

# **FUNDAMENTOS DA NEUROCIÊNCIA**

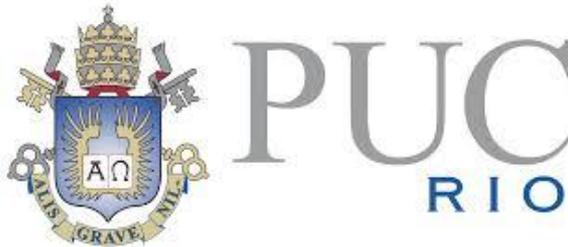
**Divisão do sistema nervoso:**

**Citologia e Histologia**

**AULA - Nº 1**

**Elaboração: Prof<sup>a</sup>: Norma M. S. Franco**

**Organização: André Mendonça**



**ATUALIZAÇÃO: Prof<sup>a</sup>.: Cátia Martins Leite Padilha**

**E-mail: [catiamlpadilha@gmail.com](mailto:catiamlpadilha@gmail.com)**

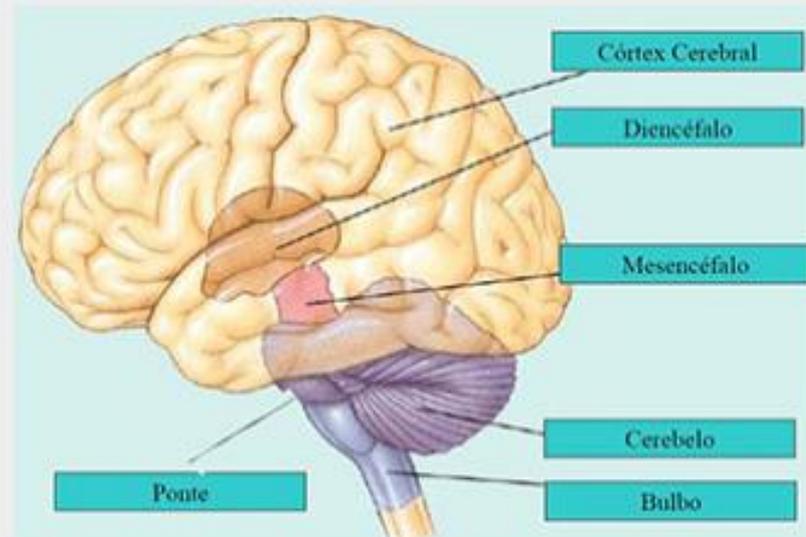
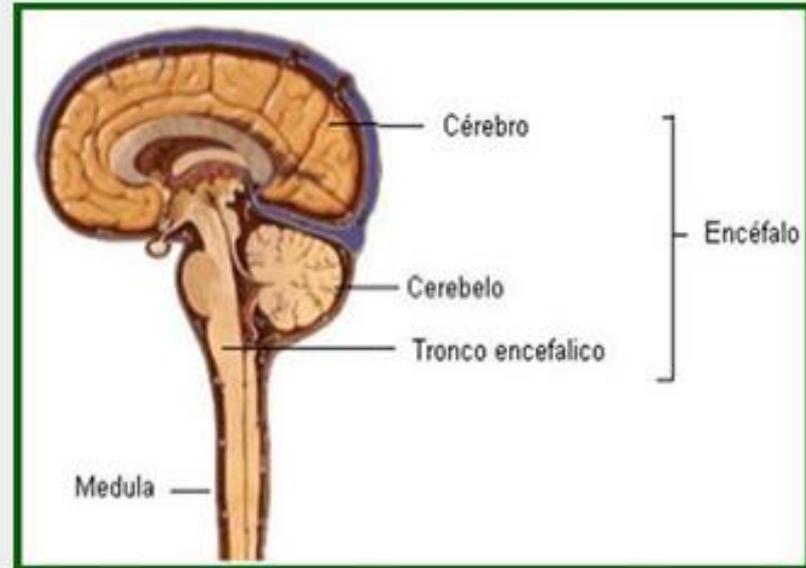
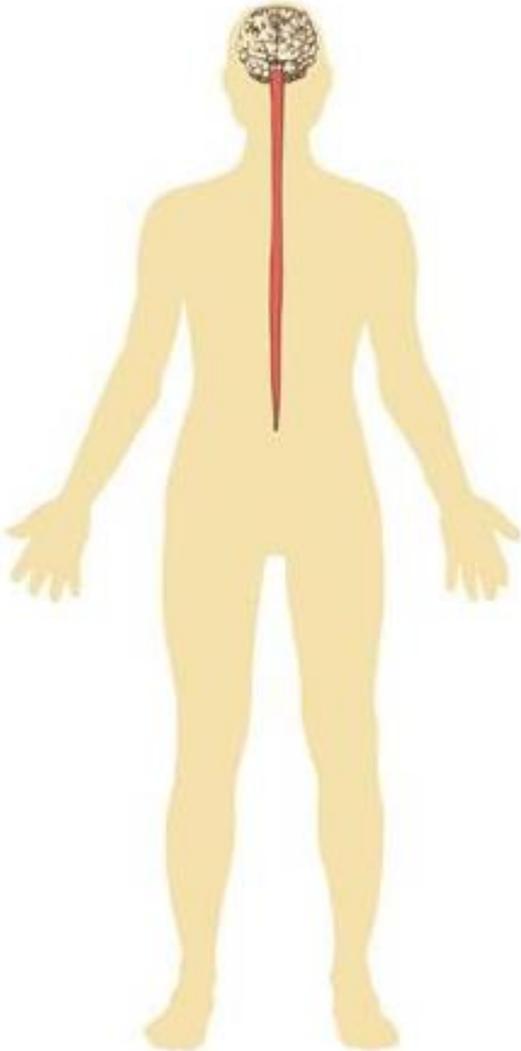
**Cel.: 98596-3168**

# DIVISÃO ANATÔMICA DO SISTEMA NERVOSO

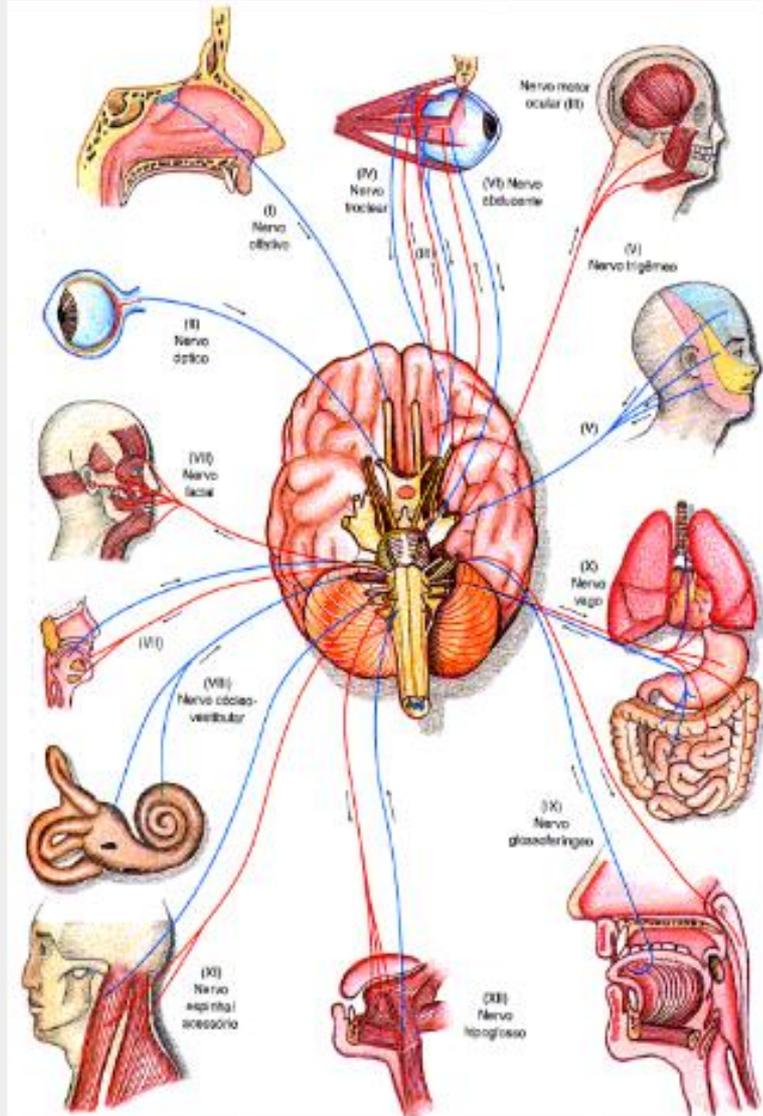
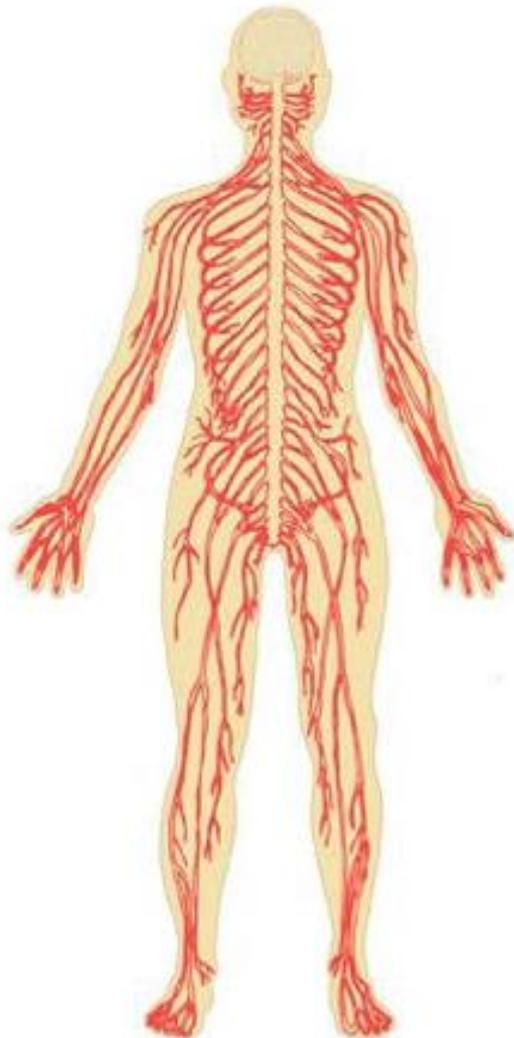


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RIO

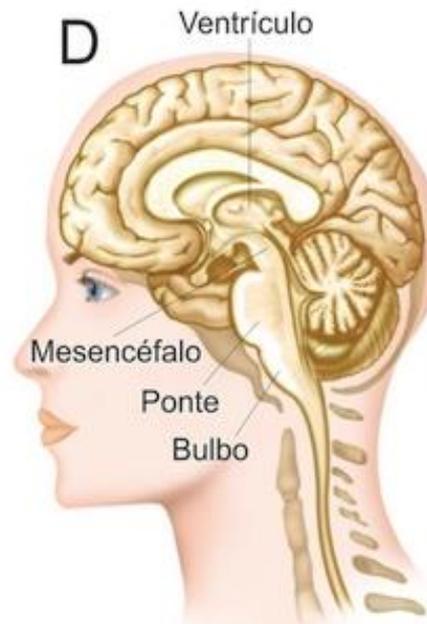
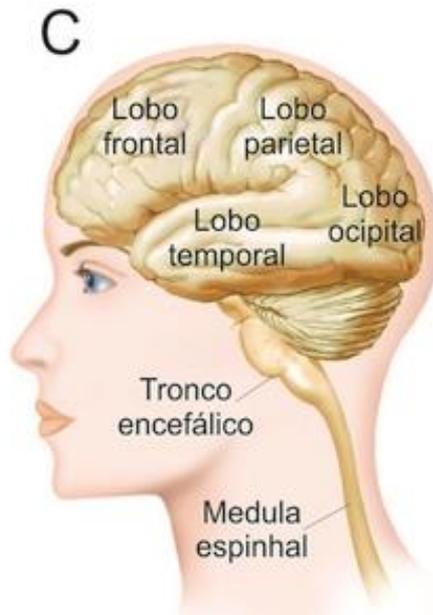
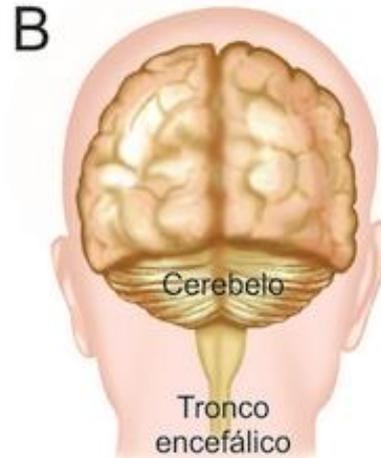
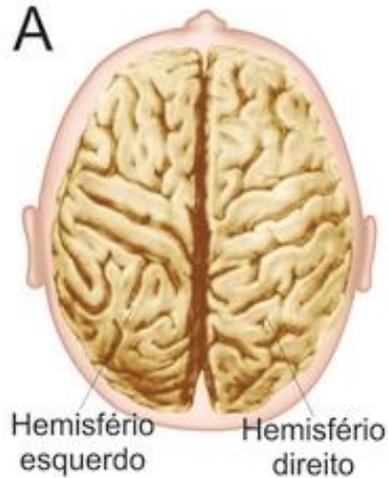
# SISTEMA NERVIOSO CENTRAL



# SISTEMA NERVOSO PERIFÉRICO

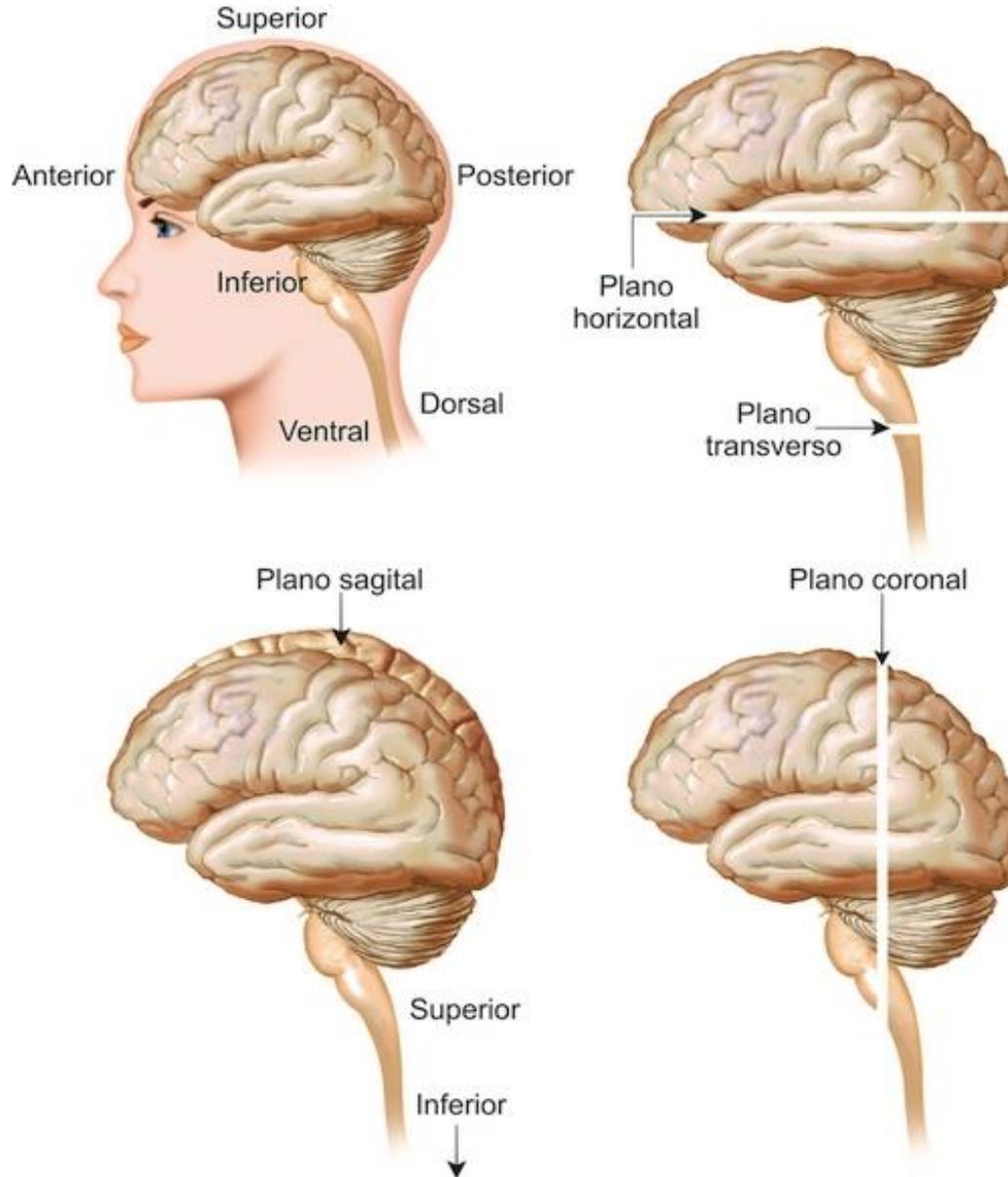


# Planos e Cortes do SNC

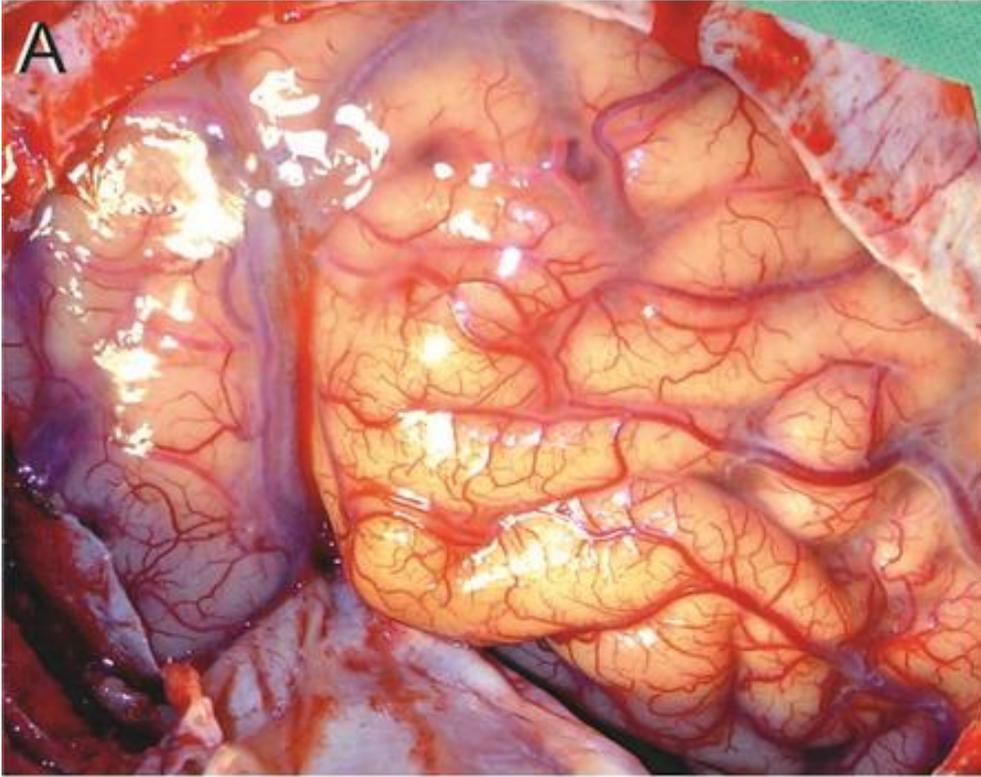


A: Vista superior.  
B: Vista posterior.  
C: Vista lateral.  
D: Vista lateral do corte sagital.

