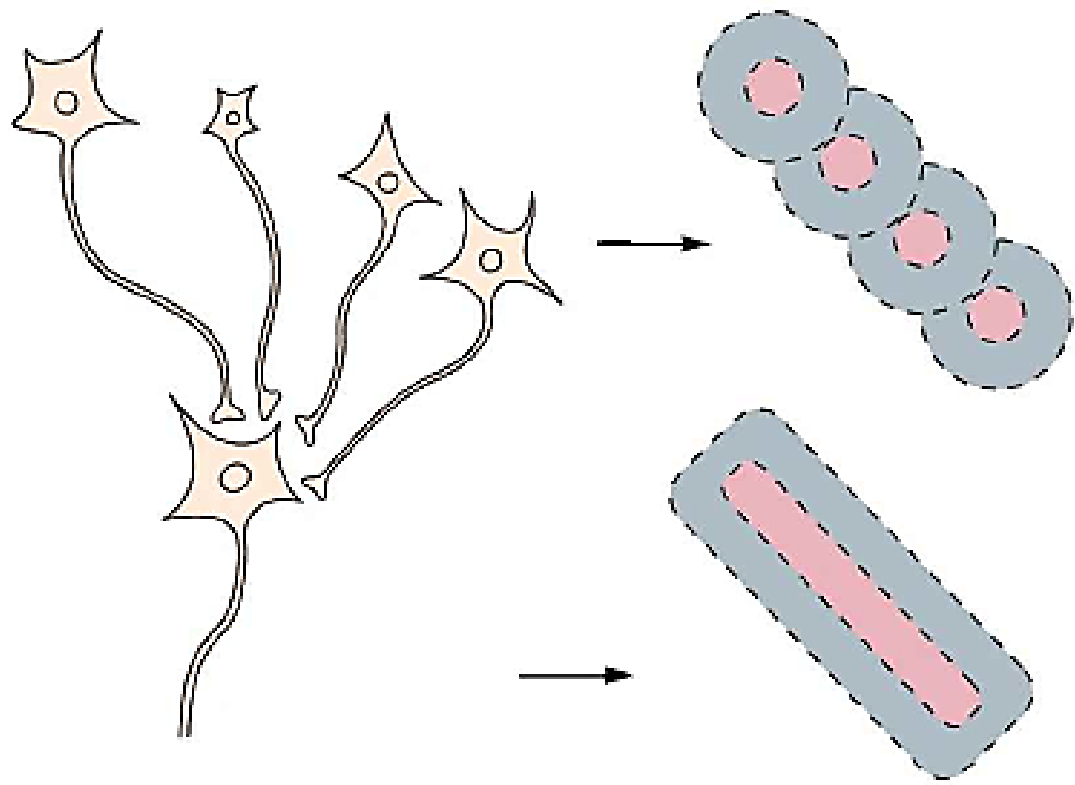
Camada cortical

Neurónios

Campos receptivos

IVCB

IIIB



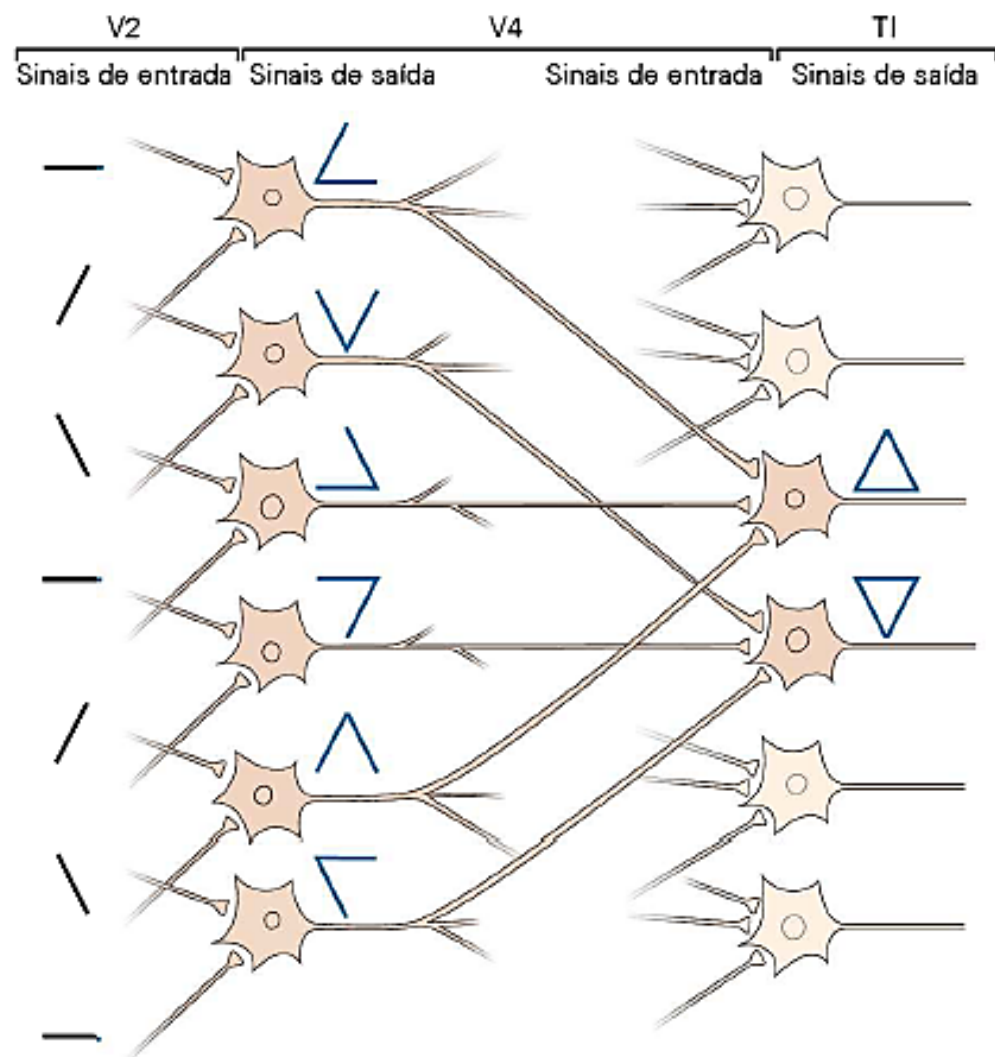
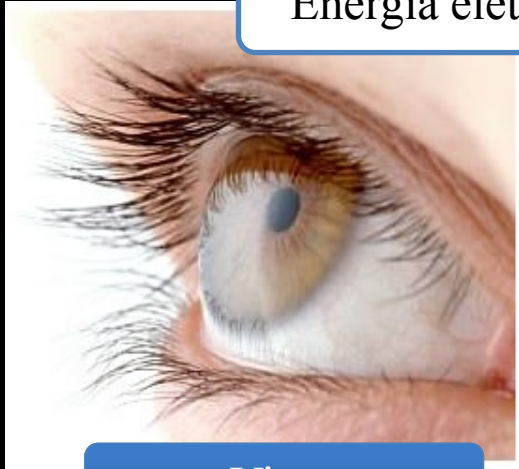


Figura 21-13 Conexões convergentes permitem que neurônios corticais abstraíam informações complexas a partir de padrões simples. Neurônios individuais no córtex visual primário

