



SISTEMA CARDIOVASCULAR

Sistema Cardiovascular

- **Objetivos da aula** – os estudantes deverão ser capazes de
- **Descrever** as funções gerais do sistema cardiovascular
- **Relacionar** os componentes vascular sanguíneo e linfático e o sentido do fluxo do sangue em relação ao coração
- **Explicar** a organização do sistema vascular sanguíneo e linfático
- **Descrever** a organização histológica da parede dos diferentes tipos de vasos sanguíneos (artérias e seus tipos, arteríolas, capilares e seus tipos, vênulas e veias) e linfáticos
- **Definir** endotélio e **relacionar** suas funções
- **Descrever** a estrutura histológica das túnicas do coração
- **Comparar** semelhanças e diferenças entre os diferentes tipos de vasos sanguíneos, os linfáticos e o coração
- **Identificar e reconhecer** as estruturas e organização tecidual do sistema cardiovascular

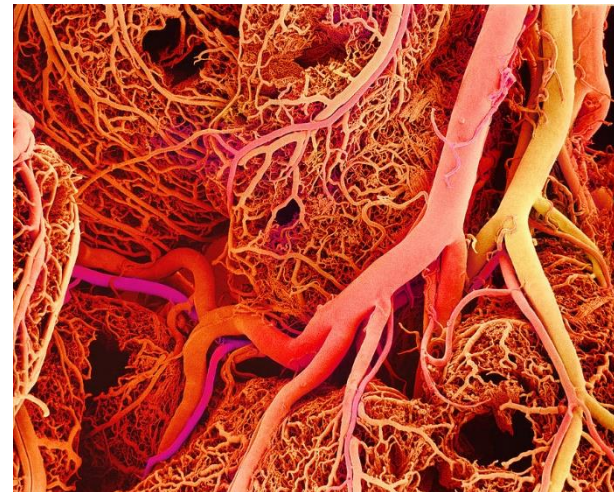
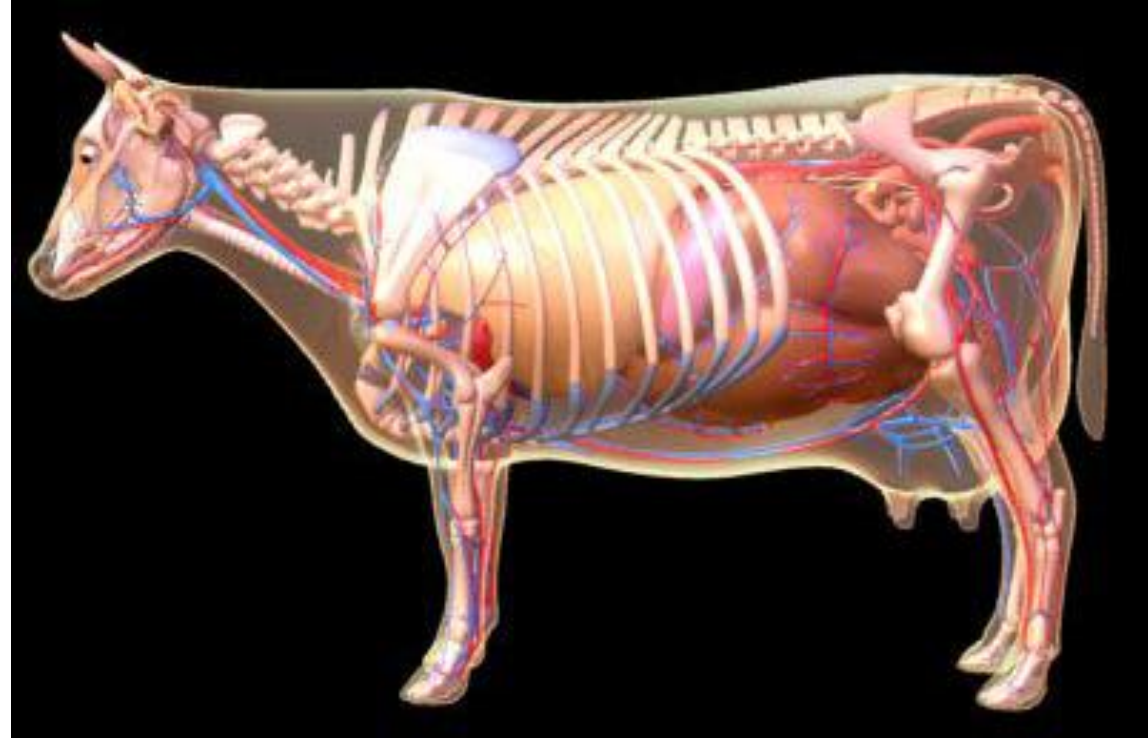
Sistema Cardiovascular

