

# EXCREÇÃO

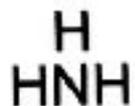
## **EXCREÇÃO**

1. Manutenção de concentrações apropriadas de solutos
2. Manutenção de um volume corpóreo adequado
3. Eliminação de produtos metabólicos
4. Eliminação de substâncias estranhas

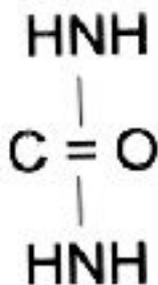
# EXCREÇÃO

1. Produtos de excreção
2. Estruturas de excreção
3. Regulação osmótica

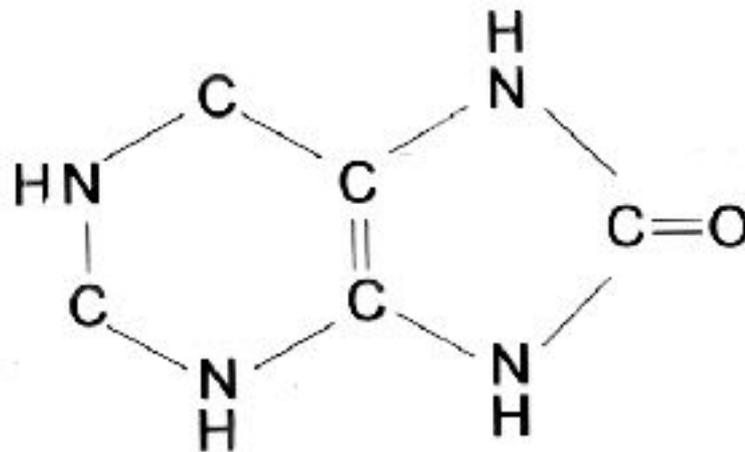
# Excretas nitrogenados



Amônia



Uréia



Ácido úrico

C/N

0

0,5

1,2

Cal. Combustão

378

638

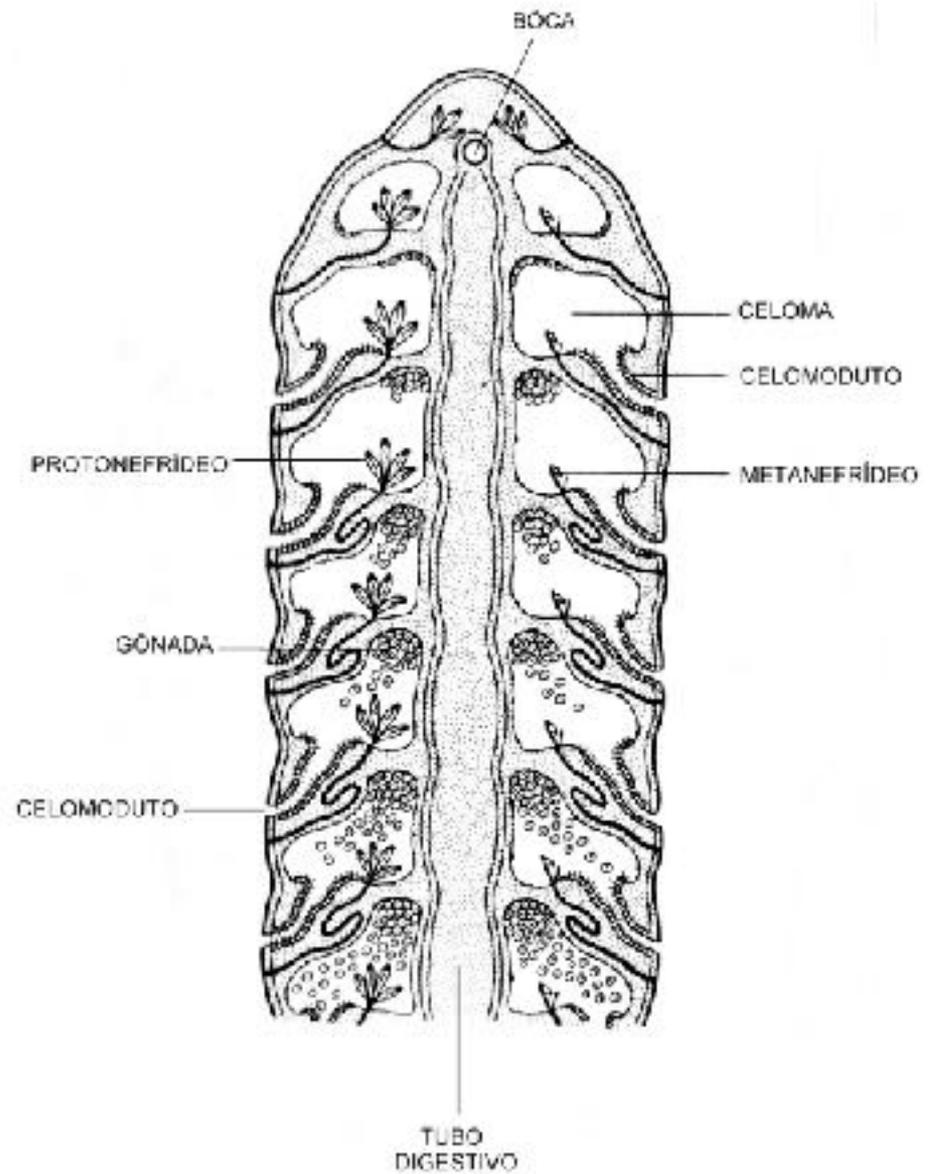
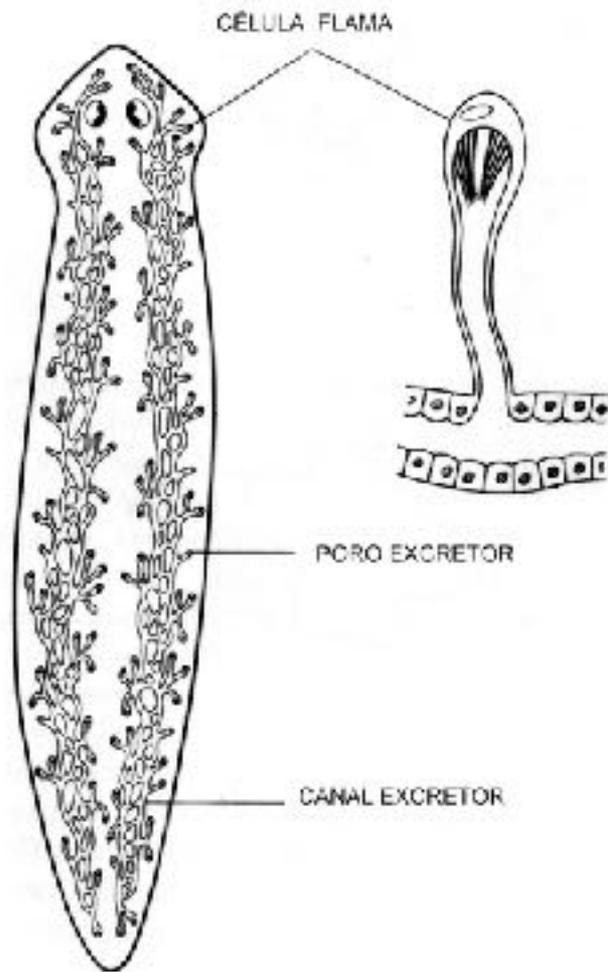
1932

Toxicidade

Necessidade de água



# Protonefrídeo e Metanefrídeo





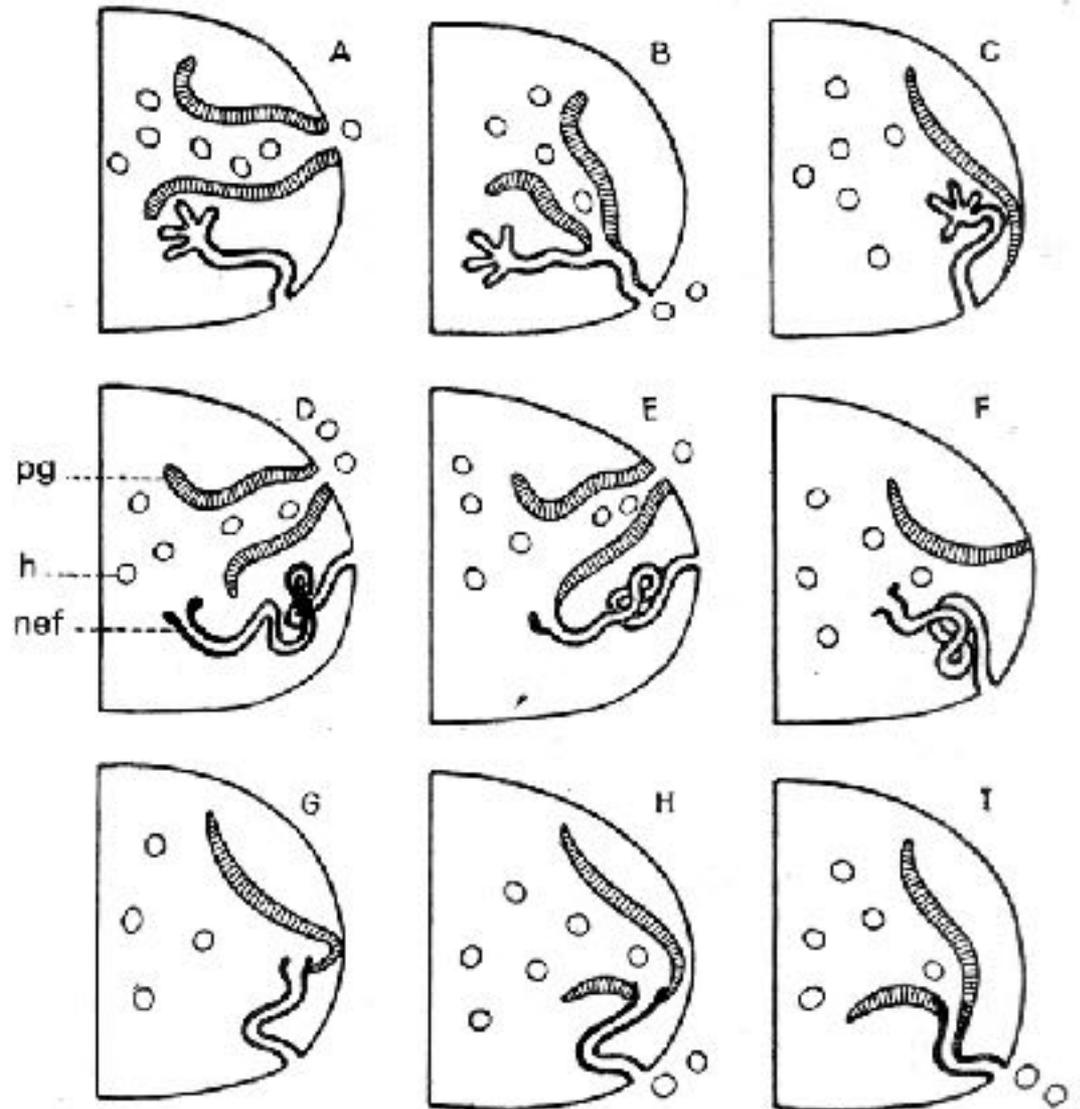
Protonefrídeo (Ectoderme)

Metanefrídeo (Ectoderme)

Celomoduto (Mesoderme)

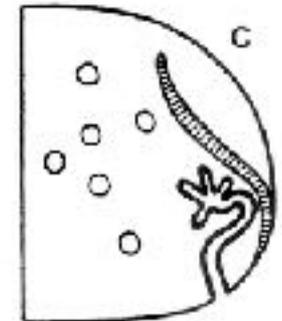
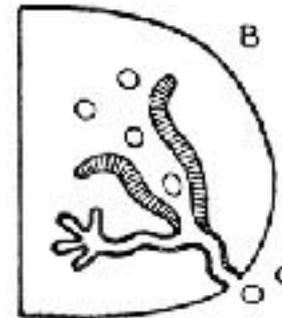
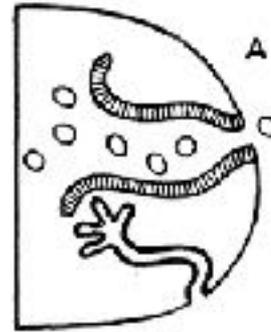
Celomoduto + Nefrídeo

= Mixonefrídeo



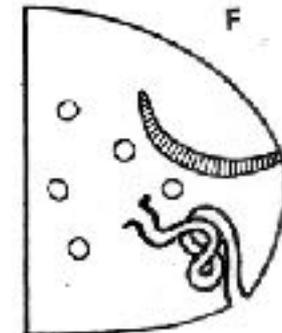
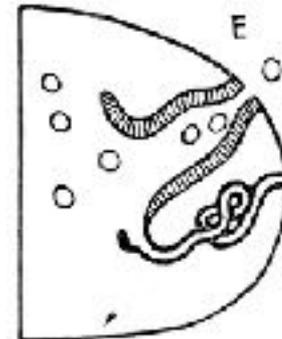
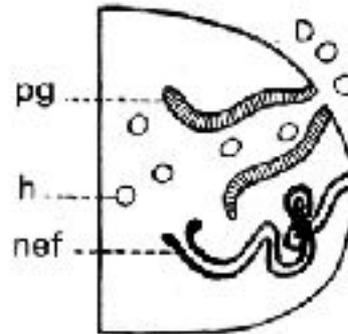
Protonefrídeo

(Polychaeta)



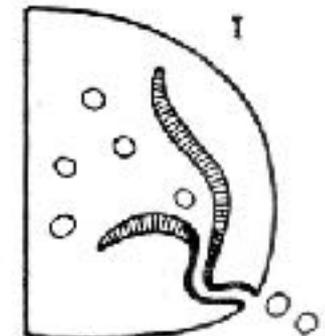
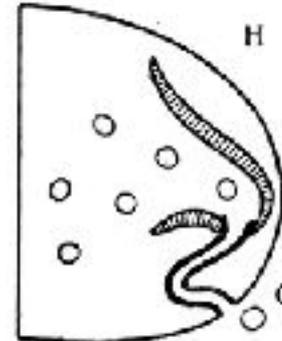
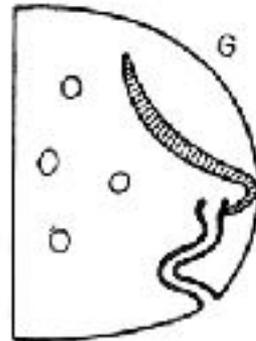
Metanefrídeo

(Polychaeta)

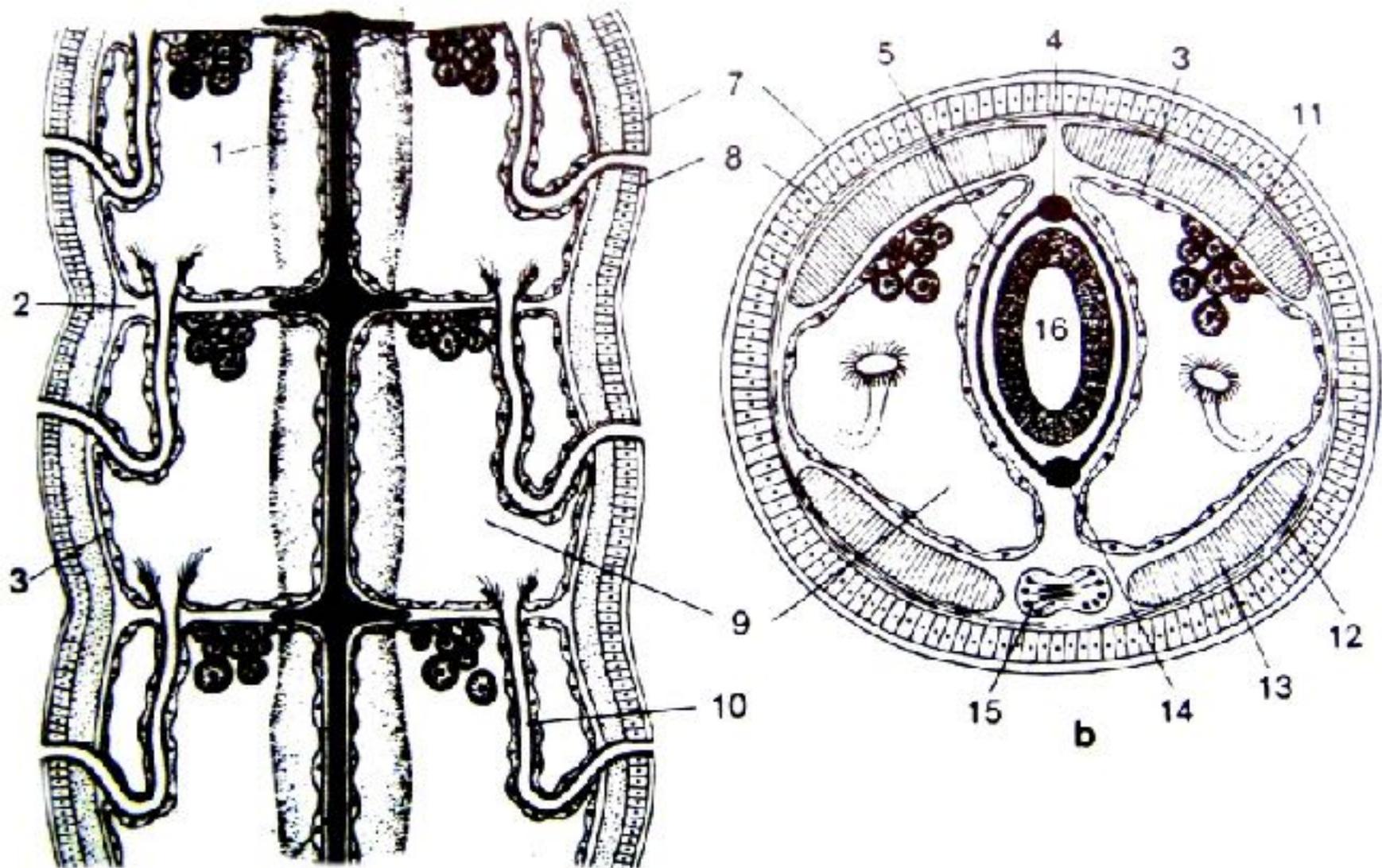


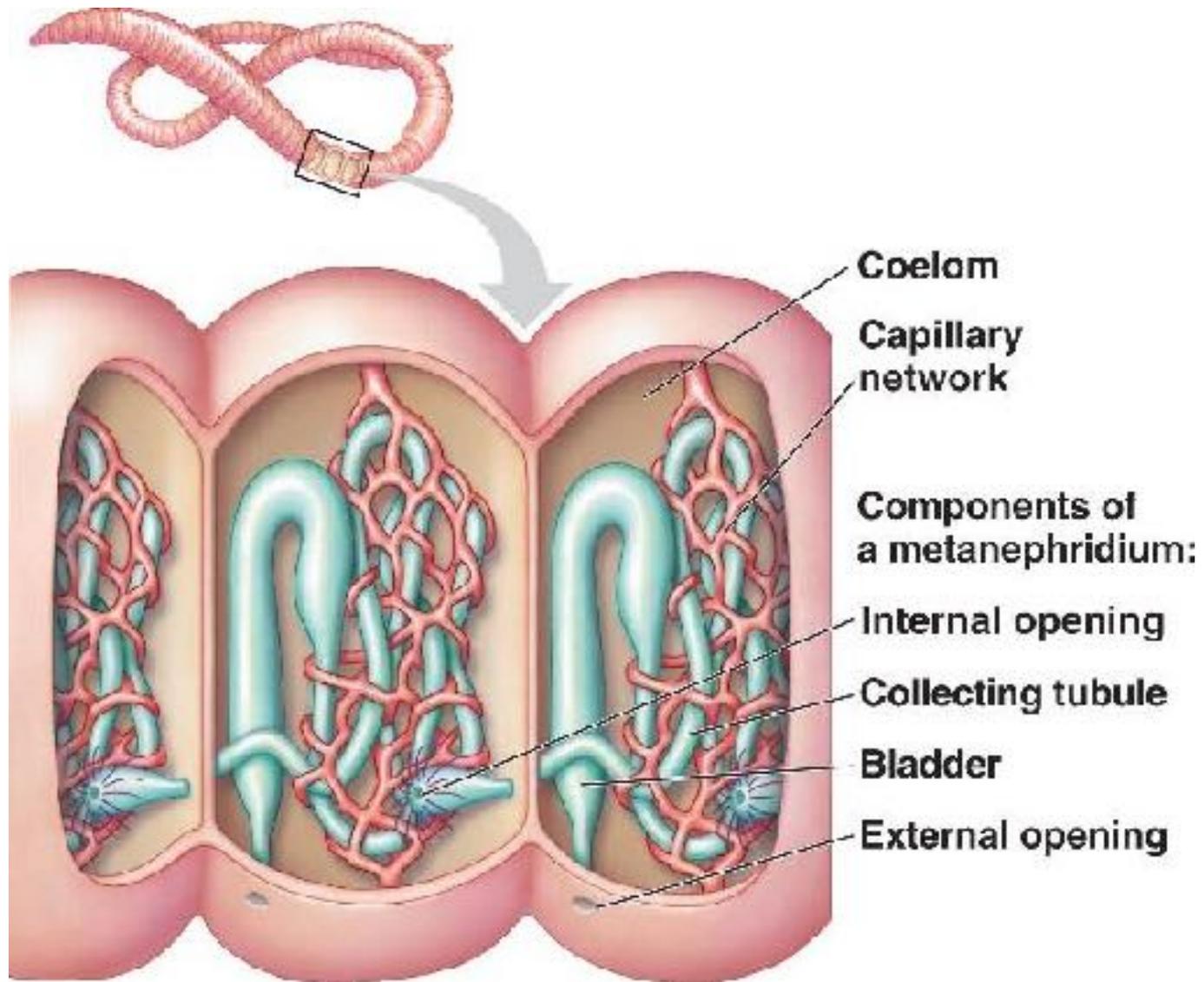
Mixonefrídeo

(Polychaeta & Oligochaeta)