Sentidos: Modalidades sensoriais - Tipos

Energia eletromagnética

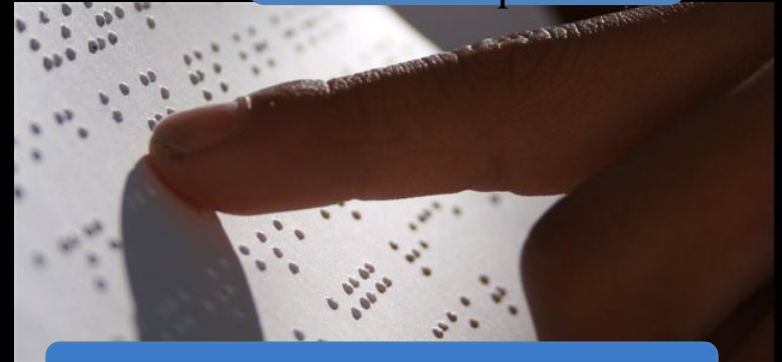


Visão



Audição

Energia mecânica
térmica e química



Somestesia



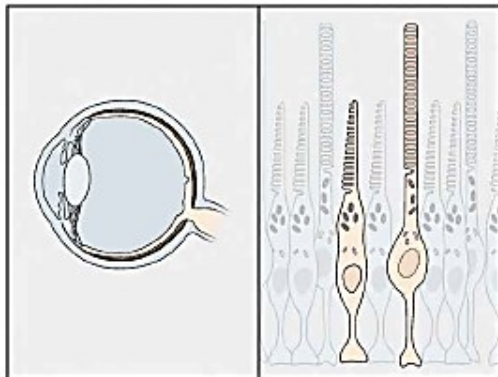
Gustação ou
paladar

Energia química

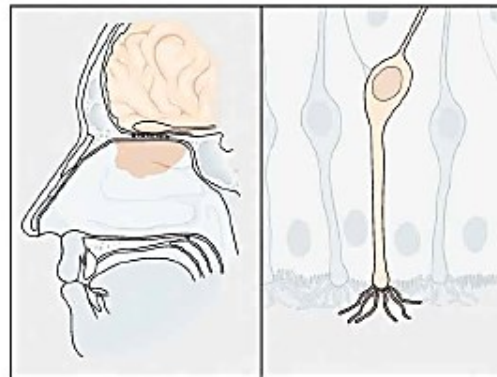


Olfação

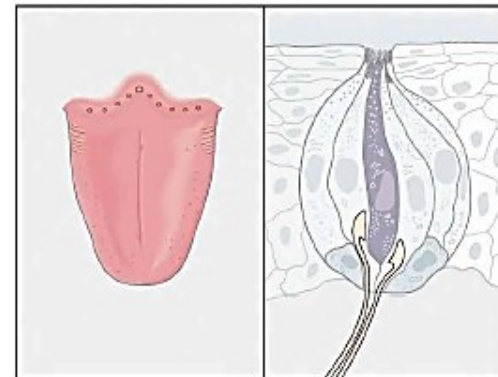
Visão



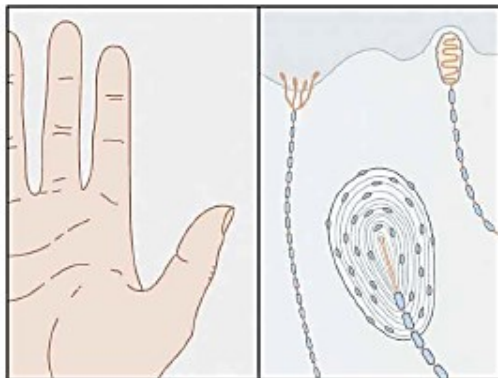
Olfato



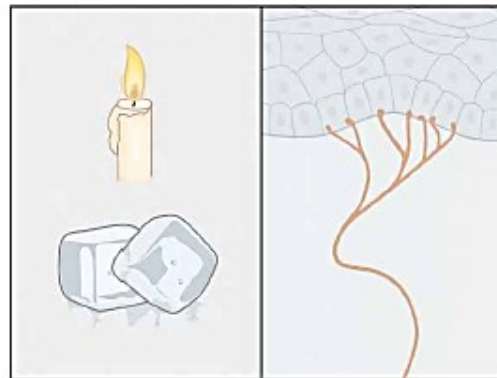
Gustação



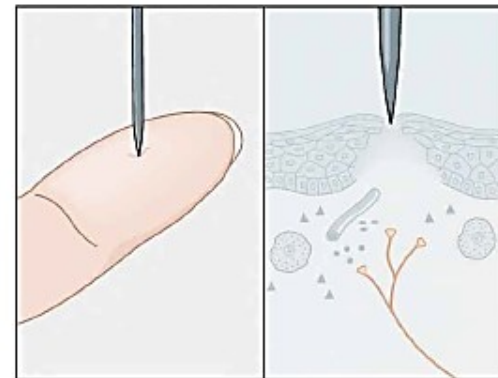
Tato