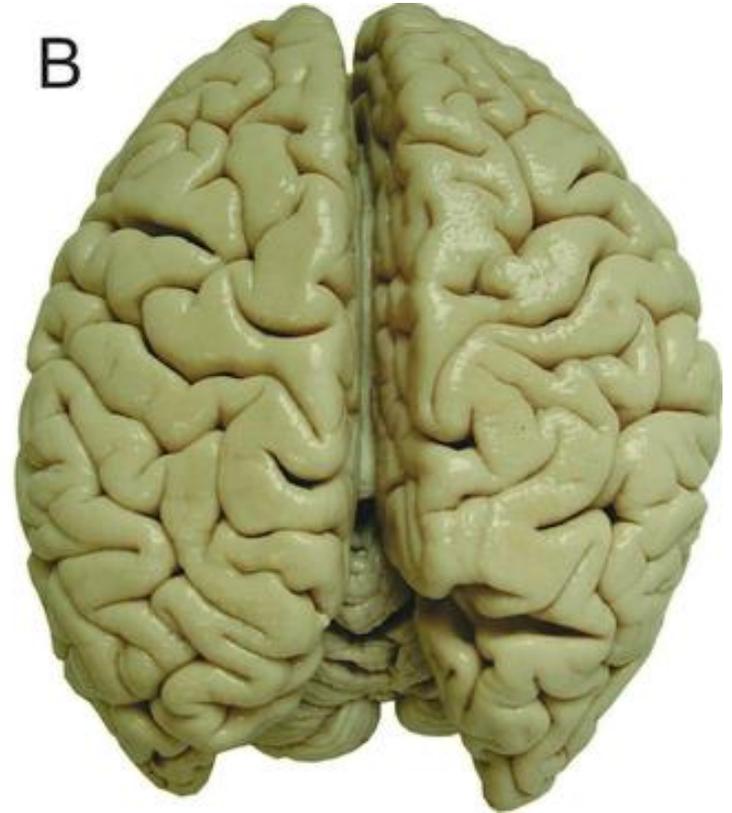
# Planos e Cortes do SNC



# O ENCÉFALO

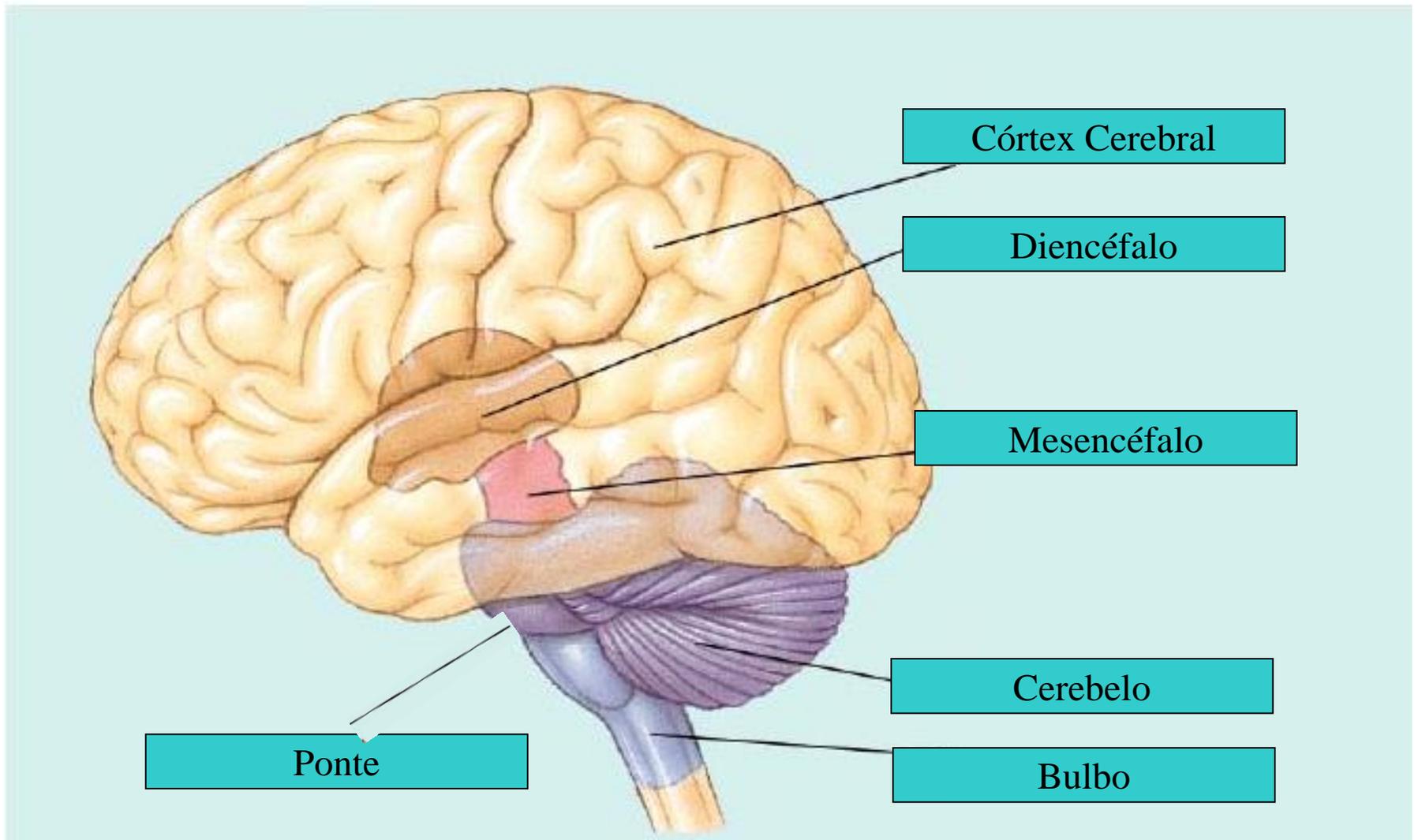


**A** - Imagem da superfície do córtex cerebral de um indivíduo vivo, similar ao que se apresenta em um campo cirúrgico.

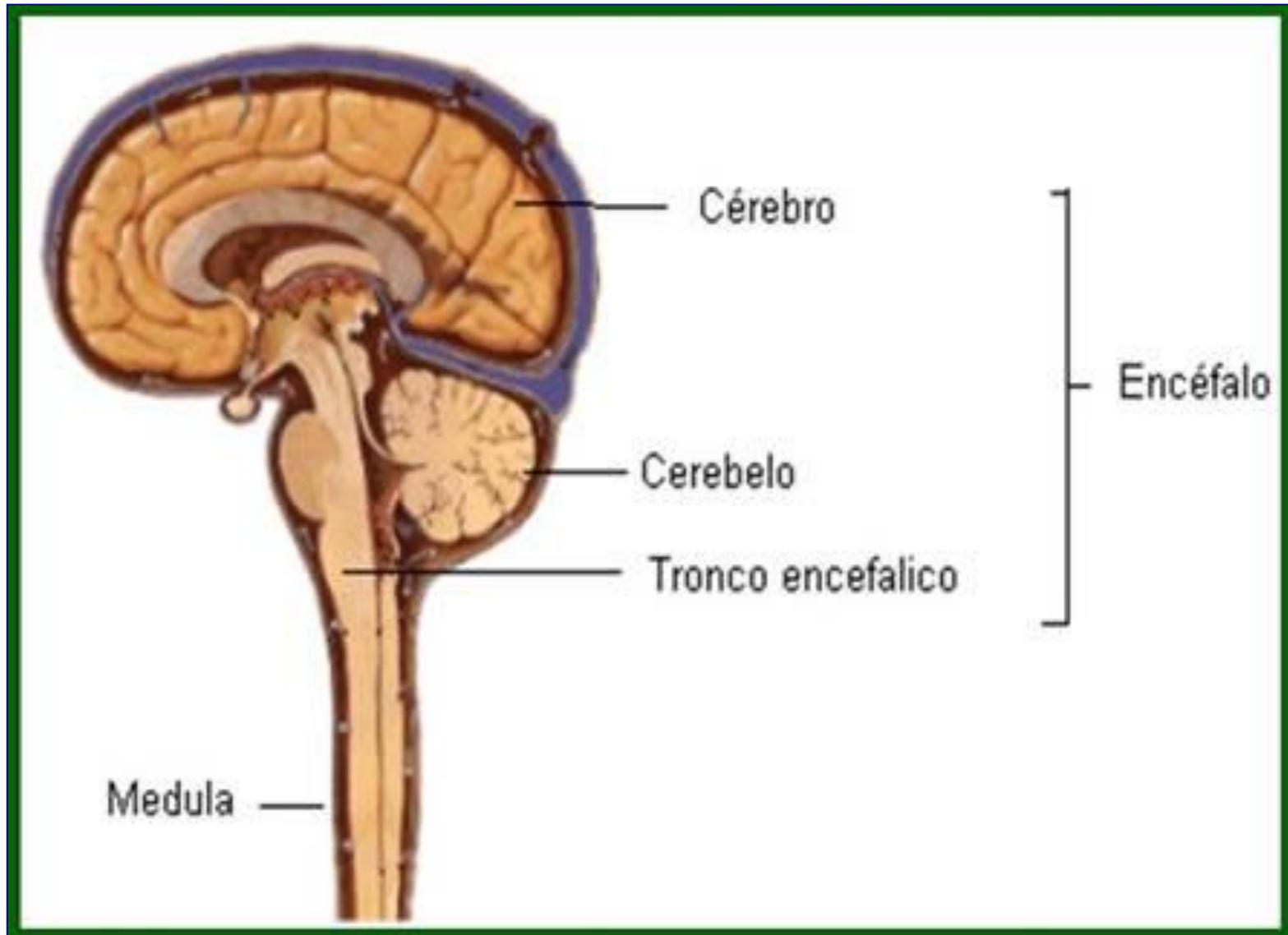


**B** - Imagem de um encéfalo fixado em formol, com as membranas de cobertura e os vasos removidos.

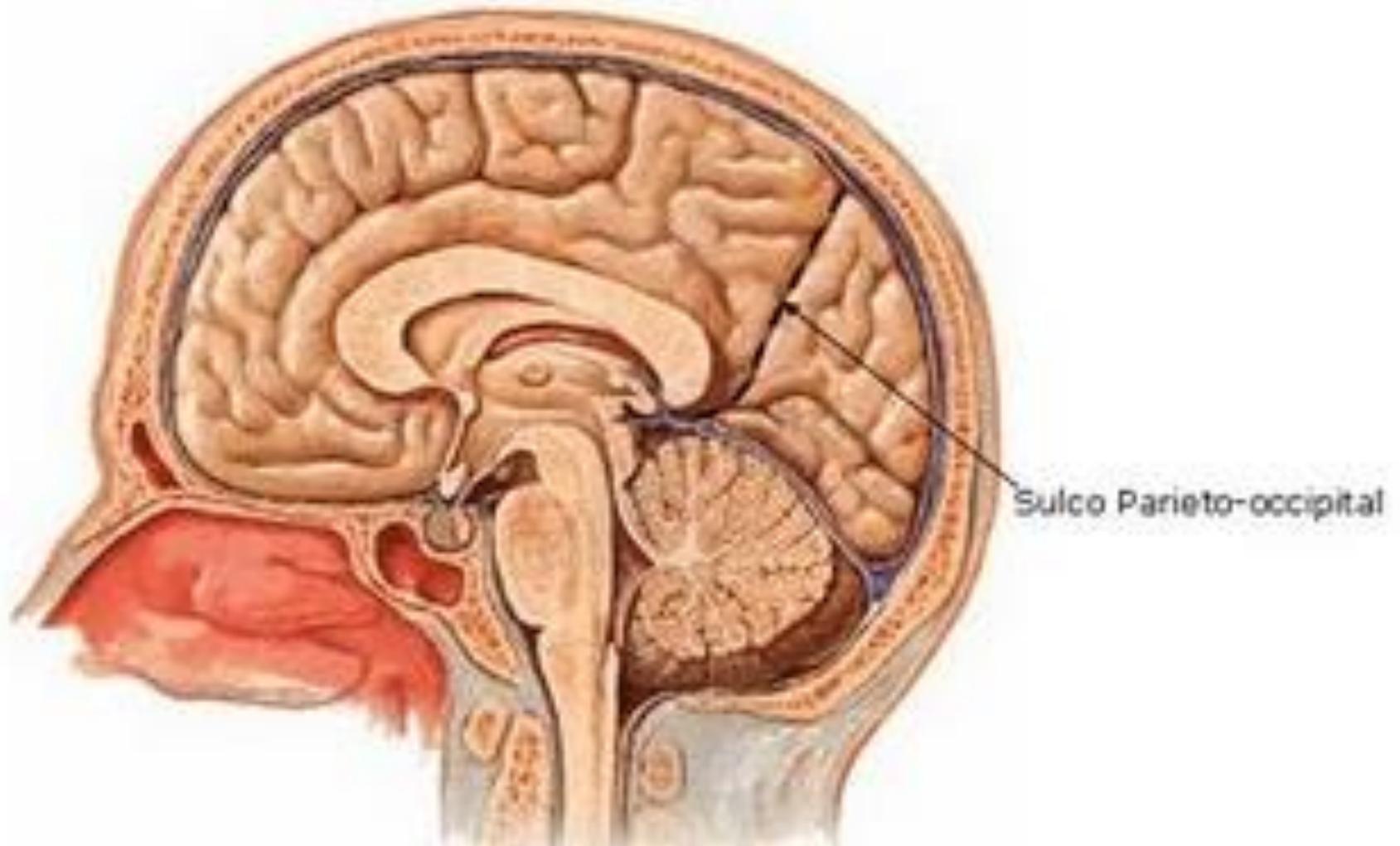
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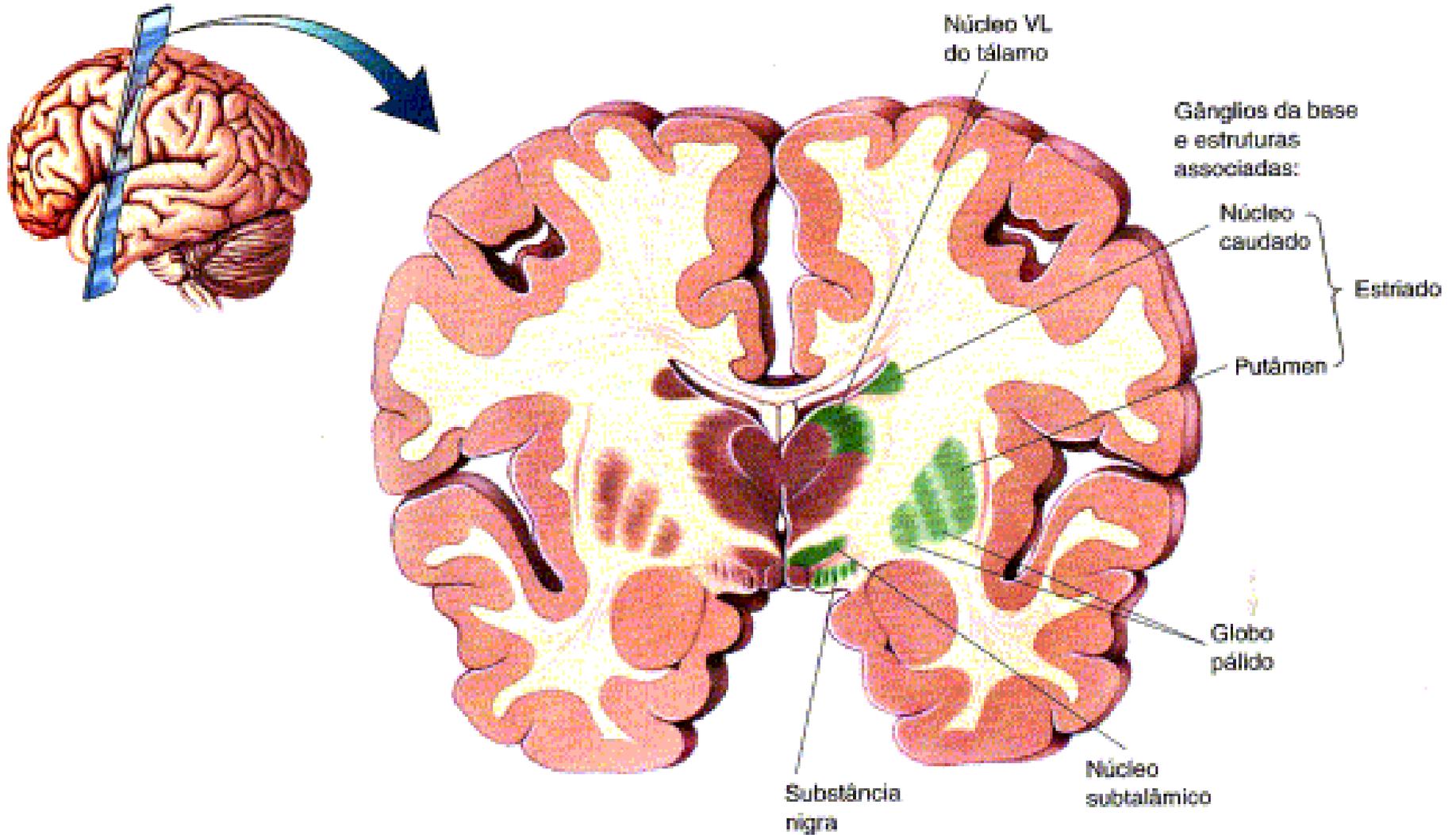
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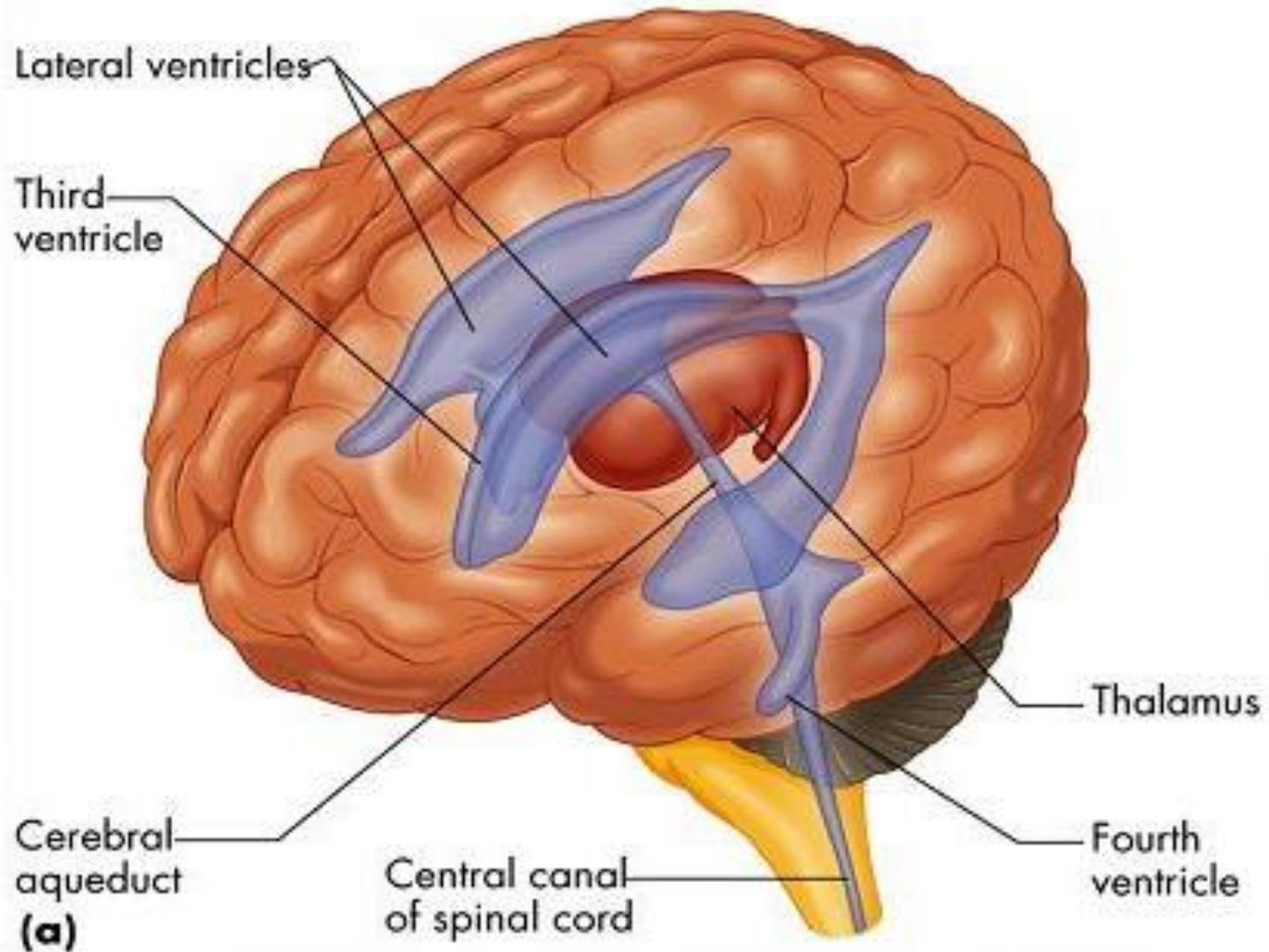
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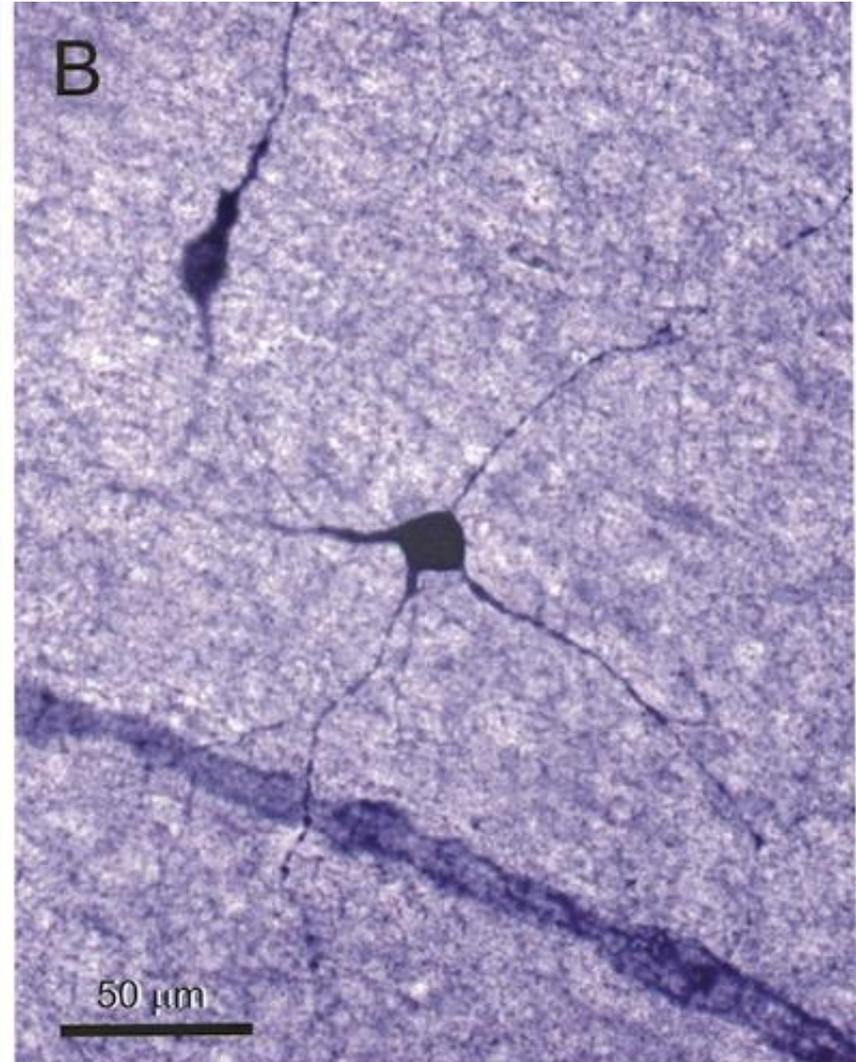
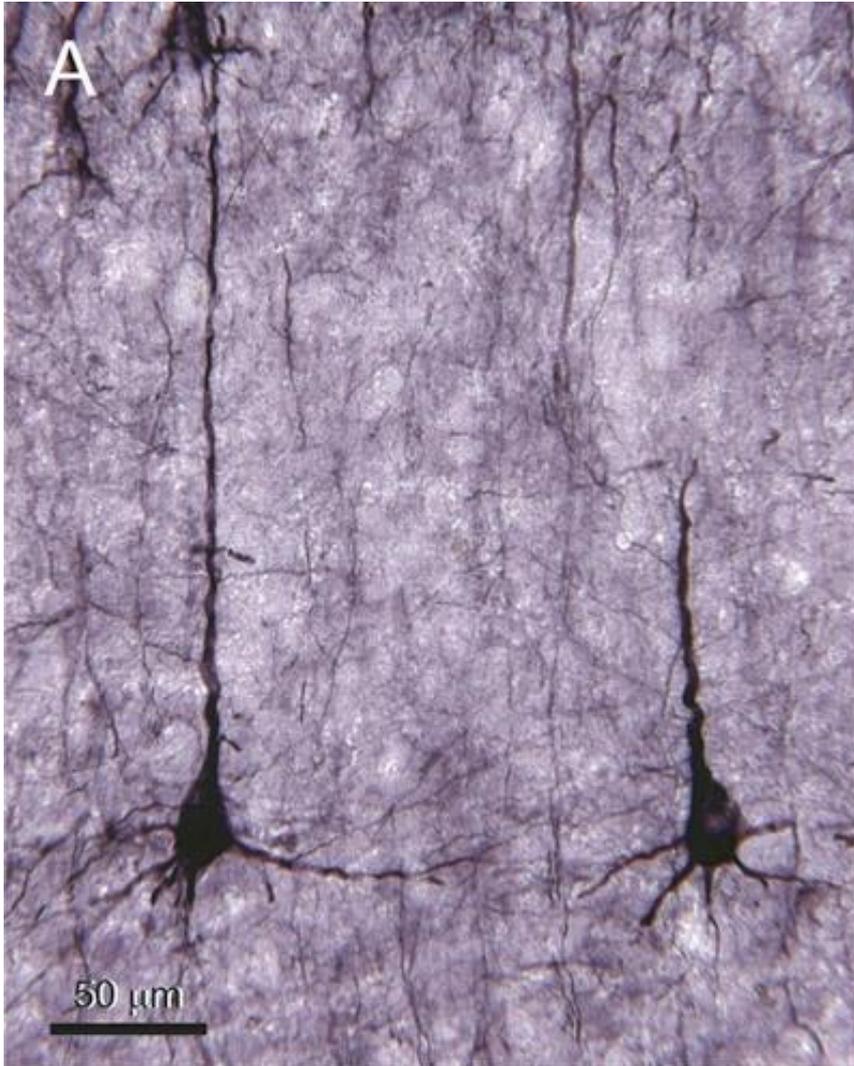
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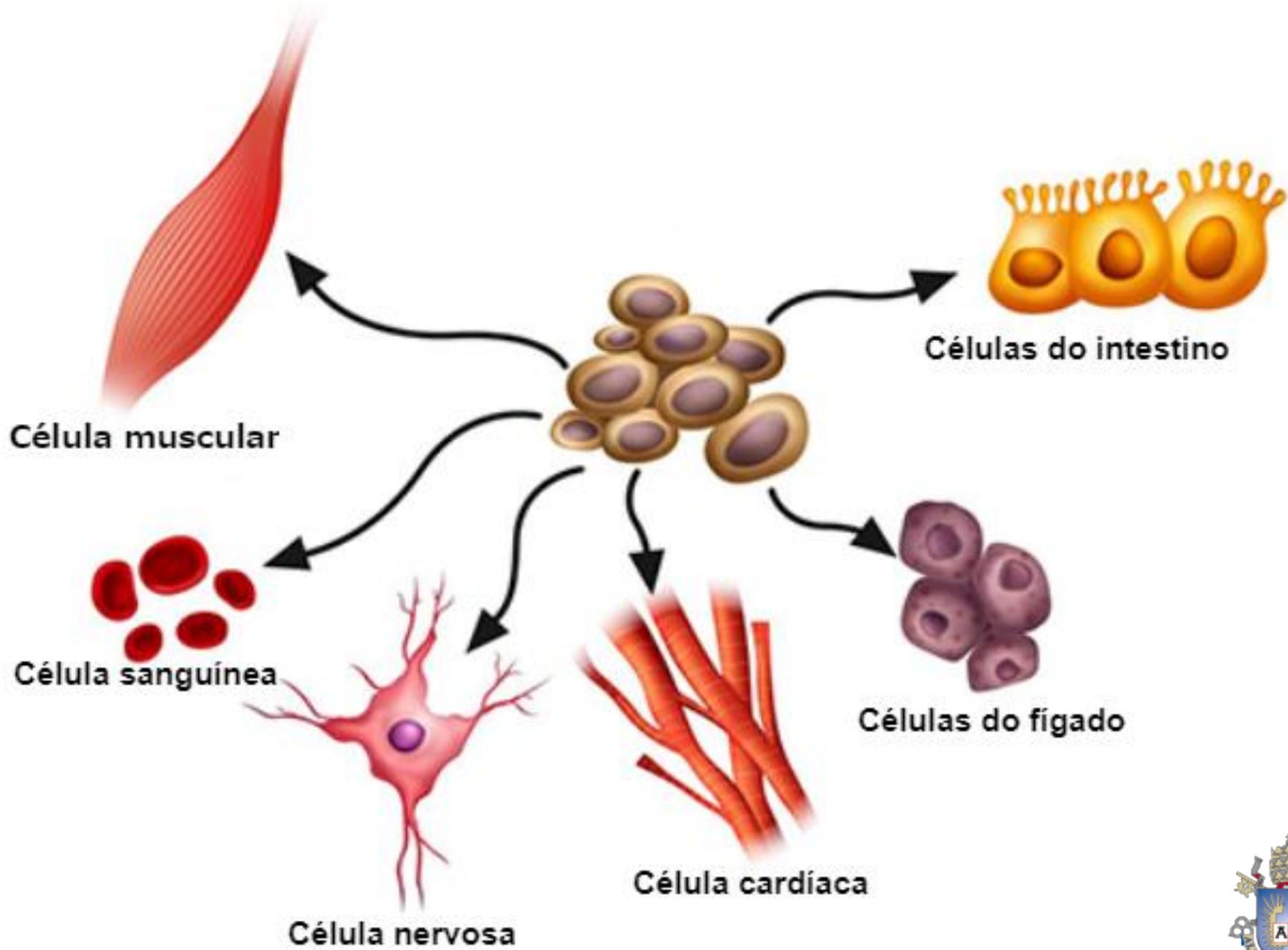