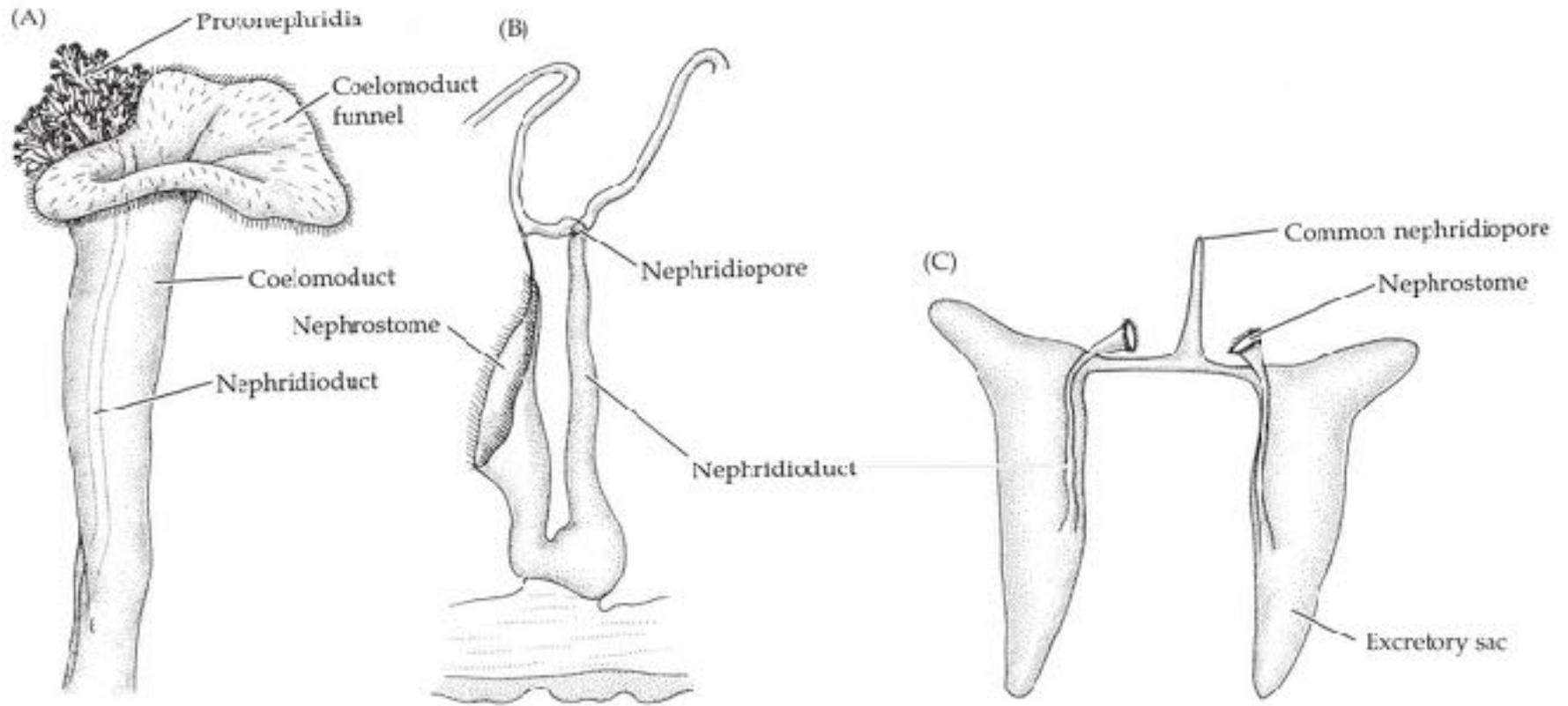


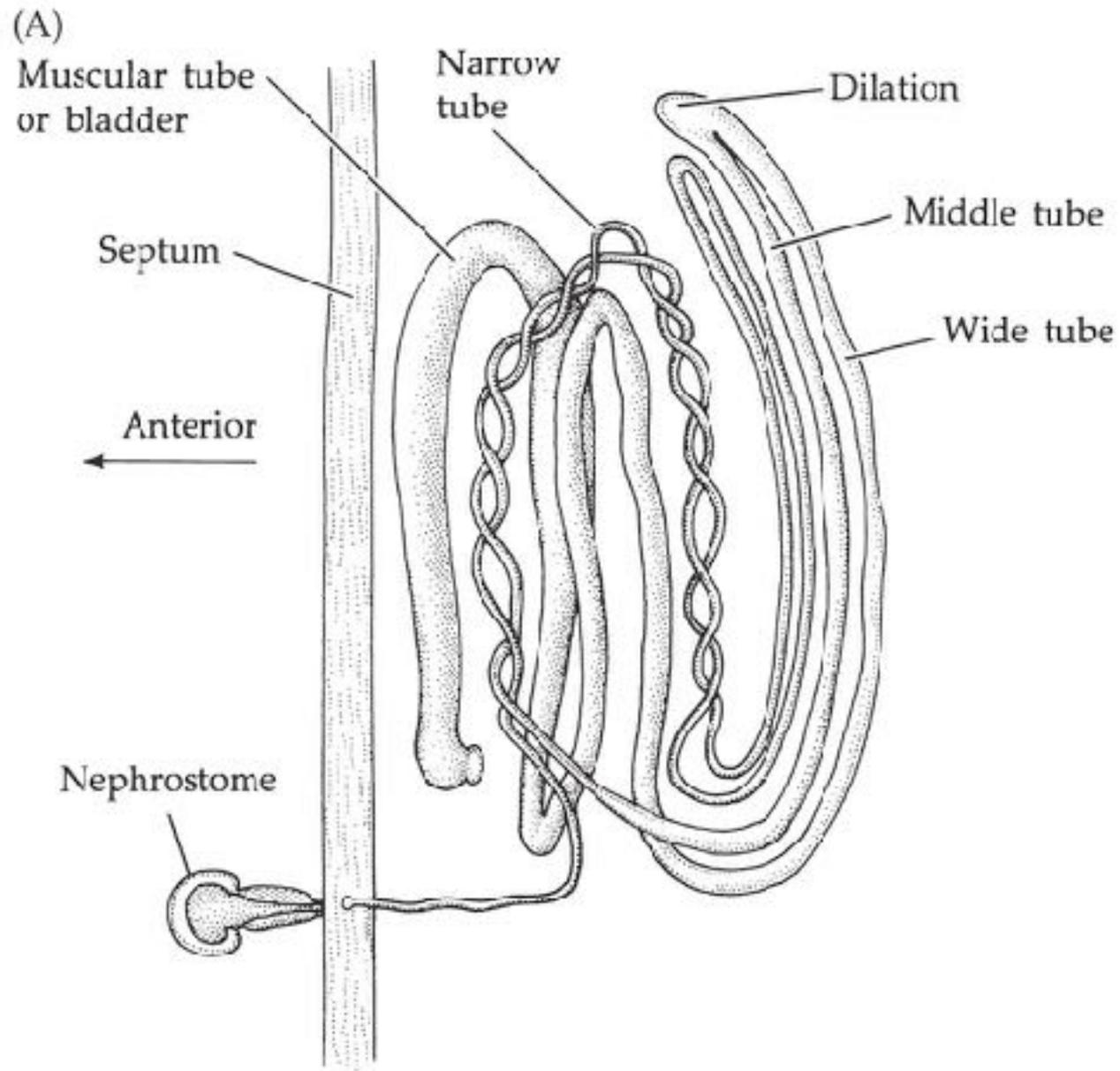
# Mixonefrídeo



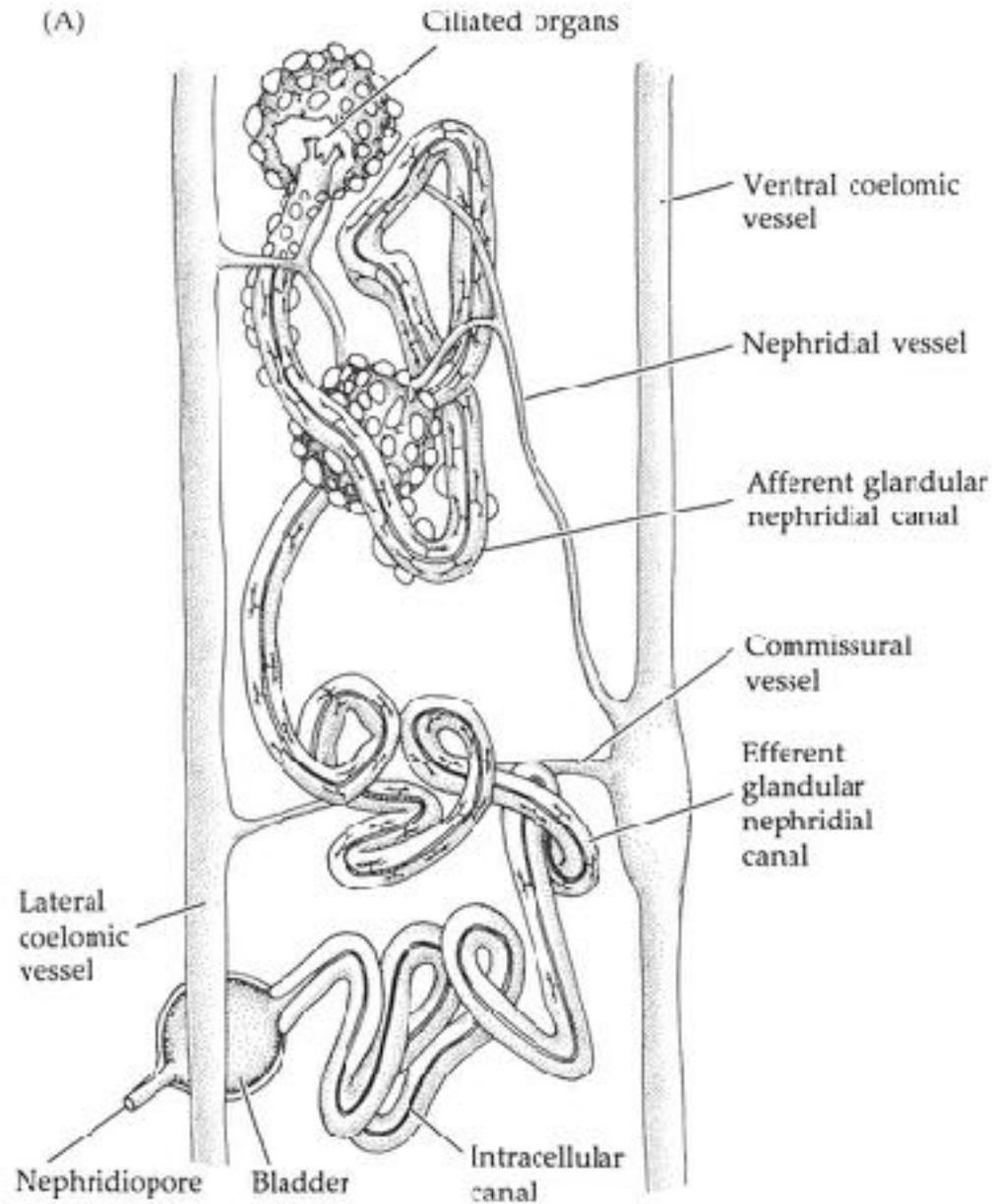


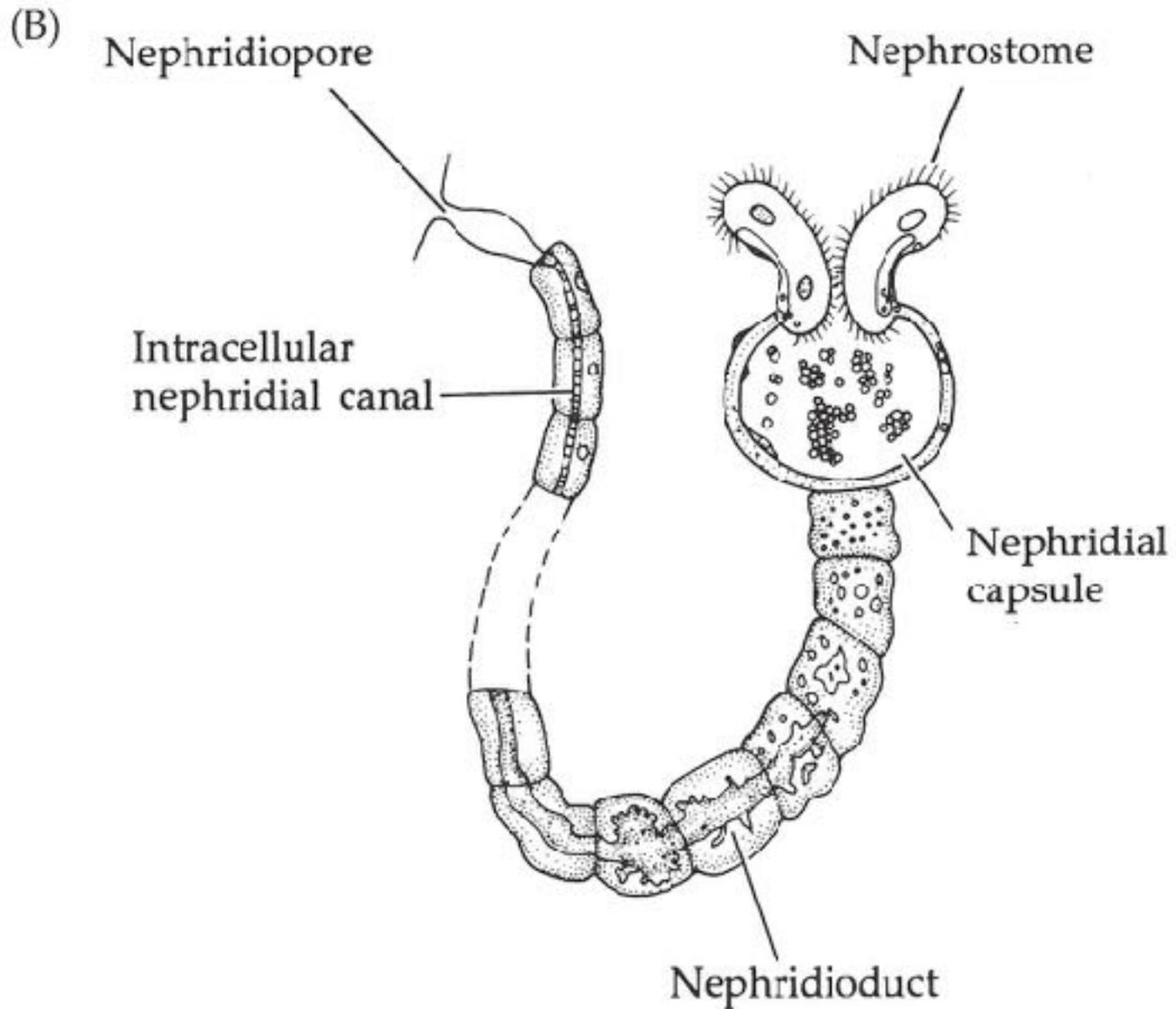
# Mixonefrídeos de Polychaeta





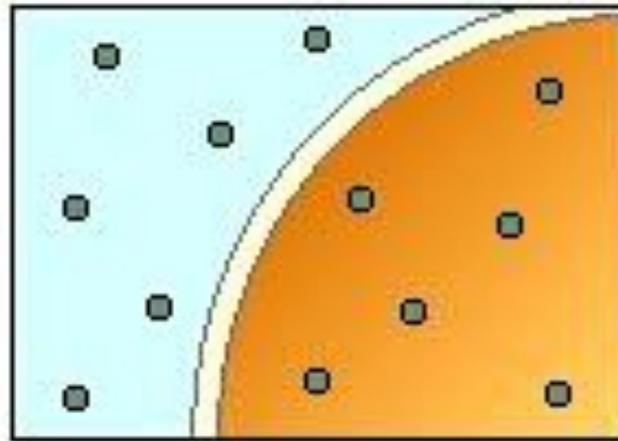
# Nefrídeo de Hirudinea (Órgão ciliar)



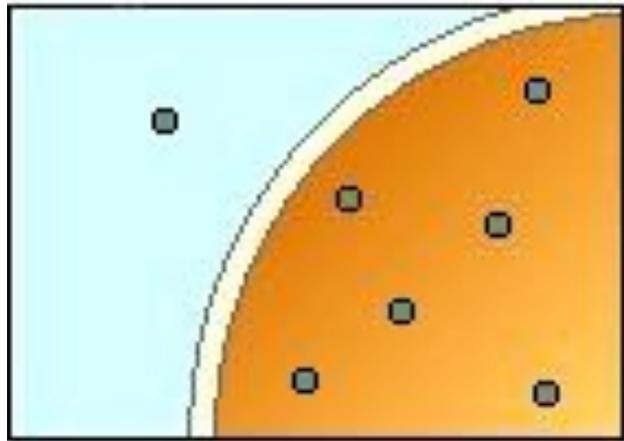


## Ambiente

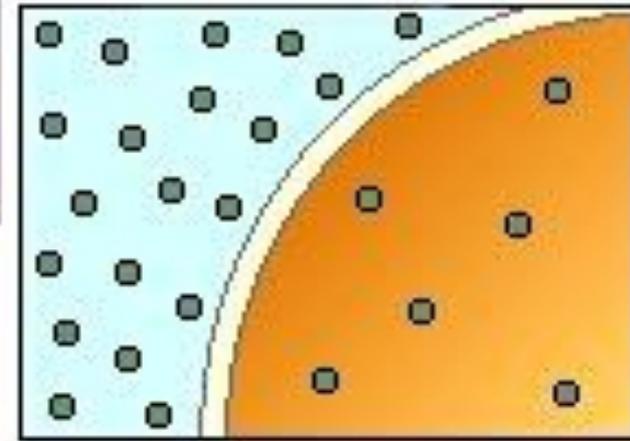
### Isotônico



### Hipotônico

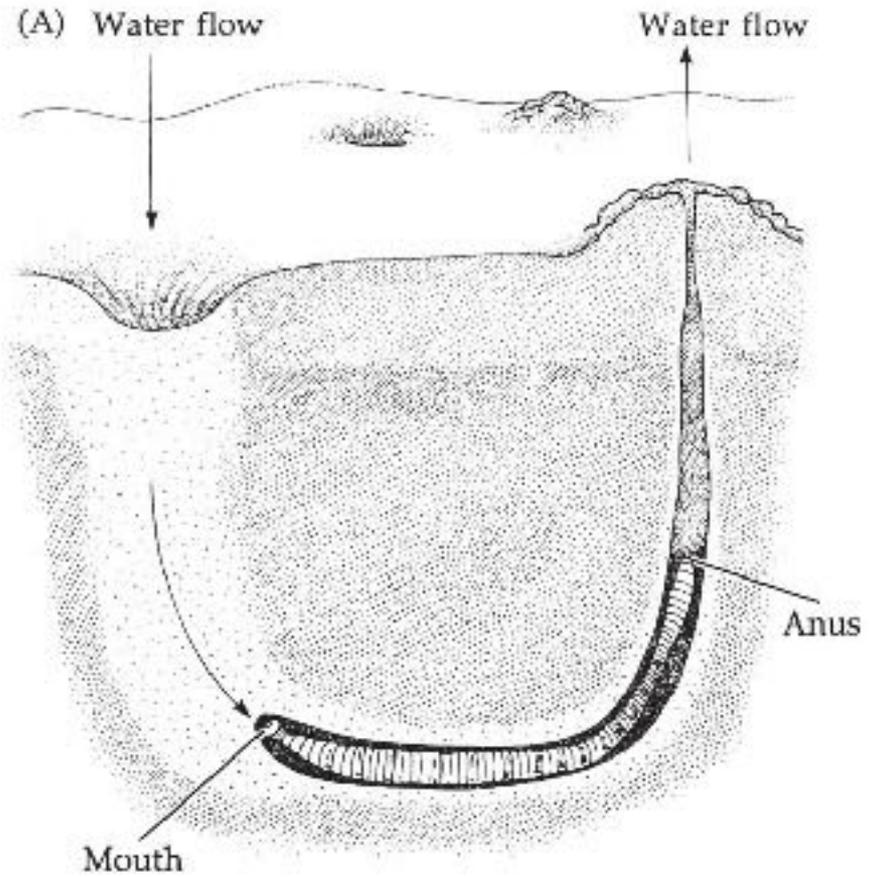


### Hipertônico



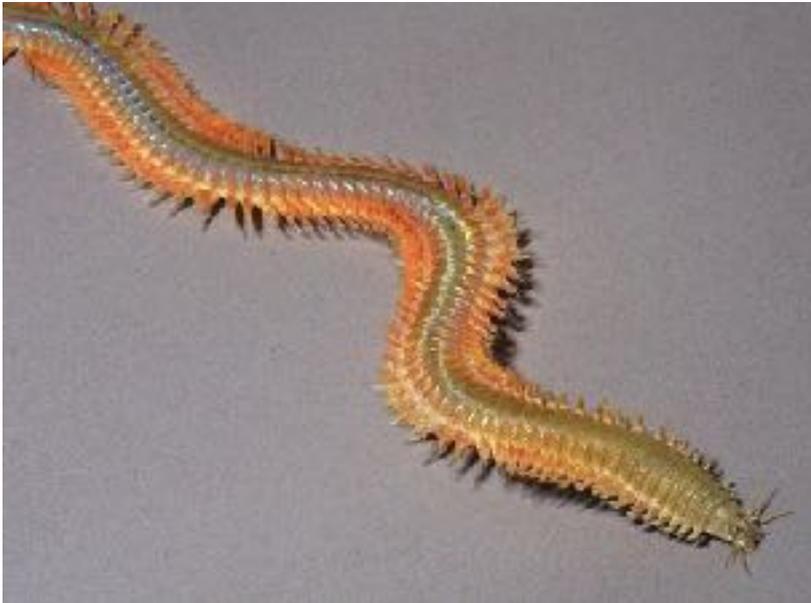


*Arenicola* spp.