- **Funções**

- **transporte**

- O_2 e nutrientes
 - CO_2 e metabólitos
 - hormônios

- **defesa**

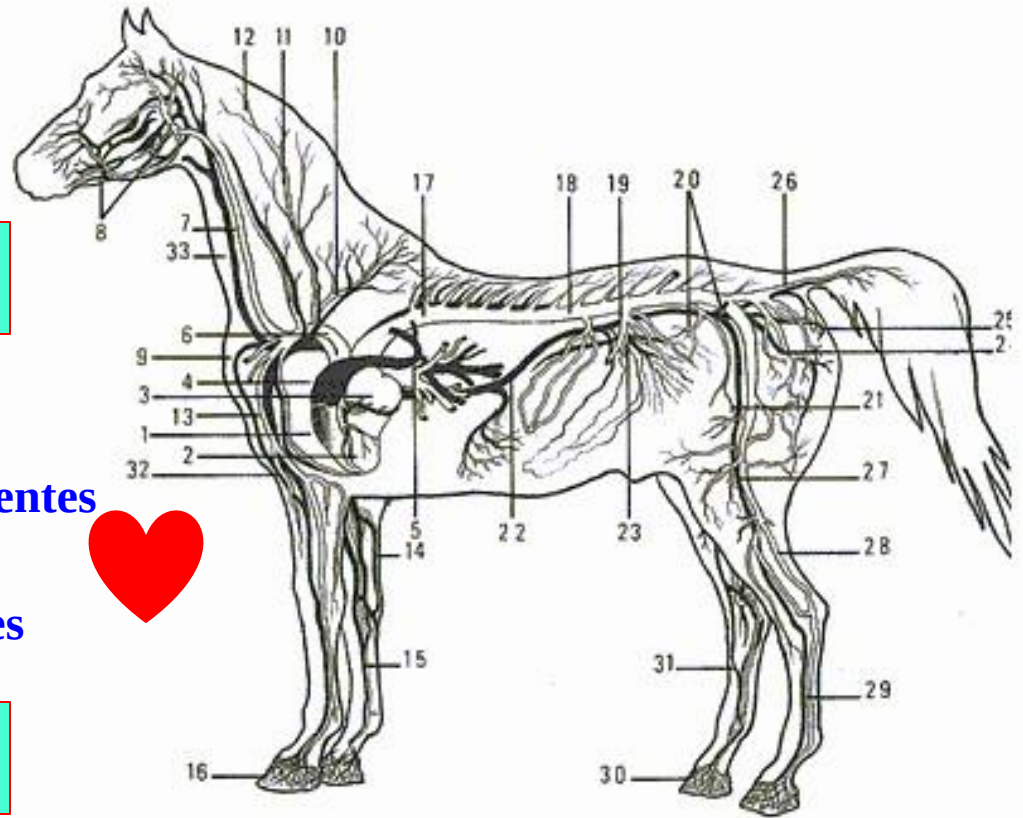


Sistema Cardiovascular

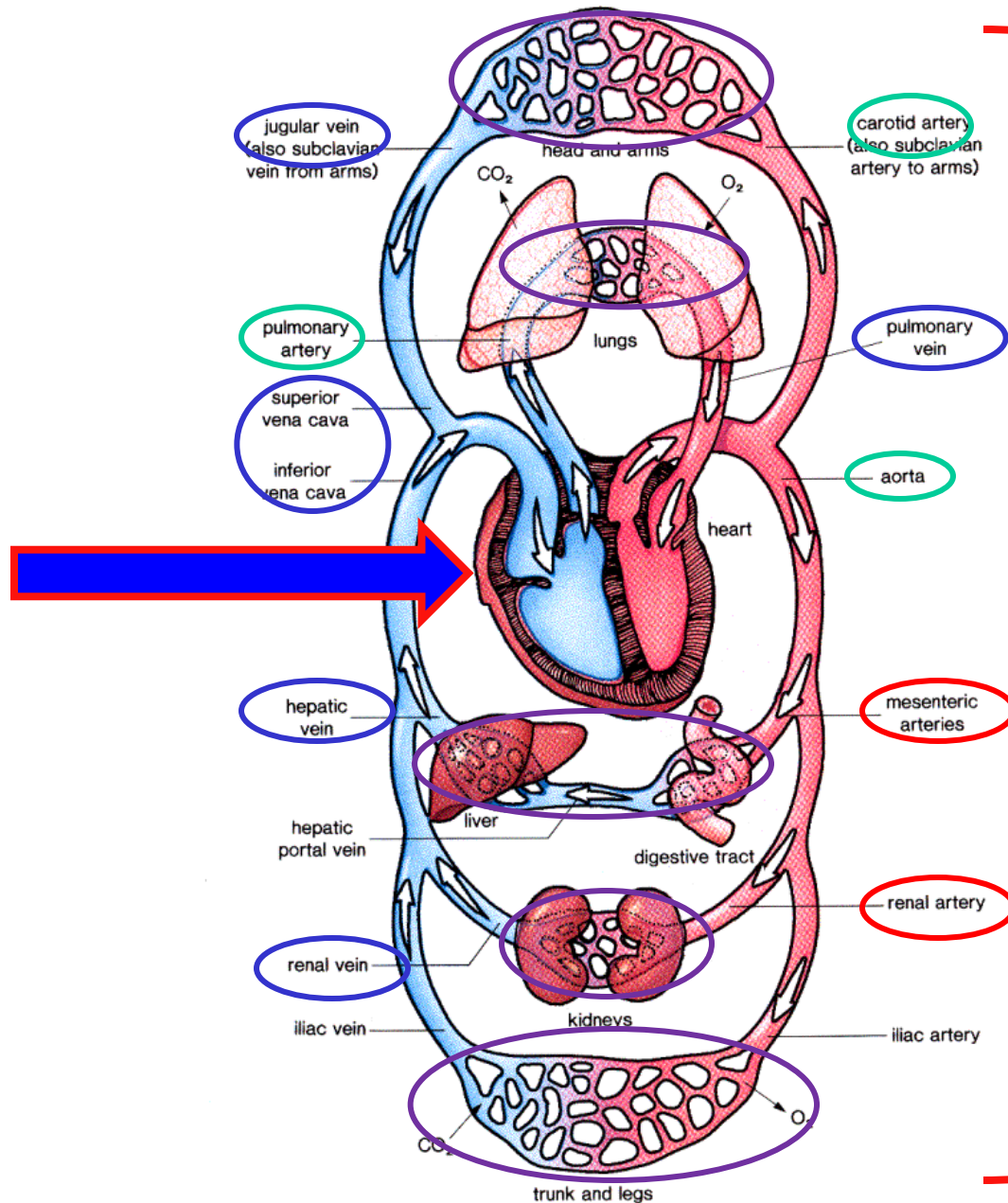
- Componentes

- **vascular sanguíneo** **sangue**
 - coração
 - **vasos sanguíneos**
 - artérias, arteríolas = **eferentes**
 - capilares
 - vênulas, veias = **aferentes**