# VENTRÍCULOS



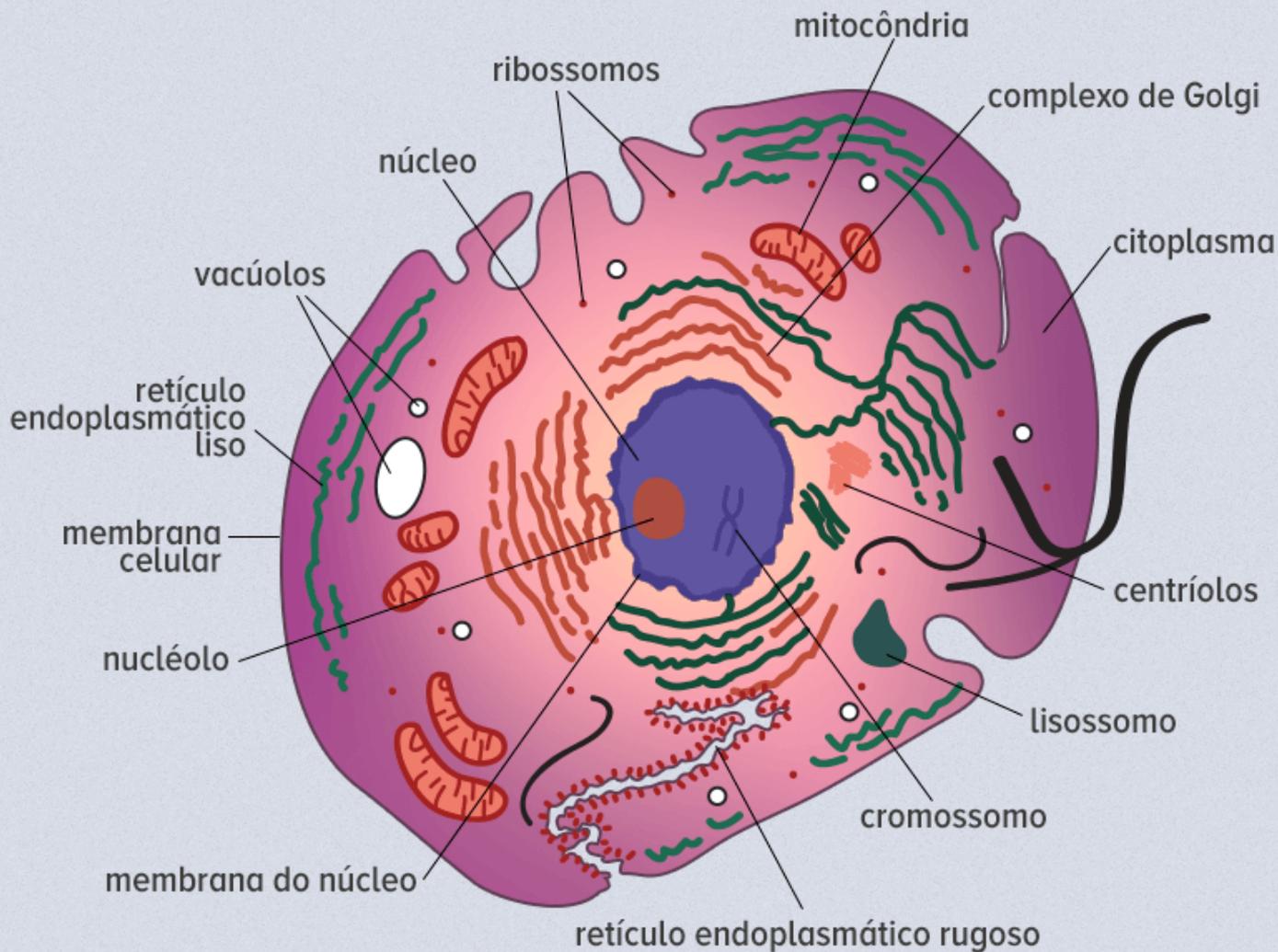
# A CÉLULA E O TECIDO NERVOSO



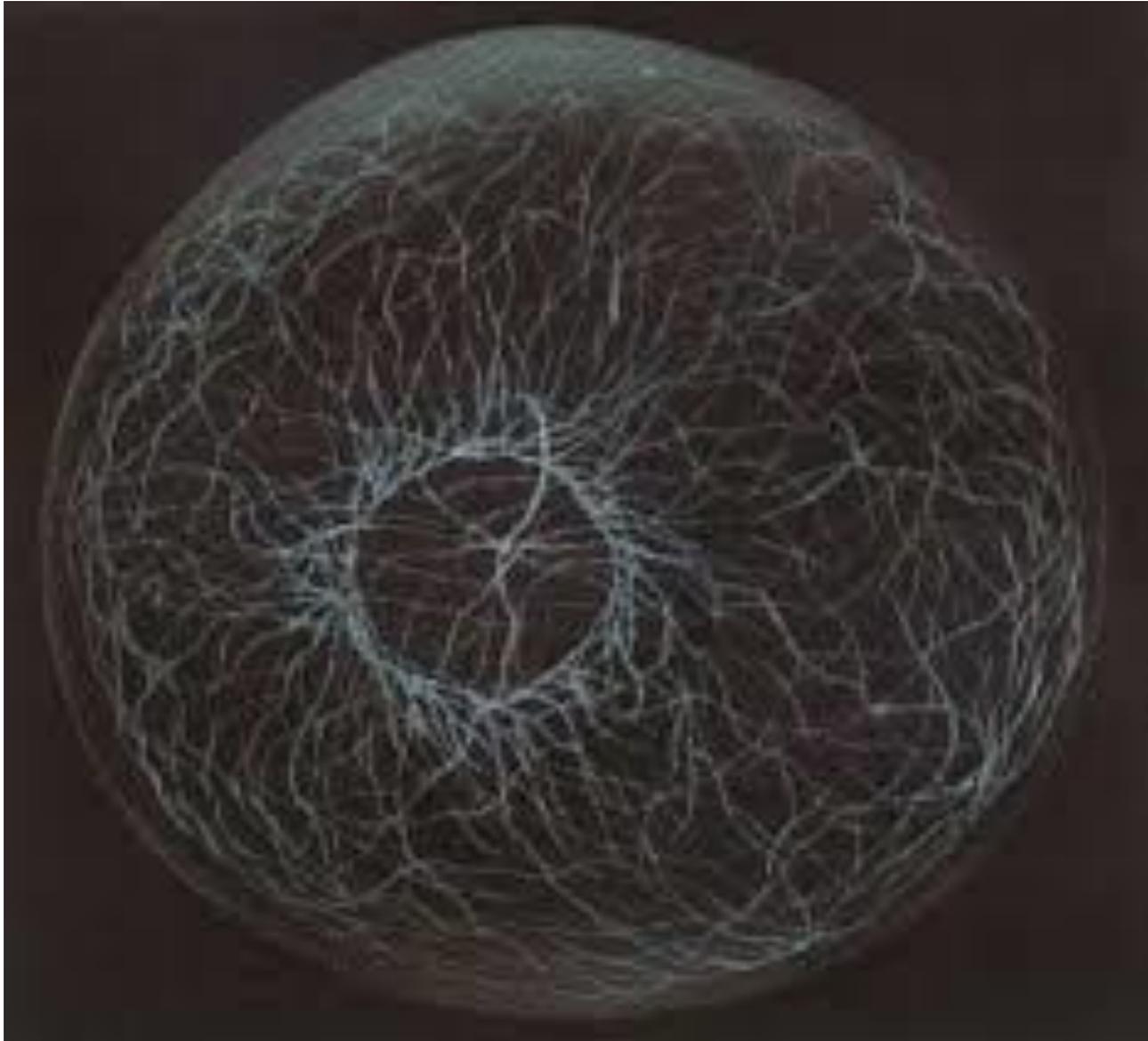




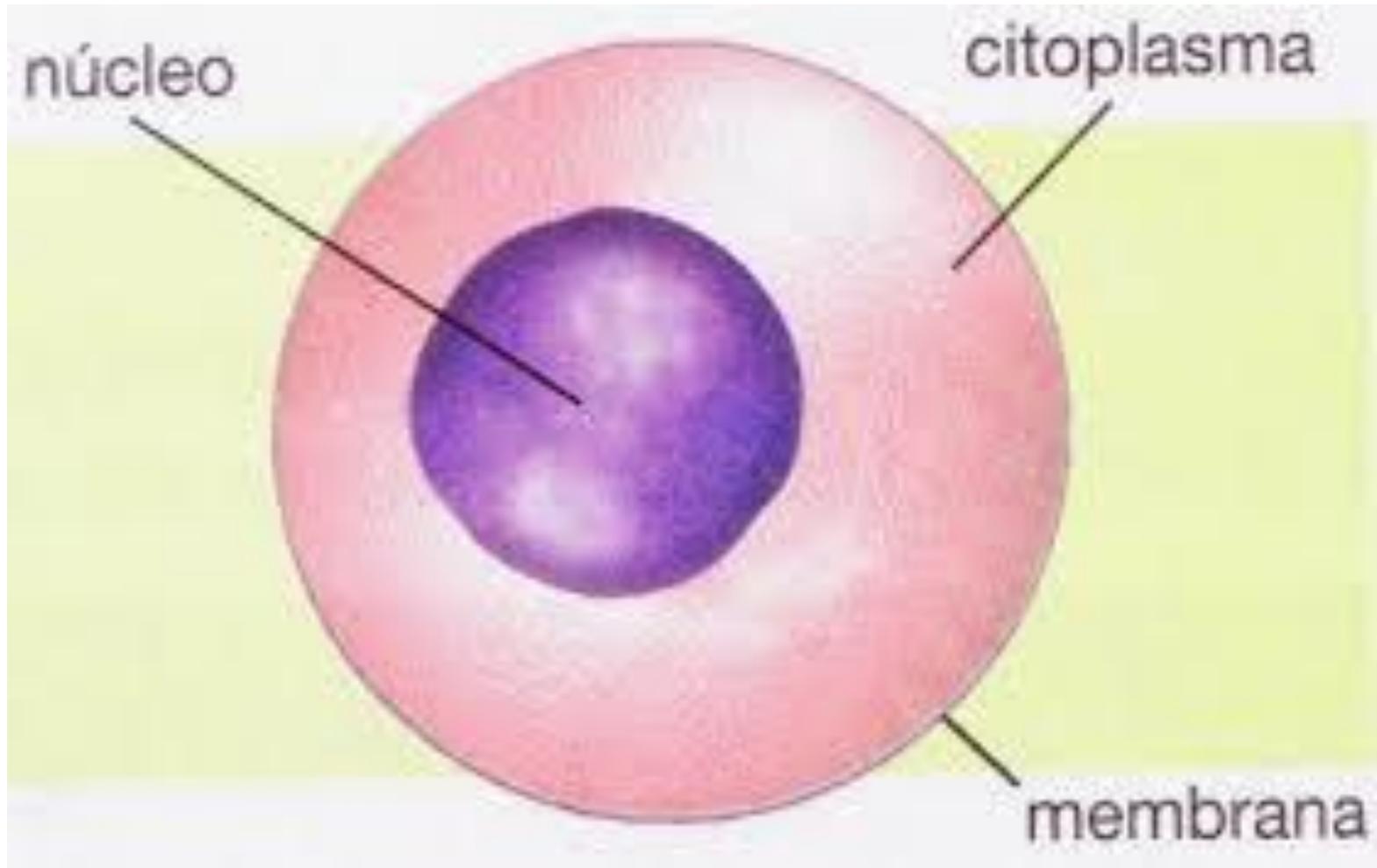
# CÉLULA DO CORPO HUMANO



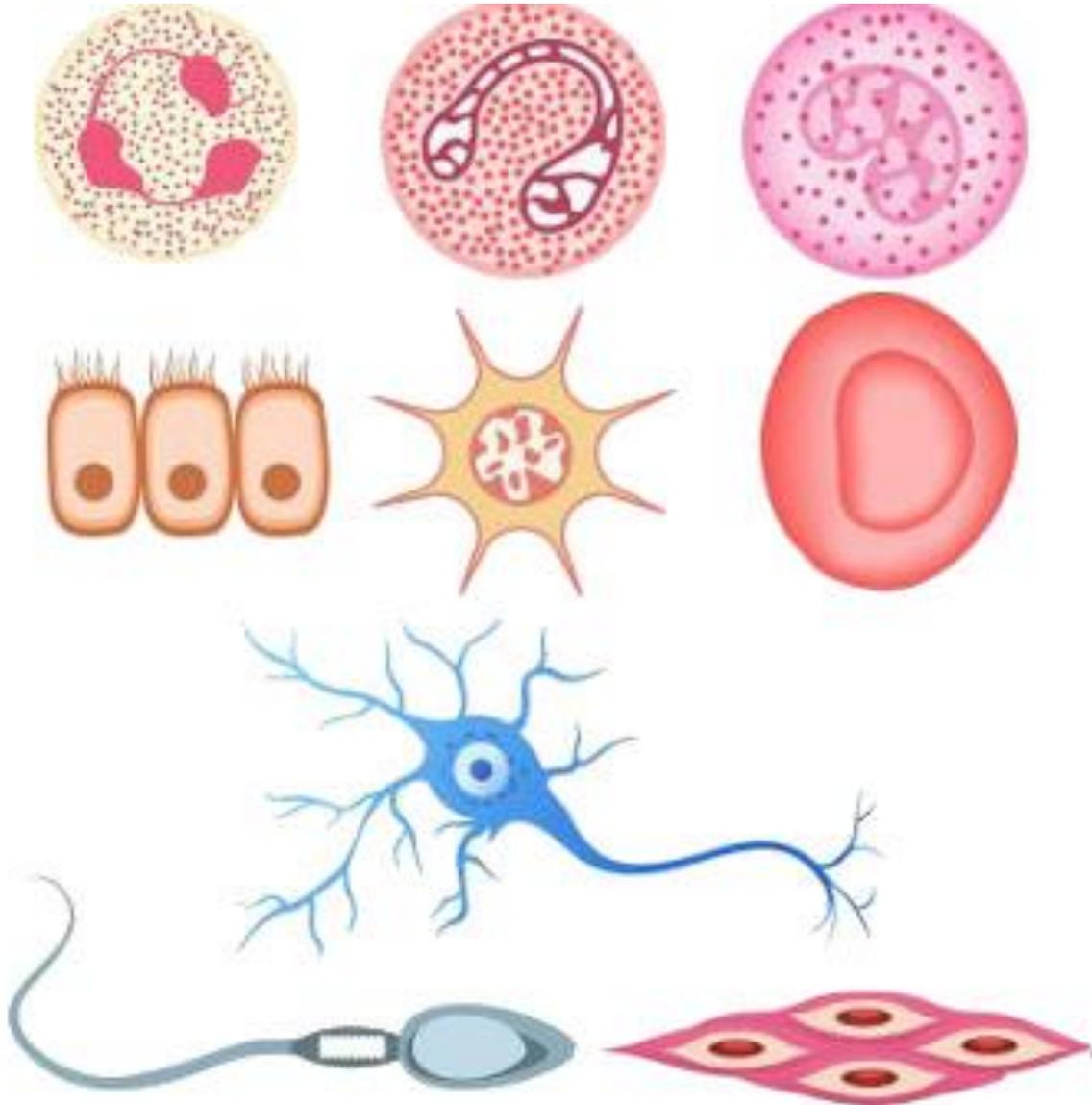
# CITOESQUELETO

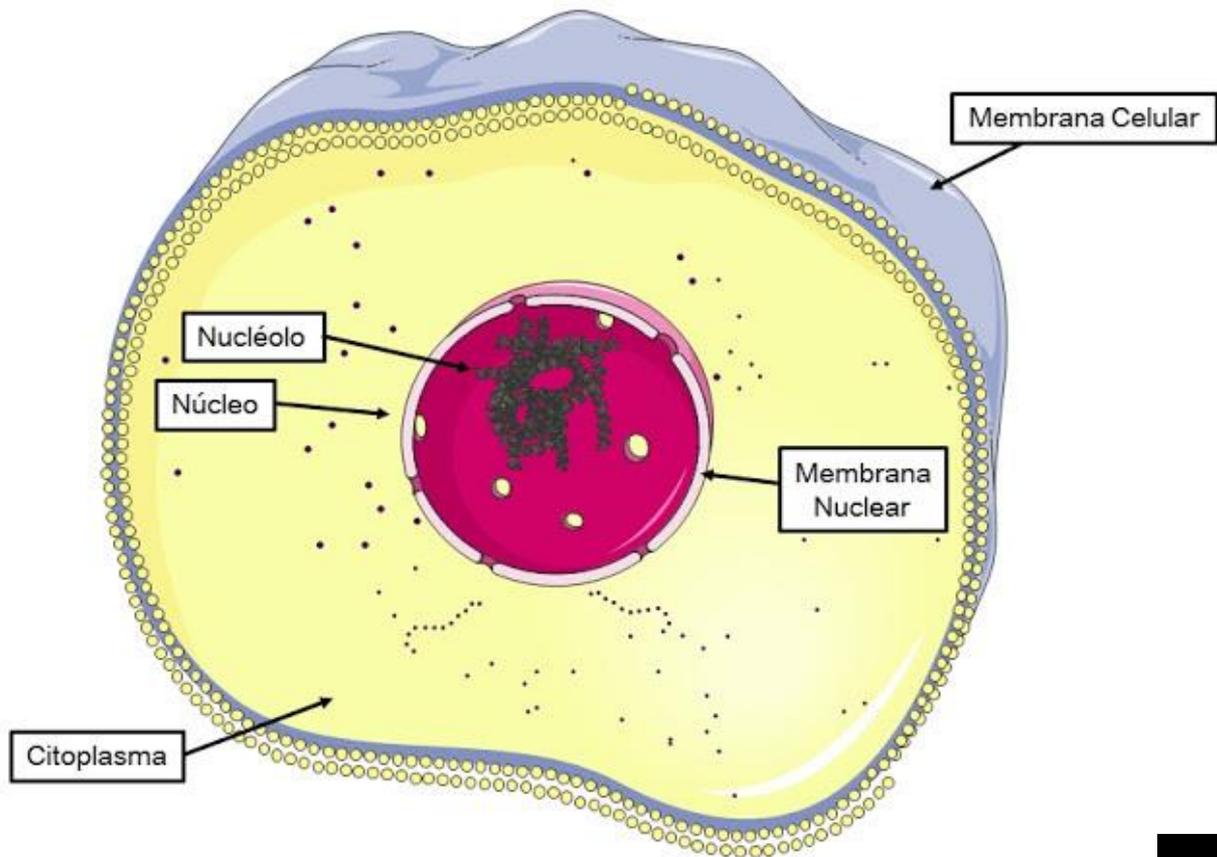


# CICLO CELULAR - INTERFASE

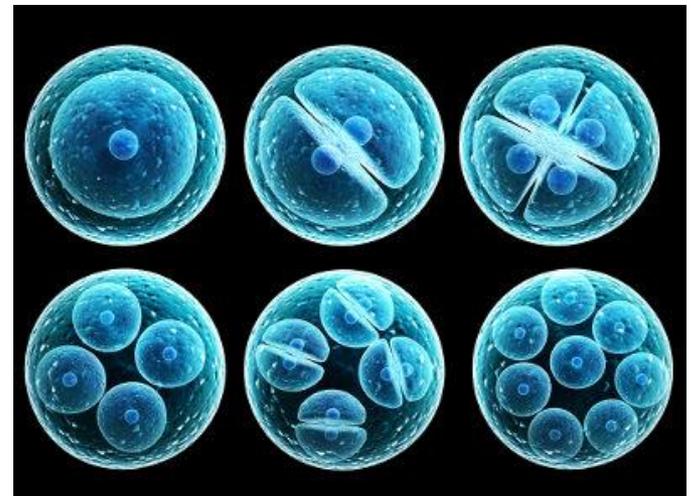


# CELULAS: LÁBEIS, ESTÁVEIS E PERMANENTES

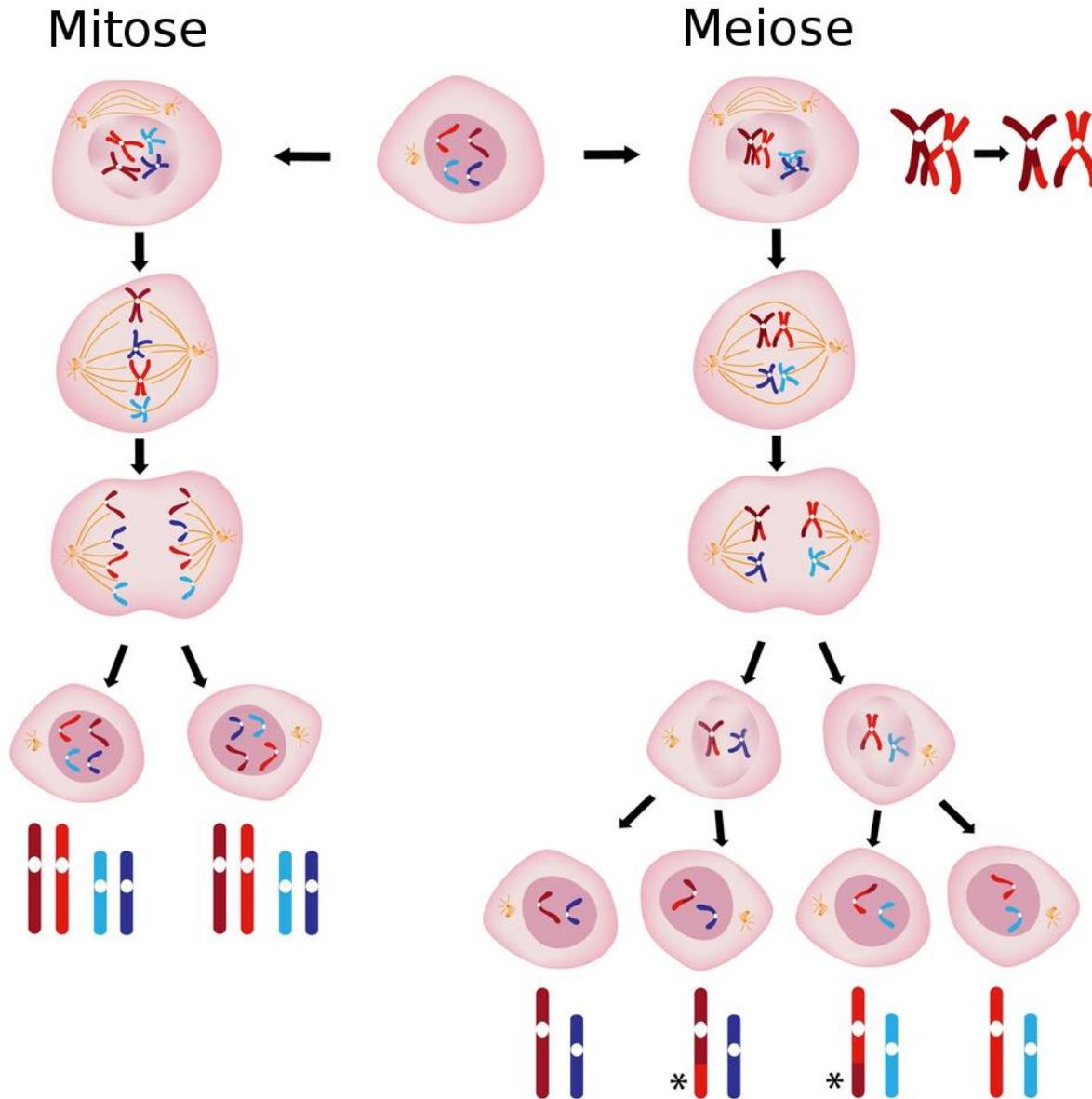