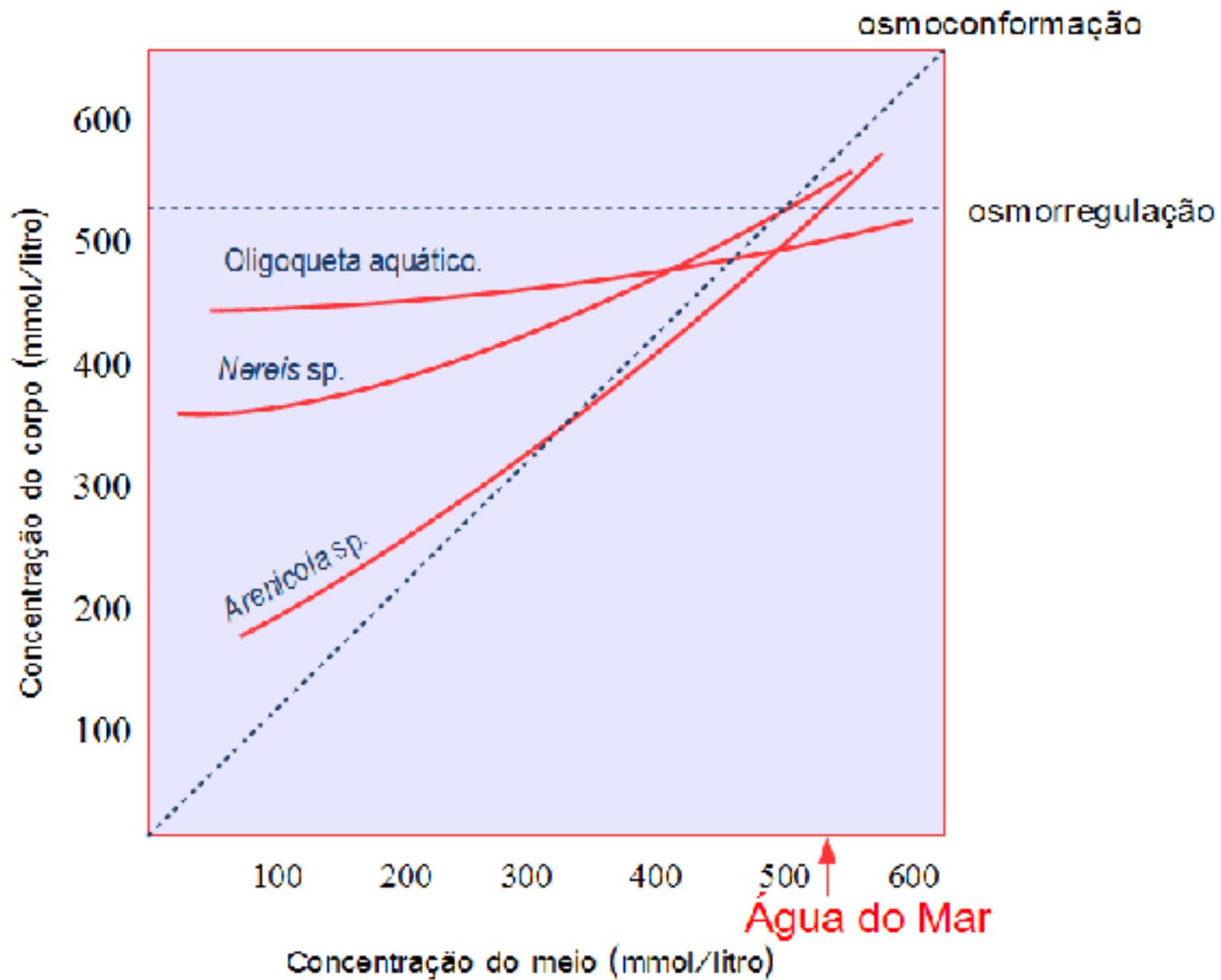


*Nereis* sp.



Oligochaeta aquático

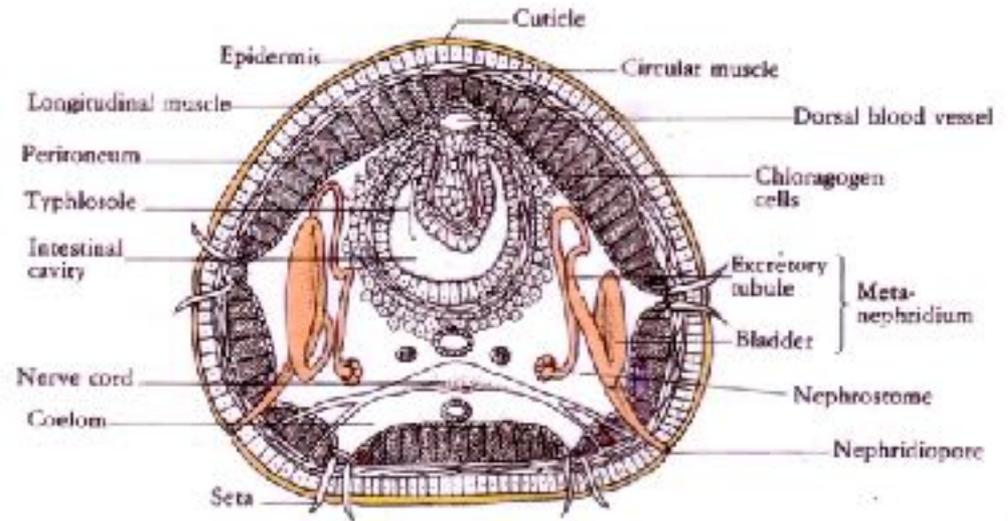




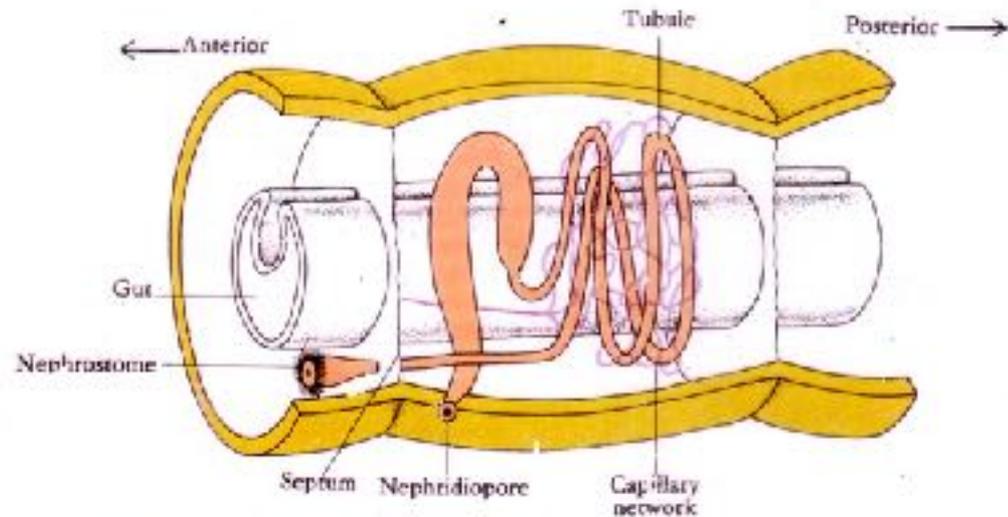
1. Impermeabilização -  $K^+$

2. Nefrídios numerosos e alongados

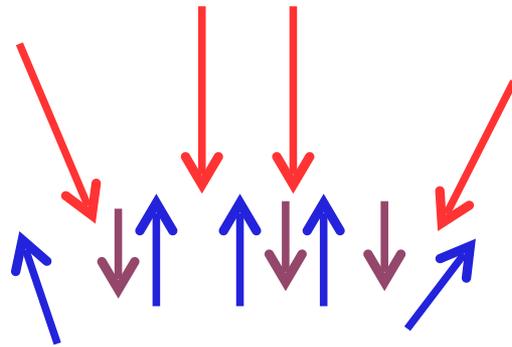
3. Esqueleto hidráulico



(a)



(b)



Pressão osmótica

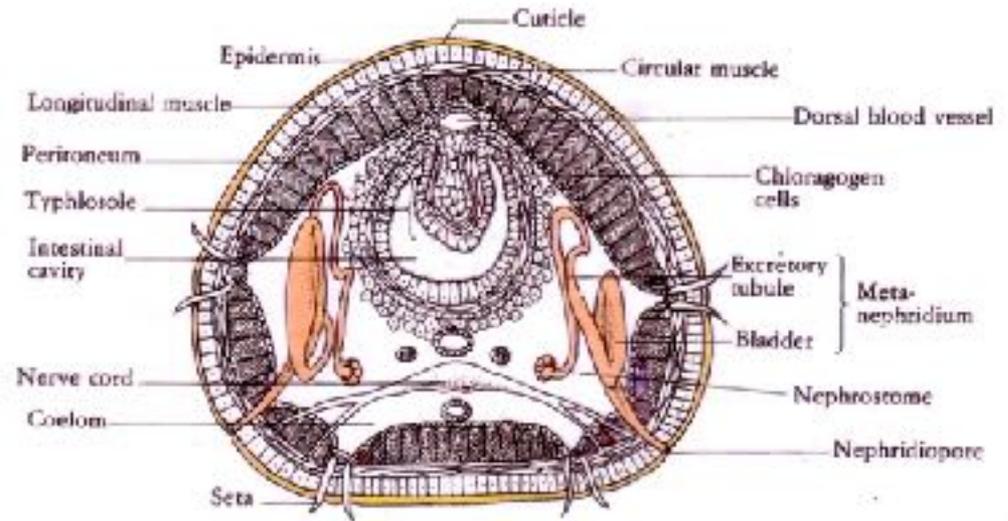
Pressão hidráulica

Resultante

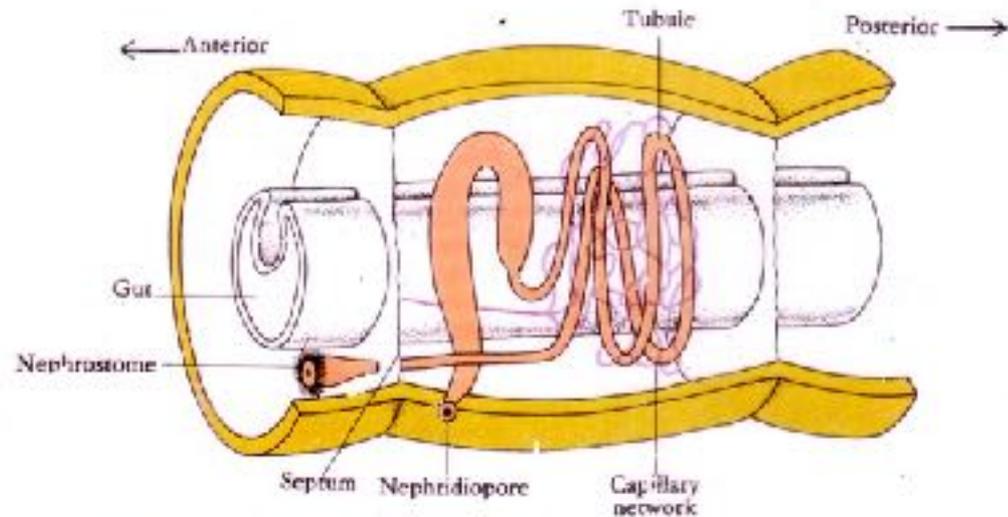
1. Impermeabilização -  $K^+$

2. Nefrídios numerosos e alongados

3. Esqueleto hidráulico



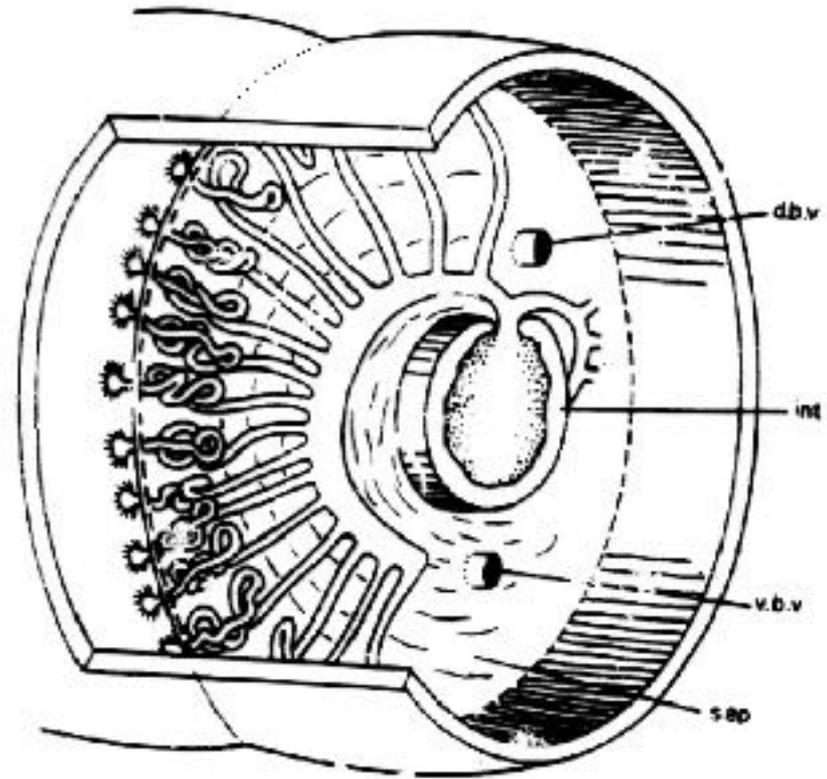
(a)



(b)

## ENTERONÉFRON

Megascolecidae



# **SISTEMA NERVOSO**

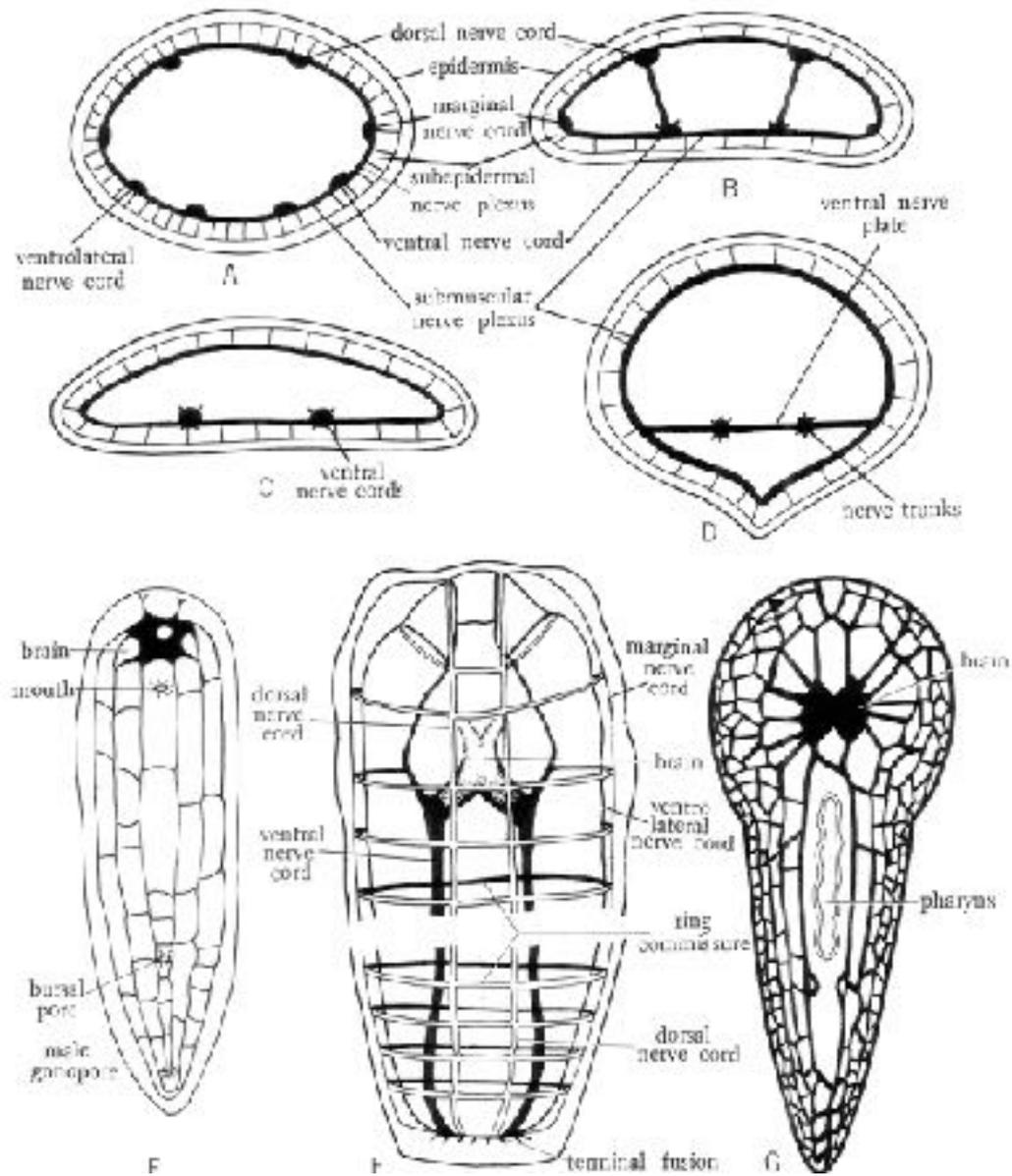
# **SISTEMA NERVOSO**

1. CONDIÇÃO PRÉ-ANELIDEANA

2. PLANO BÁSICO DOS ANELÍDEOS

3. EVOLUÇÃO DENTRO DOS ANELÍDEOS

4. FUNÇÃO E INERVAÇÃO



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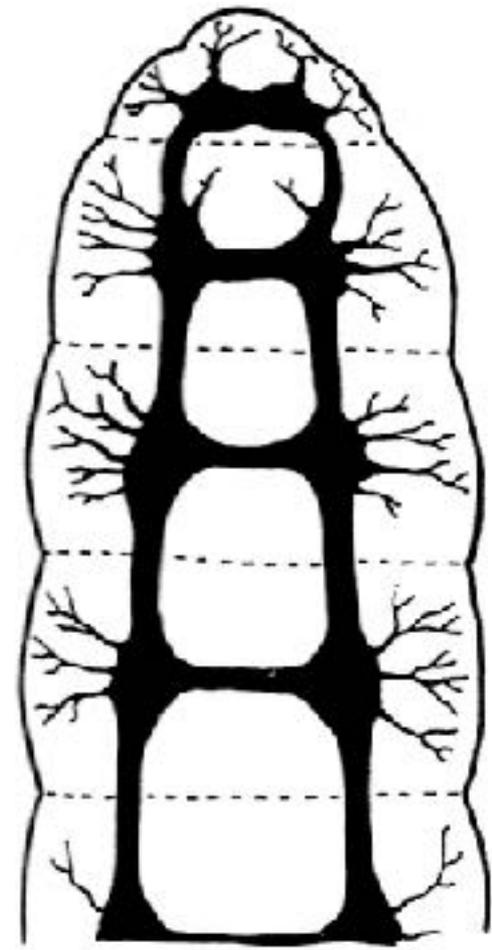
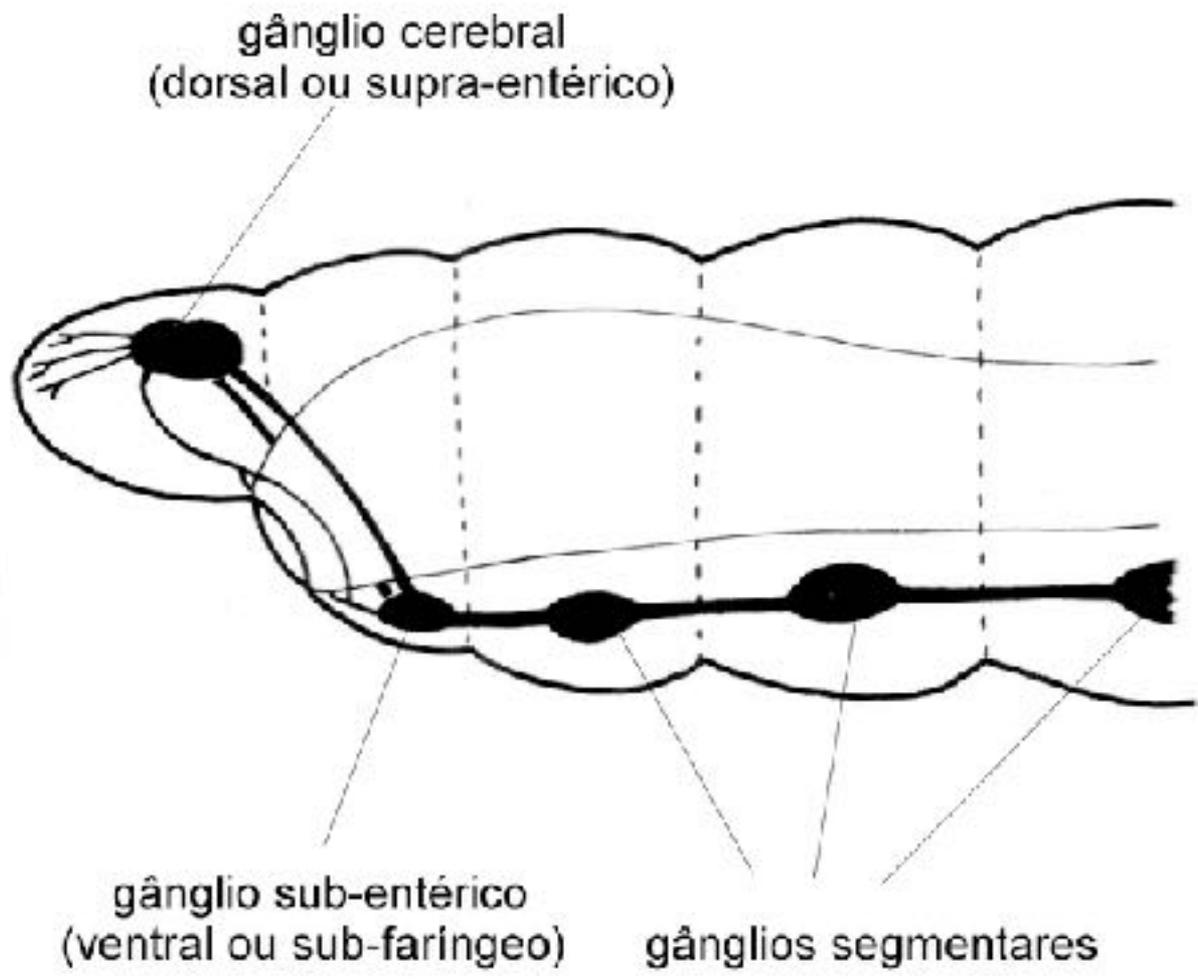
# **SISTEMA NERVOSO**