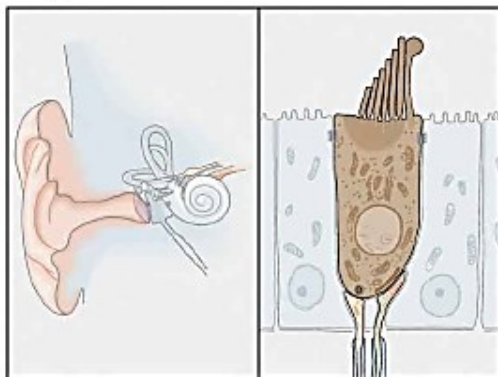
Sentidos térmicos



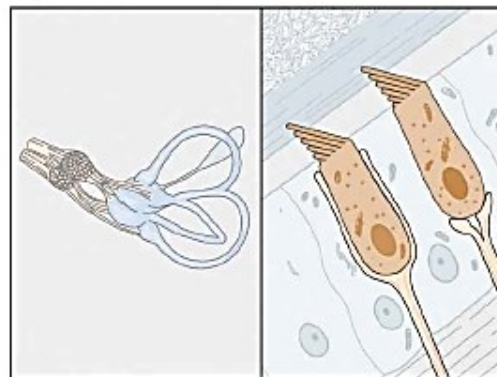
Dor



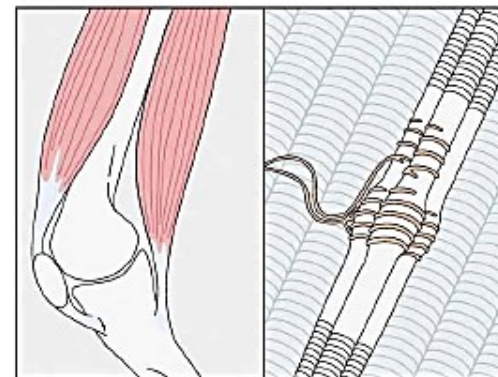
Audição



Equilíbrio

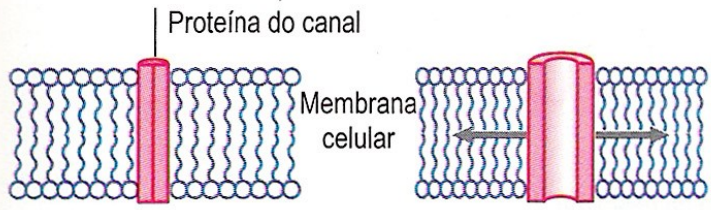


Propriocepção

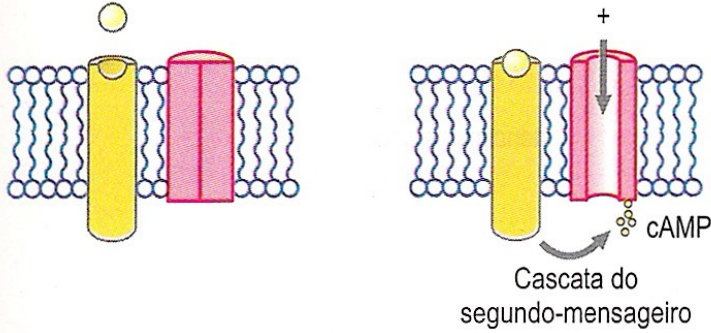


Receptores sensoriais

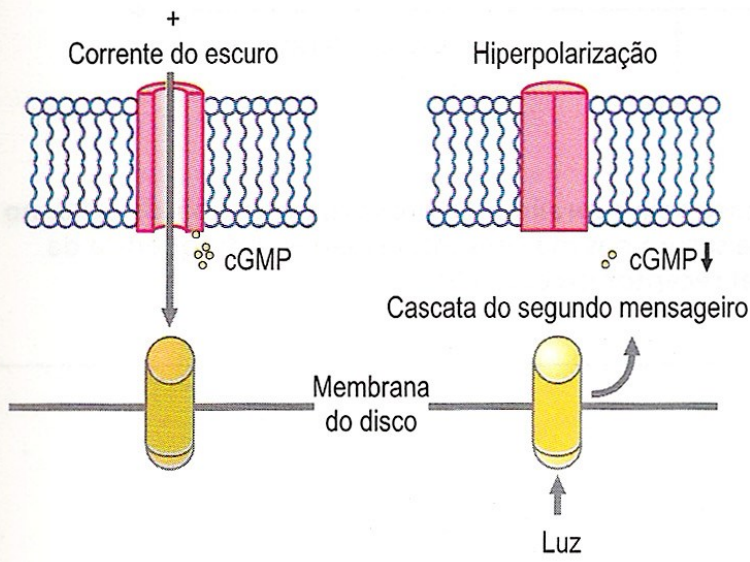
A Mecanoreceptor



B Quimioceptor

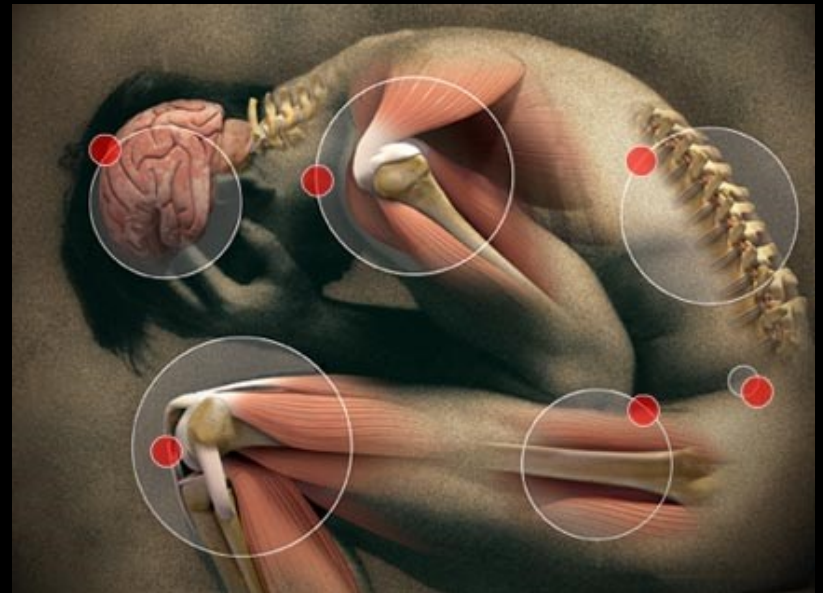


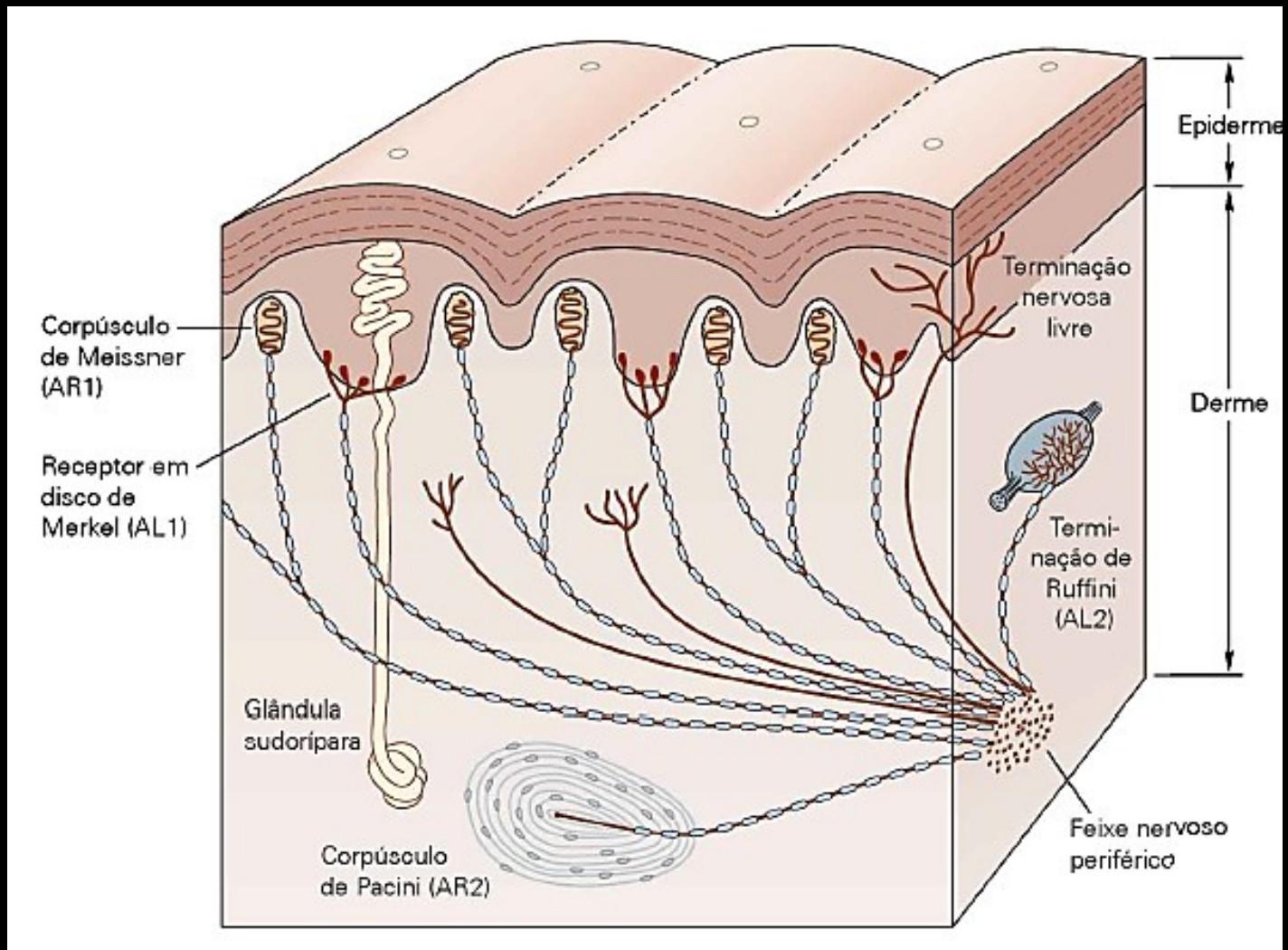
C Fotoceptor



Somestesia → do grego *soma*, corpo, e *aesthesis*, sensibilidade)