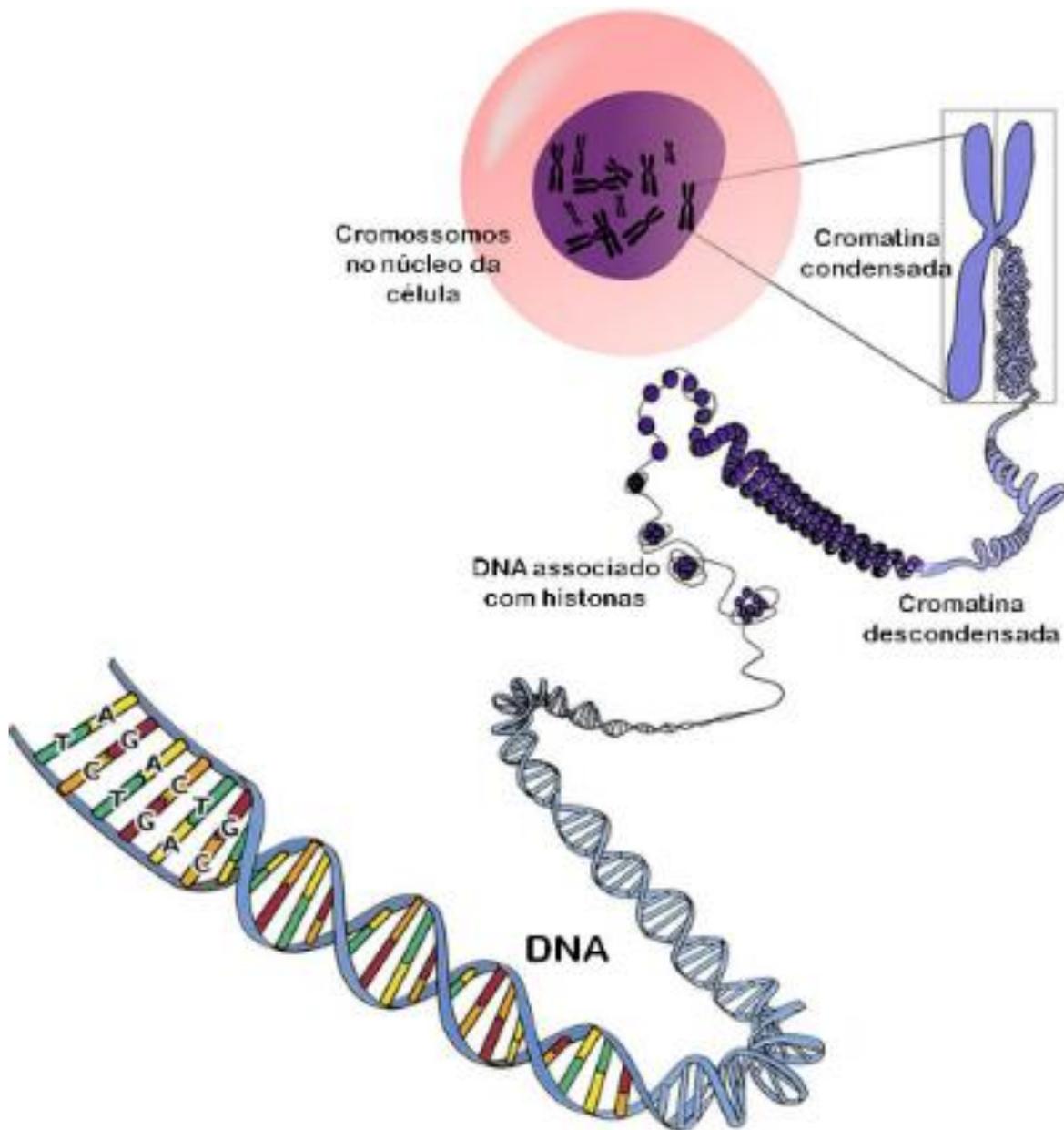
## ESTRUTURA NUCLEAR



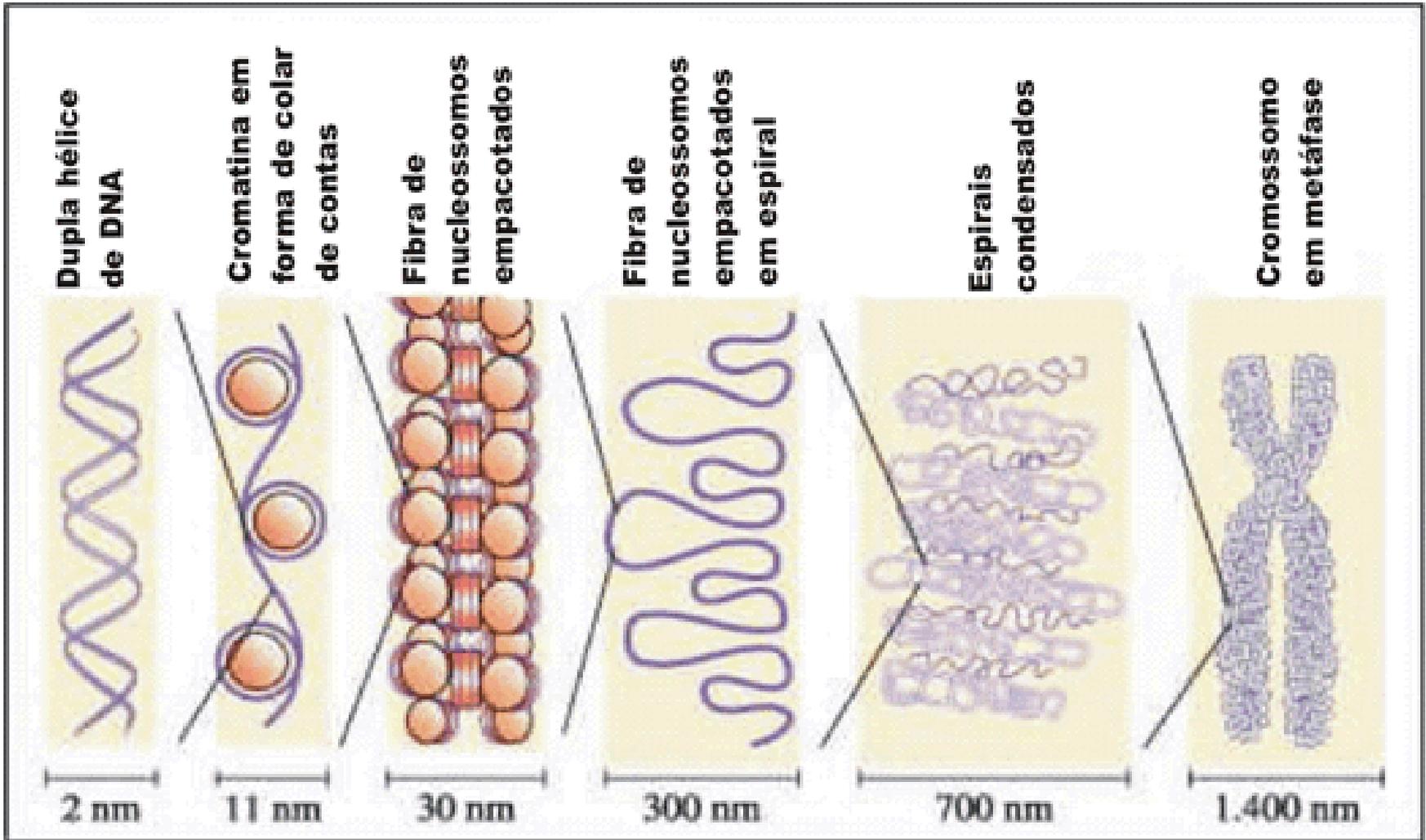
# DIVISÃO CELULAR



# CROMOSSOMO E CROMATINA



# CROMOSSOMO E CROMATINA



1

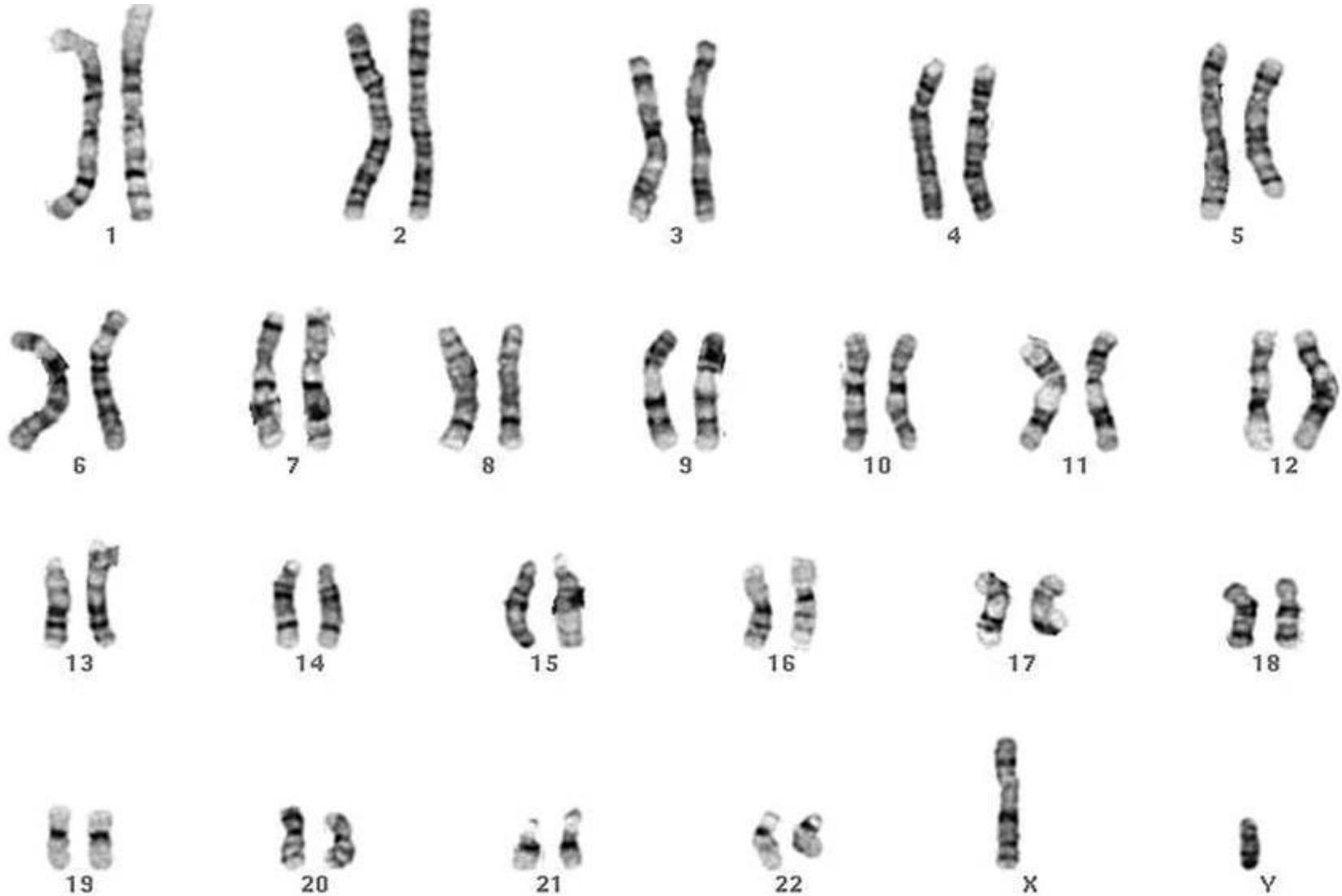
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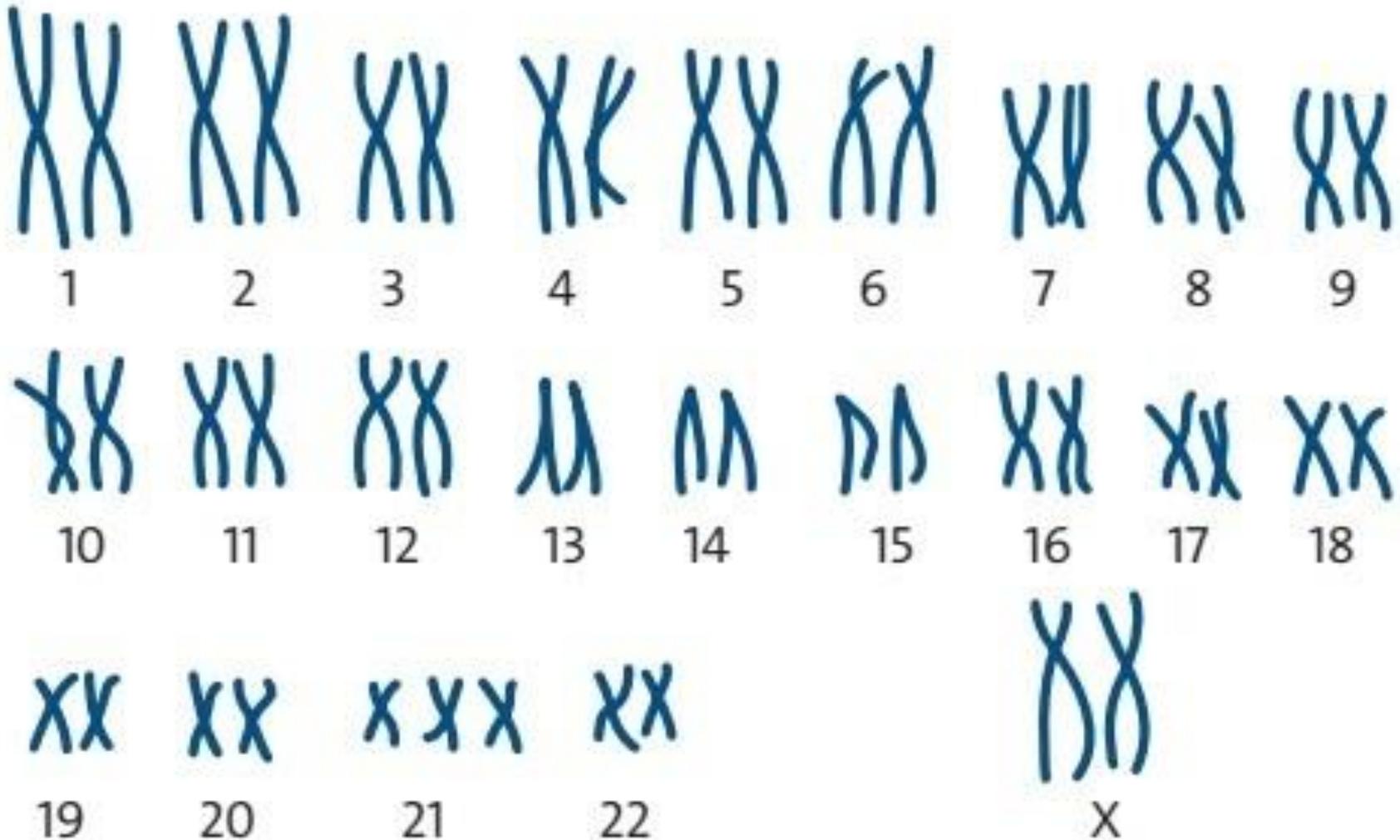
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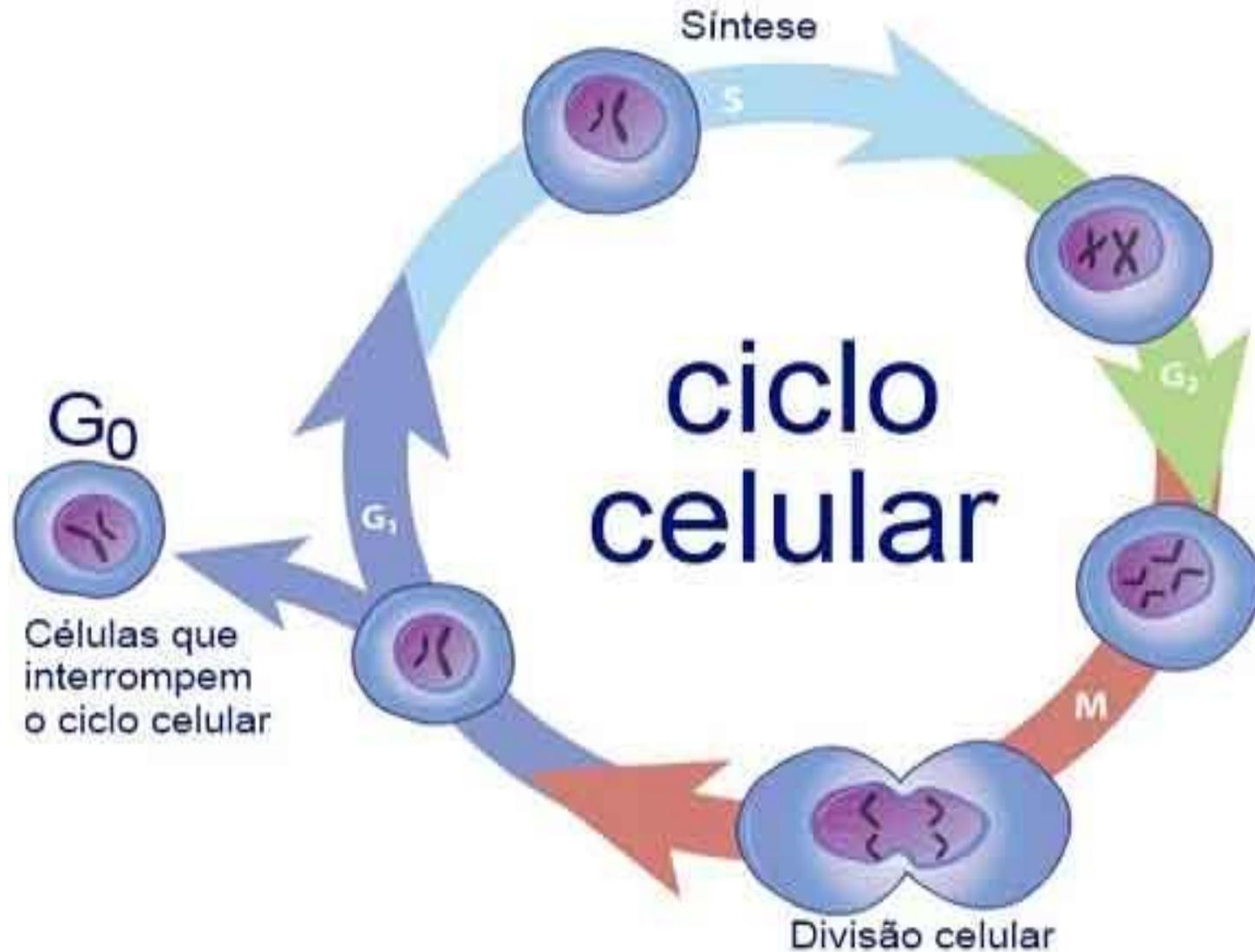
# CARIÓTIPO MASCULINO NORMAL