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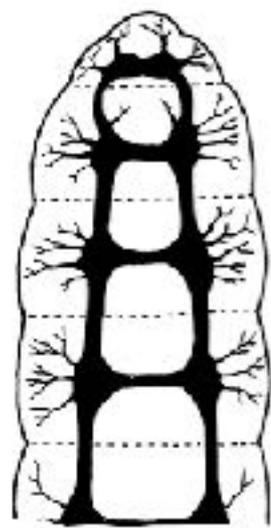
4. FUNÇÃO E INERVAÇÃO



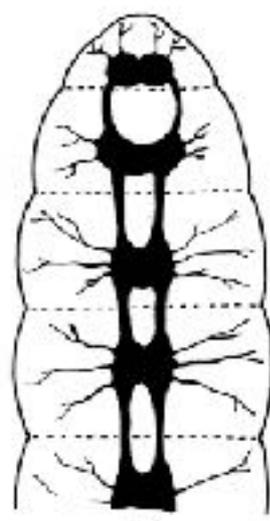


# **SISTEMA NERVOSO**

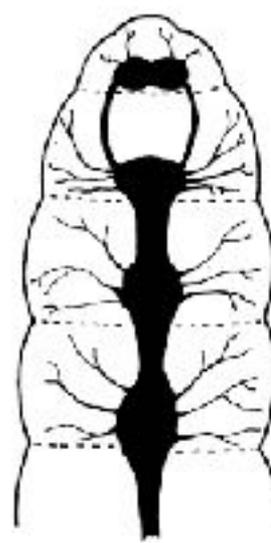
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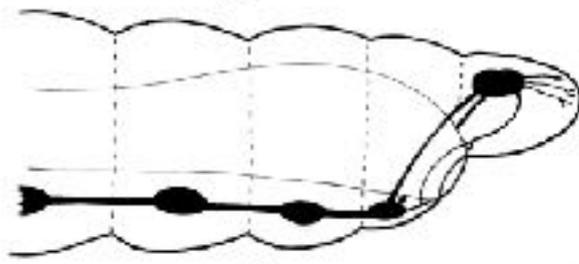
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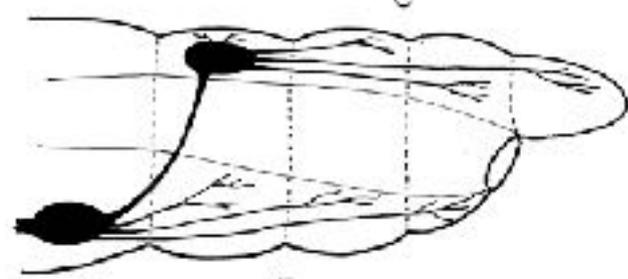
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C



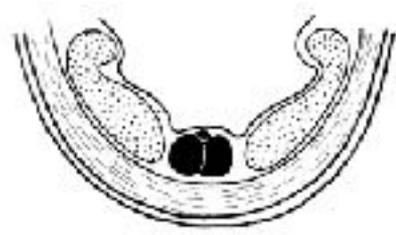
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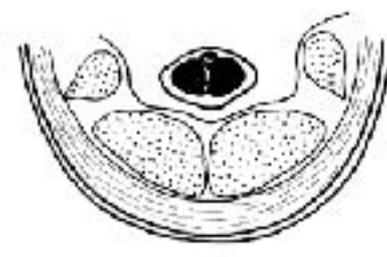
E



F

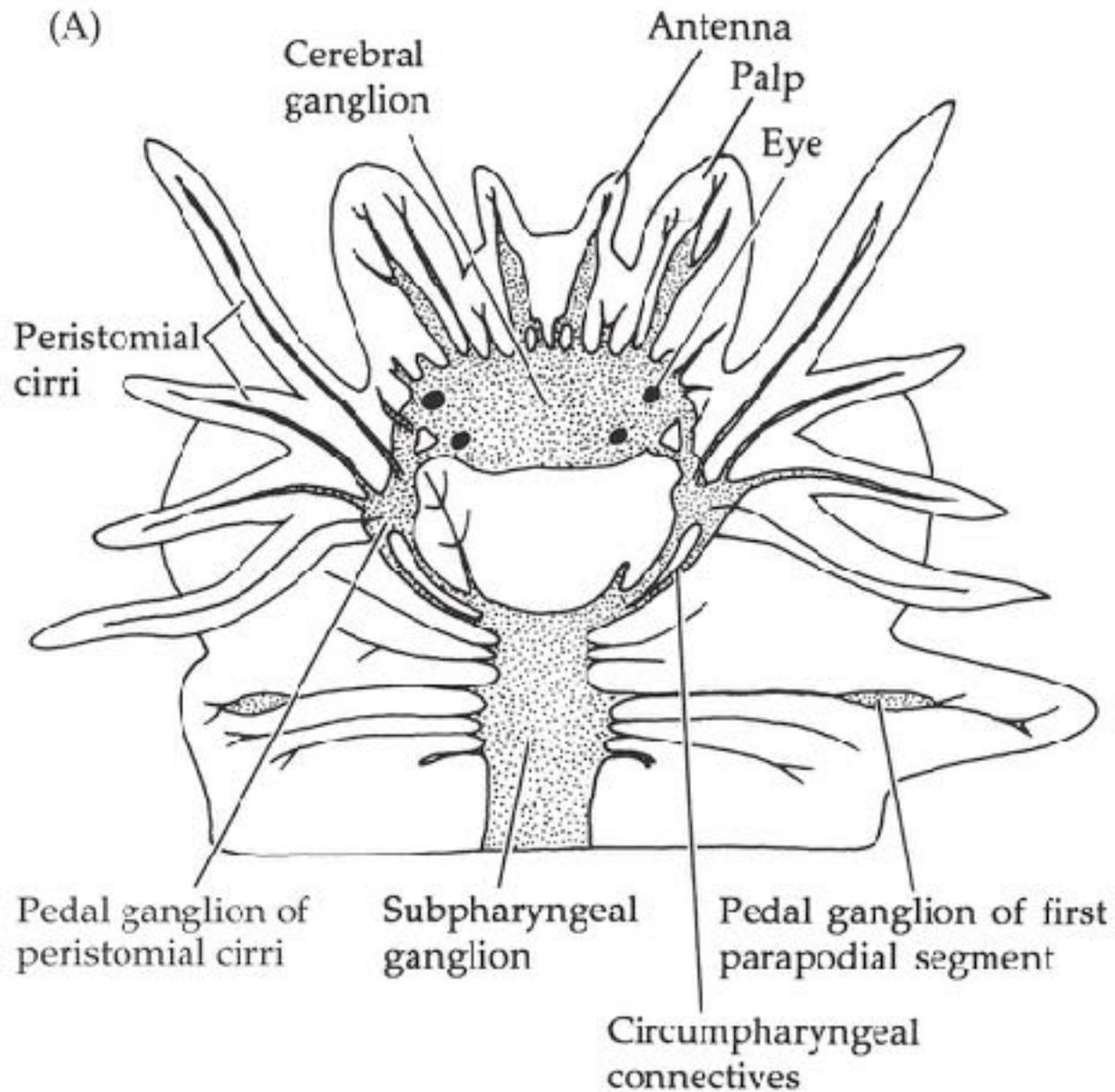


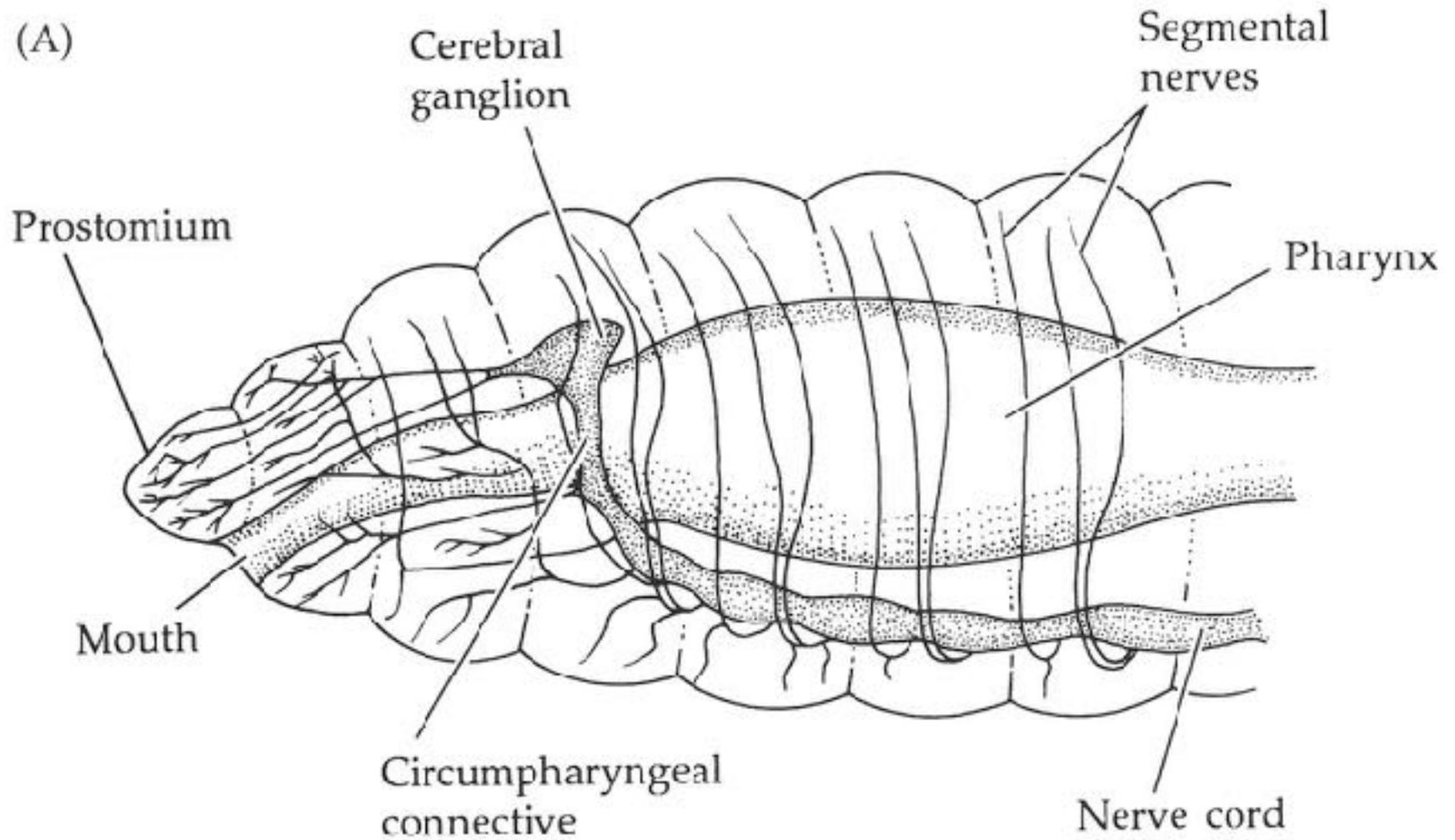
G

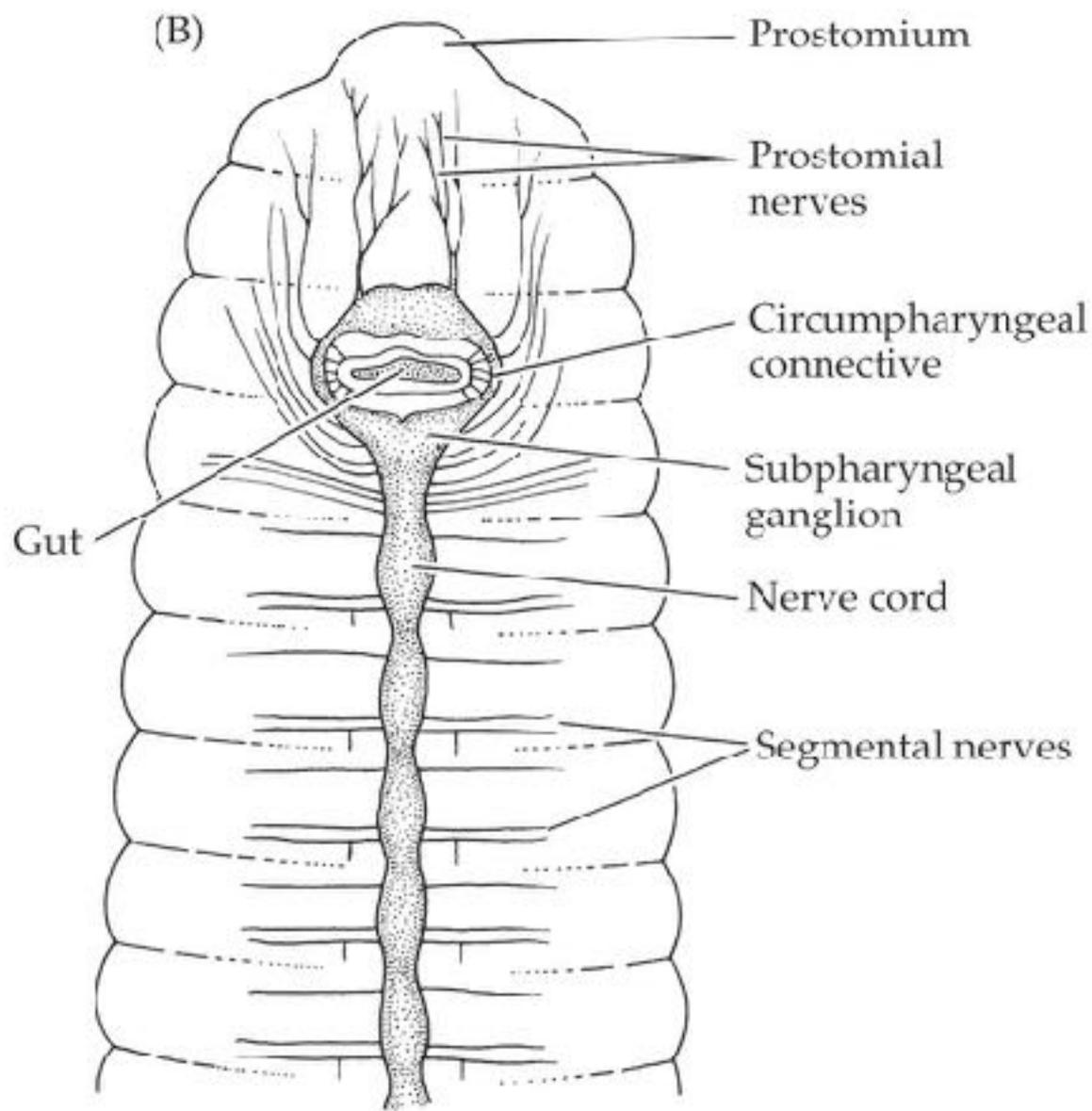


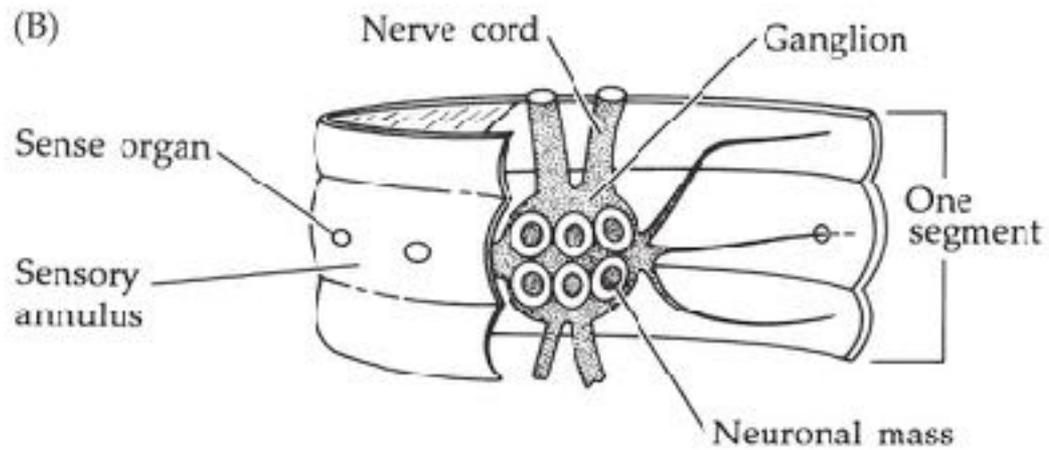
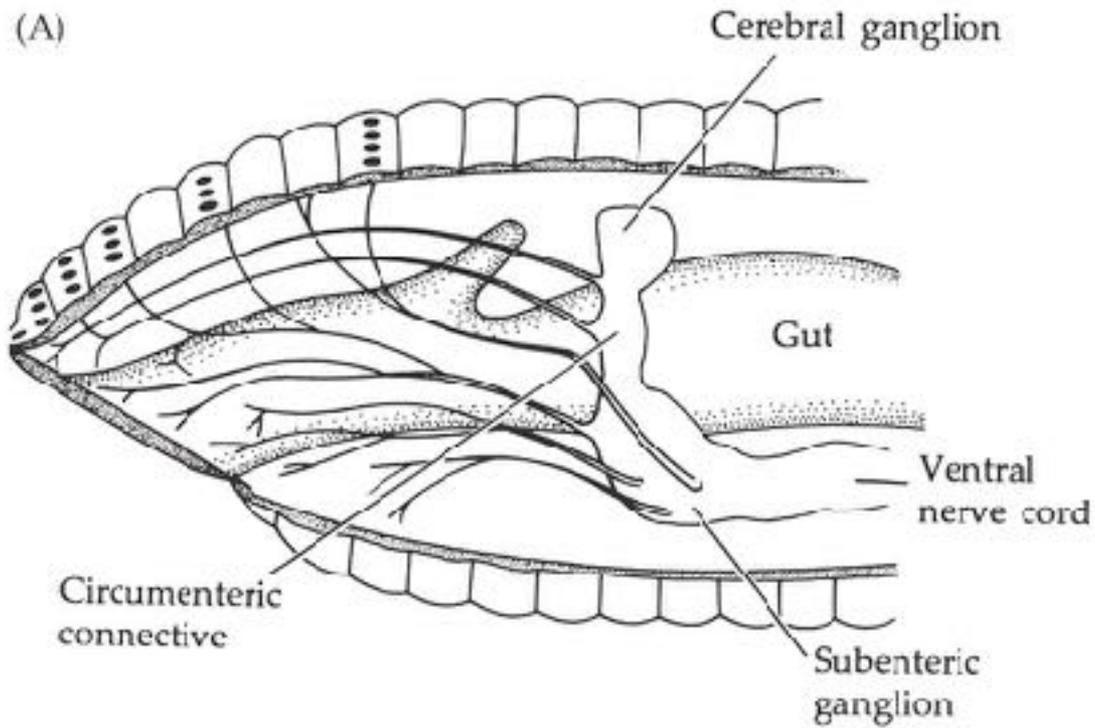
H











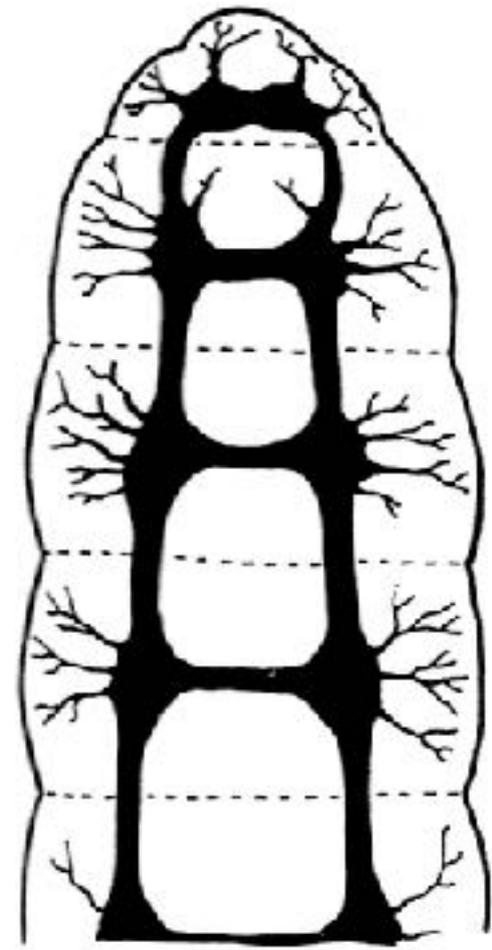
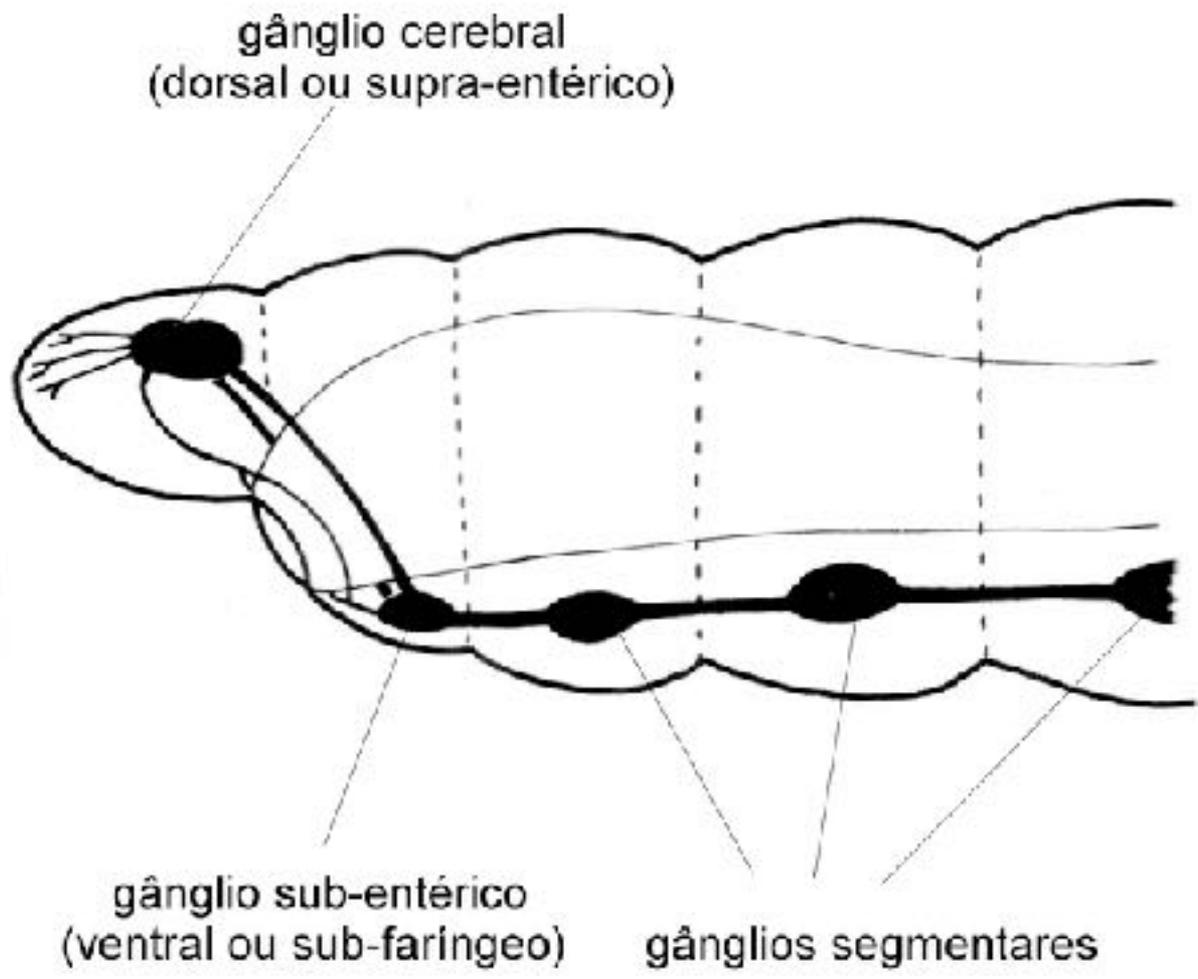
# **SISTEMA NERVOSO**