- **vascular linfático** **linfa**
 - **vasos linfáticos**
 - capilares
 - vasos e ductos = **aferentes**



Organização do sistema vascular sanguíneo



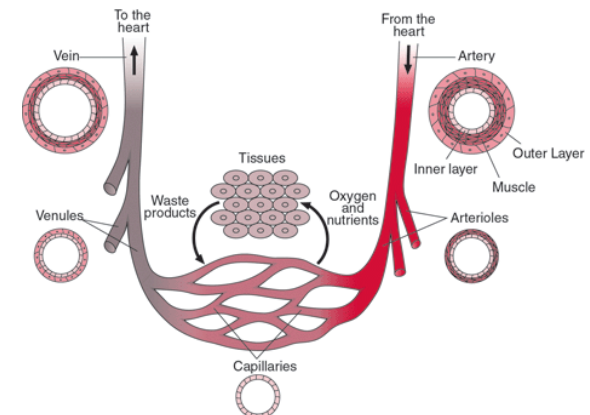
circuito fechado

Grande calibre
elásticas / condutoras

circulação pulmonar

circulação sistêmica

Médio calibre
musculares / distribuidoras



- **Endotélio**

- **Constituição**

- epitélio pavimentoso simples

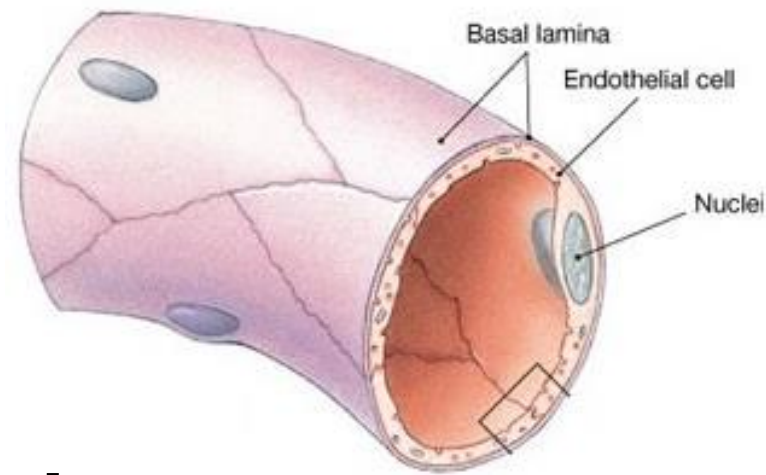
- **Funções**

- revestimento **TODO** sist. cardiovascular

- **troca de substâncias (difusão e pinocitose)**

- **papel metabólico**

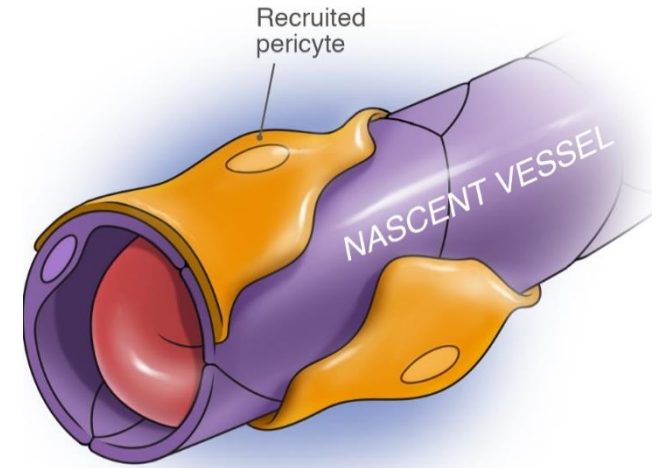
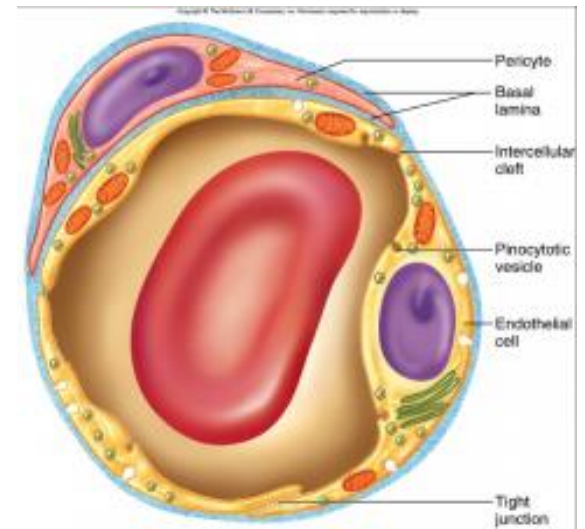
- conversão de angiotensina I em angiotensina II
- degradação de prostaglandinas, noradrenalina, entre outros
- síntese/secreção
 - **fatores vasoativos**
 - endotelina, óxido nítrico
 - **fatores de crescimento**
 - VEGF (*Vascular Endothelial Growth Factor*)