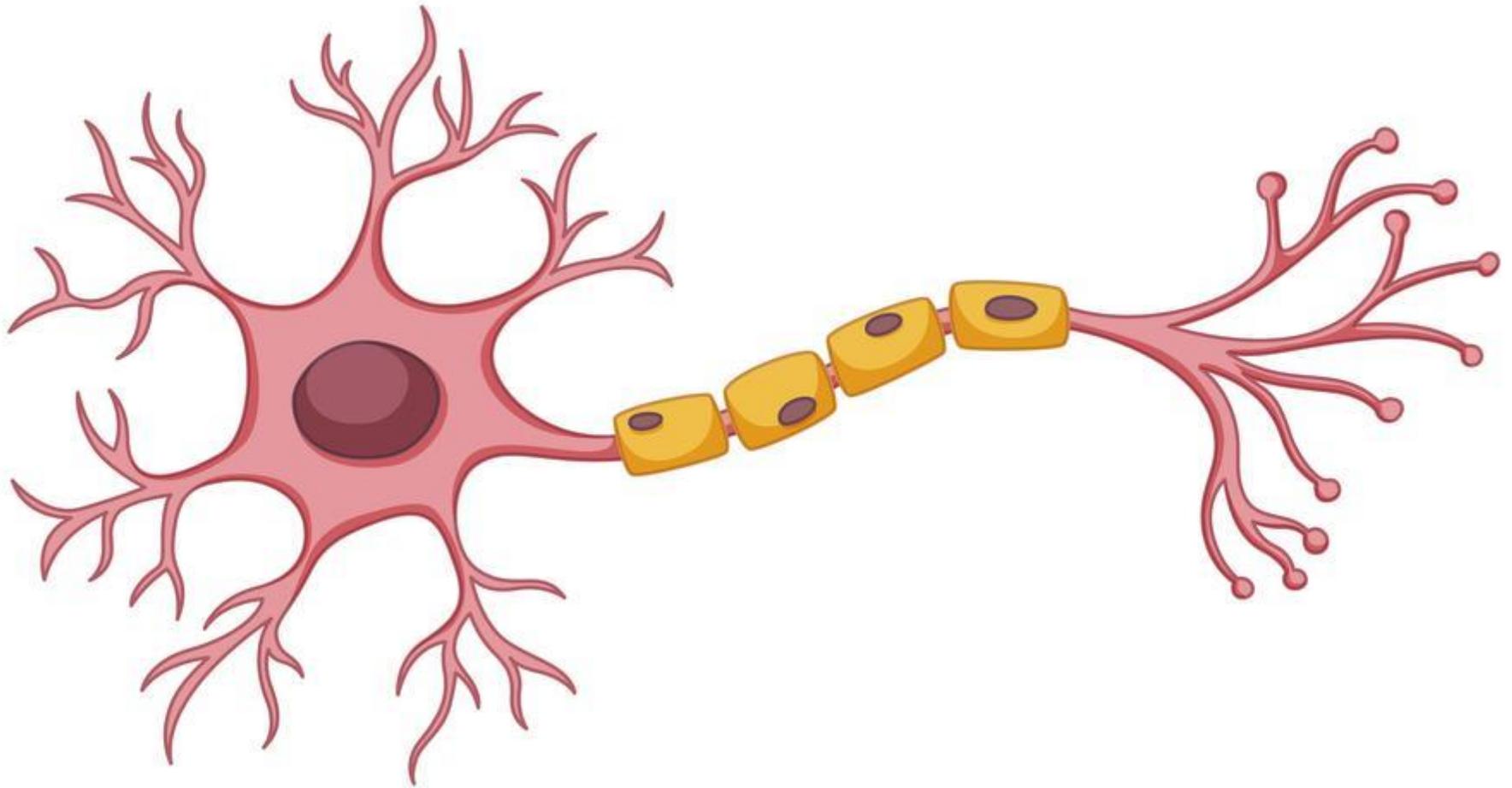
# CARIÓTIPO FEMININO - SÍNDROME DE DOWN



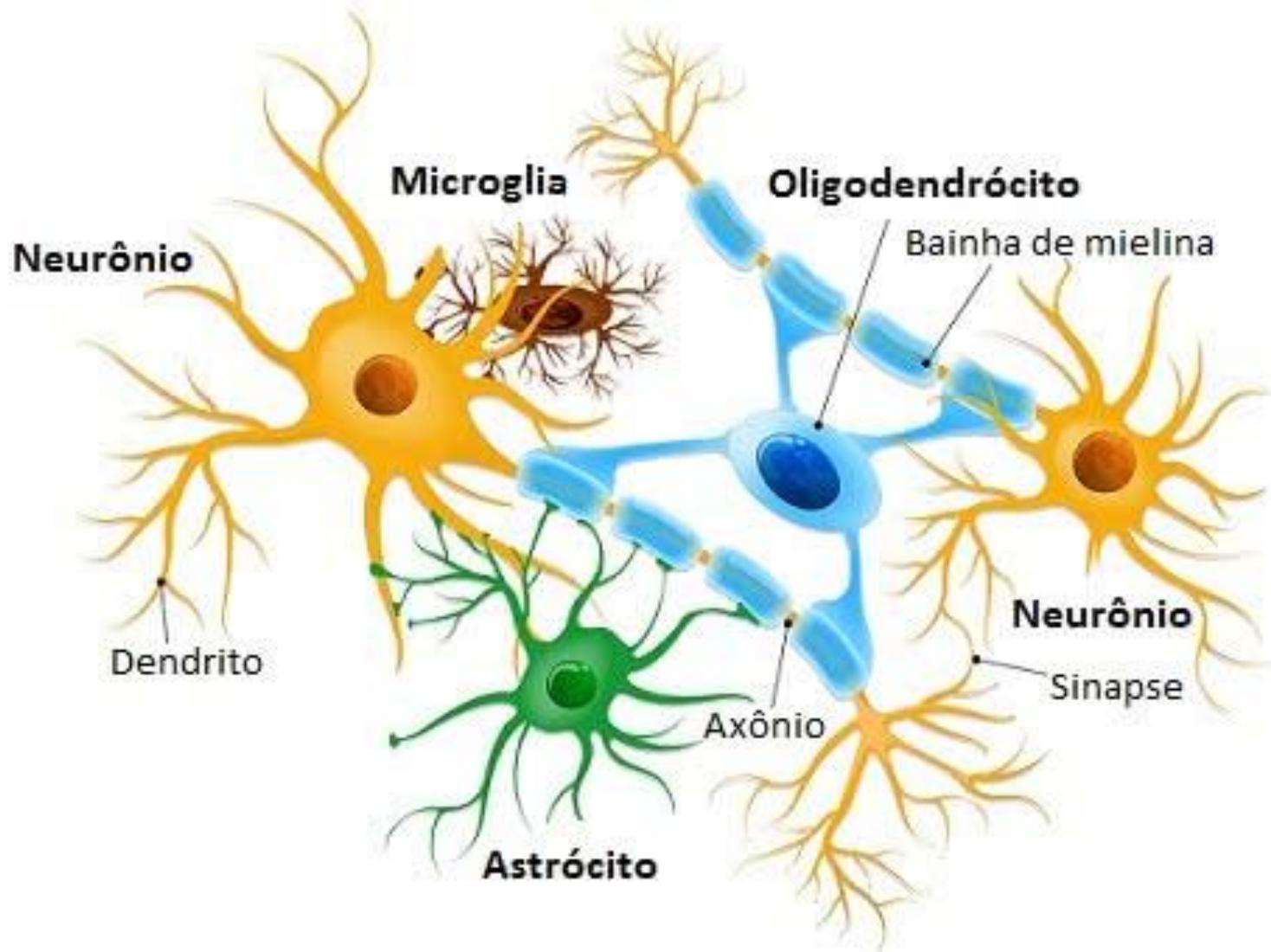
# CICLO CELULAR



# NEURÔNIO



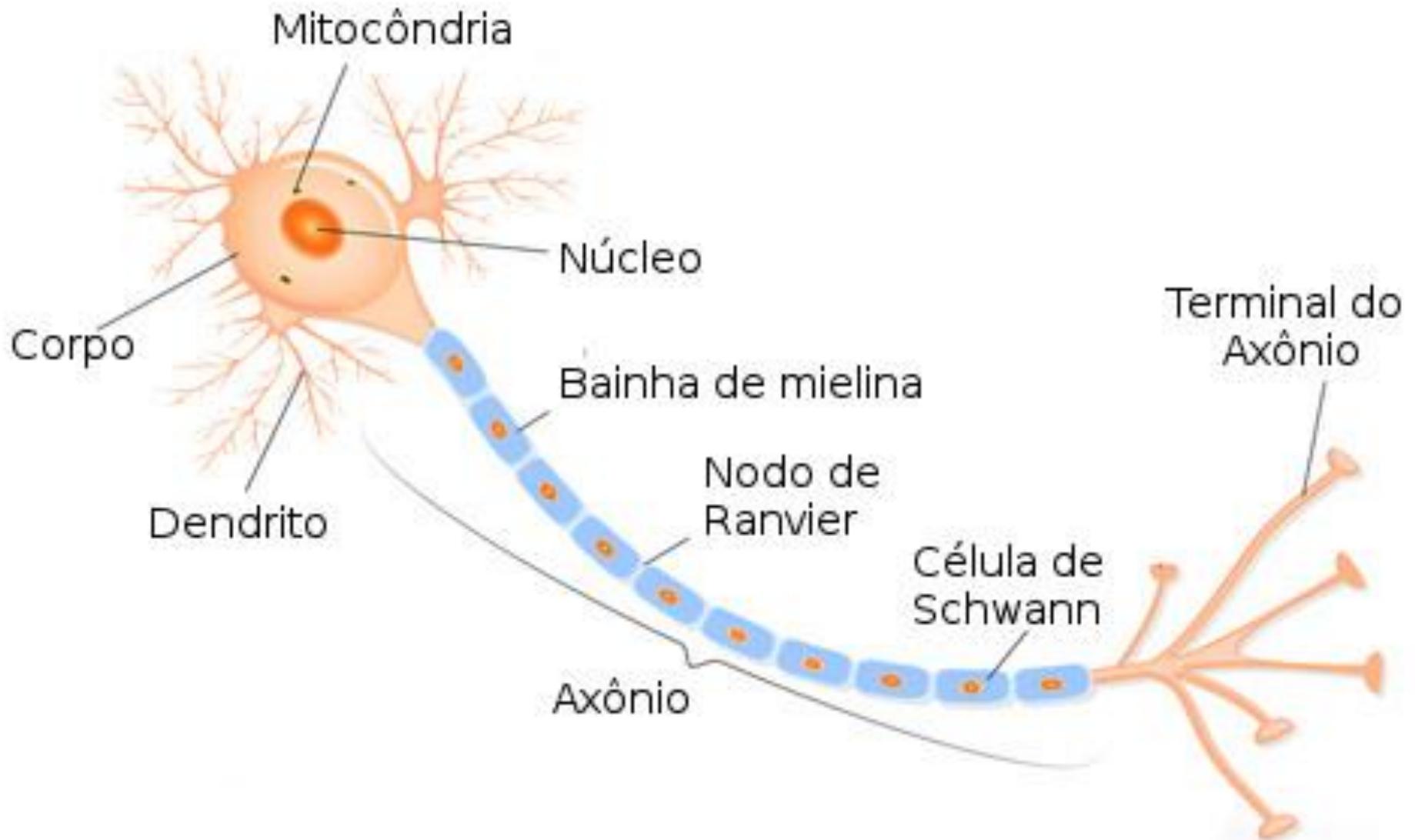
# TECIDO NERVOSO: NEURÔNIO E NEURÓGLIAS (GLIAS)



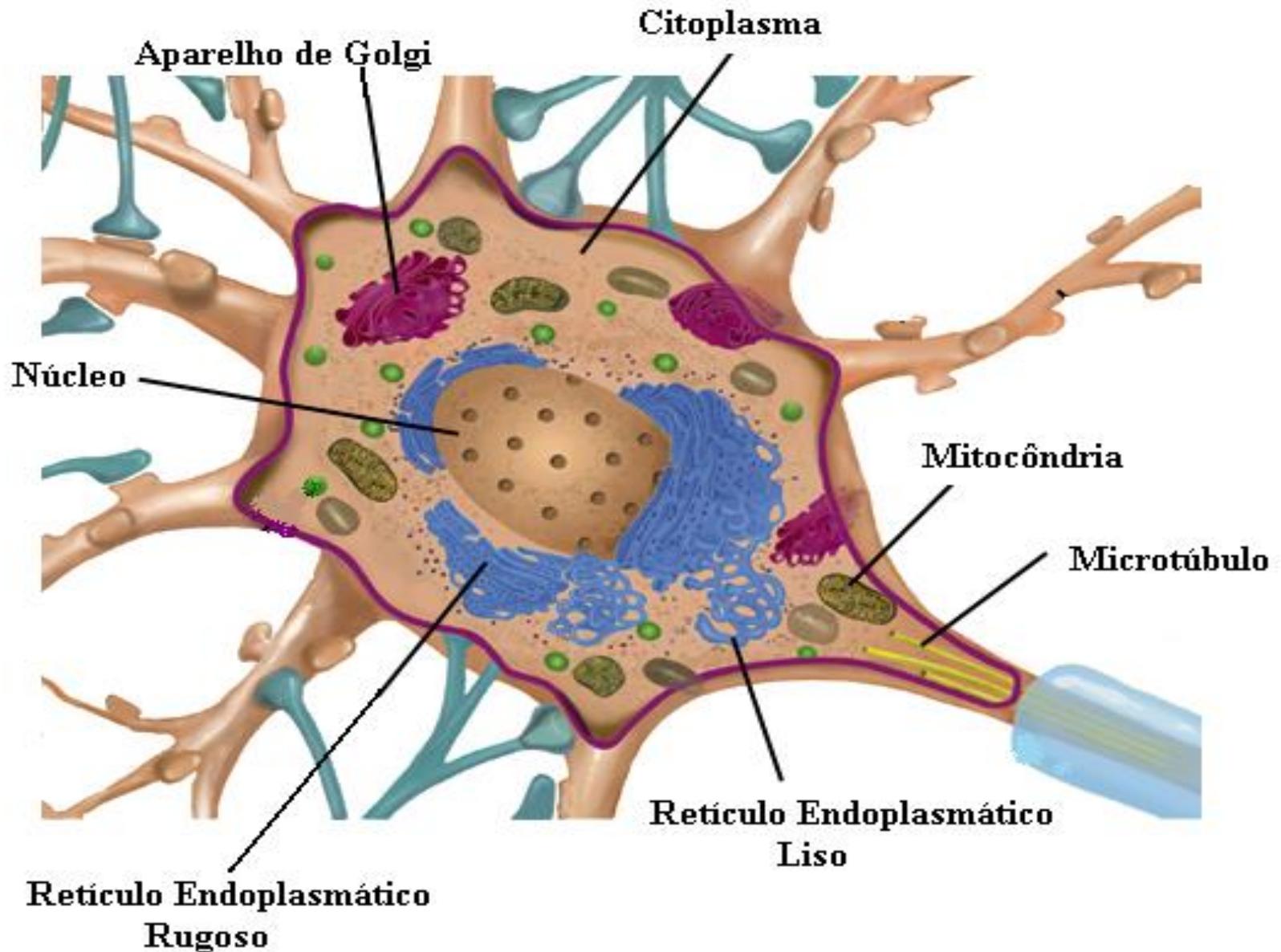
# TECIDO NERVOSO: NEURÔNIO E NEURÓGLIAS (GLIAS)



# ESQUEMA DE UM NEURÔNIO

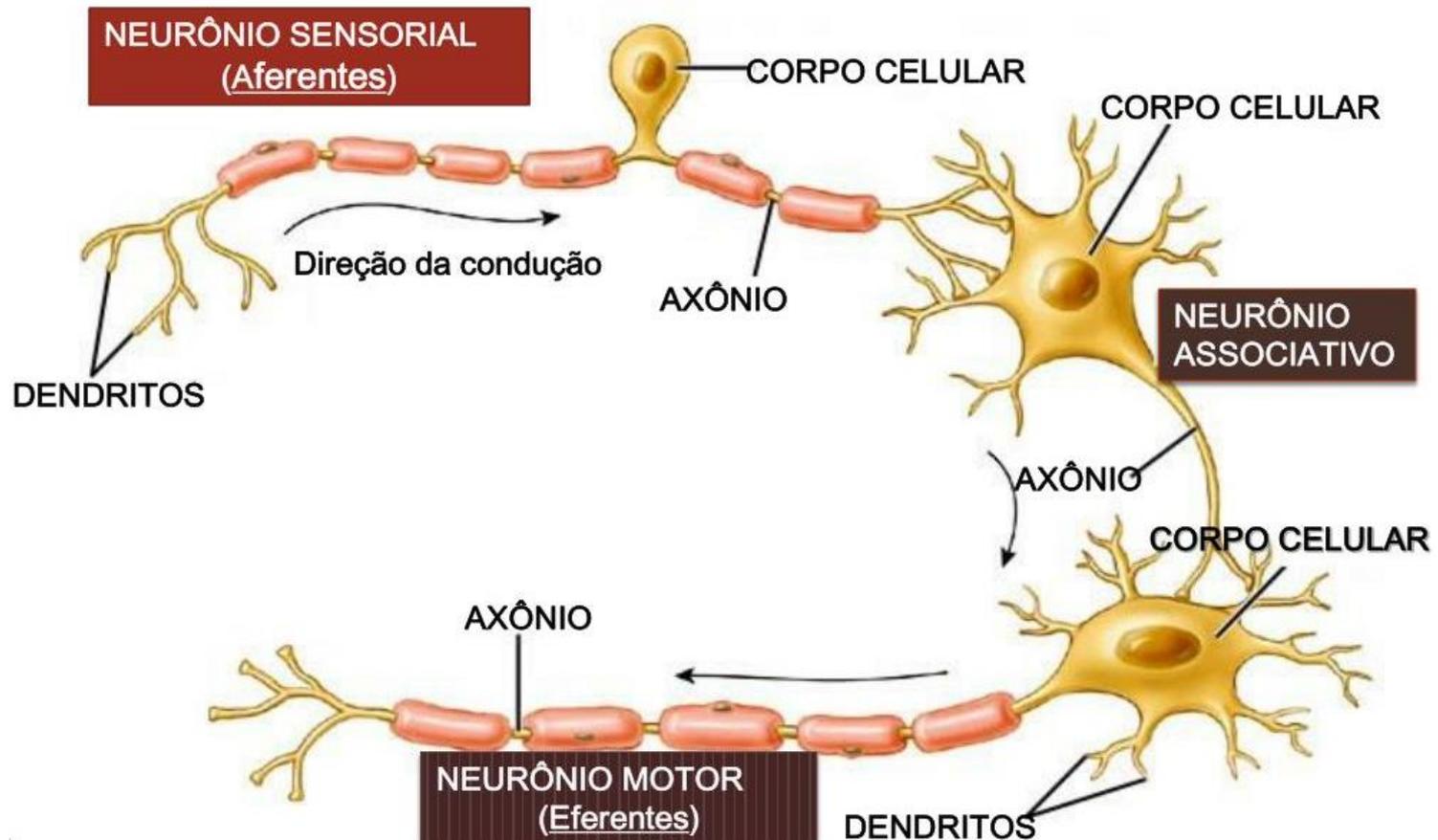


# ESTRUTURA INTERNA DO NEURÔNIO



# Classificação dos Neurônios: Segundo a Função

- a) Neurônios Aferentes ou Sensitivos
- b) Neurônios Eferentes ou Motores
- c) Neurônios de Associação ou Interneurônios



# Classificação dos Neurônios: Segundo a Função

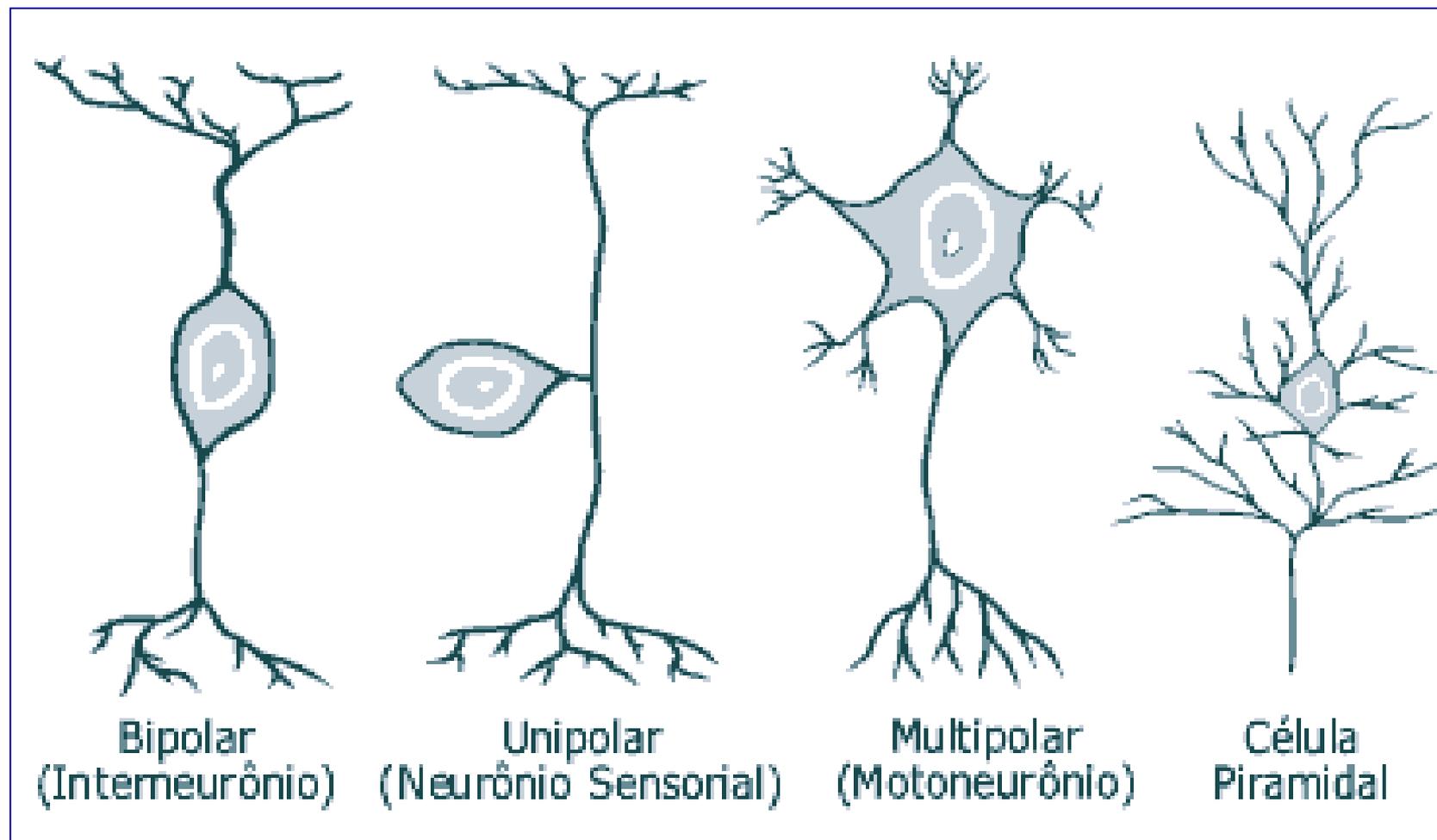
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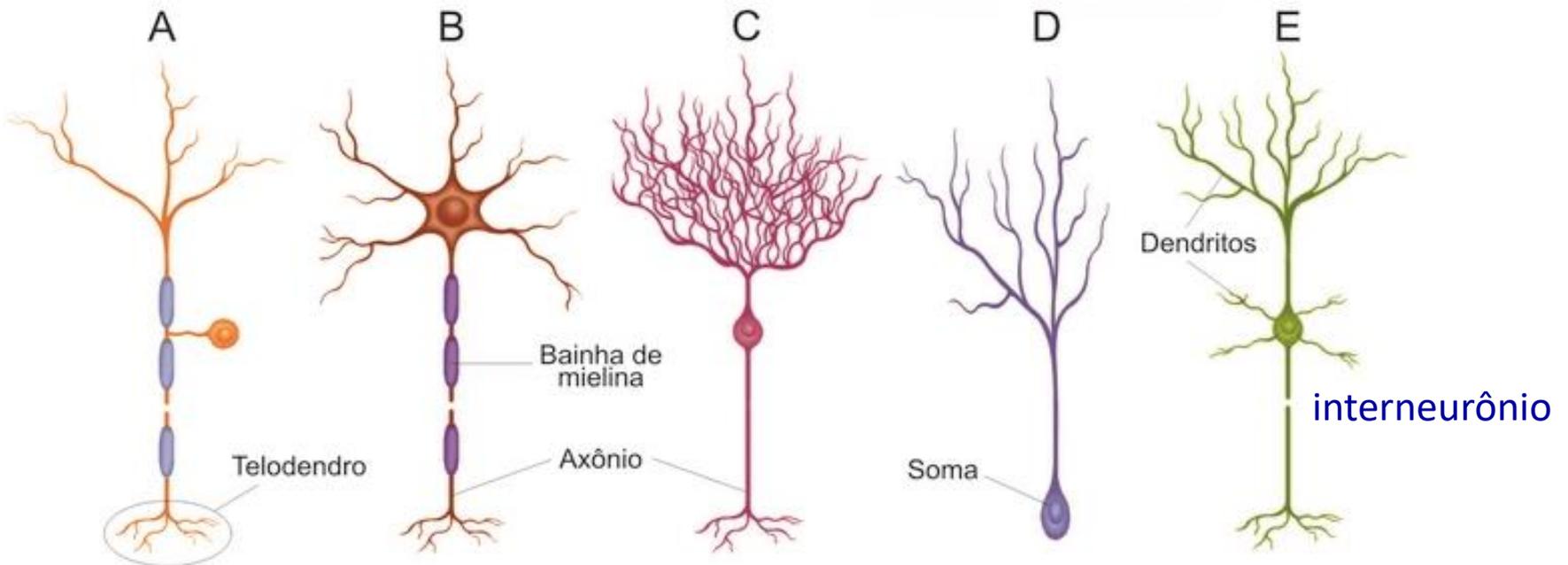
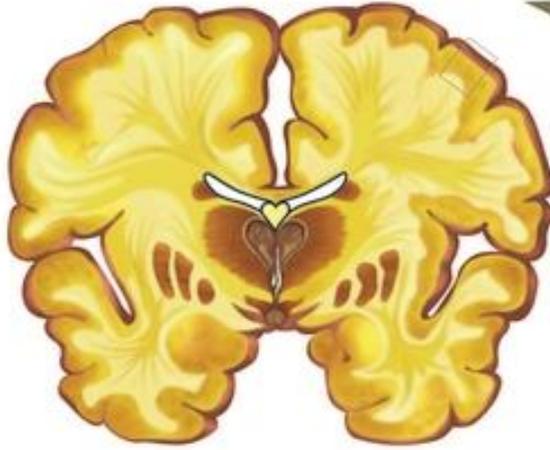
**Aferentes ou sensoriais:** transmitem o impulso nervoso de diversas partes do corpo para os centros nervosos (encéfalo e medula espinhal).