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## **INERVAÇÃO**

### **Gânglio cerebral**

Centro sensorial

Efeito inibitório sobre o gânglio sub-entérico

### **Gânglio sub-entérico**

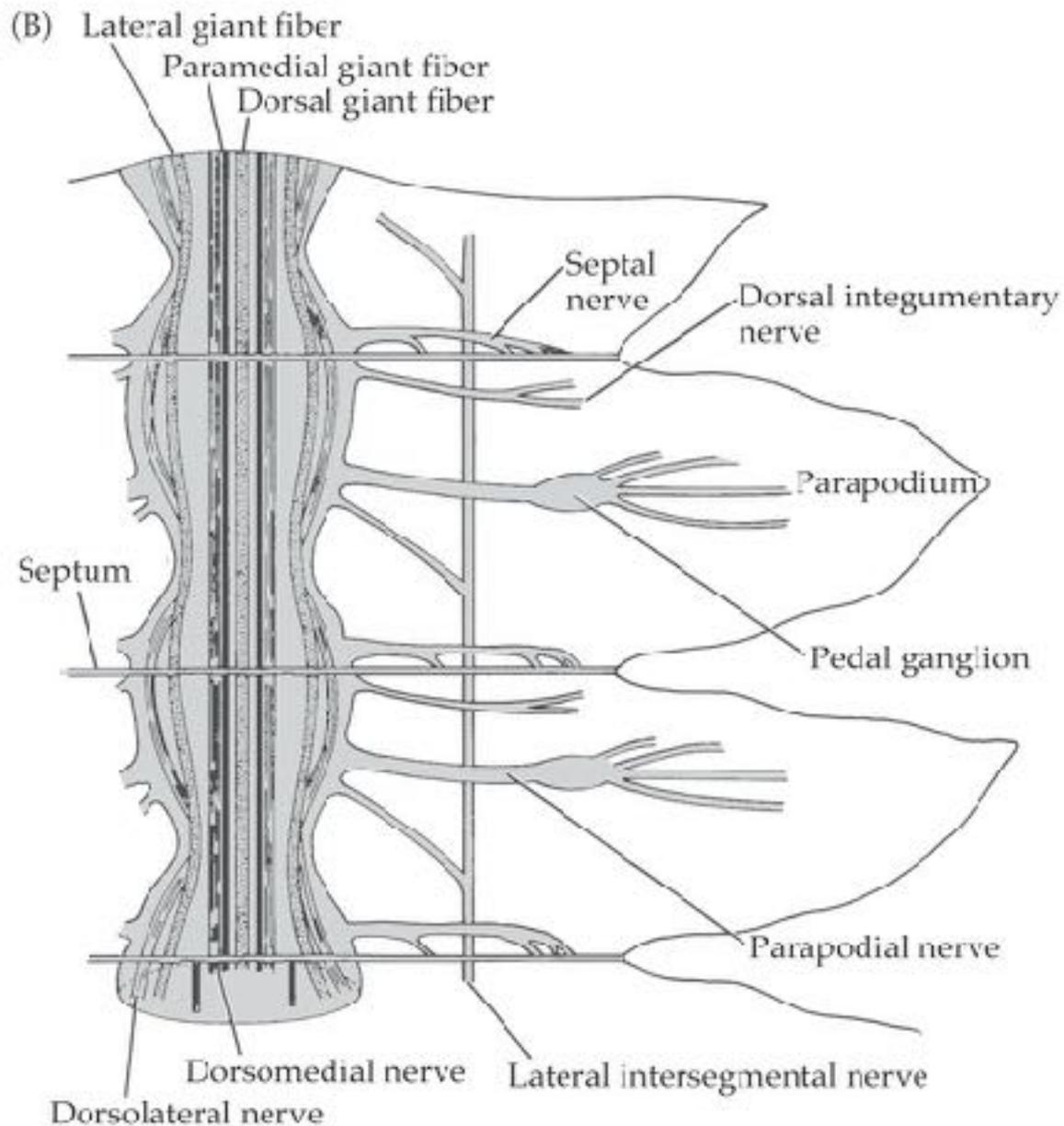
Centro motor

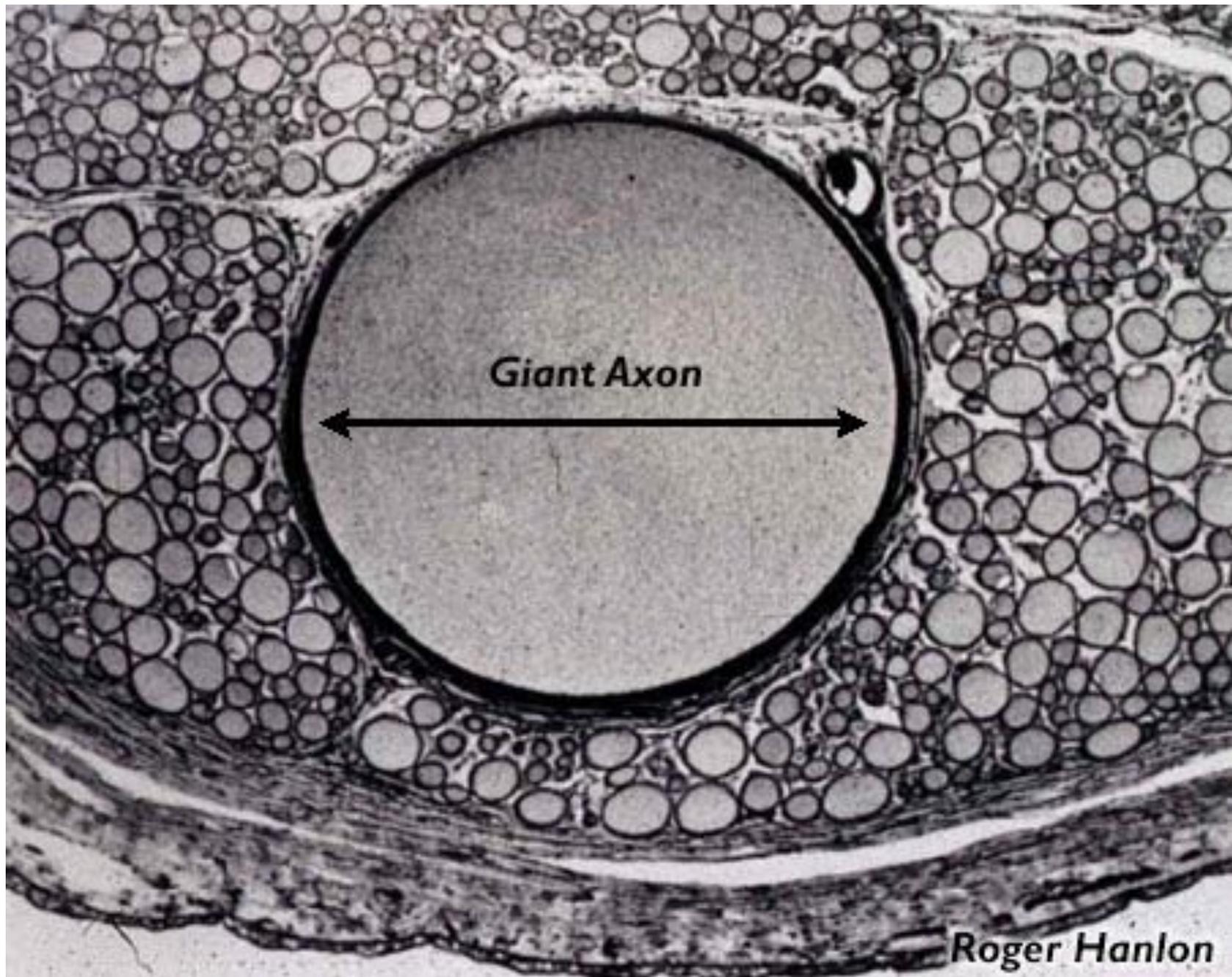
### **Gânglios segmentares**

Inervação local – musculatura parapodial

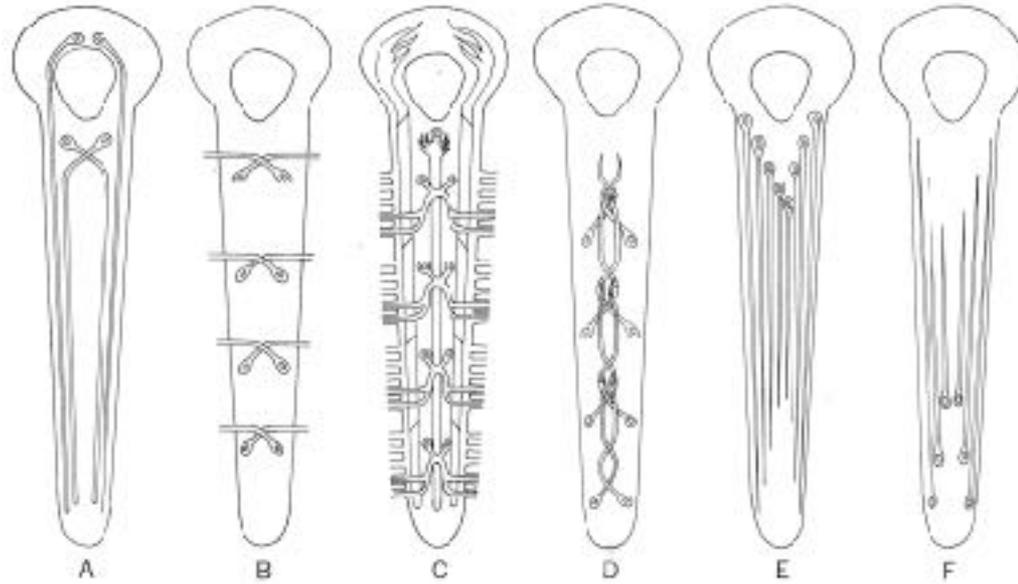
Inervação local – receptores sensoriais

Reflexos locais





# Sistema nervoso: fibras gigantes



# **SISTEMA SENSORIAL**

# **SENSORES**

1. MECANORRECEPTORES

2. FOTORRECEPTORES

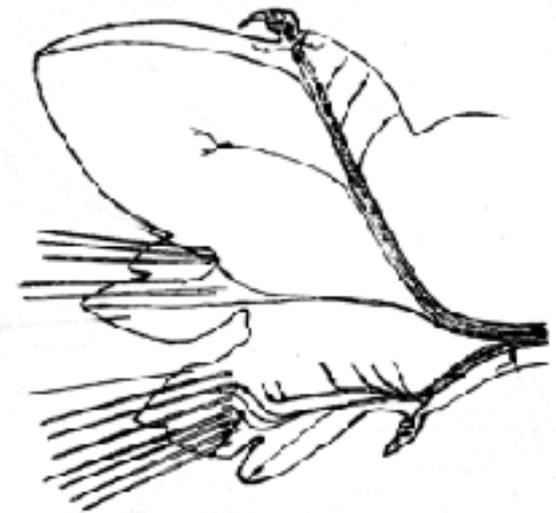
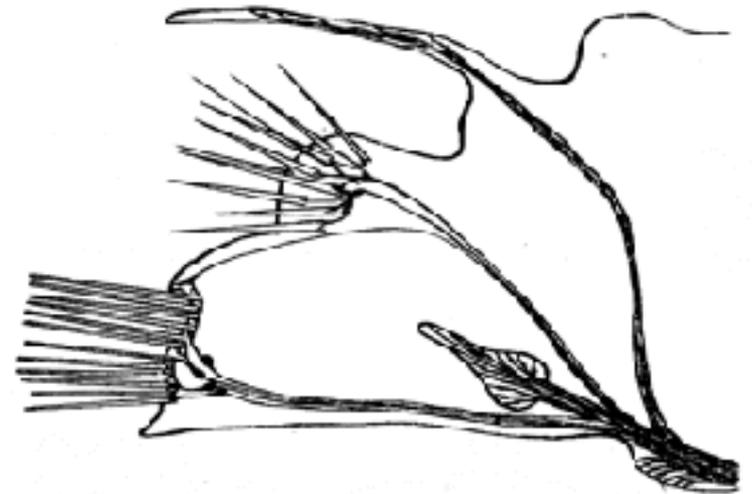
3. QUIMIORRECEPTORES

# **SISTEMA SENSORIAL**

**1. MECANORRECEPTORES**

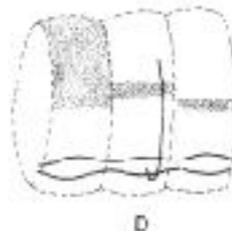
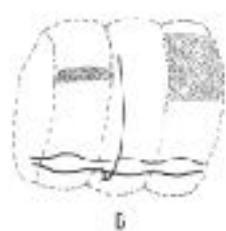
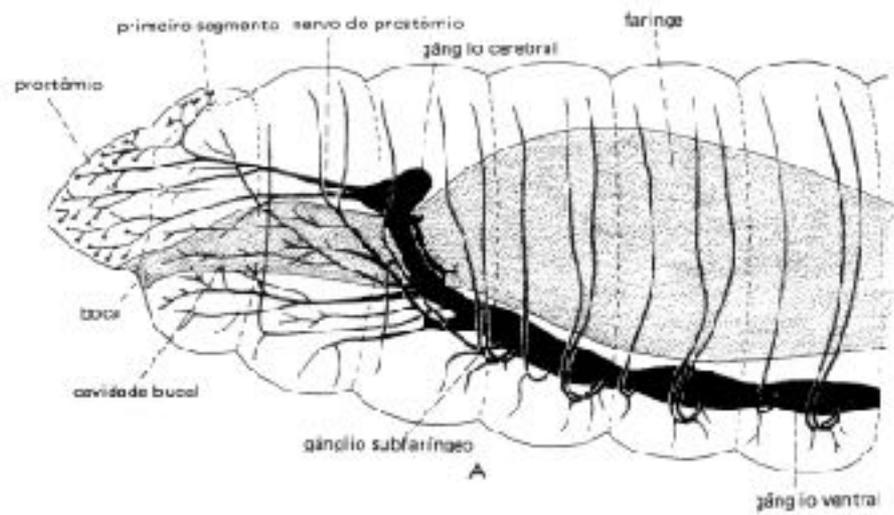
**2. FOTORRECEPTORES**