Sensação: tátil, pressórica, térmica, dolorosa (nociceptiva) e proprioceptiva



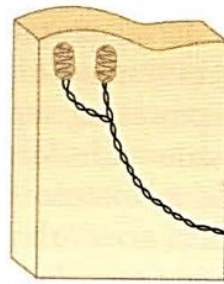


Mecanorreceptores cutâneos

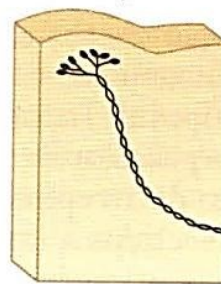
A – Modalidade

Estímulo

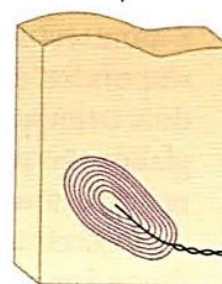
Receptores



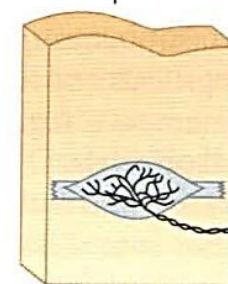
Corpúsculo de Meissner



Células de Merkel



Corpúsculo de Pacini



Terminações de Ruffini

Adaptação rápida

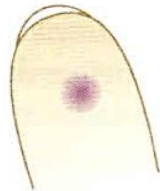
Adaptação rápida

B – Localização

Adaptação lenta

Adaptação lenta

Campo receptivo

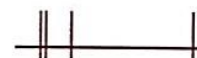


Superficiais

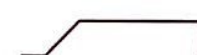
Profundos

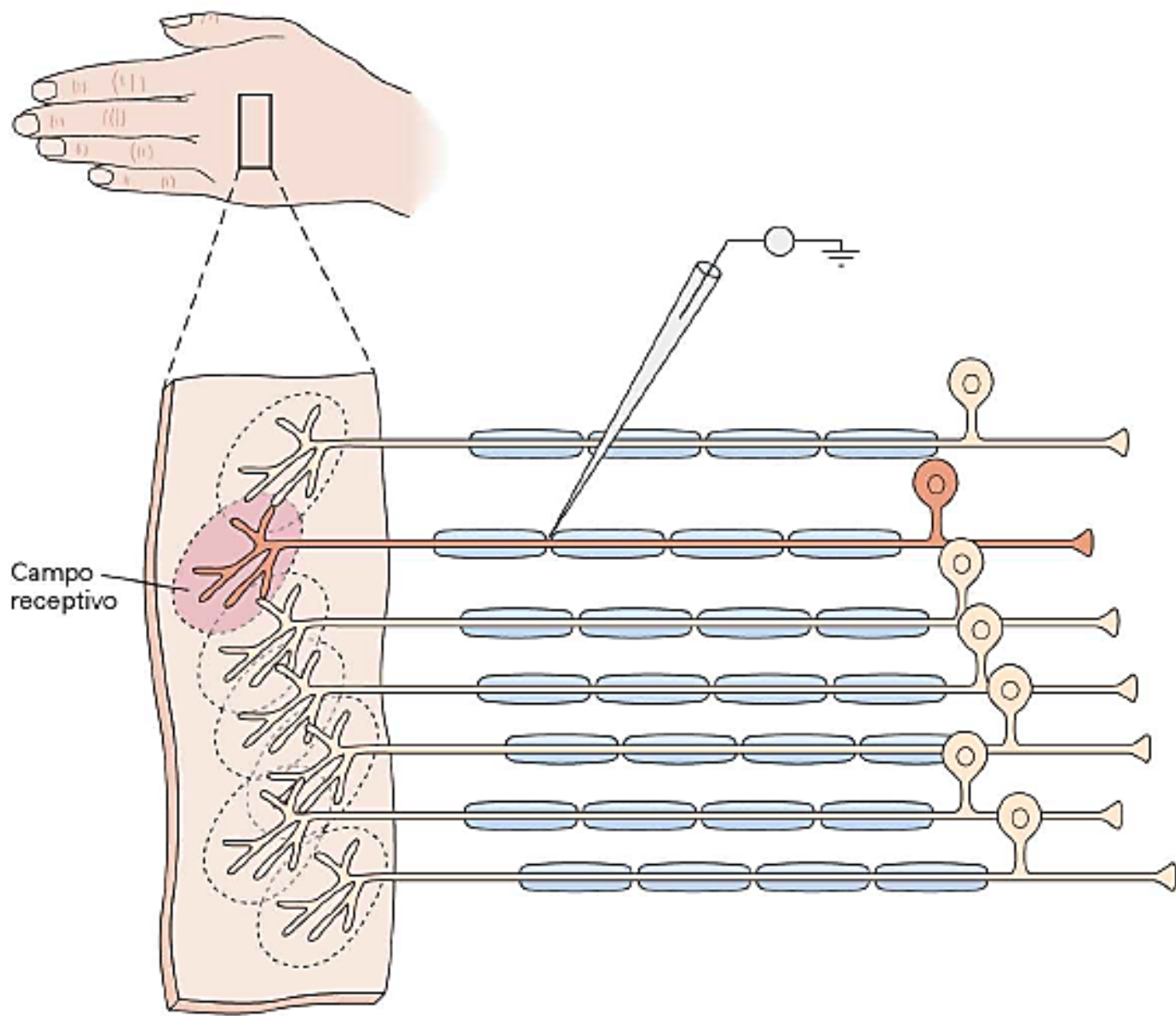
C – Intensidade e tempo de resposta

Descarga na fibra aferente

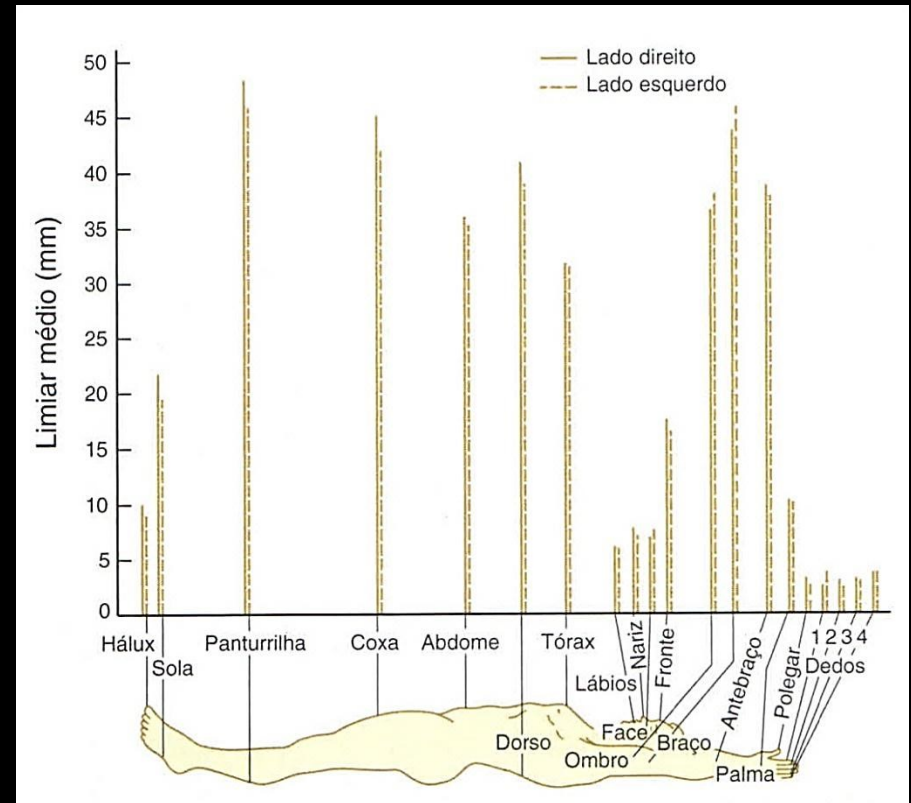
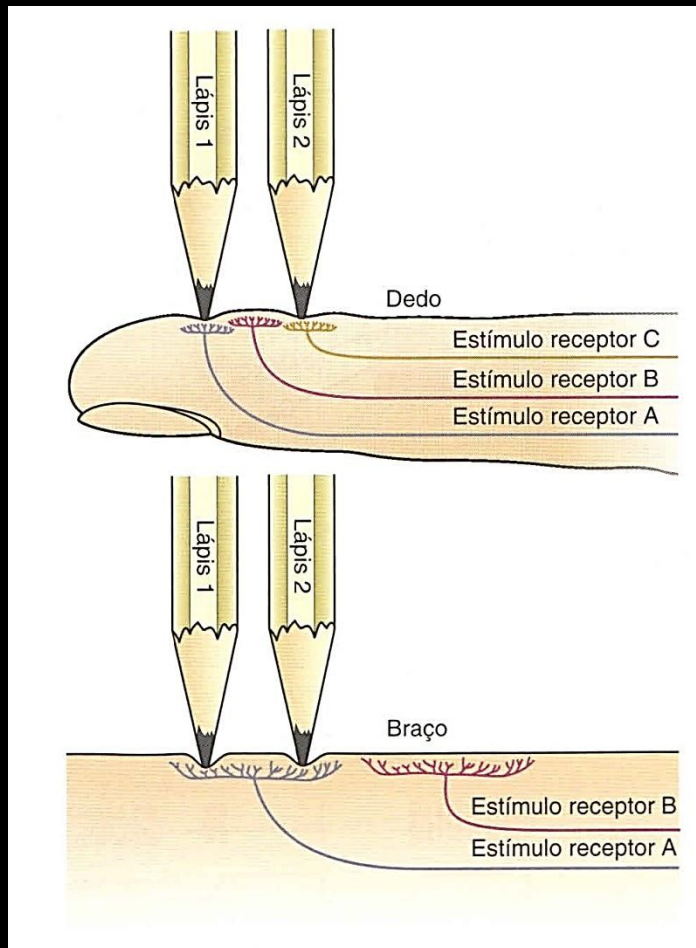