**Eferentes ou motores:** transmitem o impulso nervoso dos centros nervosos para os músculos glândulas e vísceras.

**Interneurônios ou de associação:** transmitem o impulso nervoso entre neurônios aferentes e eferentes.

# Classificação dos Neurônios: Segundo a Estrutura

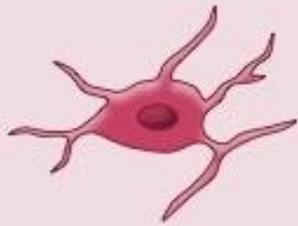




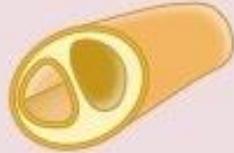
Diversos tipos morfológicos, localizados em diferentes regiões do sistema nervoso: Pseudounipolar (A), Estrelado (B), de Purkinje (C), Unipolar (D) e Piramidal (E).

# NEURÓGLIAS (CÉLULAS GLIAS)

\*A palavra “glia” vem do grego e significa cola.

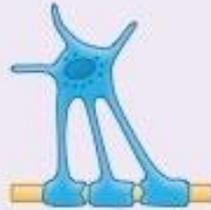


Satellite cells

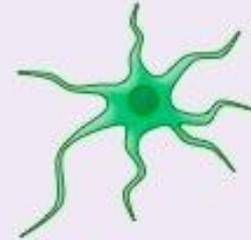


Schwann cells

Peripheral Nervous System



Oligodendrocytes



Astrocytes



Microglia



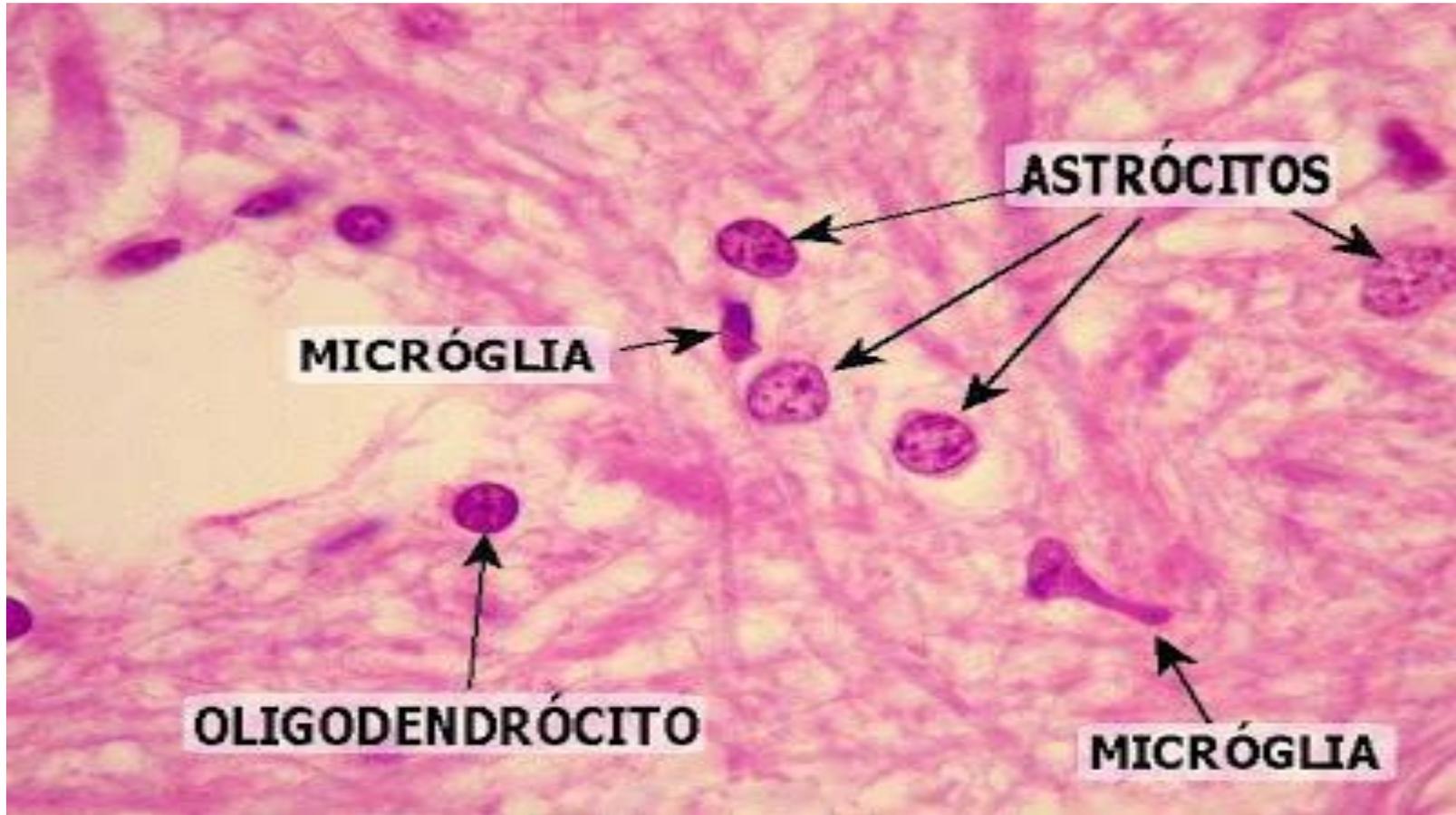
Ependymal cells

Central Nervous System

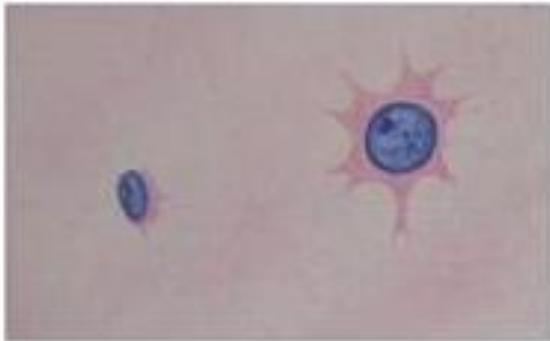
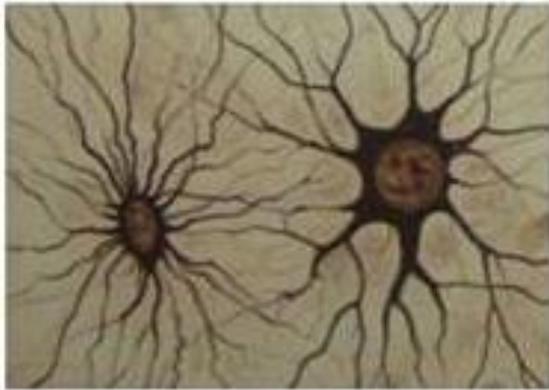
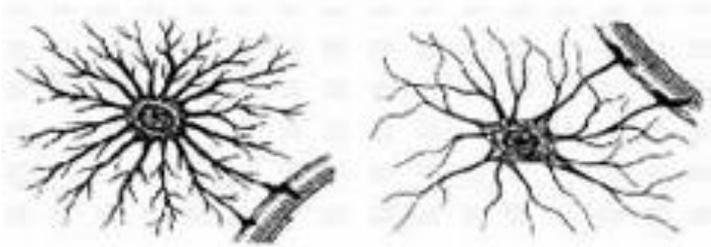


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# NEURÓGLIAS (CÉLULAS GLIAS)

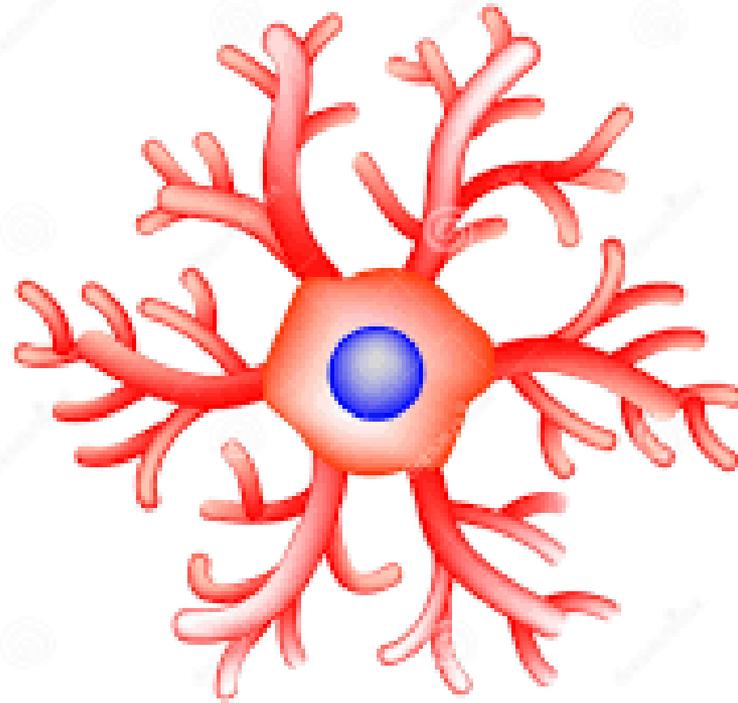


# ASTRÓCITOS



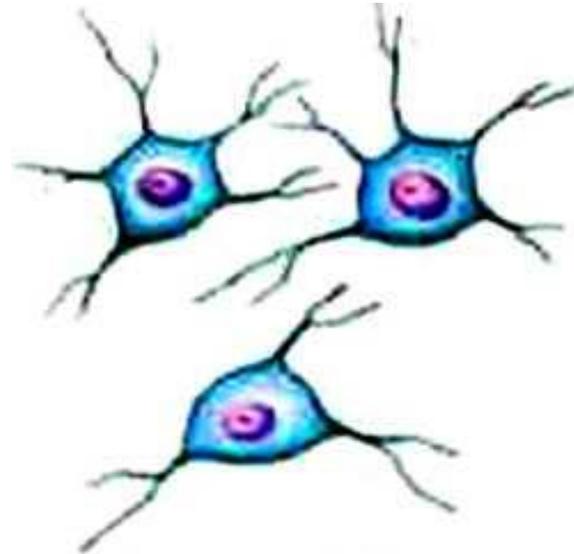
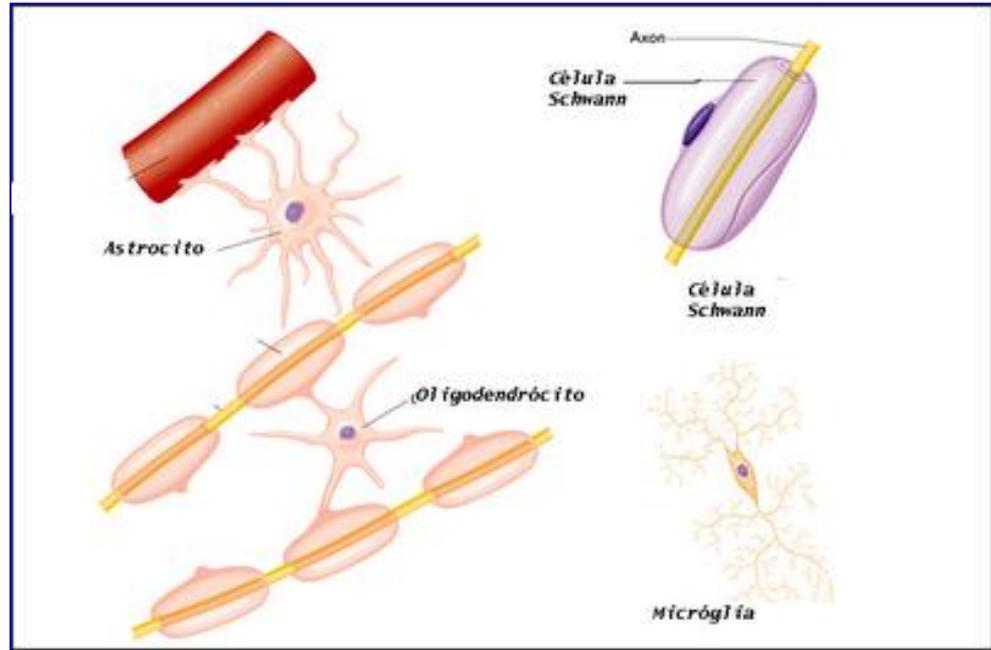
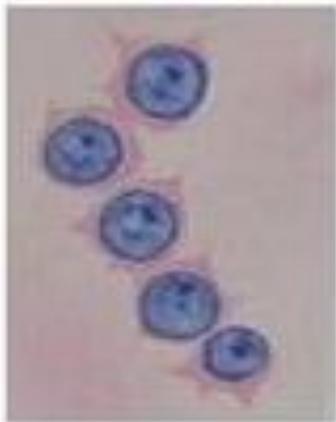
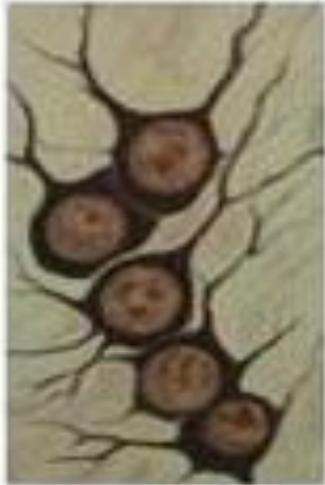
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# MICRÓGLIA

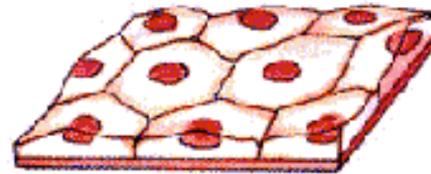
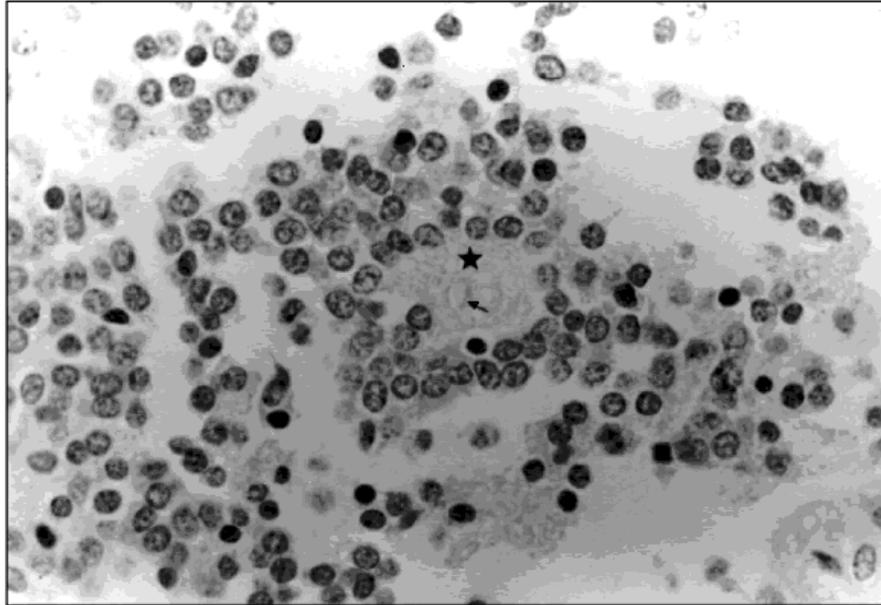


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# MICRÓGLIA



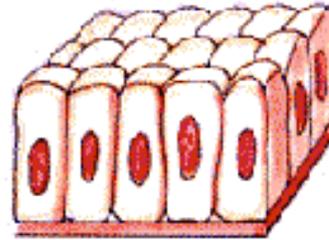
# CÉLULAS EPENDIMÁRIAS



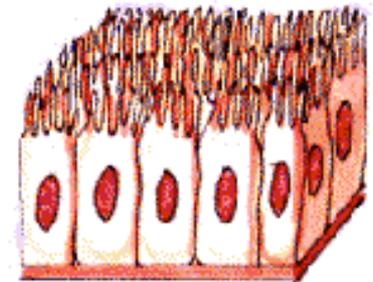
Epitelio plano



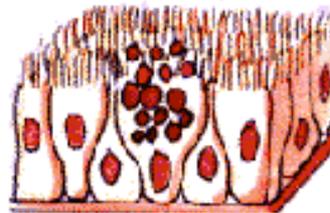
Epitelio cúbico



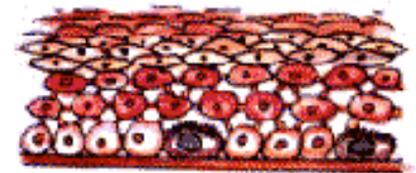
Epitelio cilíndrico simple



Epitelio cilíndrico ciliado



Epitelio con células

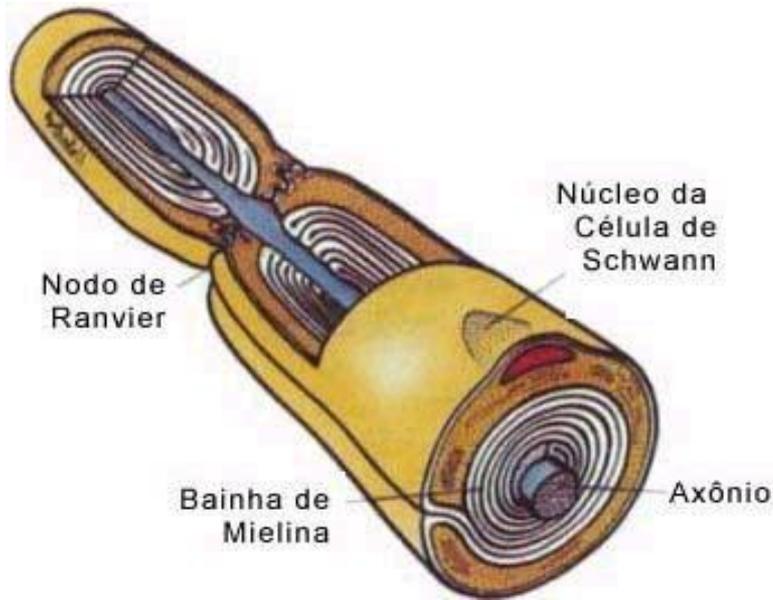
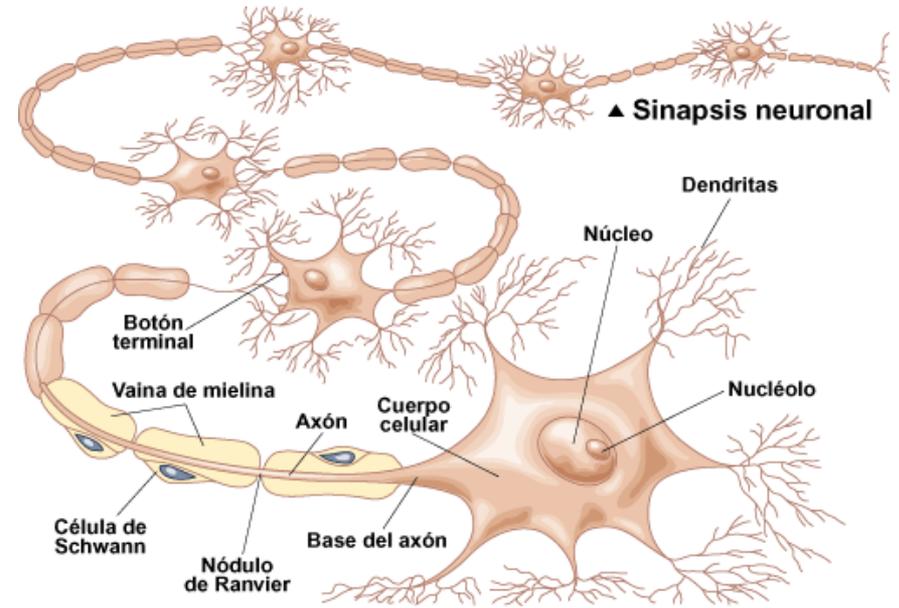


Epitelio plano estratificado



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# CÉLULAS DE SCHVANN

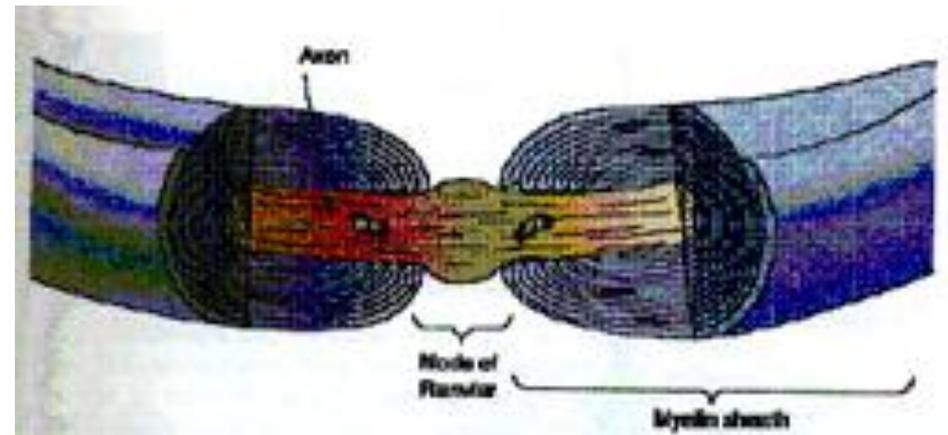


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# BAINHA DE MIELINA

## 2 FORMAÇÕES

- Nódulos de Ranvier
- Condução



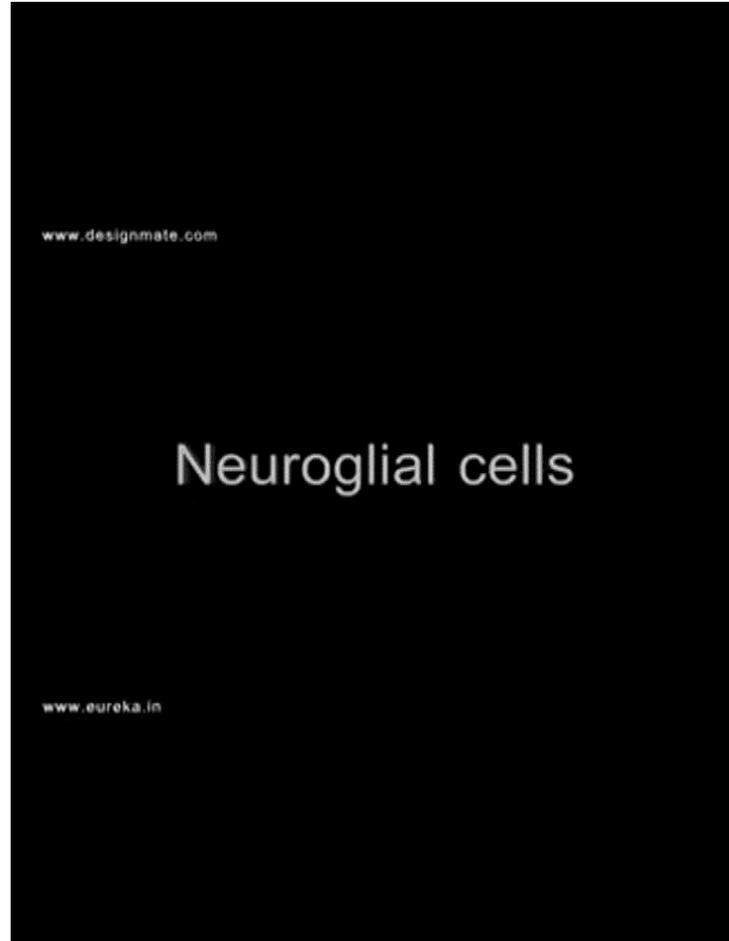
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# Ação das Glías no SNC (Tipos)