**3. QUIMIORRECEPTORES**

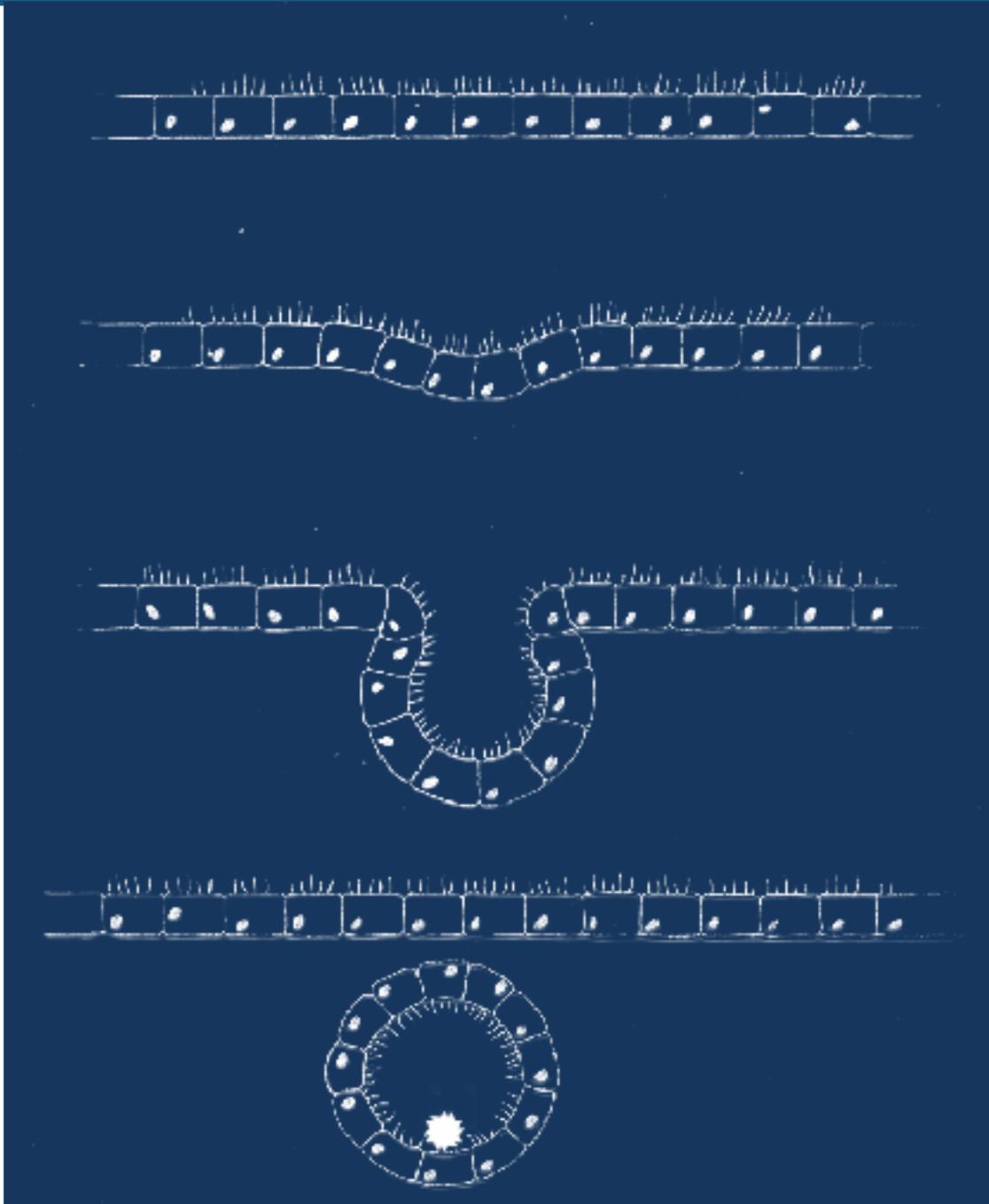


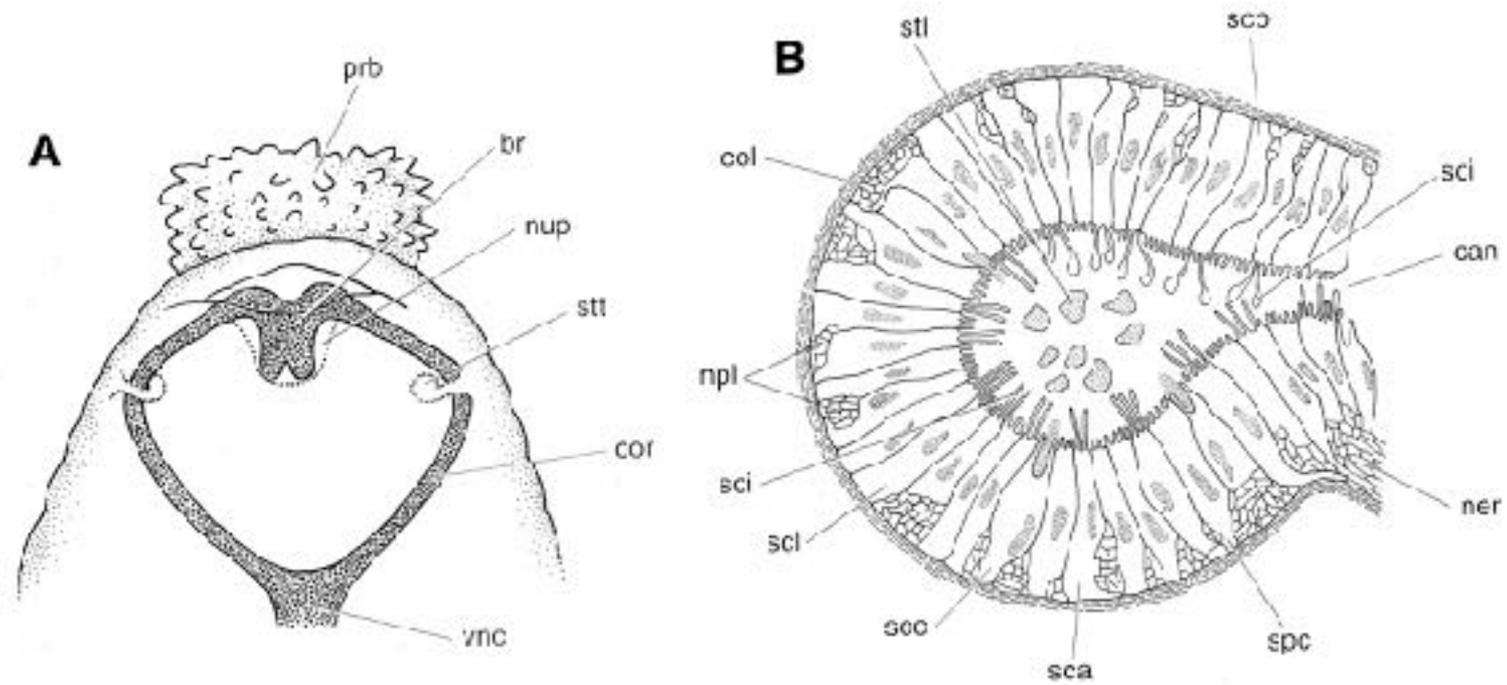


# Mecanorreceptores: tato e vibração

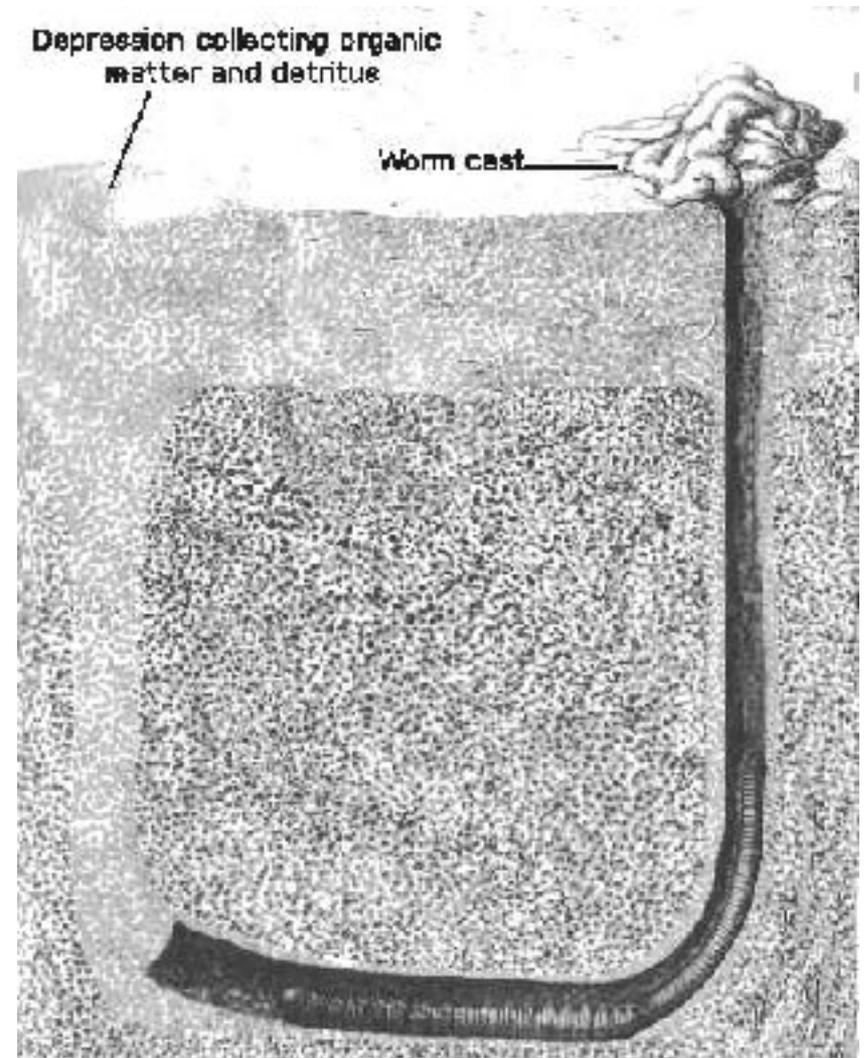


# Mecanorreceptores: estatocisto





*Arenicola* spp.