Estímulo mecânico

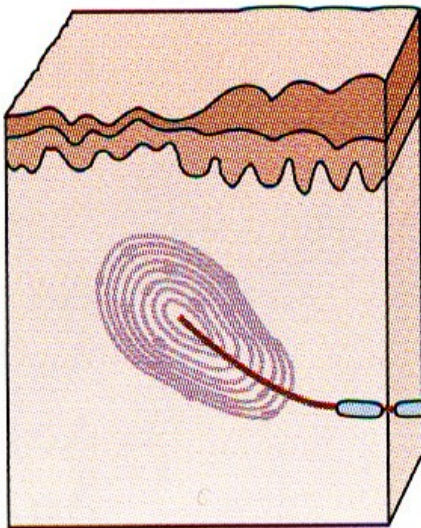




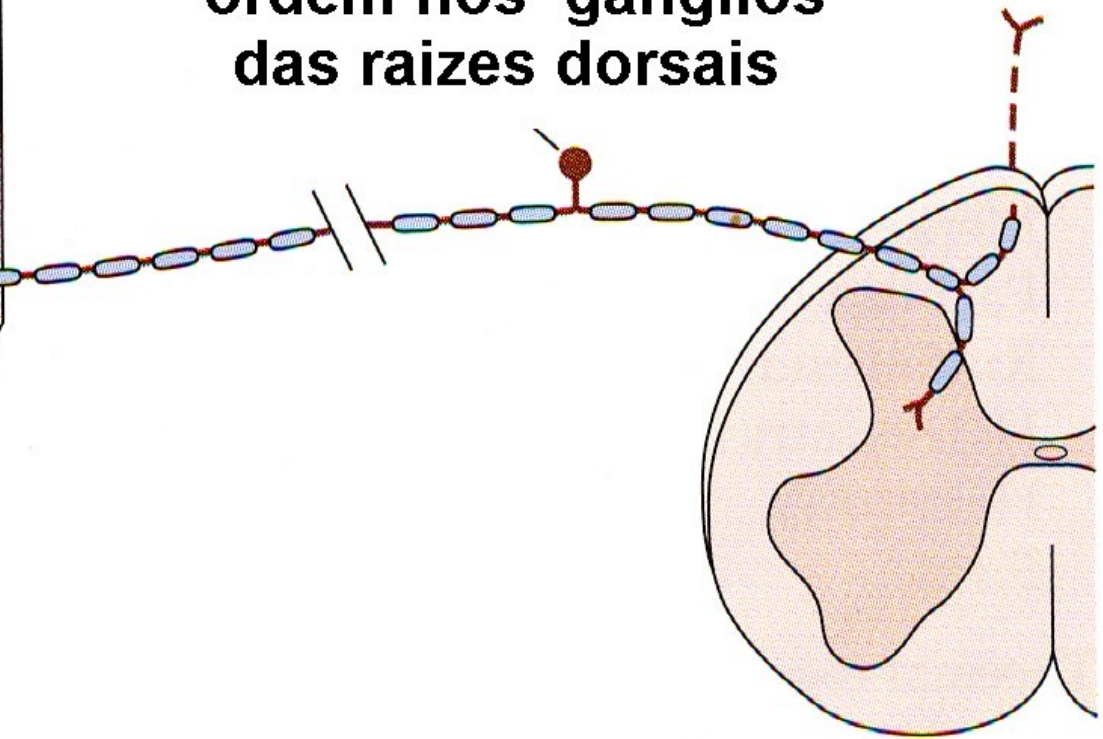
Tamanho do campo receptivo

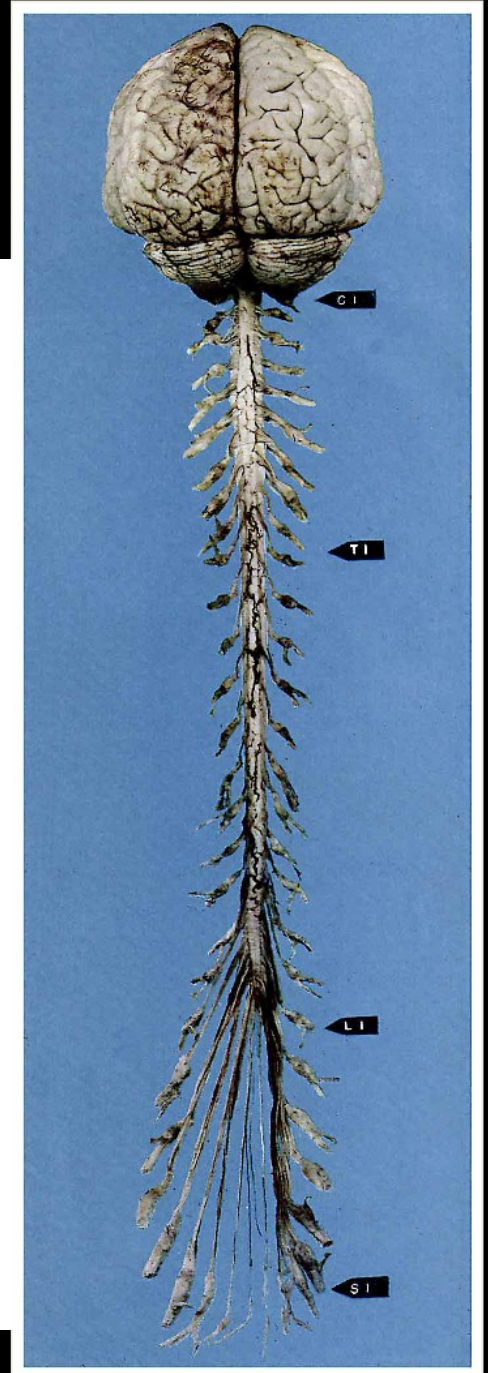
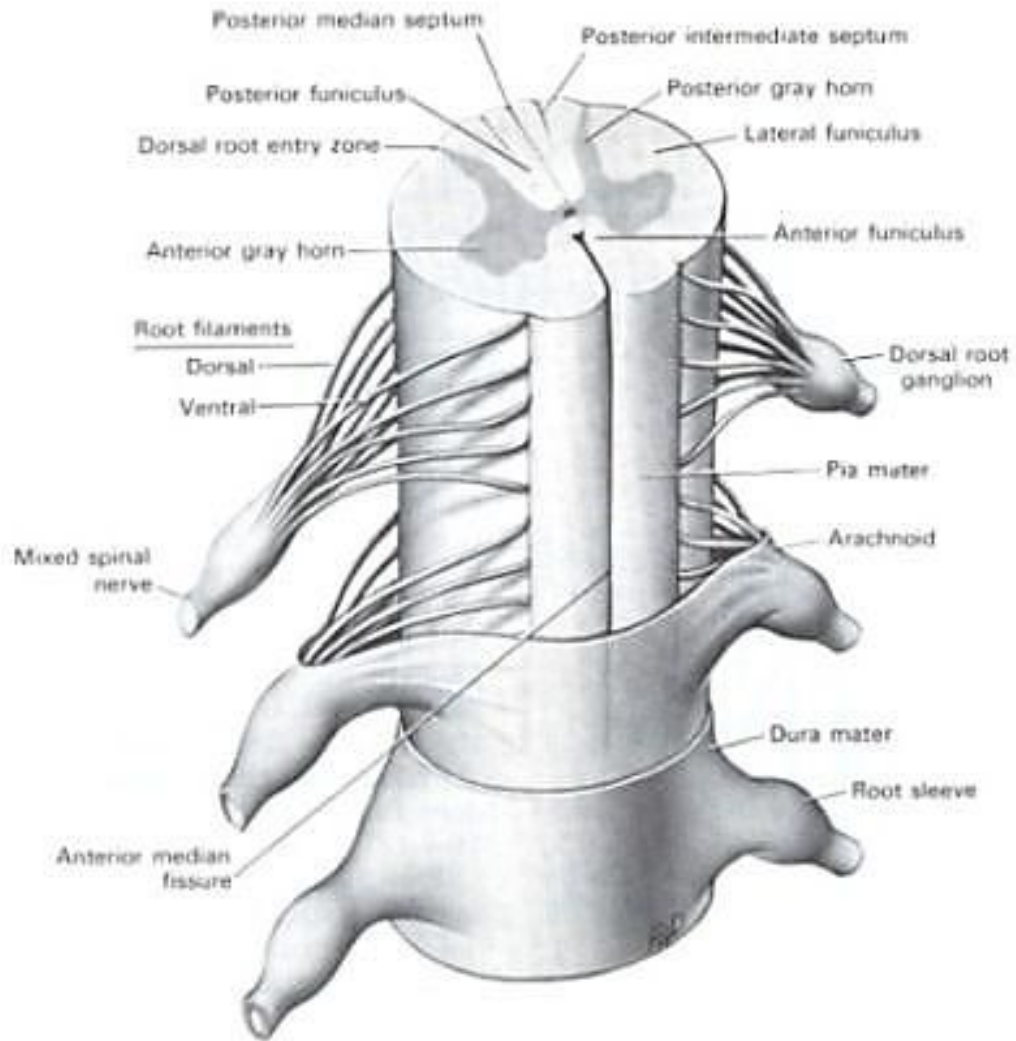


Mecanoreceptor na pele

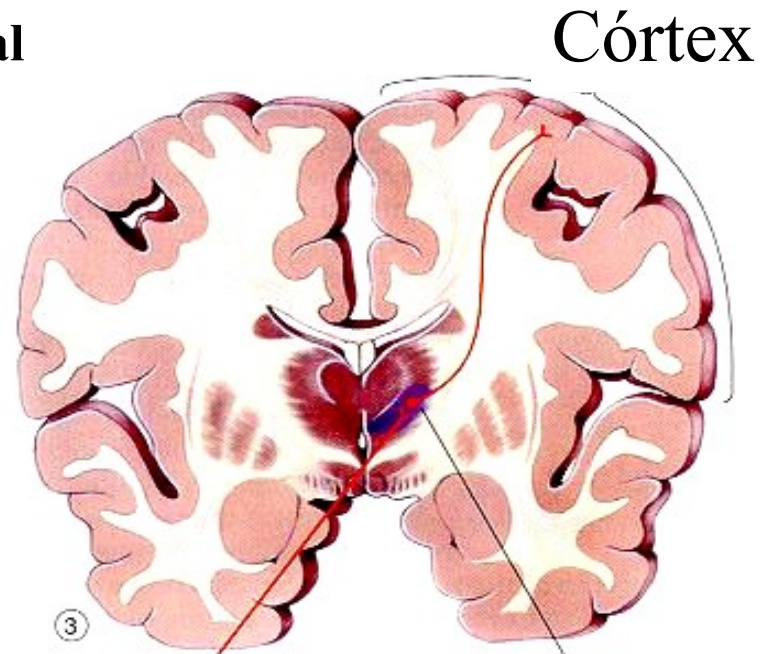
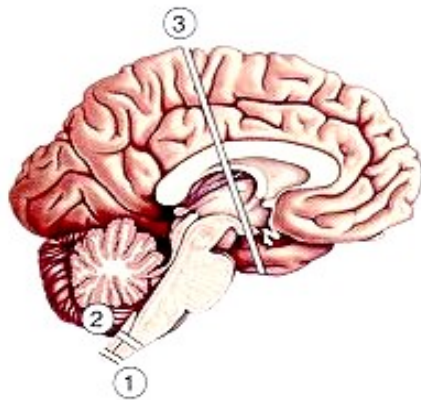


Neurônio de primeira
ordem nos gânglios
das raízes dorsais





Sistema da coluna dorsal (Lemnisco medial)