Aperte o play

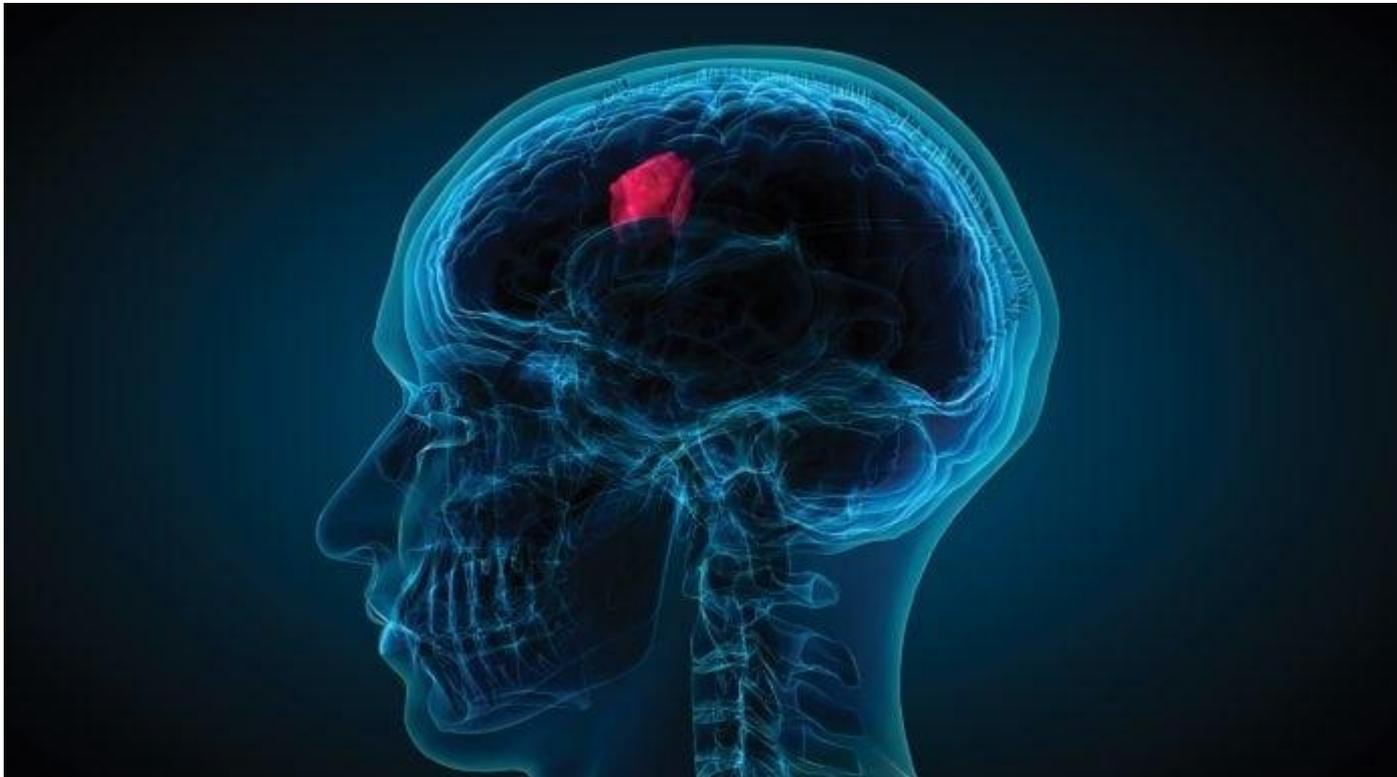
# Ação das glias no SNC (Função)



Aperte o play

# GLIOMAS

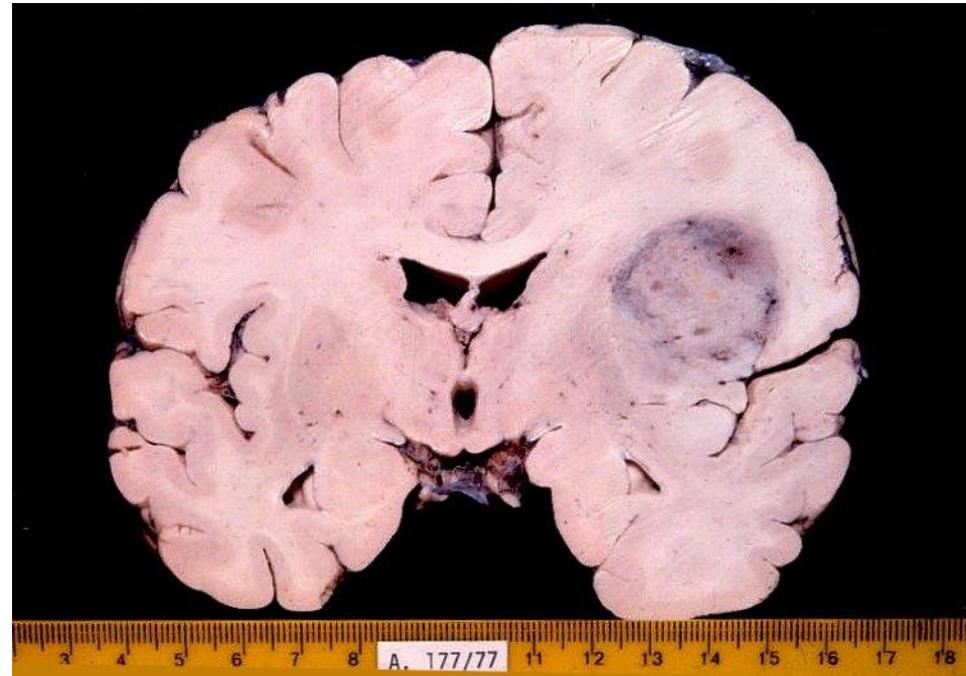
**O termo é usado para tumores originados em células da glia: astrocitomas, glioblastomas, oligodendrogliomas e ependinomas.**



# ASTROCITOMAS

Variam de aspecto e comportamento biológico conforme o local de origem no SNC.

Os astrocitomas mais malignos são chamados de glioblastoma multiforme (grau IV).



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RIO

# GLIOBLASTOMAS - INFILTRAÇÃO



- Glioblastomas têm alto poder infiltrativo e podem propagar-se à distância no mesmo hemisfério através de tratos da substância branca.
- Podem também propagar-se ao outro hemisfério pelo corpo caloso, como demonstrado aqui.
- A isto se chama 'tumor em asa de borboleta'. Apesar da tendência a infiltrar o tecido nervoso, glioblastomas praticamente nunca dão metástases fora do SNC.

# TECIDO NERVOSO: NEURÔNIO E NEURÓGLIAS (GLIAS)

## BIPOLARES

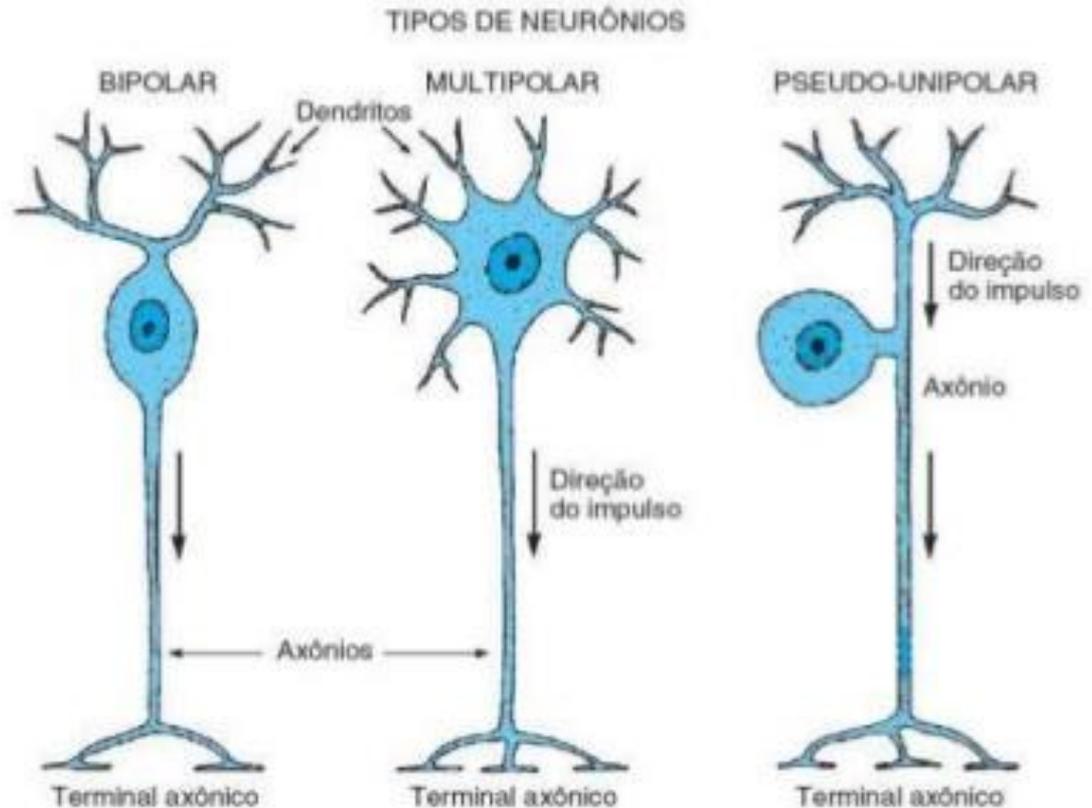
Apresenta um único axônio e um único dendrito.

## MULTIPOLARES

Apresentam um único axônio e vários dendritos.

## PSEUDO-UNIPOLARES

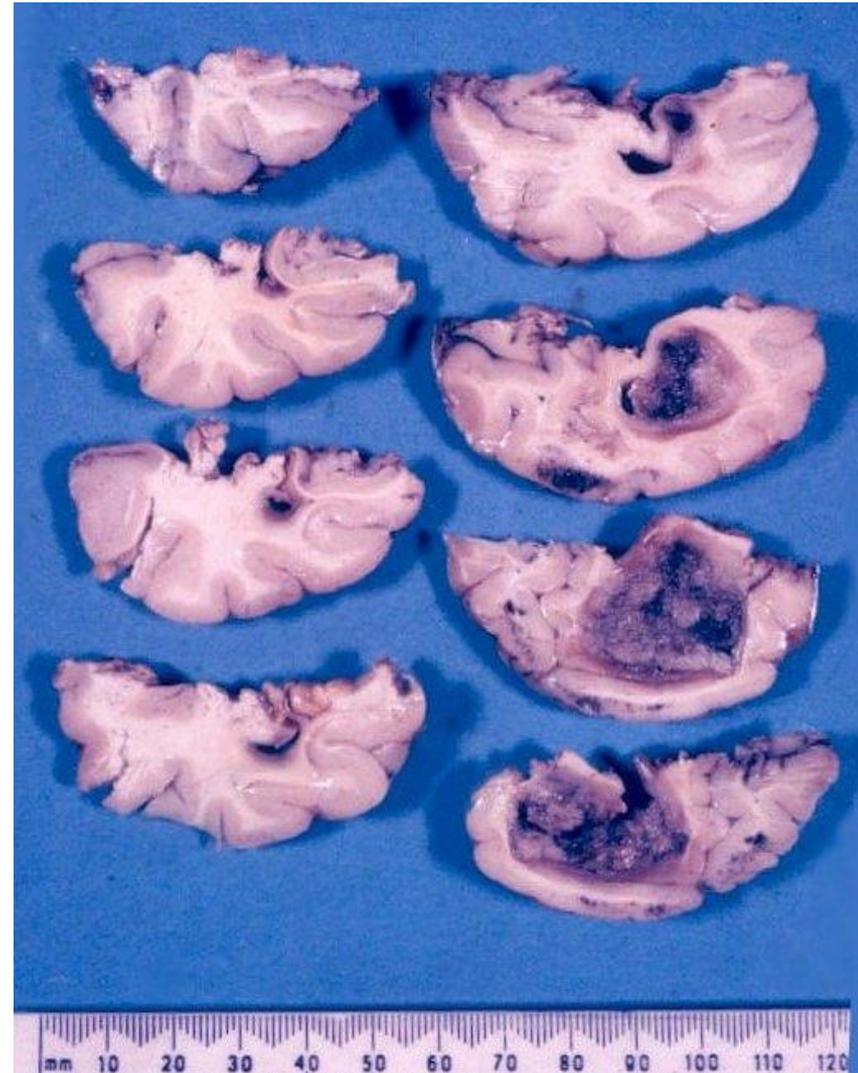
Apresentam um único axônio com uma só neurofibra.



# OLIGODENDROGLIOMAS

**São tumores de hemisfério cerebral de adultos, com incidência menor que os astrocitomas e glioblastomas.**

**Macroscopicamente, formam massas acinzentadas, geralmente melhor delimitadas que os astrocitomas.**

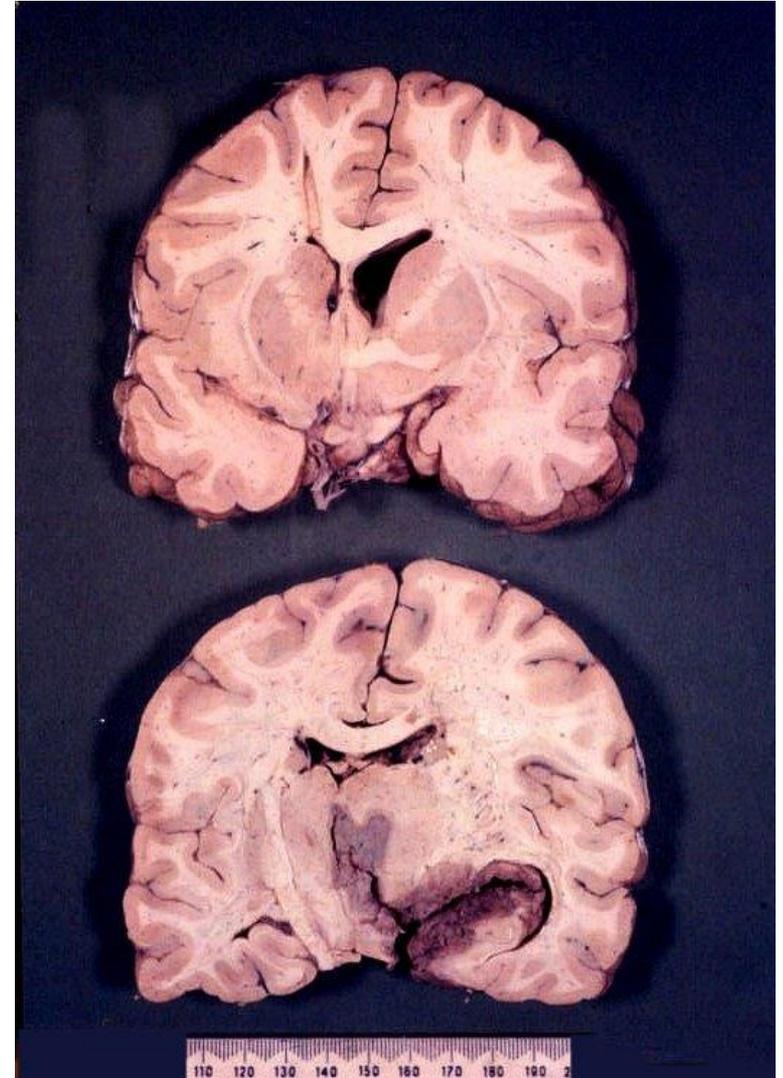


# Ependinomas

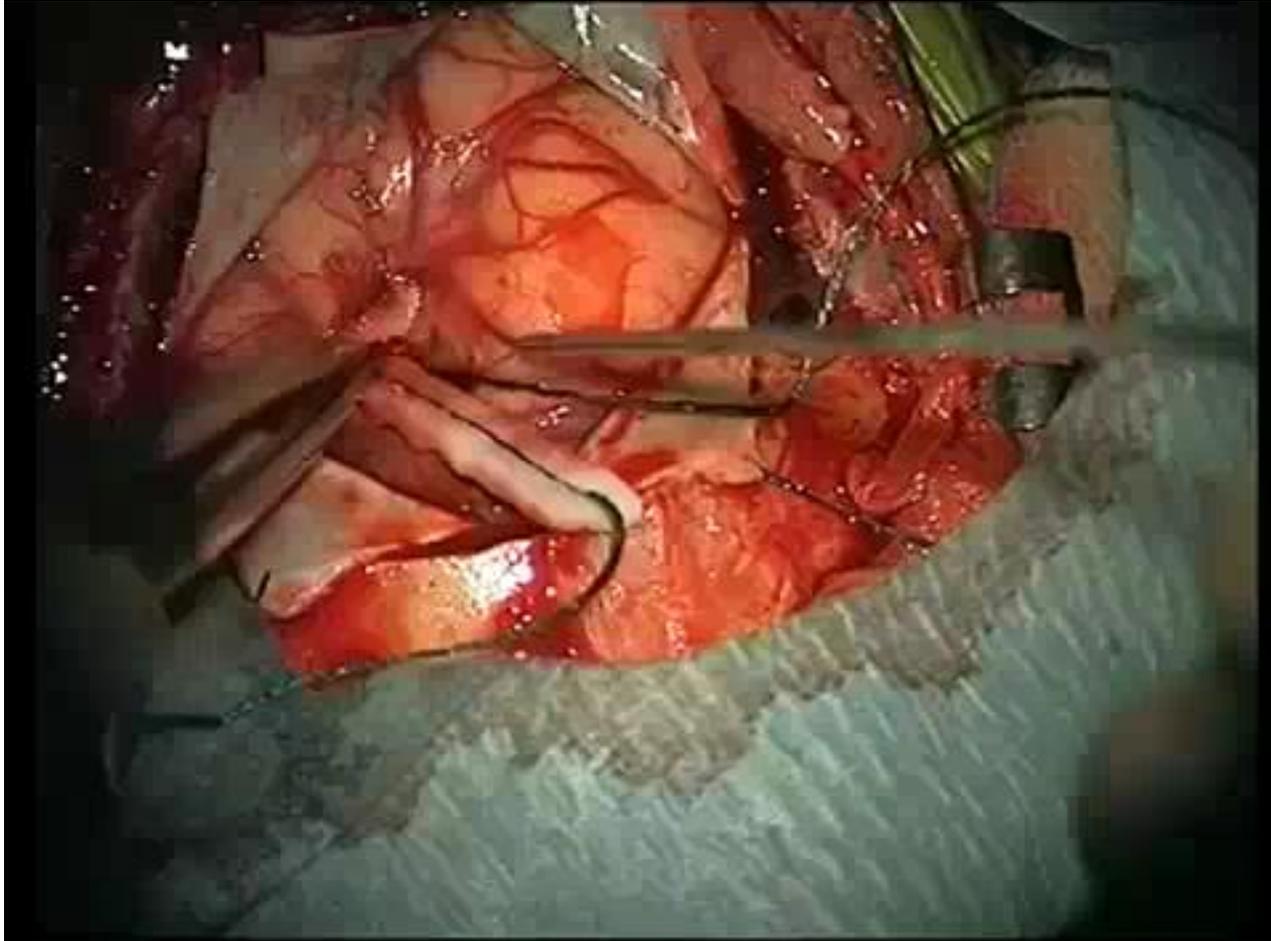
**São neoplasias de células ependimárias, portanto em relação topográfica com os ventrículos.**

**Podem originar-se nos ventrículos laterais ou no IV<sup>o</sup> ventrículo.**

**A distribuição etária é ampla, indo de crianças até a idade adulta.**

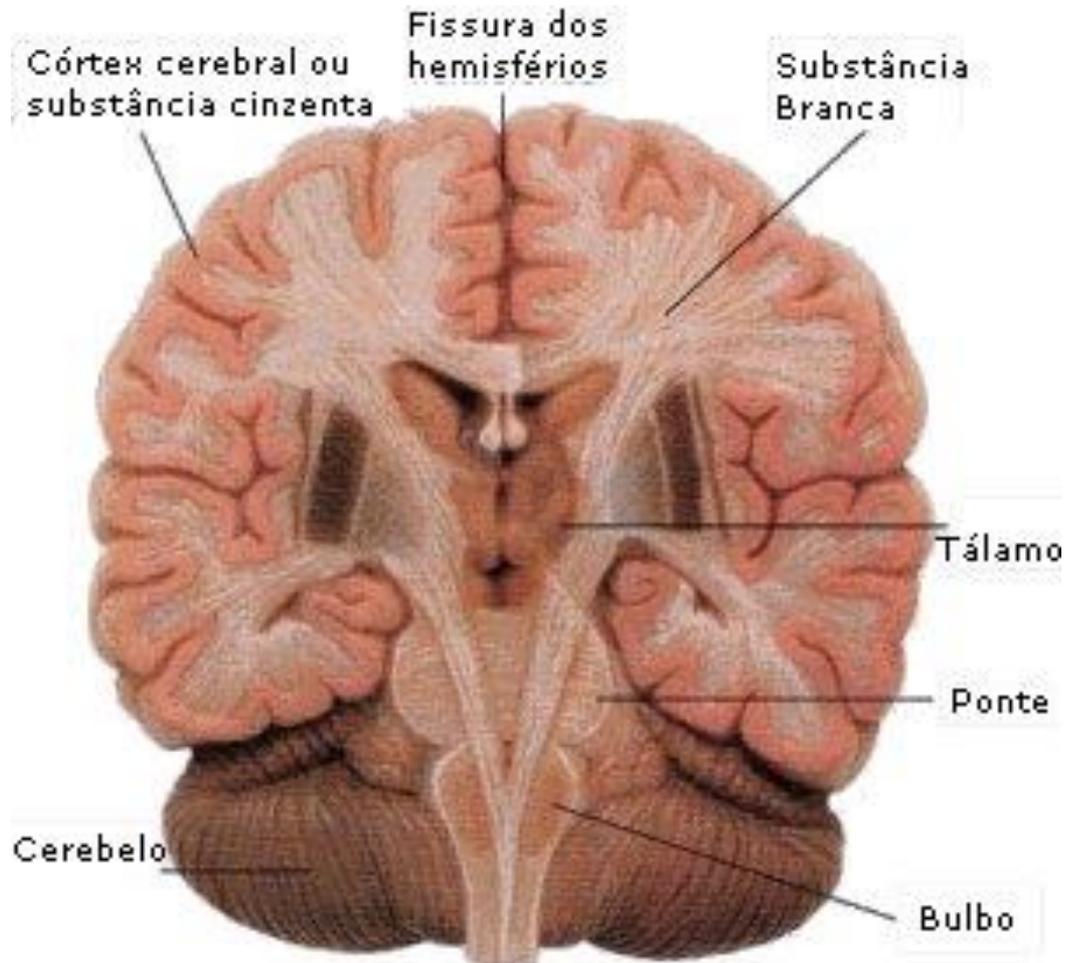
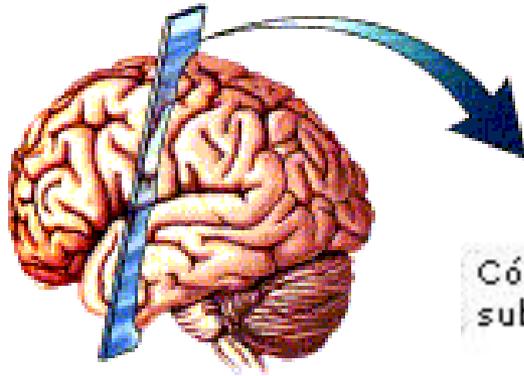