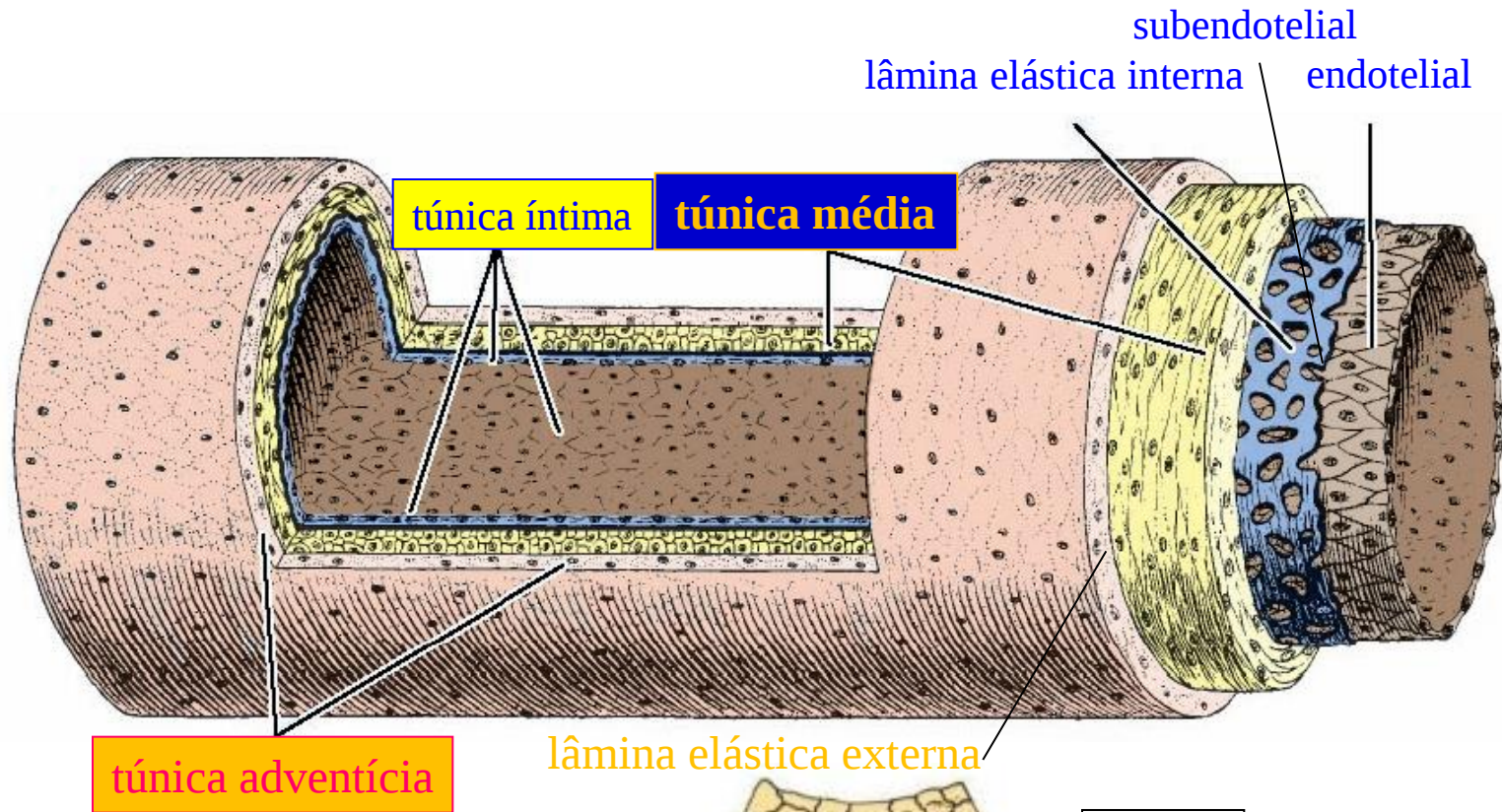
- **Endotélio**

- **Pericitos**

- capilares / vênulas
 - reparação tecidual - angiogênese



Parede vascular



epit pavim simples
conjuntivo frouxo
fibras elásticas

músculo liso

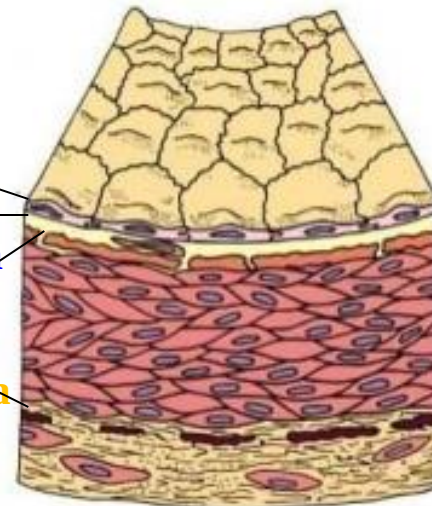
fibras elásticas e colágenas

conjuntivo frouxo

fibras elásticas e colágenas

endotelial
subendotelial
elástica interna

elástica externa



LUZ

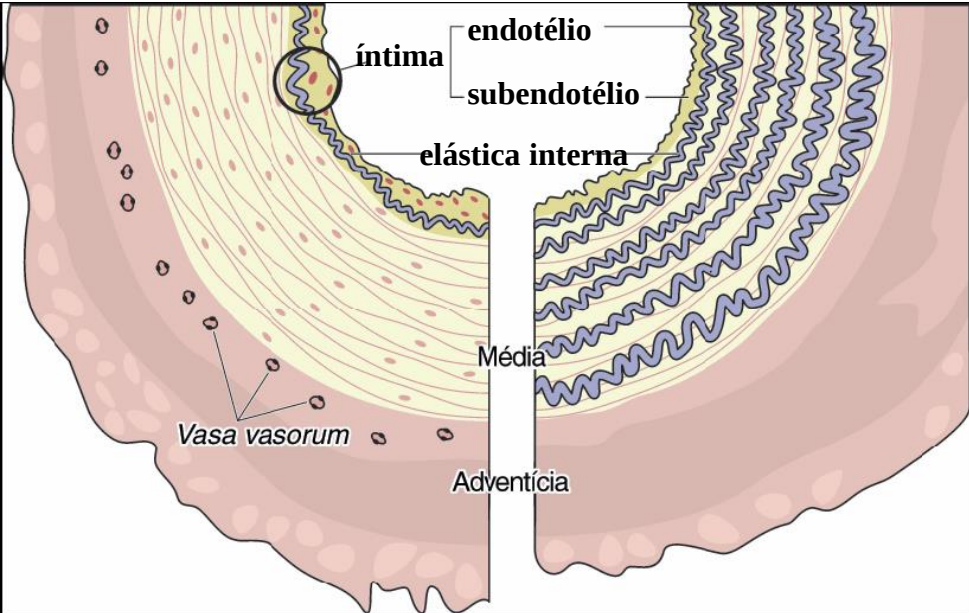
íntima

média