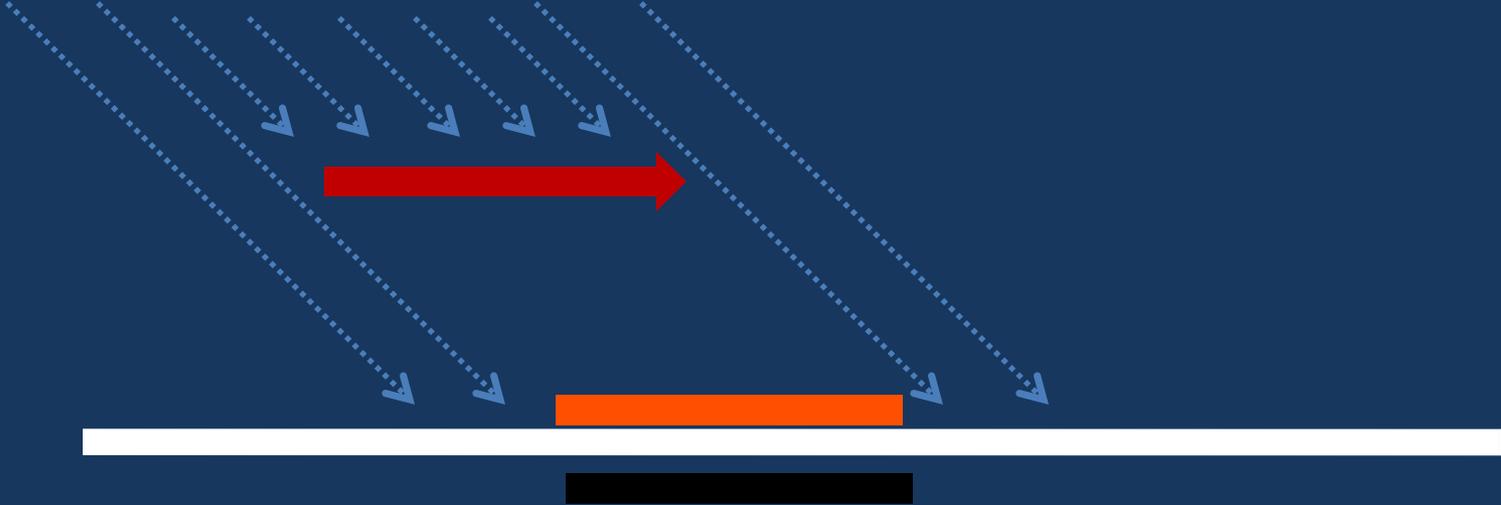
# **SISTEMA SENSORIAL**

1. MECANORRECEPTORES

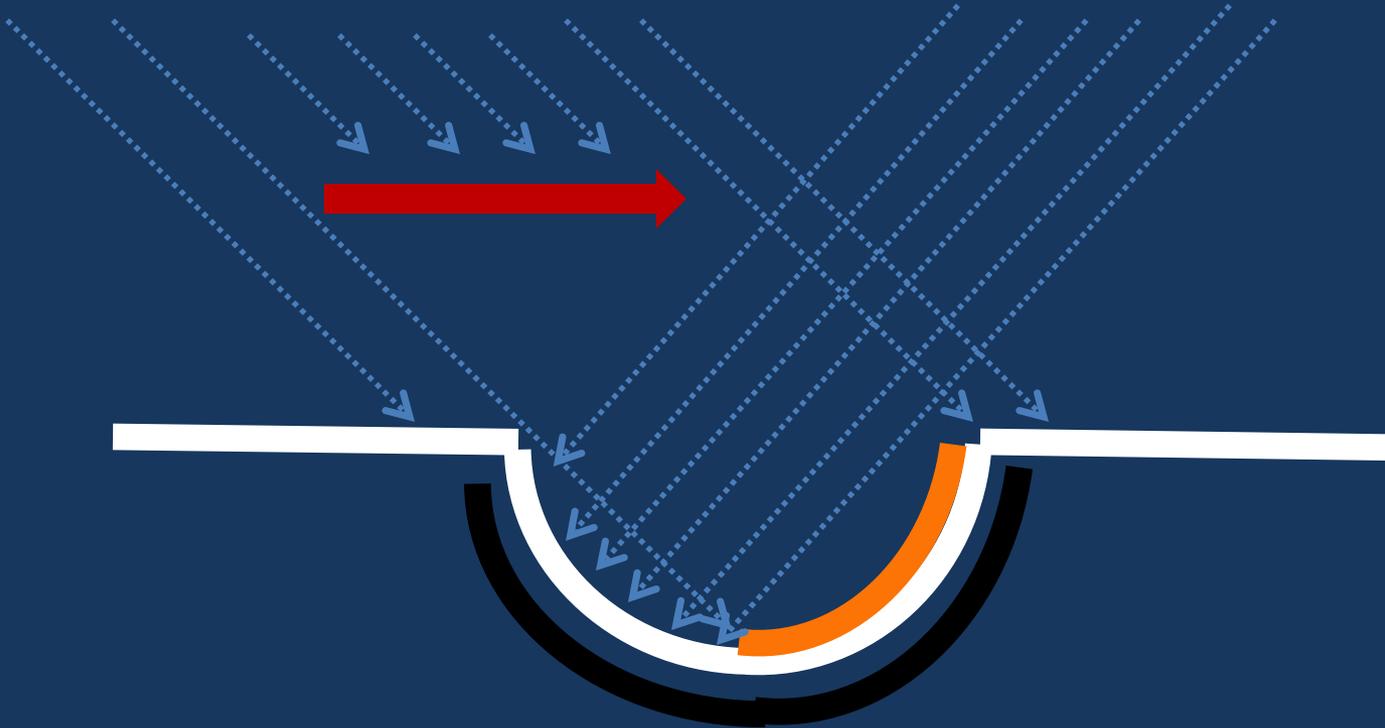
2. FOTORRECEPTORES

3. QUIMIORRECEPTORES

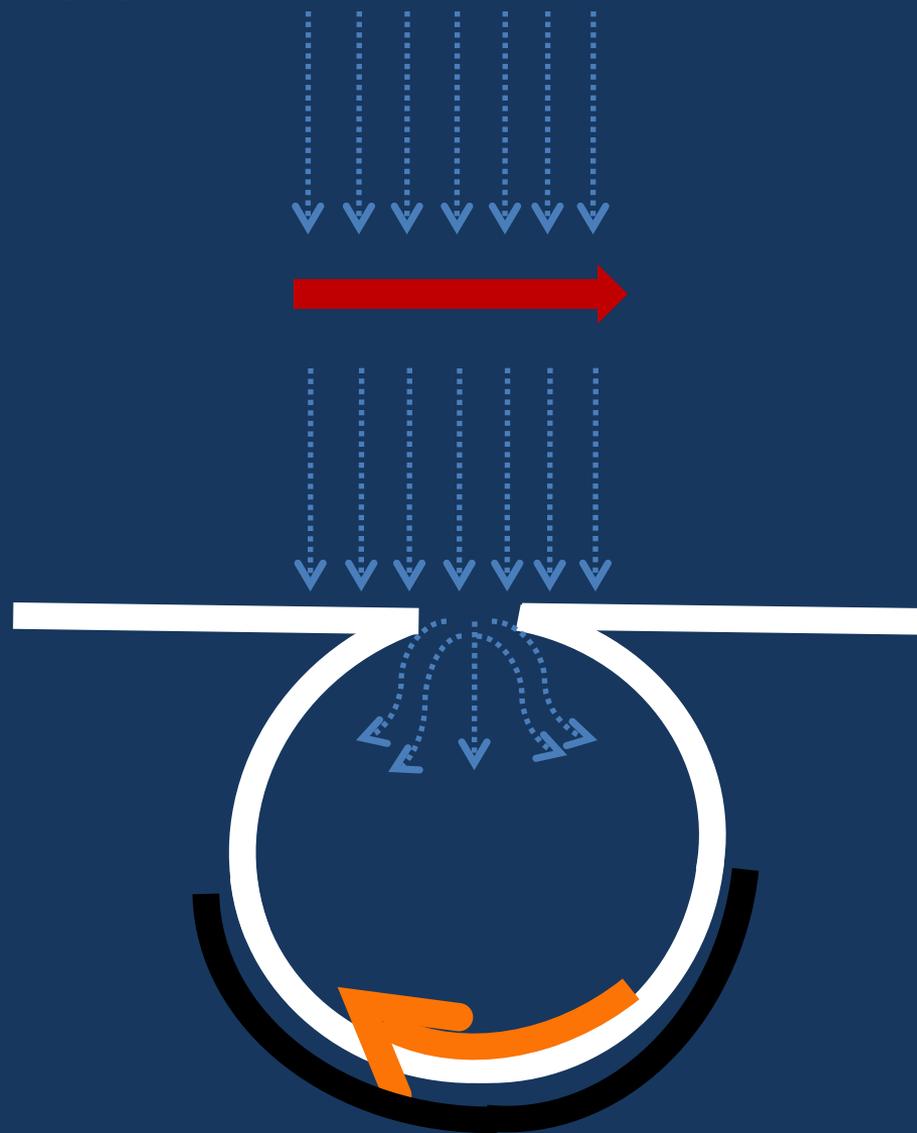
# Manchas ocelares



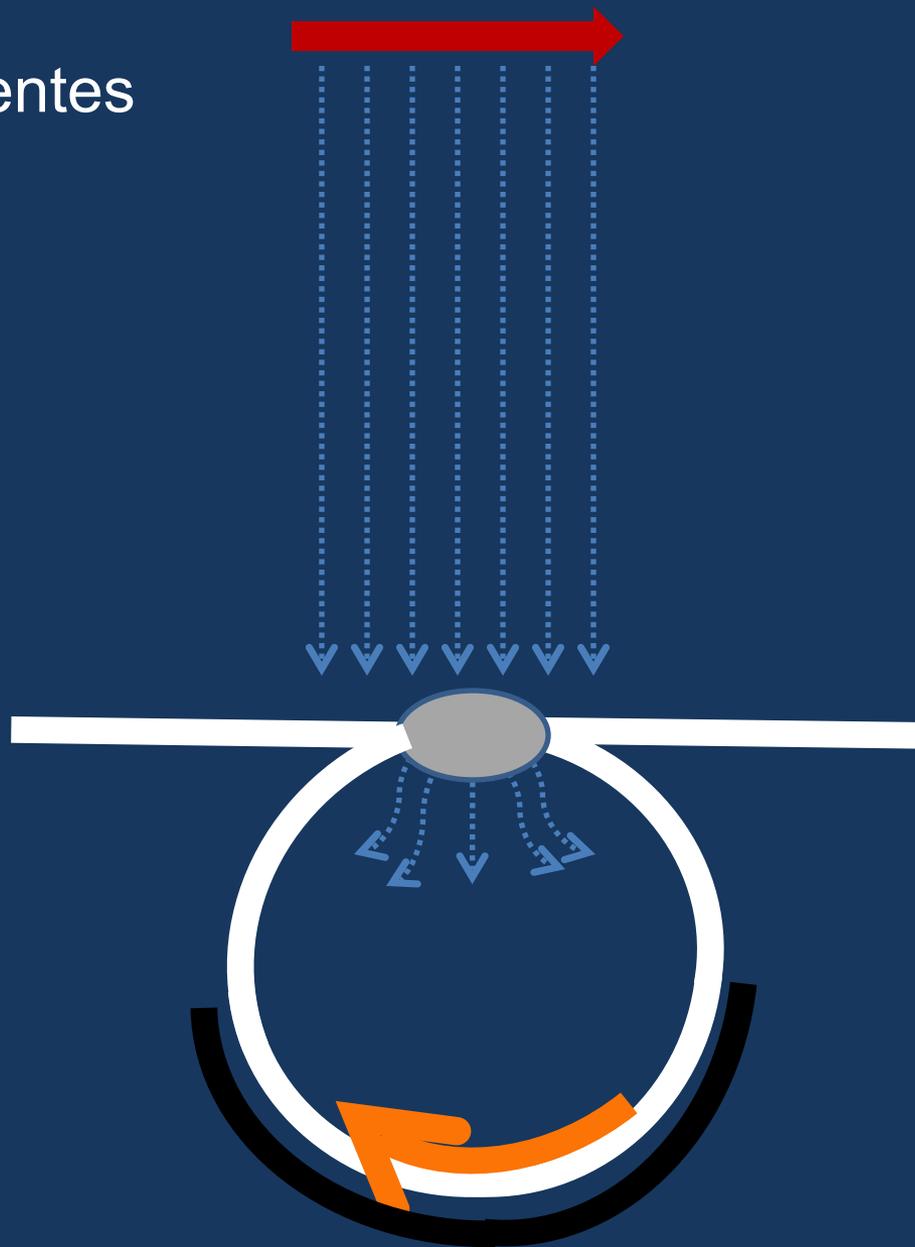
# Ocelos



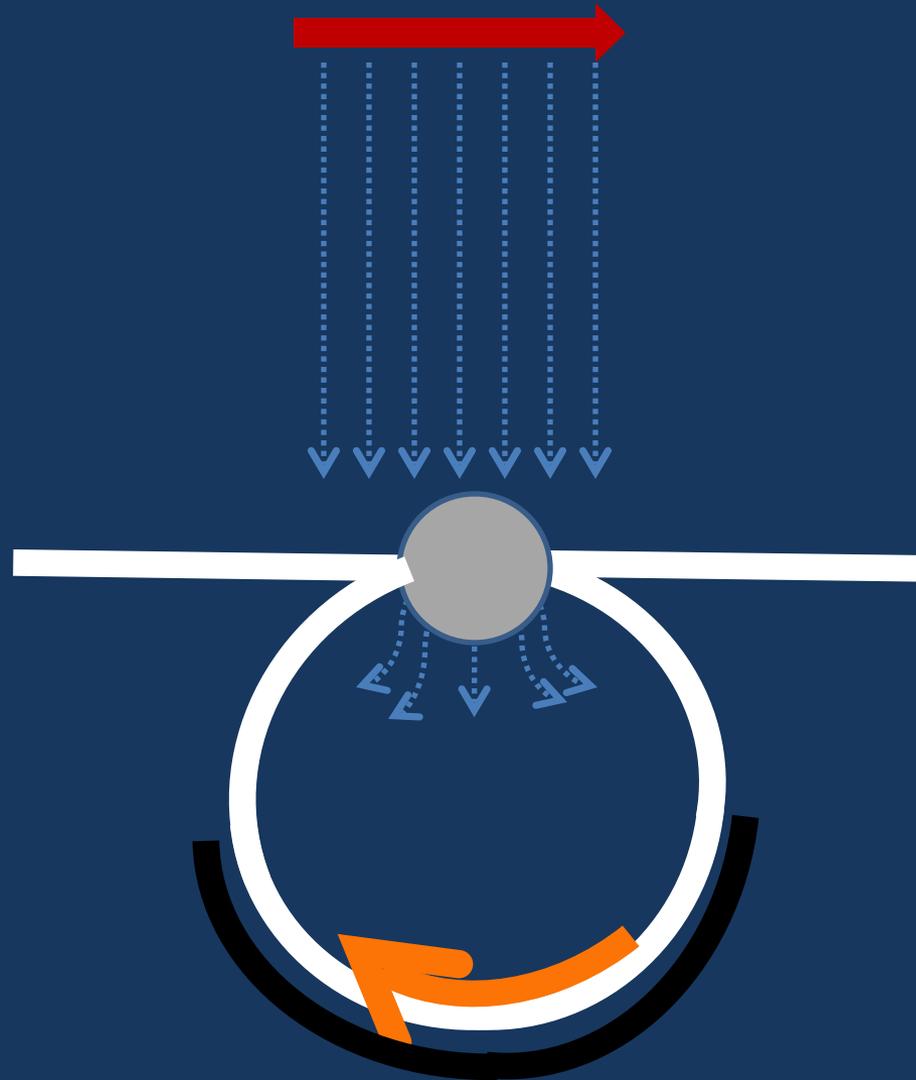
# Olhos em câmara



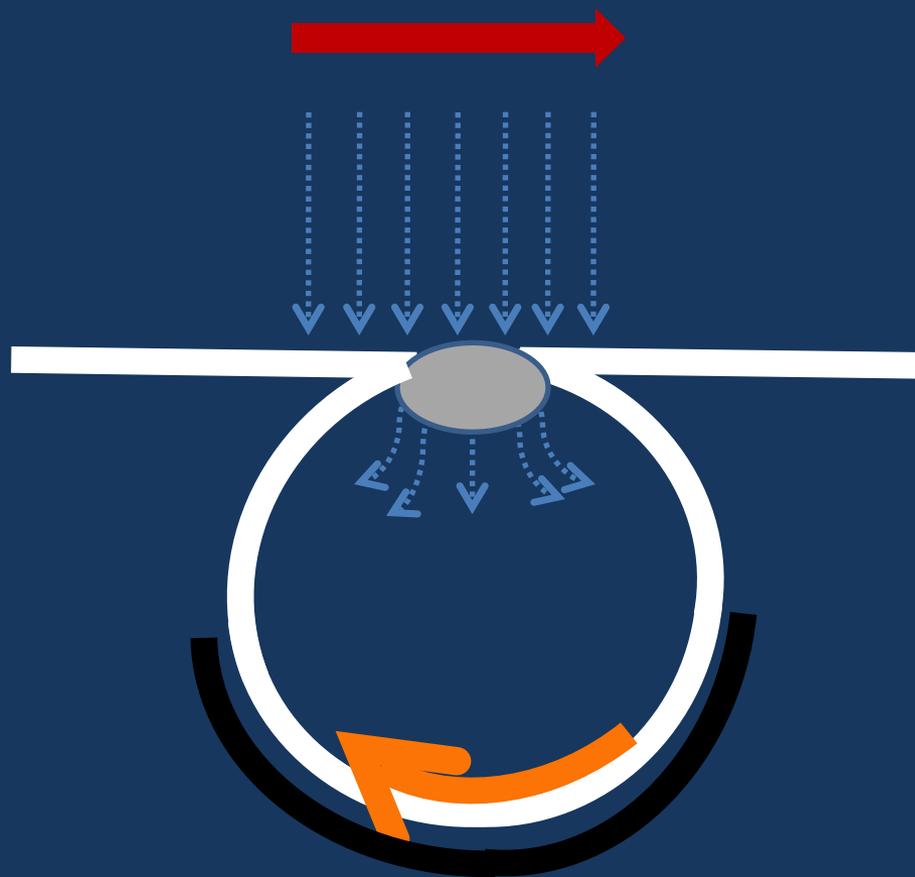
Olhos com lentes



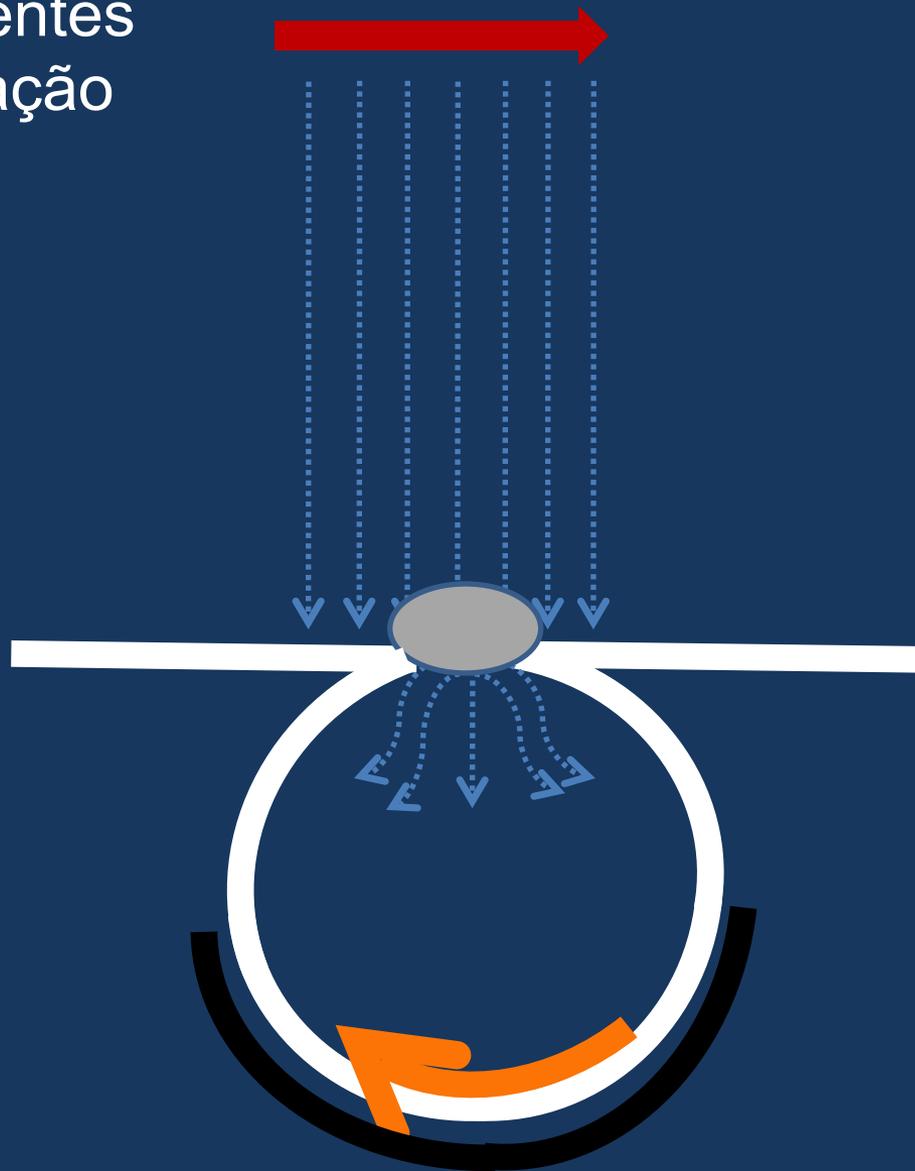
# Olhos com lentes

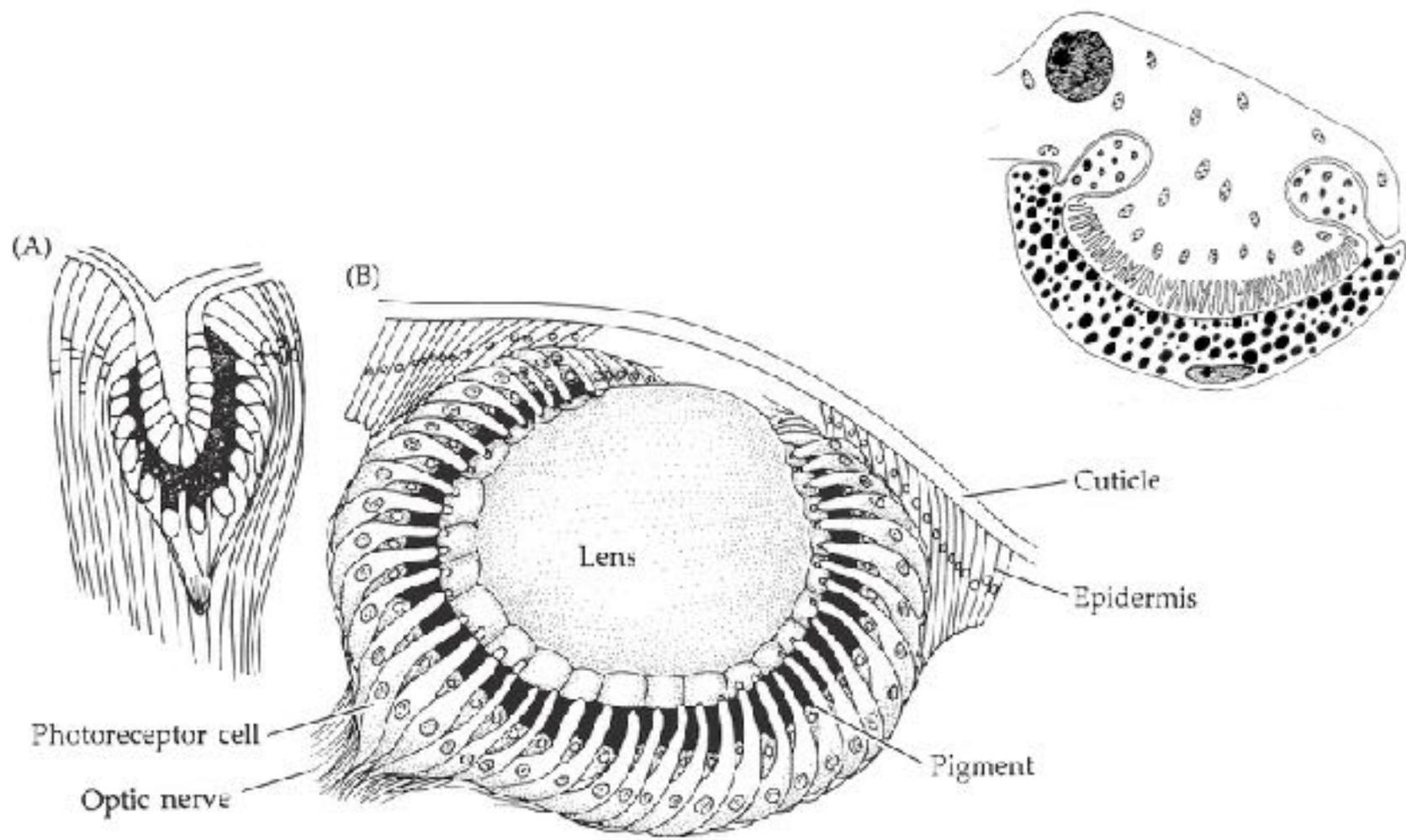


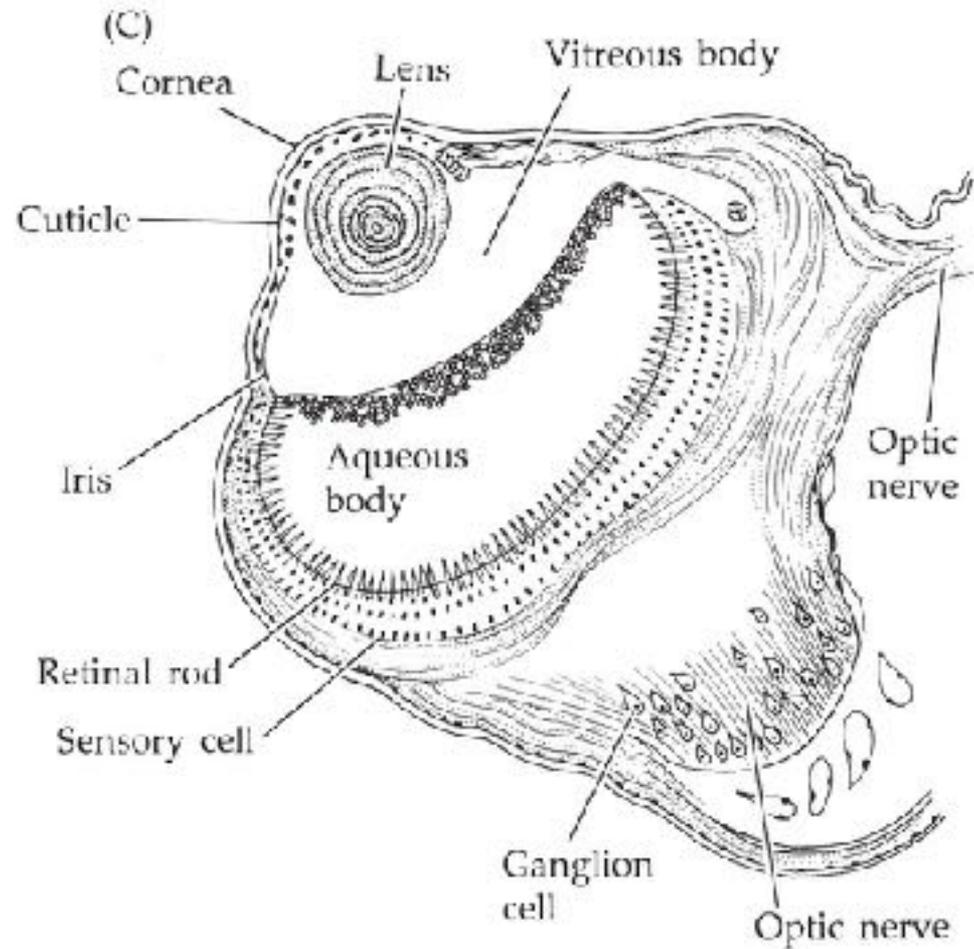
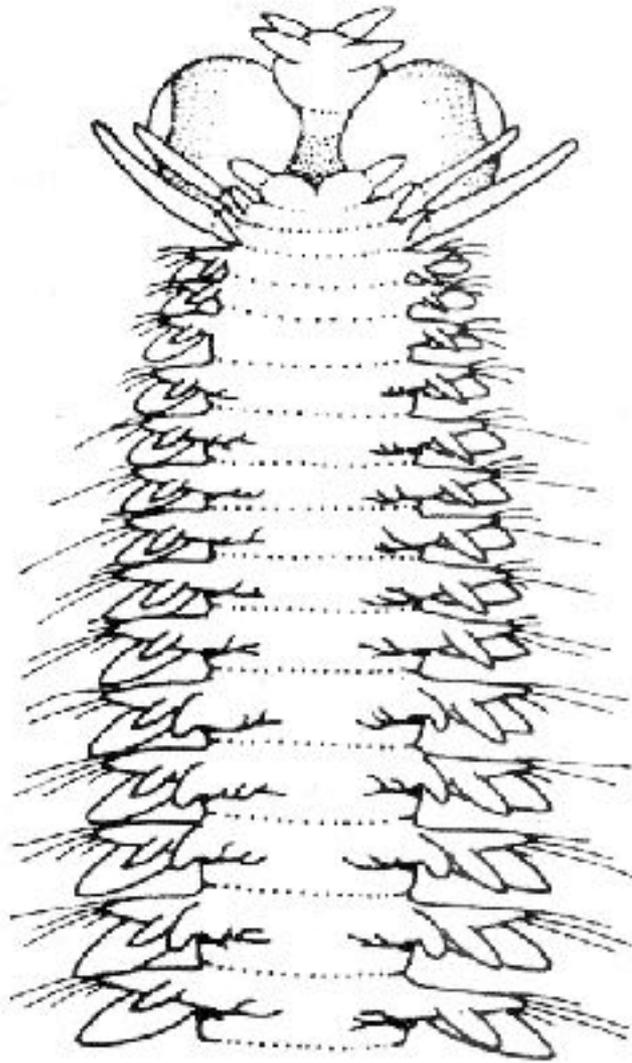
# Olhos com lentes de acomodação

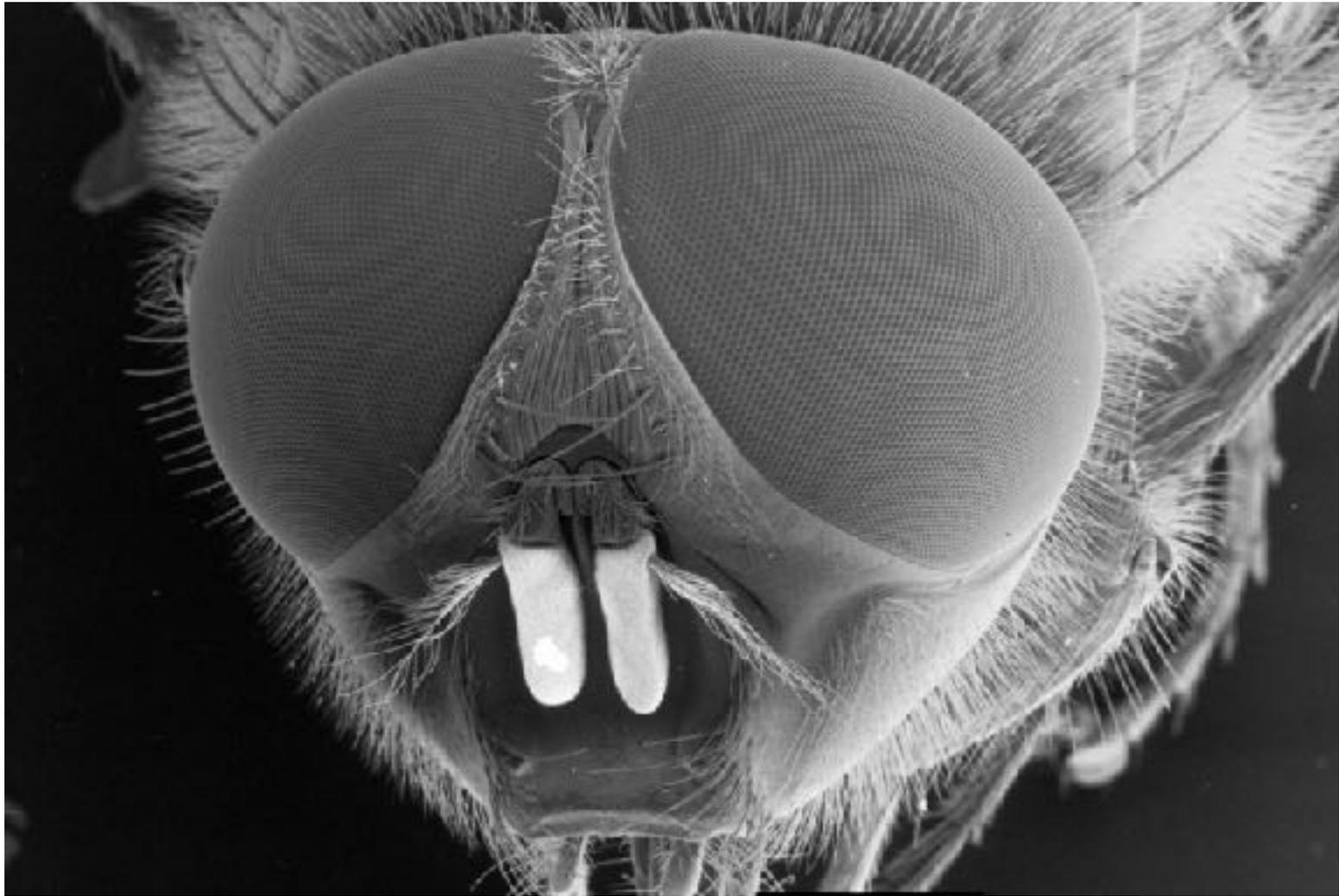


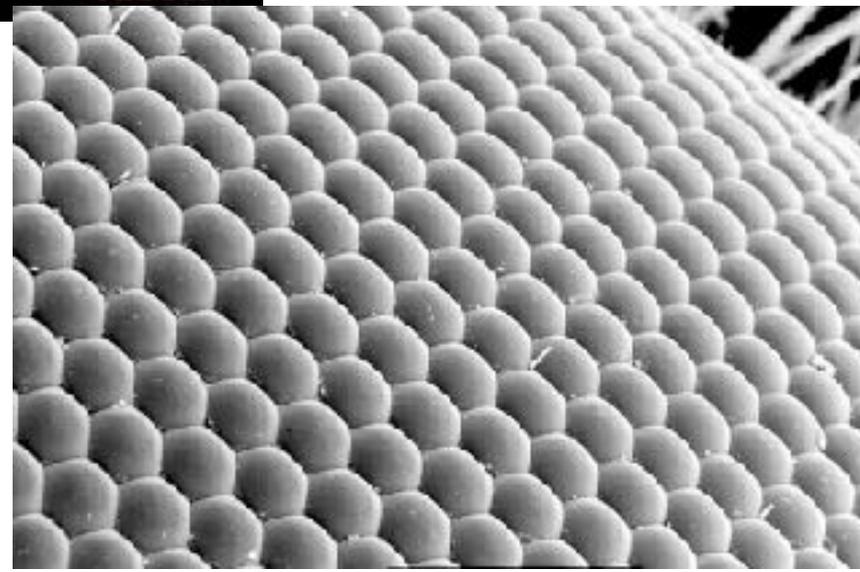
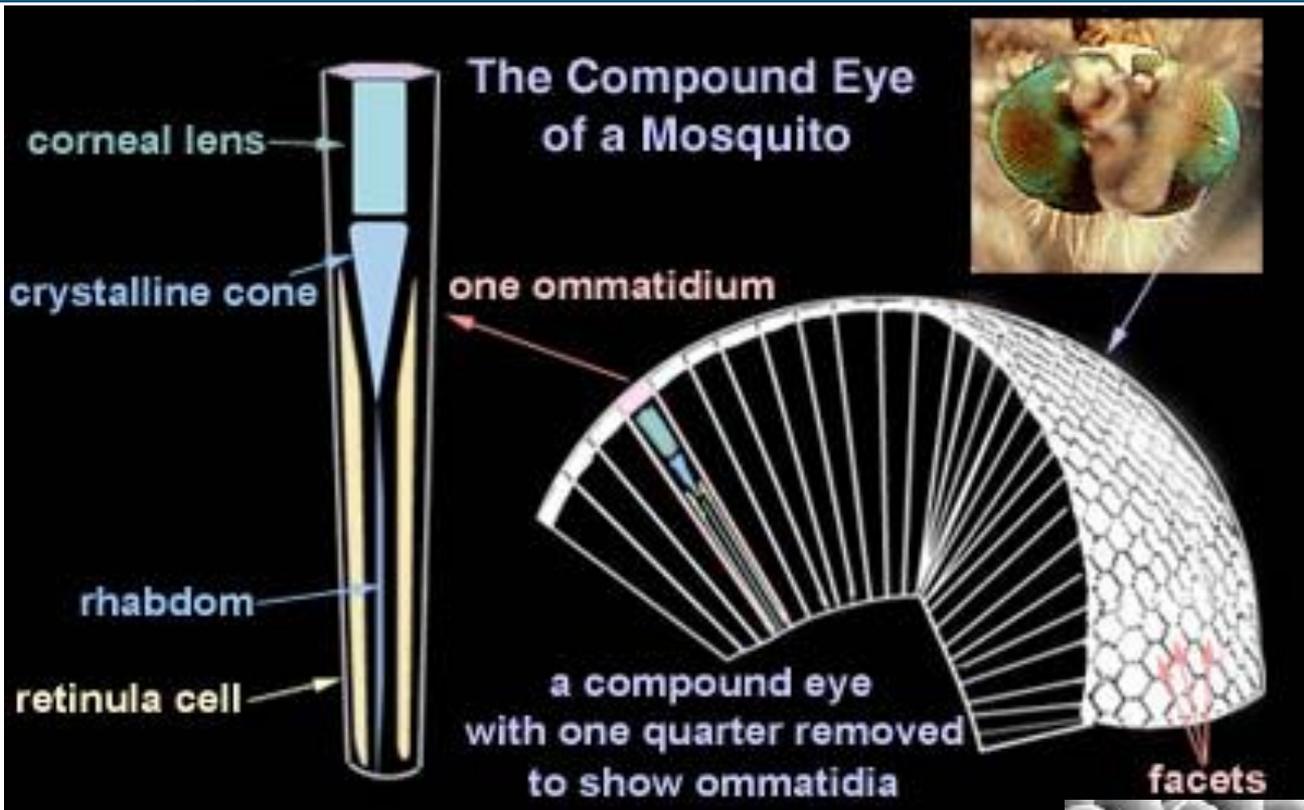
Olhos com lentes  
de acomodação