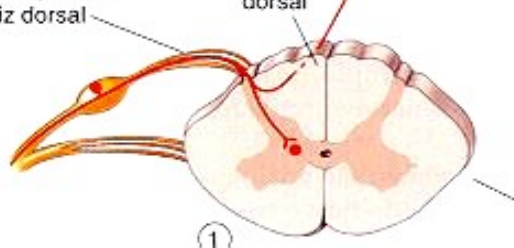
Núcleos da
coluna dorsal



Bulbo

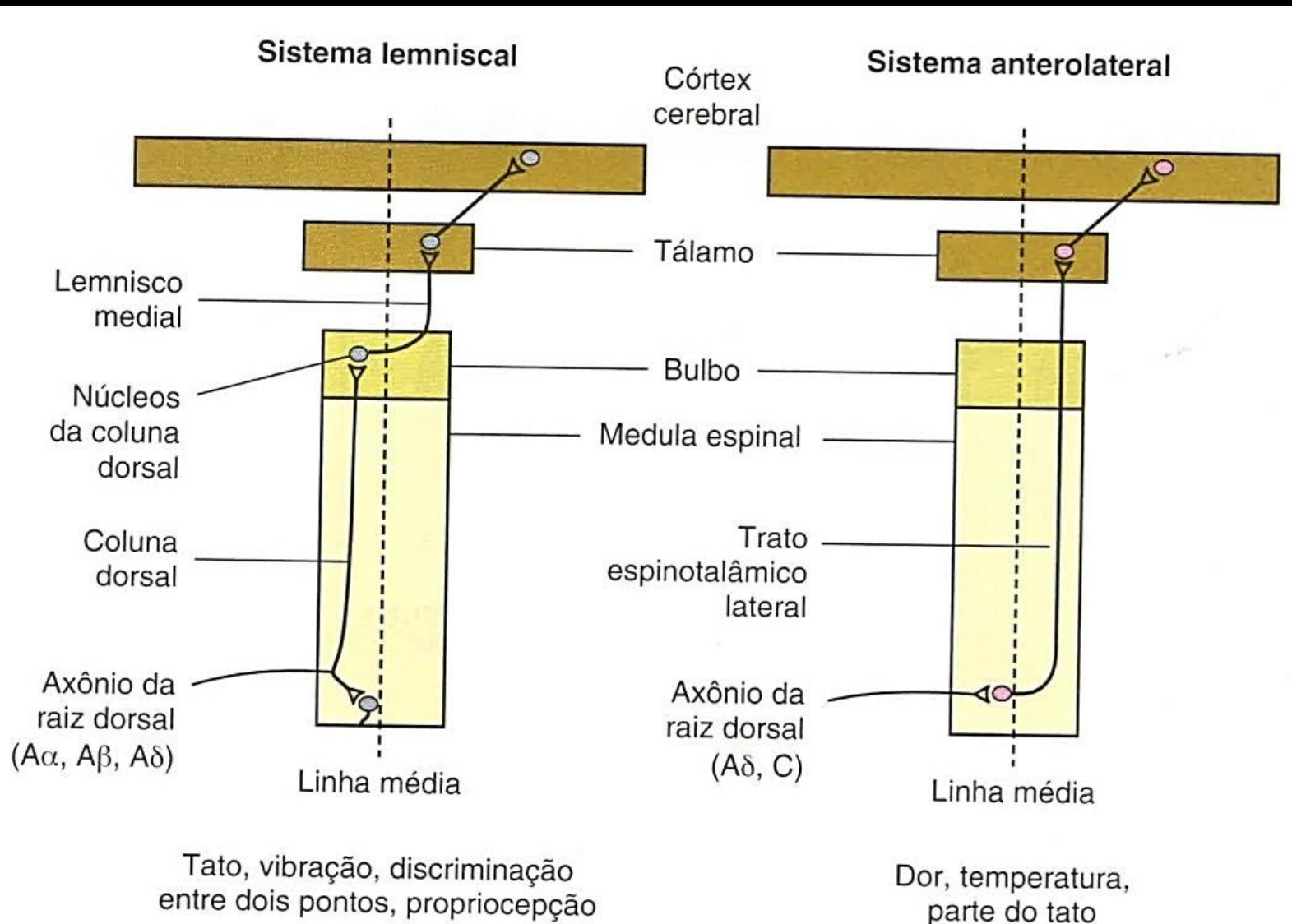
Axônios grossos
da raiz dorsal

Coluna
dorsal



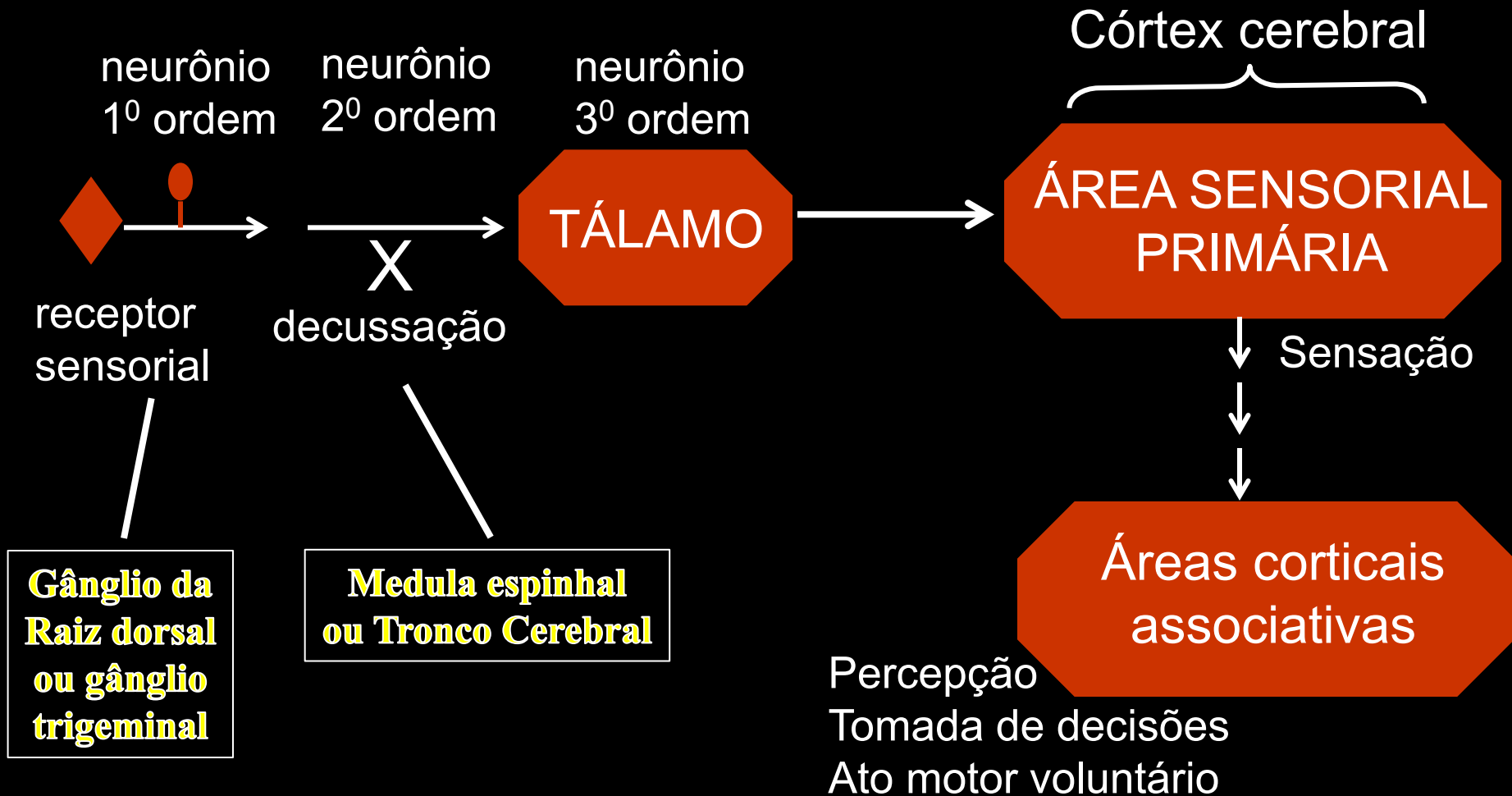
Medula Espinal

Sistema da coluna dorsal vs. anterolateral



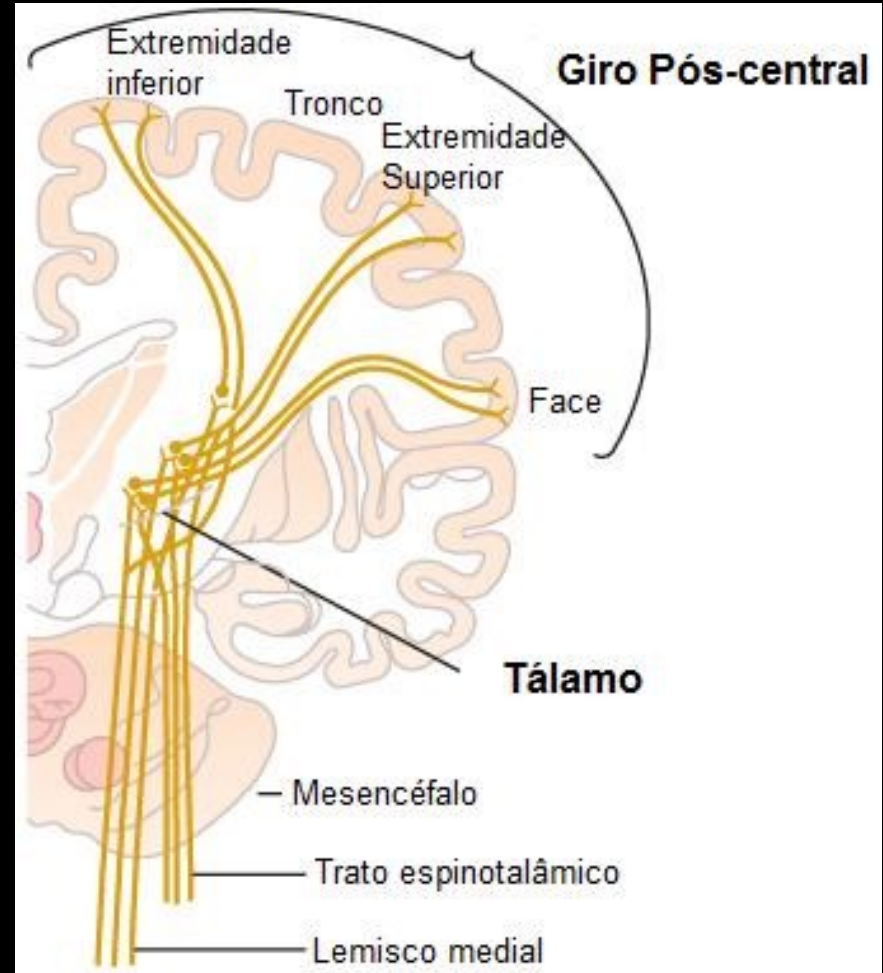