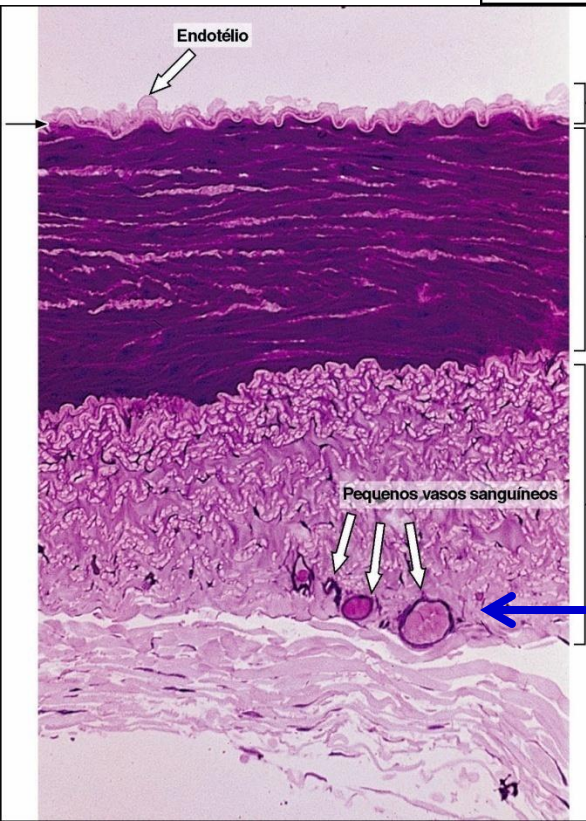
adventícia

• **Artérias**

Médio calibre
muscular / distribuidora



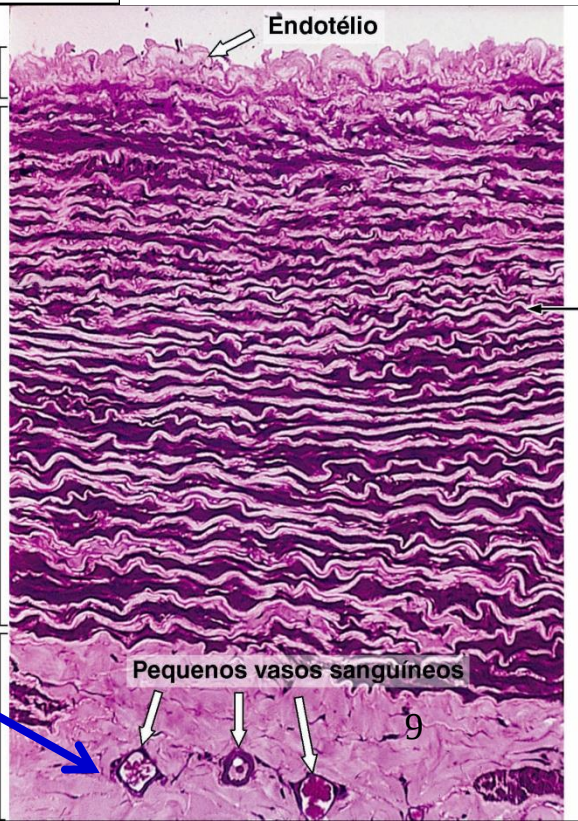
Grande calibre
elástica / condutora



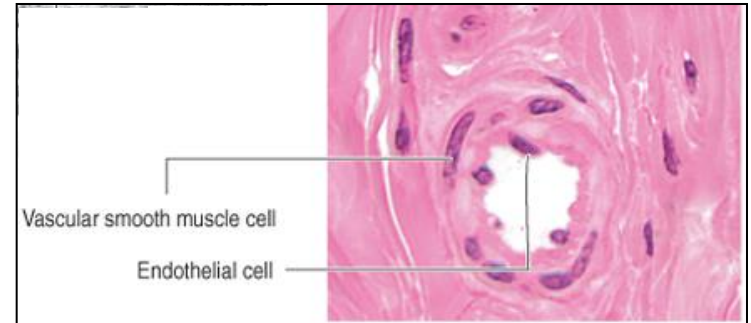
íntima
média
adventícia

vasa vasorum

íntima
média
adventícia

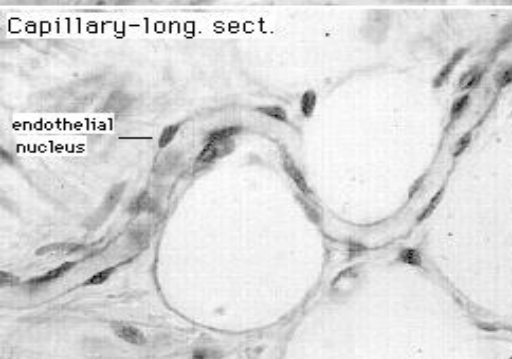
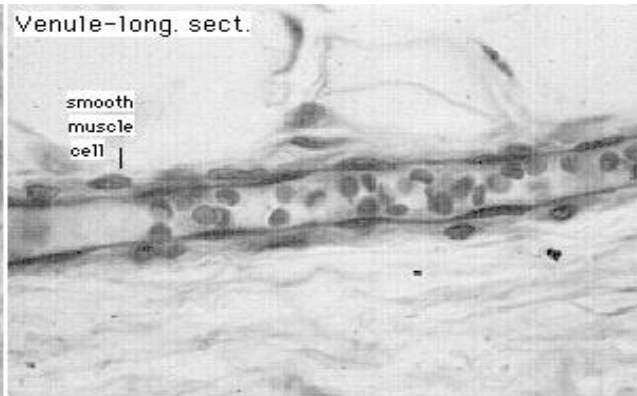
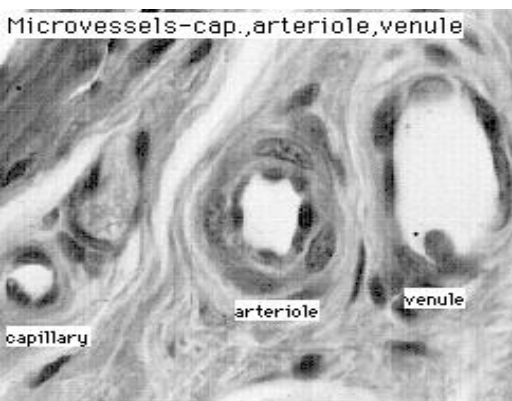
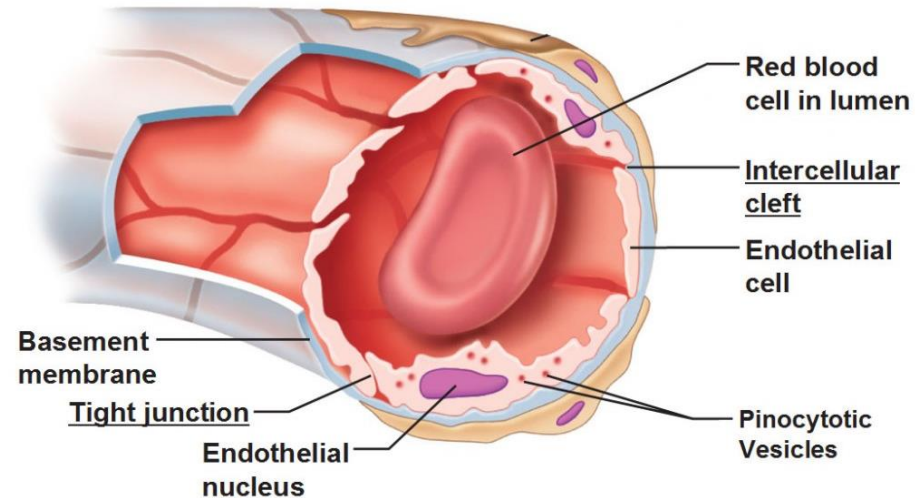


- **Arteríola** – pequeno calibre