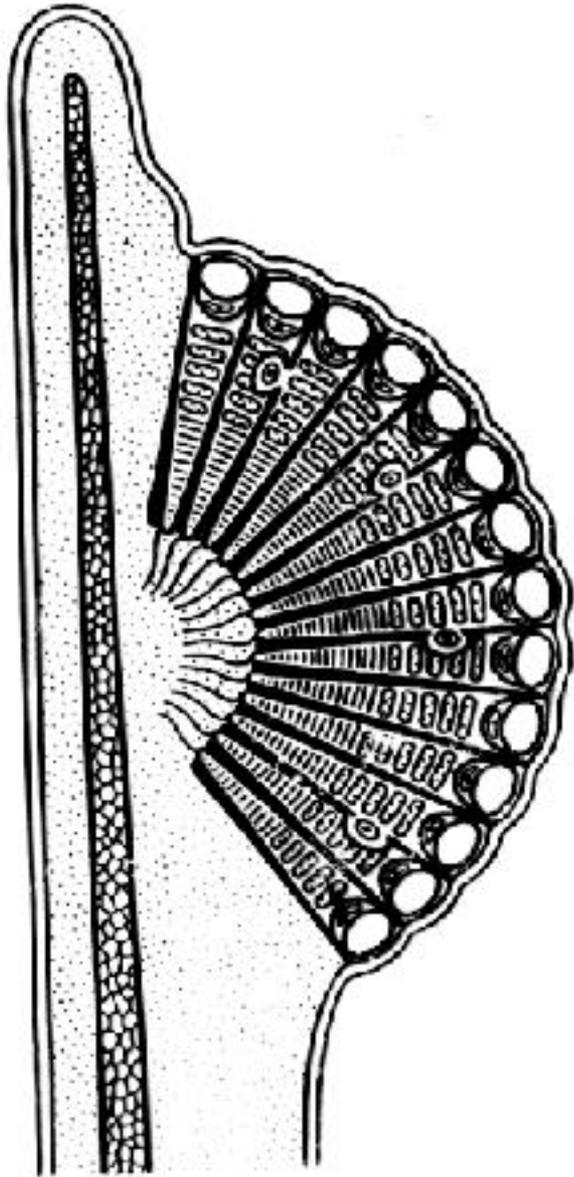












*Megalomma bioculatum*

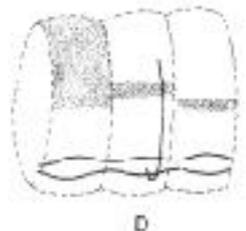
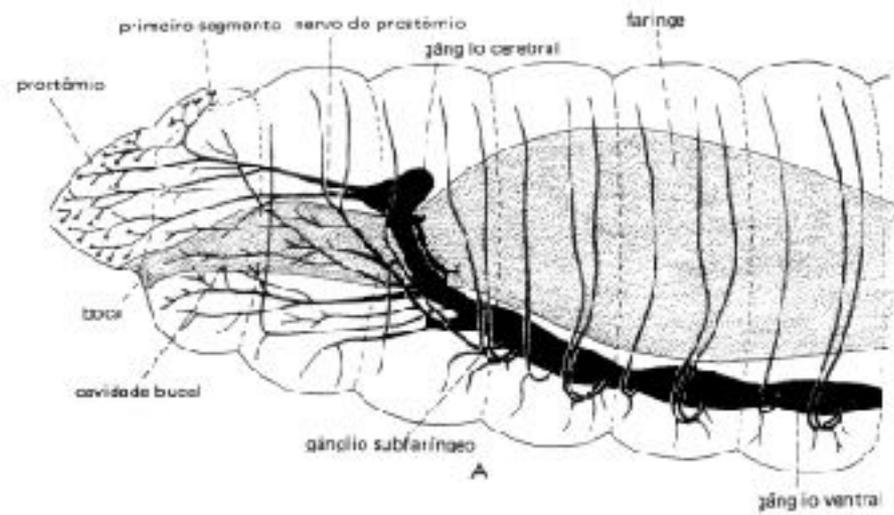
# **SISTEMA SENSORIAL**

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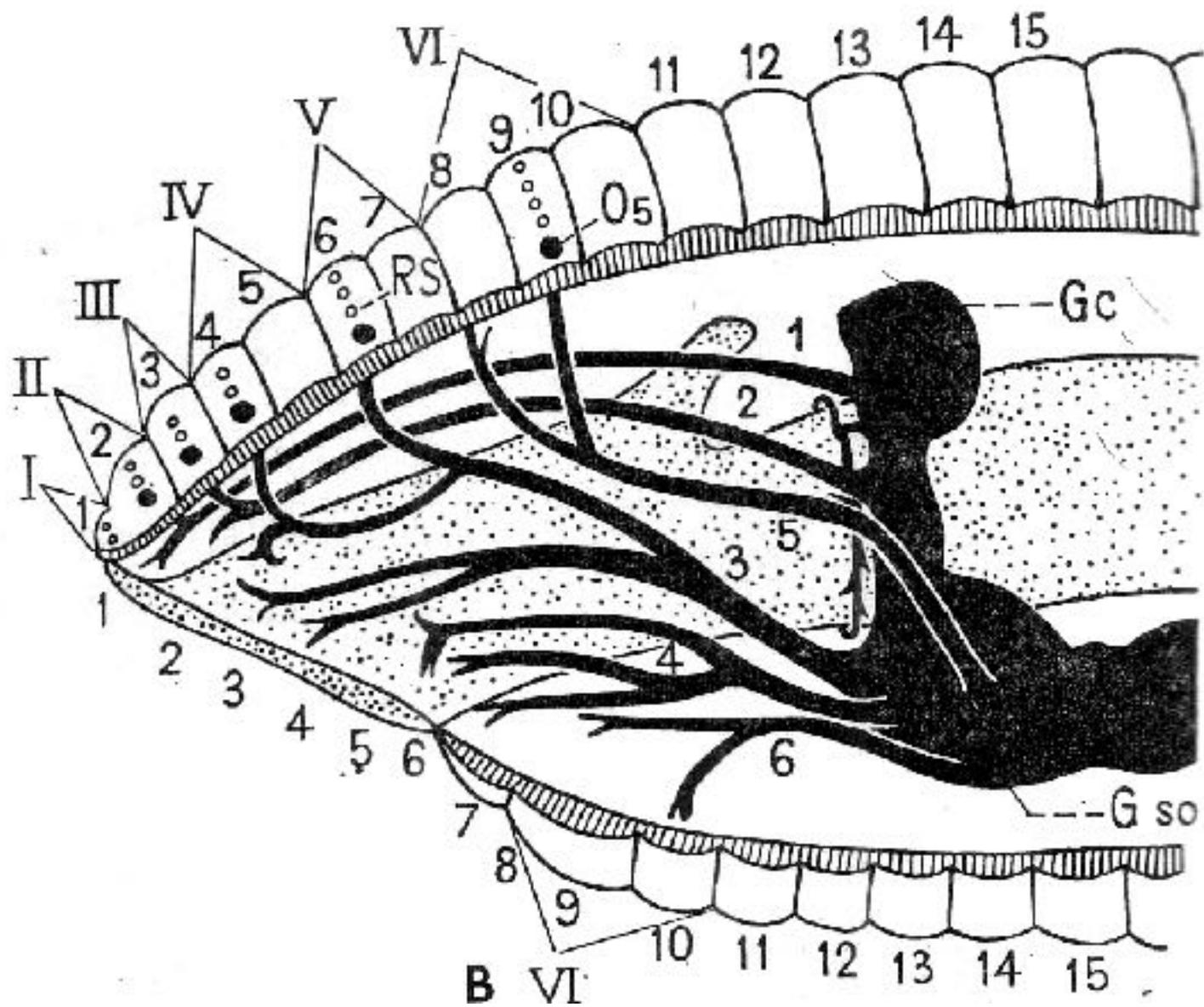
2. FOTORRECEPTORES

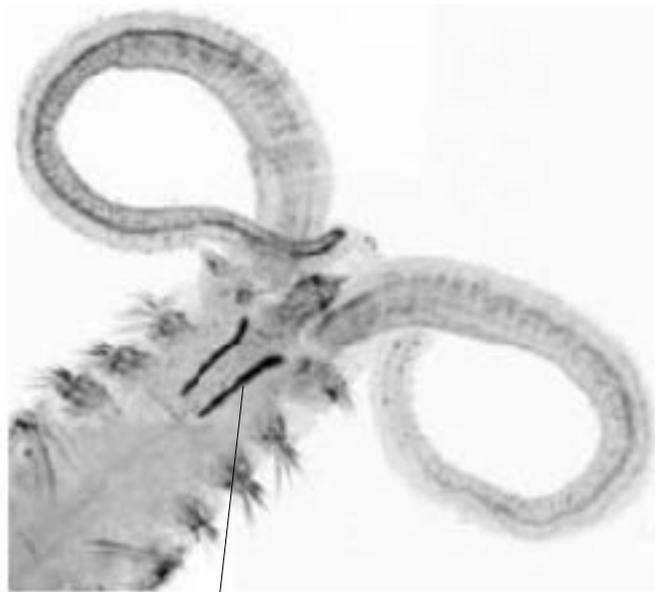
3. QUIMIORRECEPTORES

# Quimiorreceptores

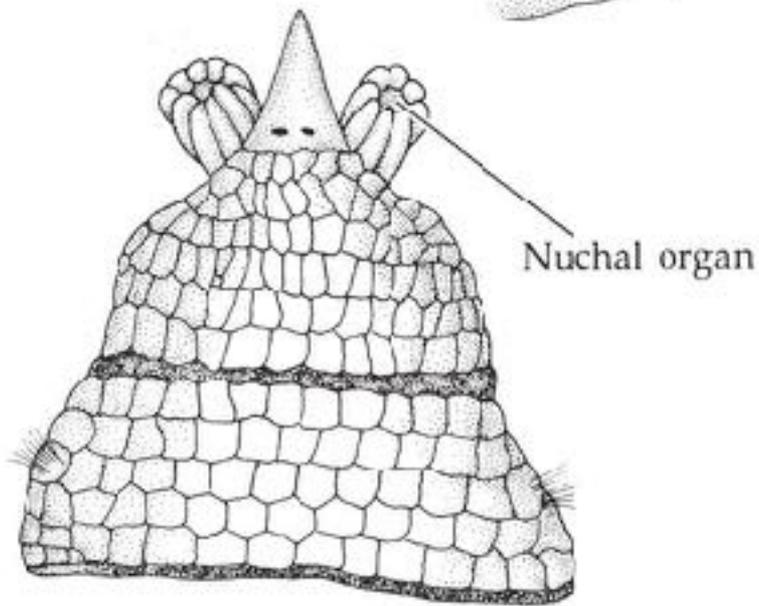
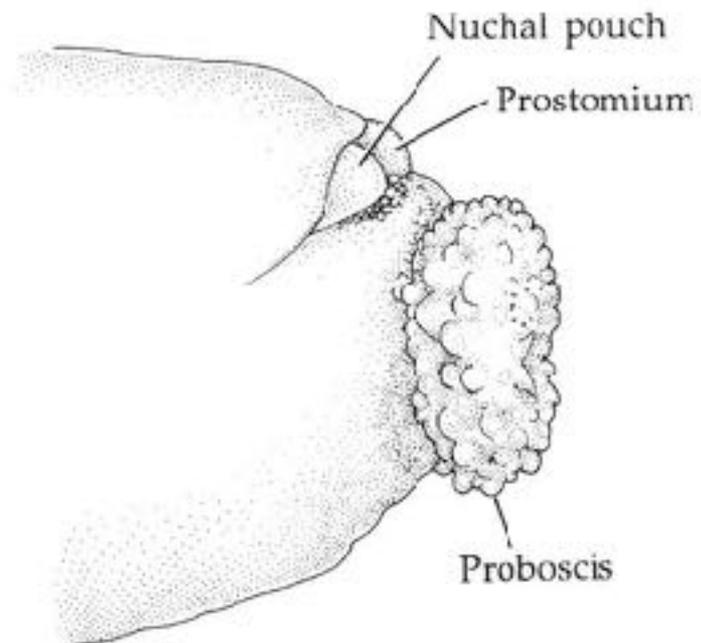


# Sistema sensorial: Hirudinea

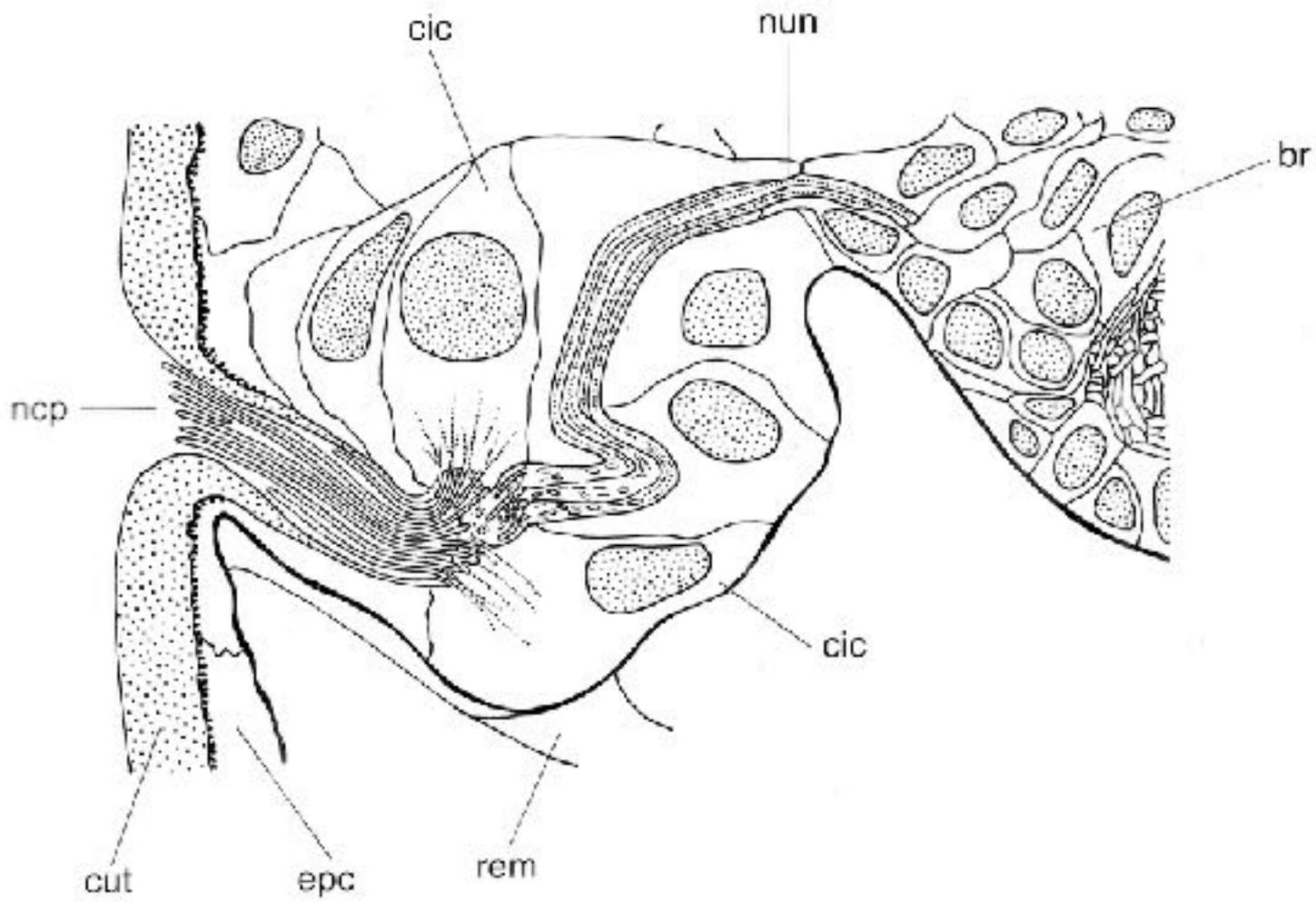


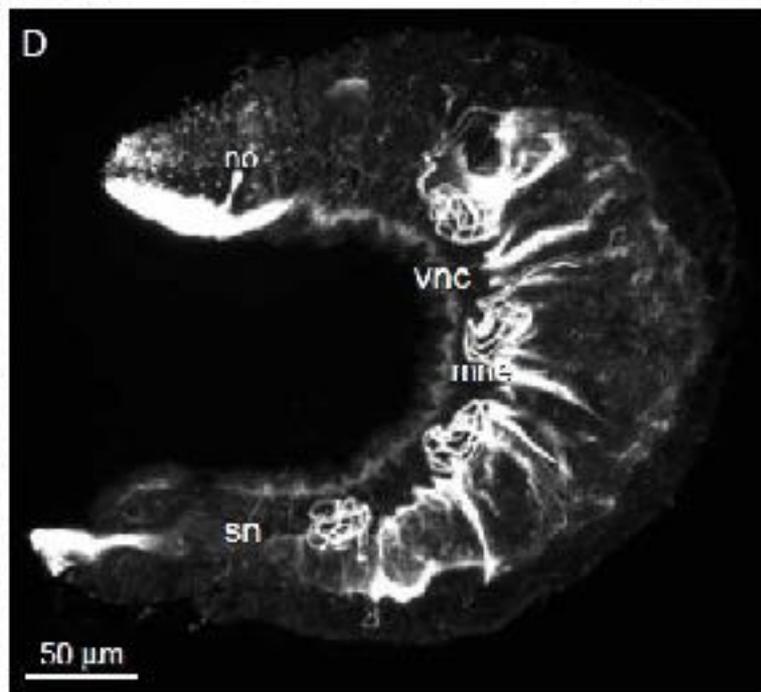
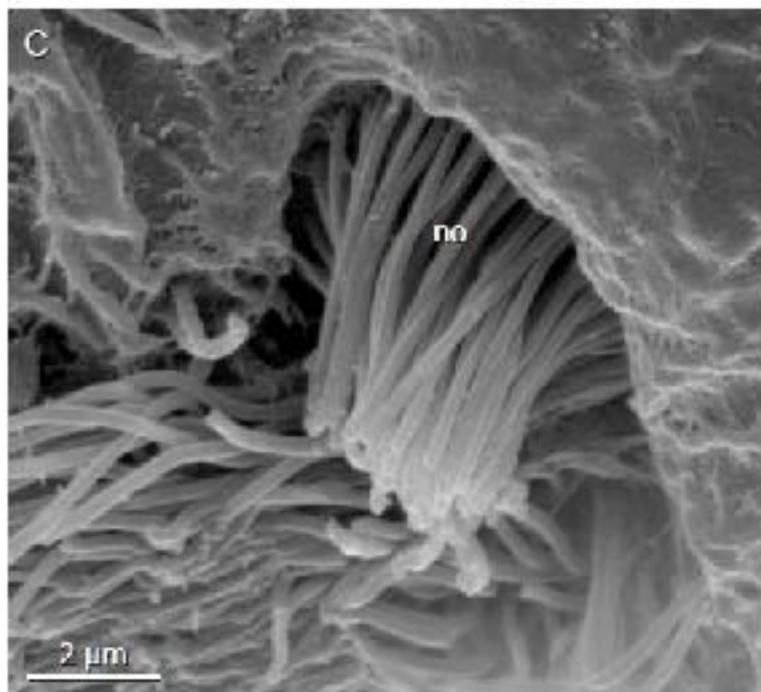
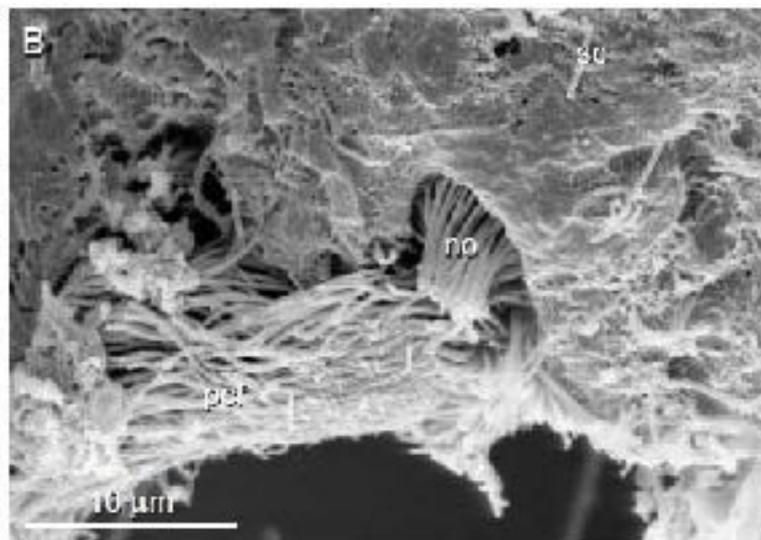
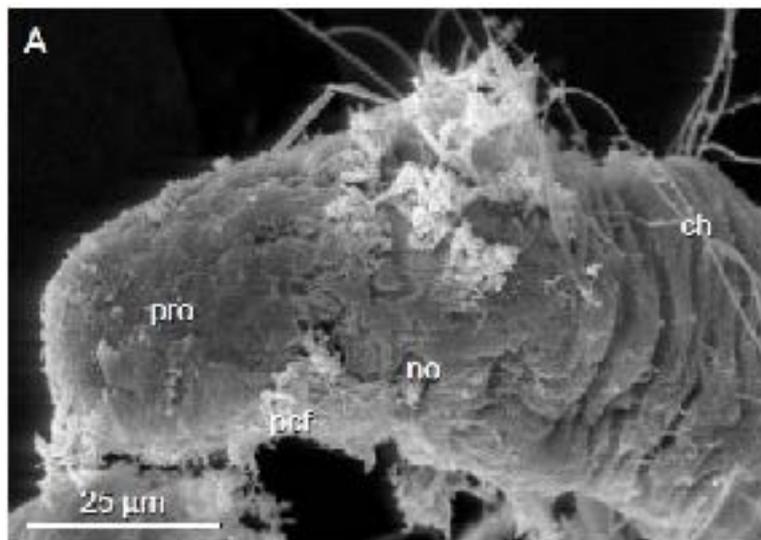


Órgão nugal



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# TERMORRECEPÇÃO