SISTEMAS SENSORIAIS: GENERALIDADES

Organização geral de uma via sensorial



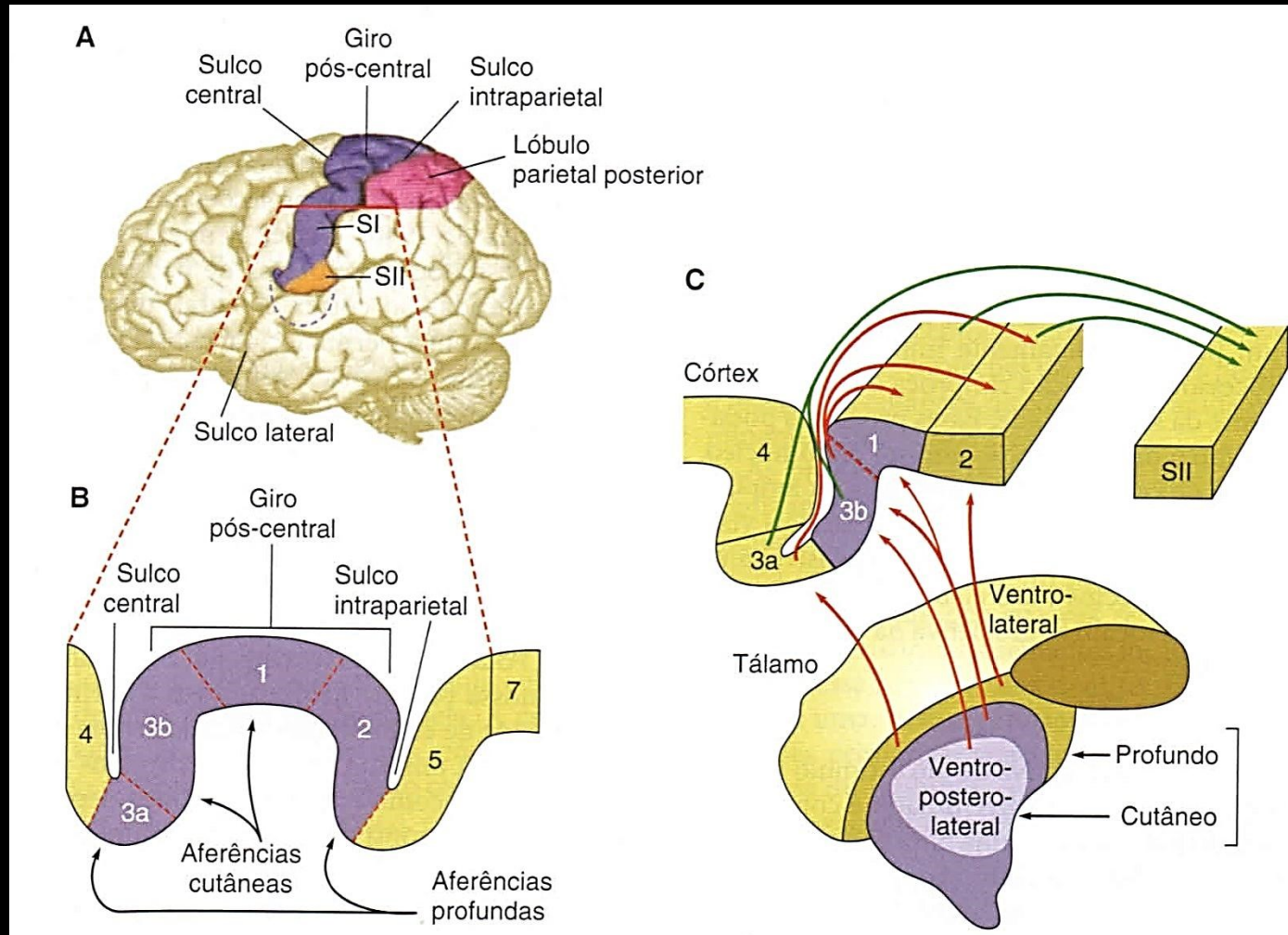
TÁLAMO

- Sensibilidade – relé sensitivo
 - exceção – estímulos olfatórios
- Reorganiza os estímulos provenientes dos terminais sensoriais (periferia e tronco cerebral) e transmite essas informações processadas ao córtex