- **túnica íntima**
 - **endotélio**
 - subendotelial delgada
 - lâmina elástica interna **presente ou não**
- **túnica média**
 - uma a duas camadas de células musculares lisas
 - controle do fluxo sanguíneo
 - lâmina elástica externa **ausente**
- **túnica adventícia**
 - delgada

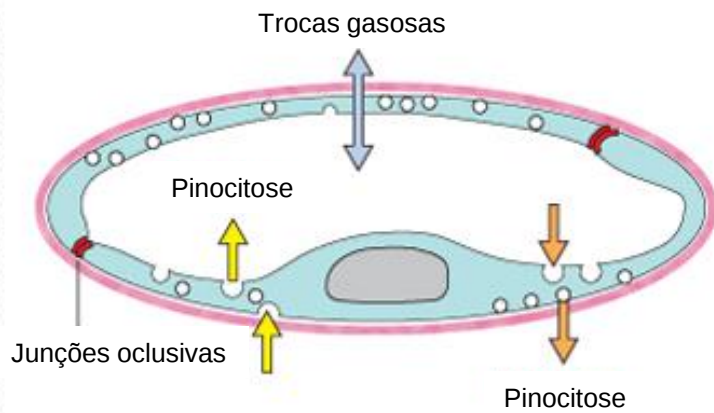


• Capilares

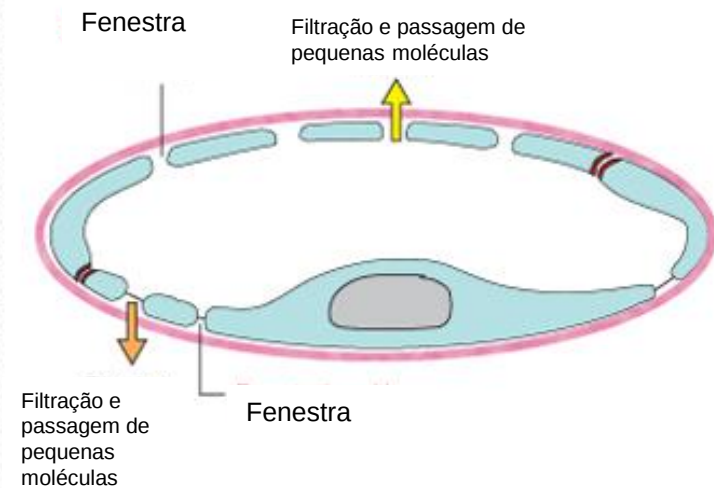
- < calibre
- 1-3 células endoteliais
- LB; pericitos
- fluxo lento
- local de trocas