# Cirurgia de Glioblastoma



**Aperte o play**

# Substância Branca e Substância Cinzenta



# NERVOS



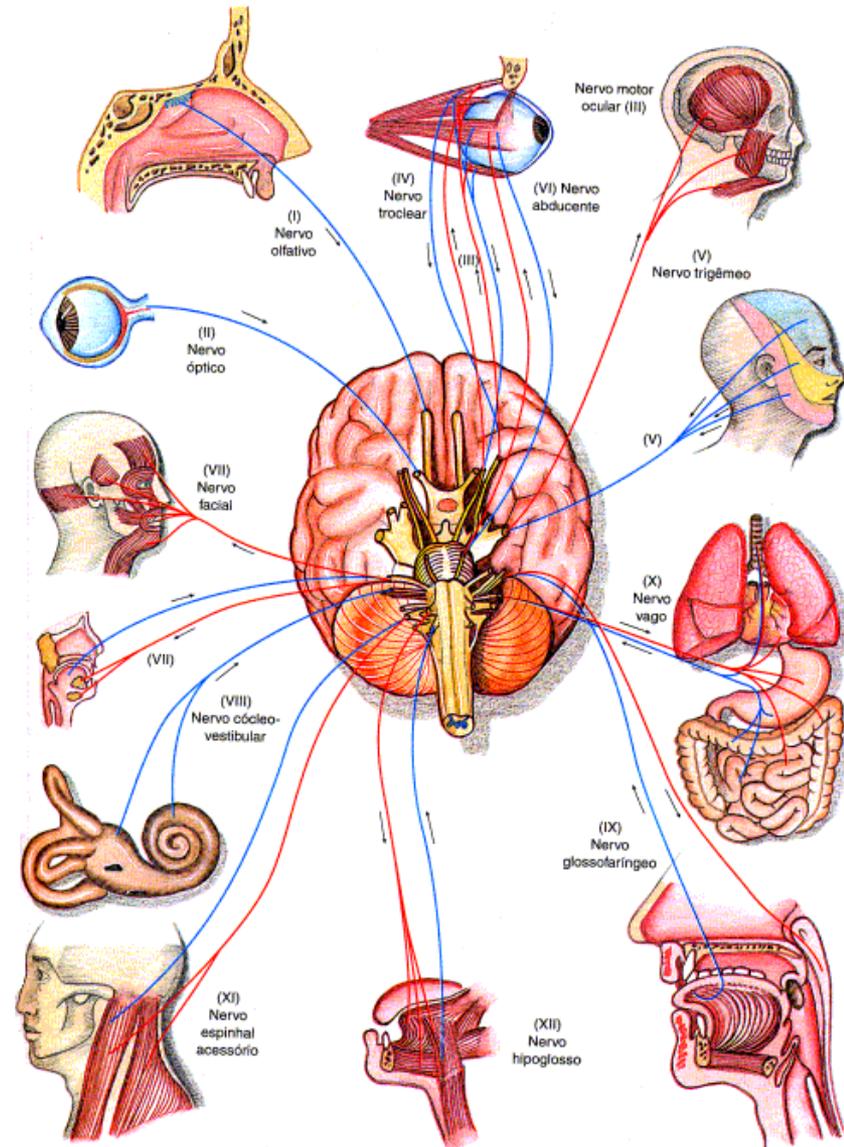
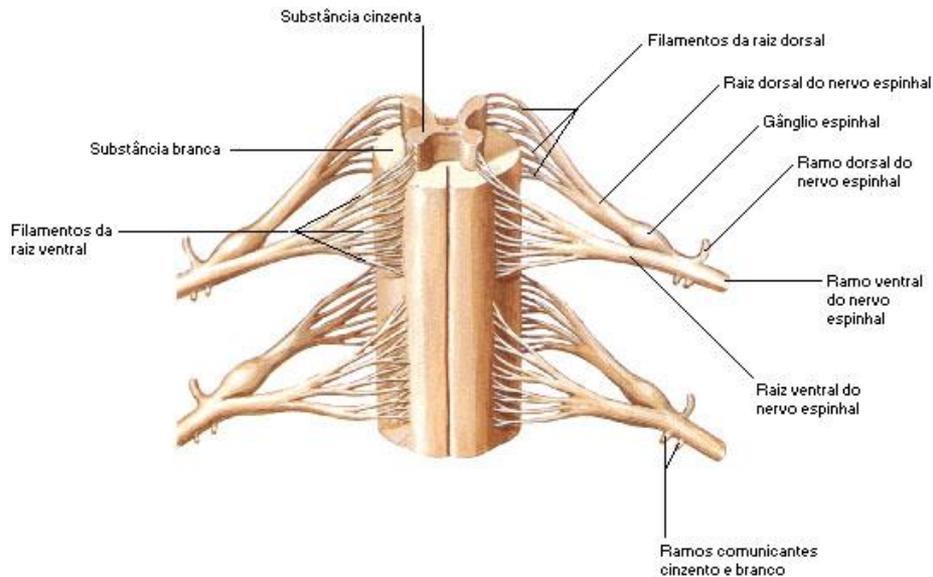
Aferentes

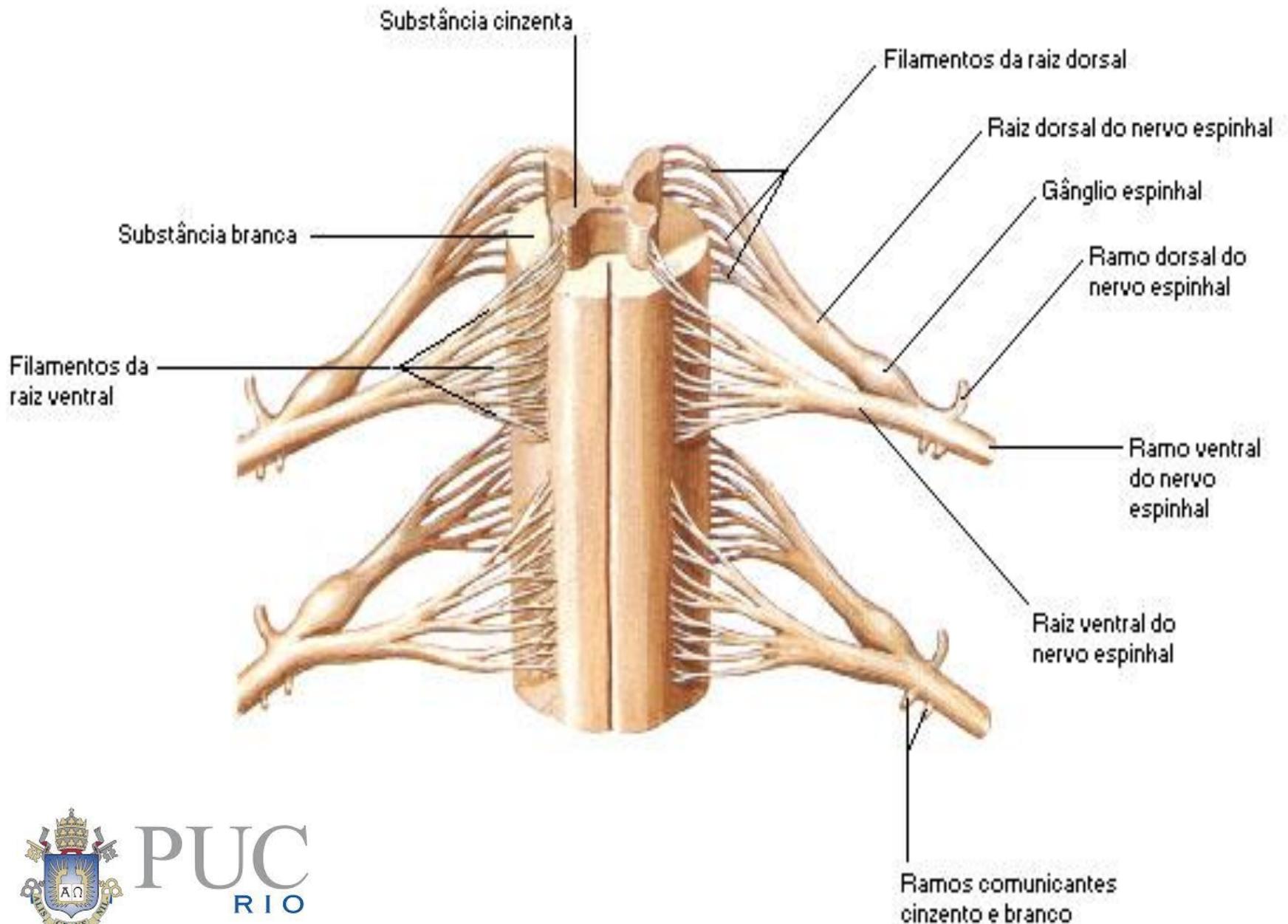


Eferentes



Mistos



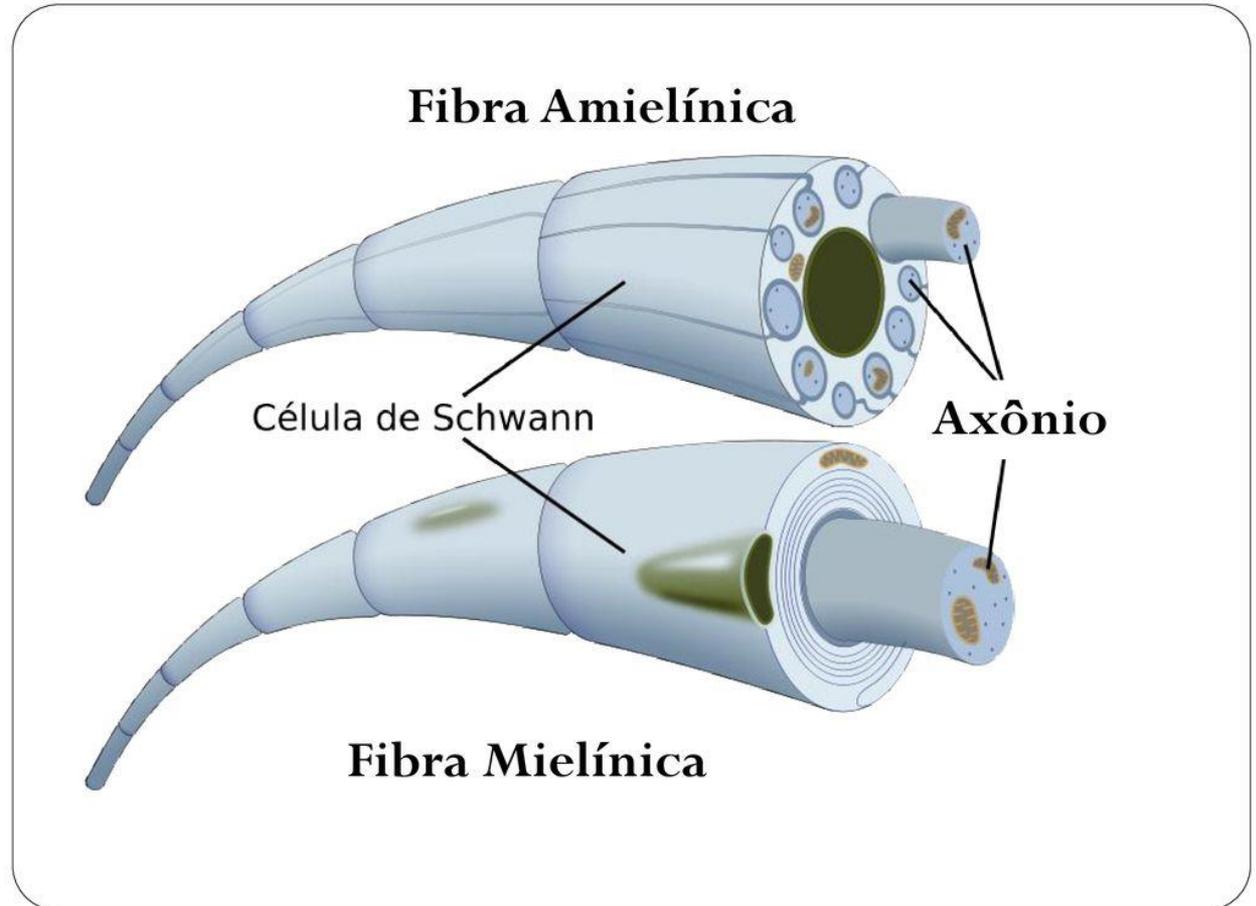


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RIO

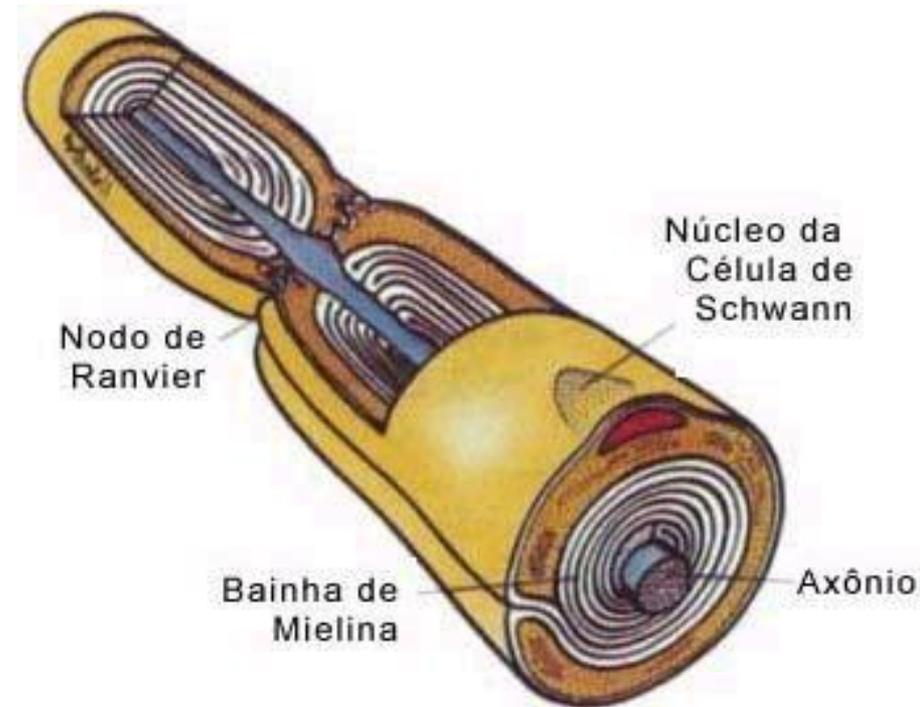
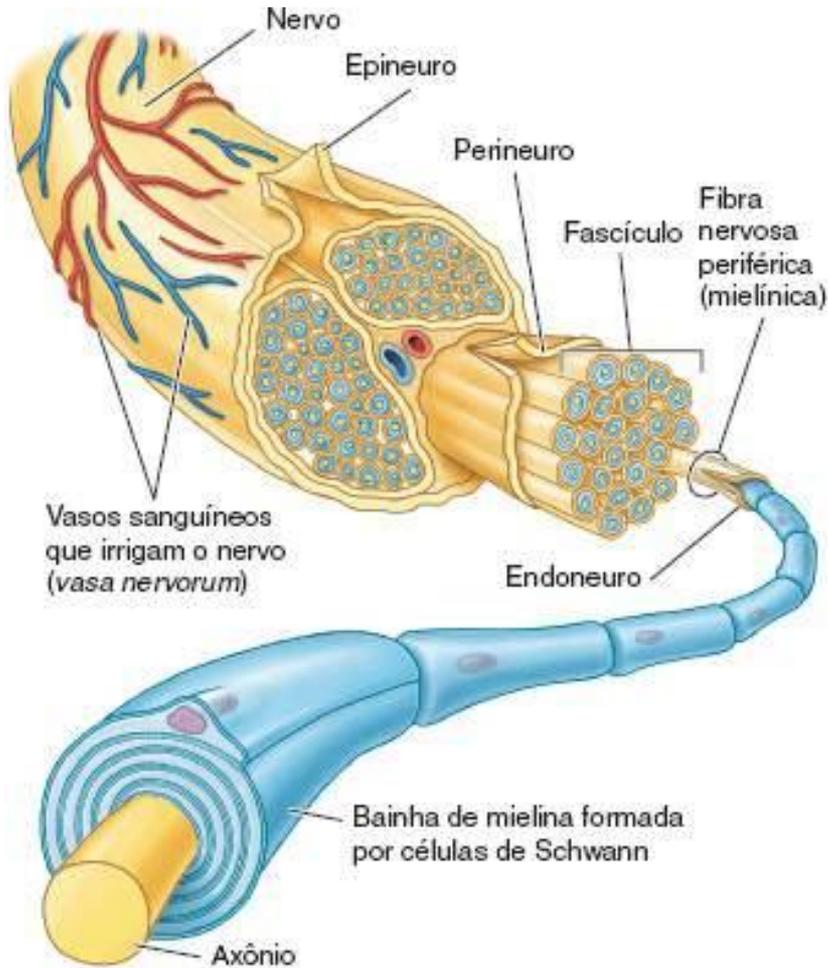
# Fibras Nervosas

⇒ Mielínicas

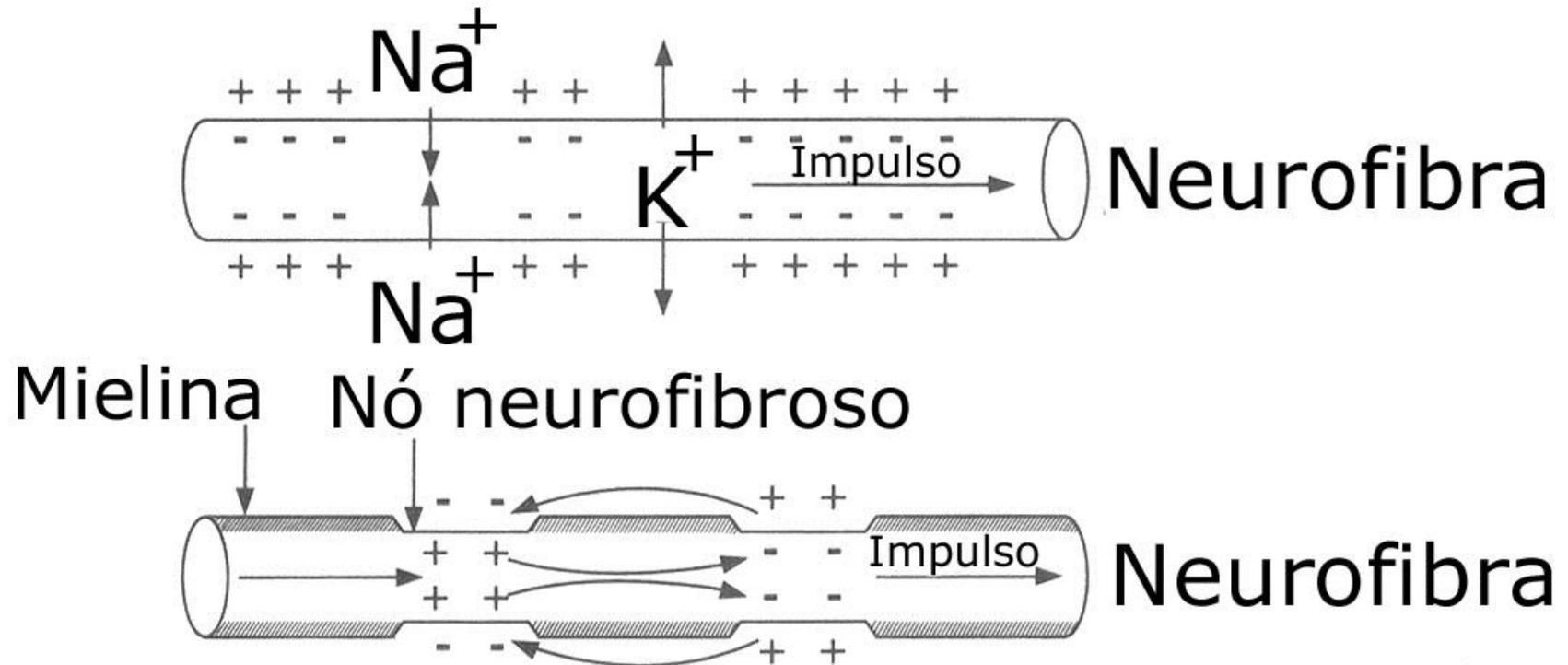
⇒ Amielínicas



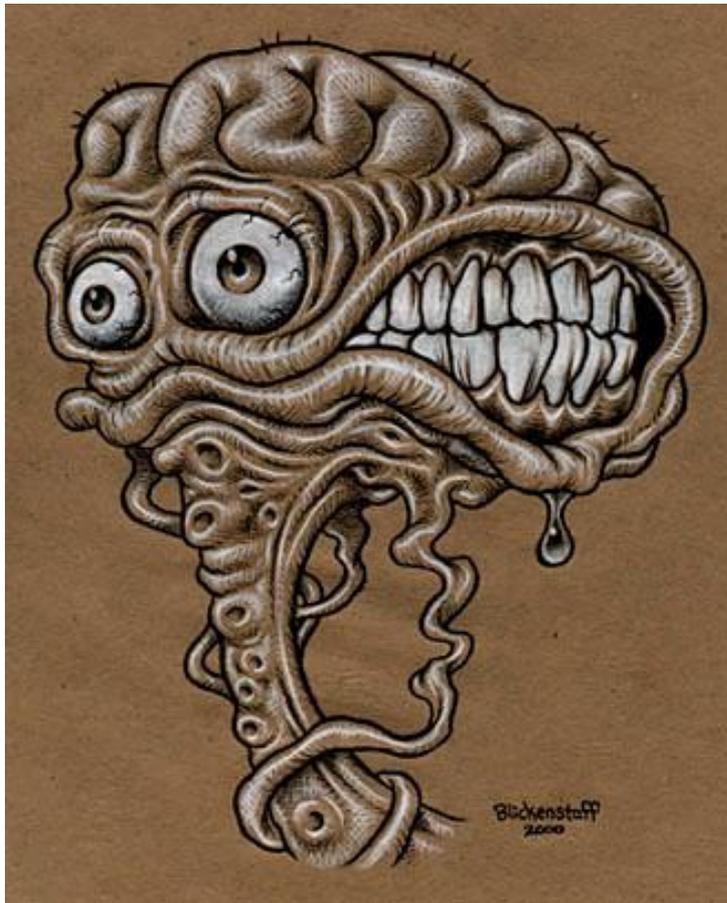
# Fibras Nervosas Mielínicas



# Fibras Nervosas Amielínicas



# FIQUE DE OLHO!



**Fim da Unidade I**



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