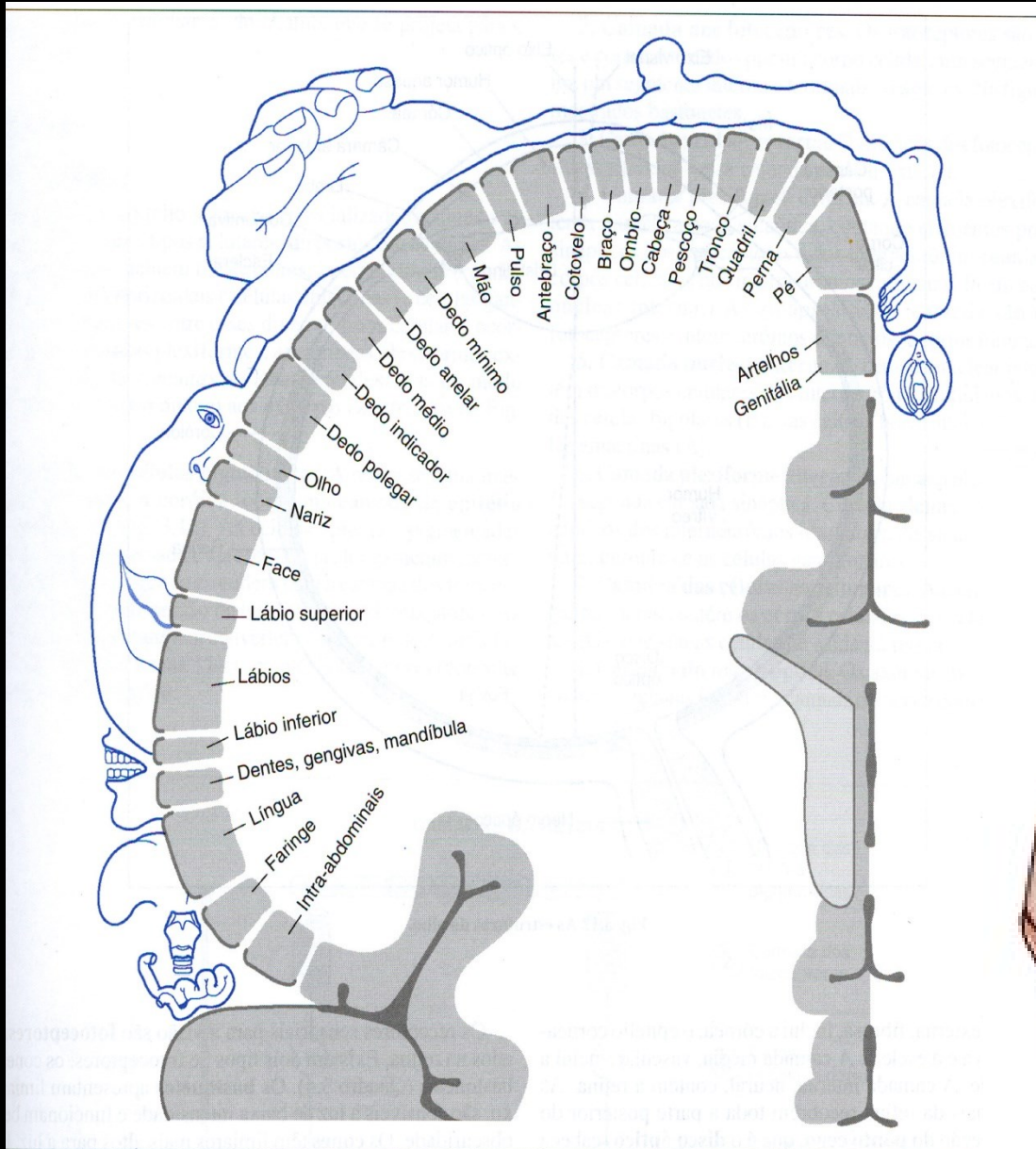


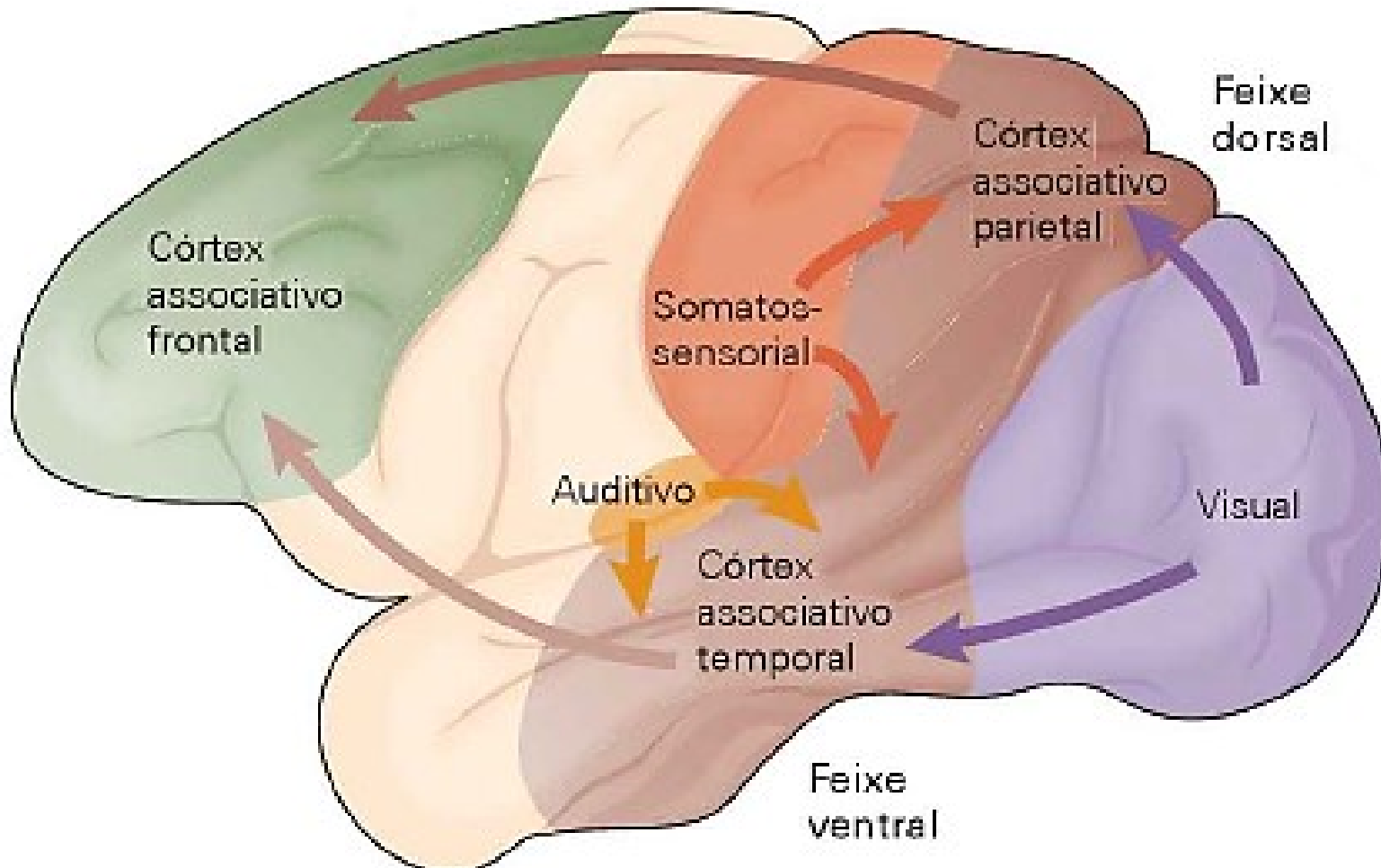
Córtex Somestésico Primário

Giro pós-central



Homúnculo somato -sensorial

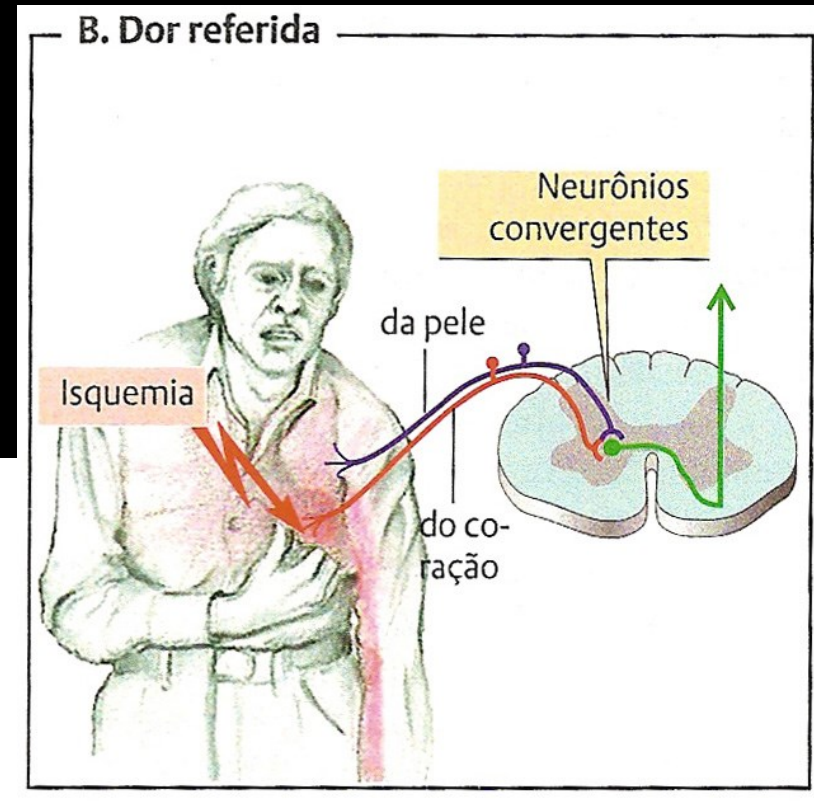
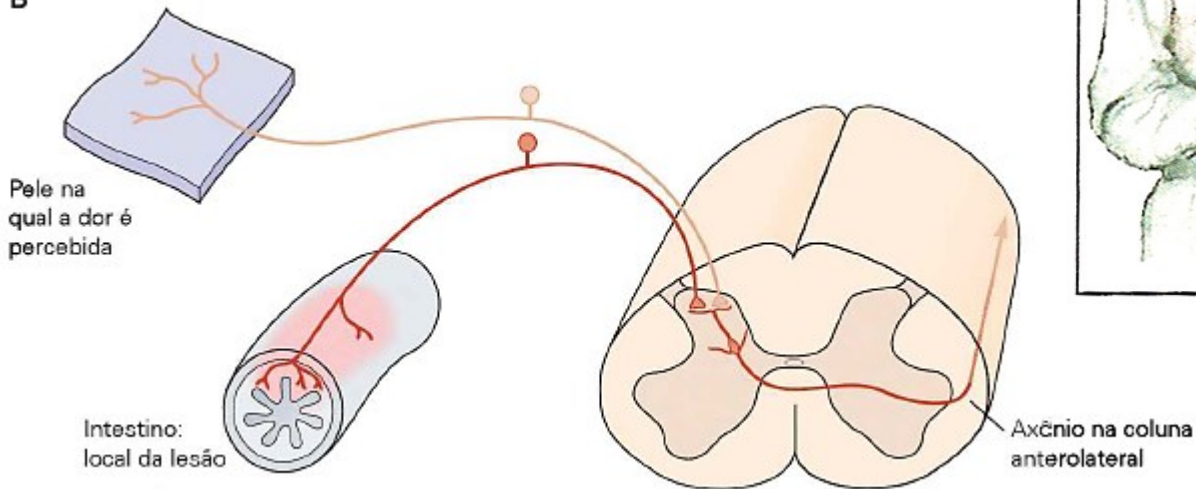




Dor referida:

O **dor referida** têm origem visceral e é referida a locais na pele.

B



Dor referida