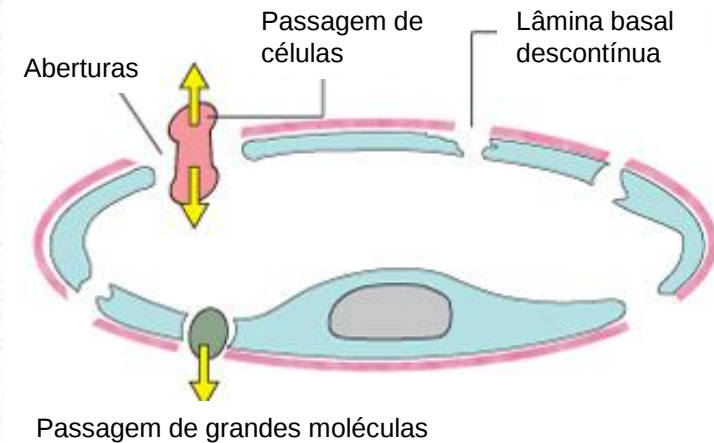
• Tipos de capilares



capilar **contínuo**



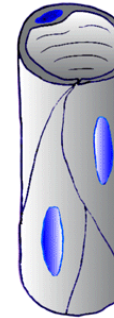
capilar **fenestrado**



capilar **descontínuo / sinusoide**

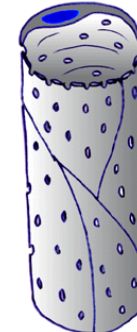
CAPILLARY TYPES

Continuous
Capillary



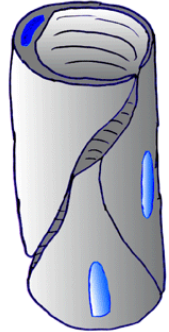
Typical
Locations
fat
muscle
nervous
system

Fenestrated
Capillary

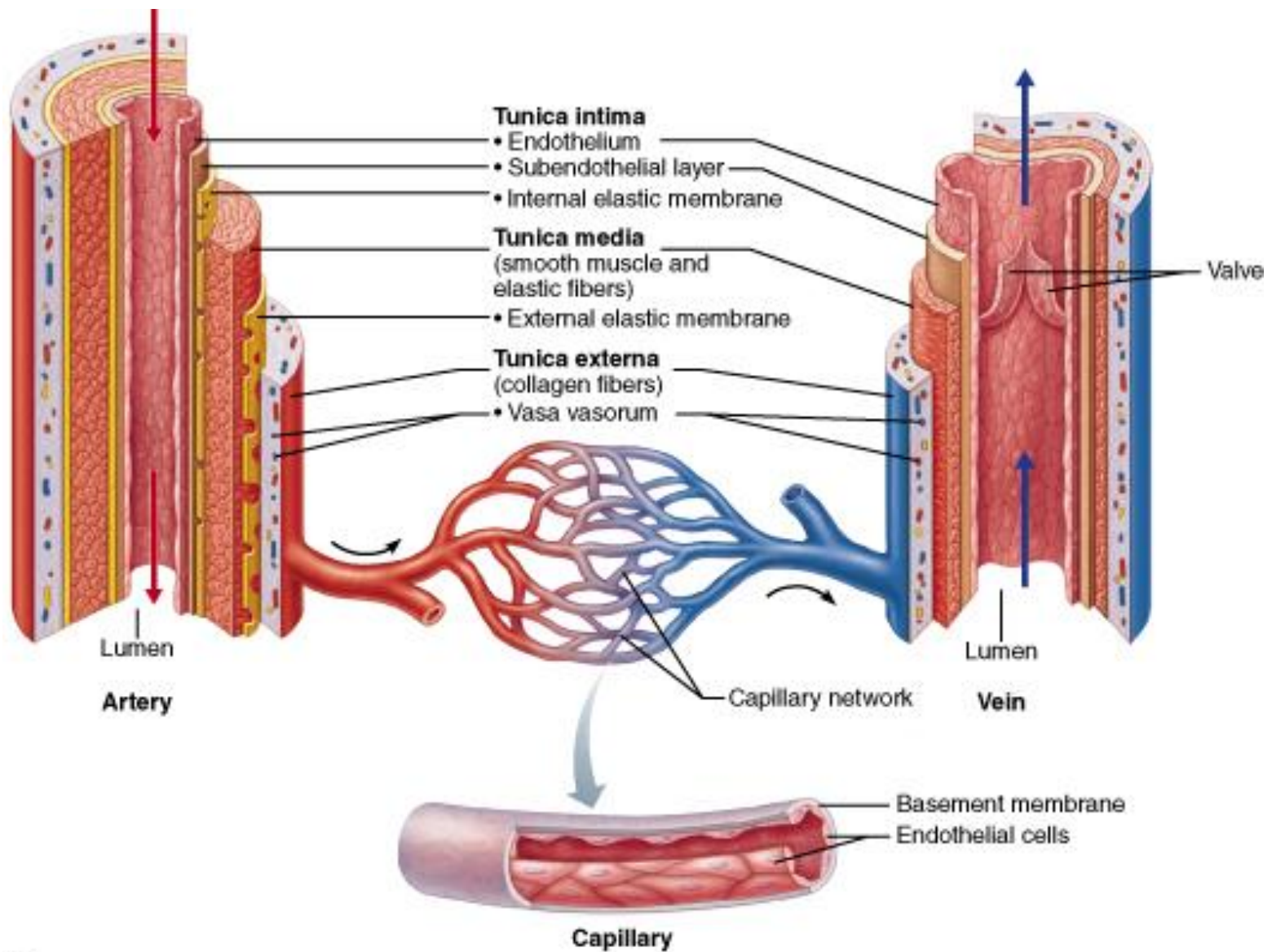


Typical
Locations
intestinal villi
endocrine glands
kidney glomeruli

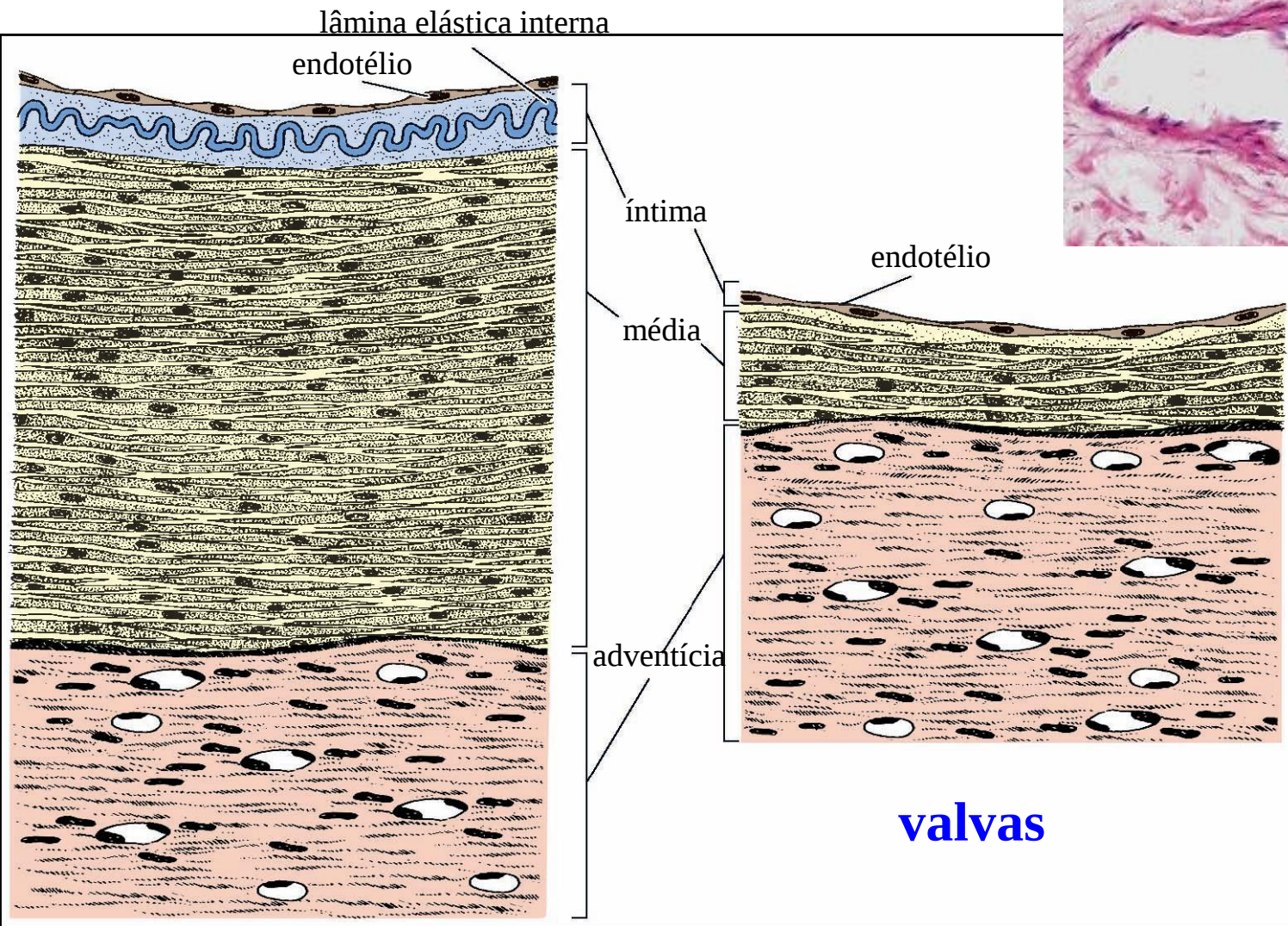
Discontinuous
Capillary



Typical
Locations
liver
bone marrow
spleen



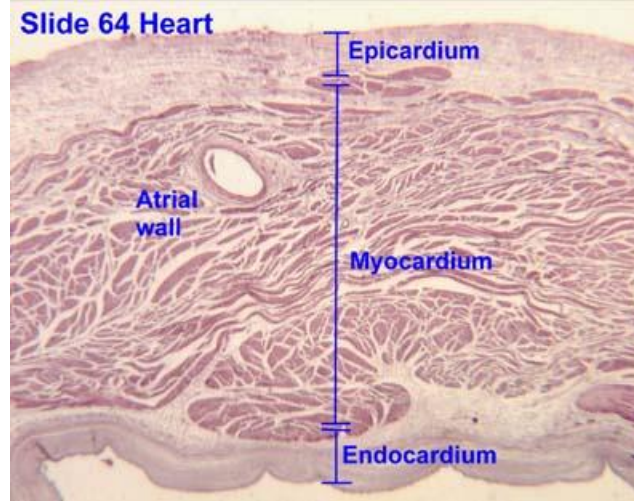
(b)



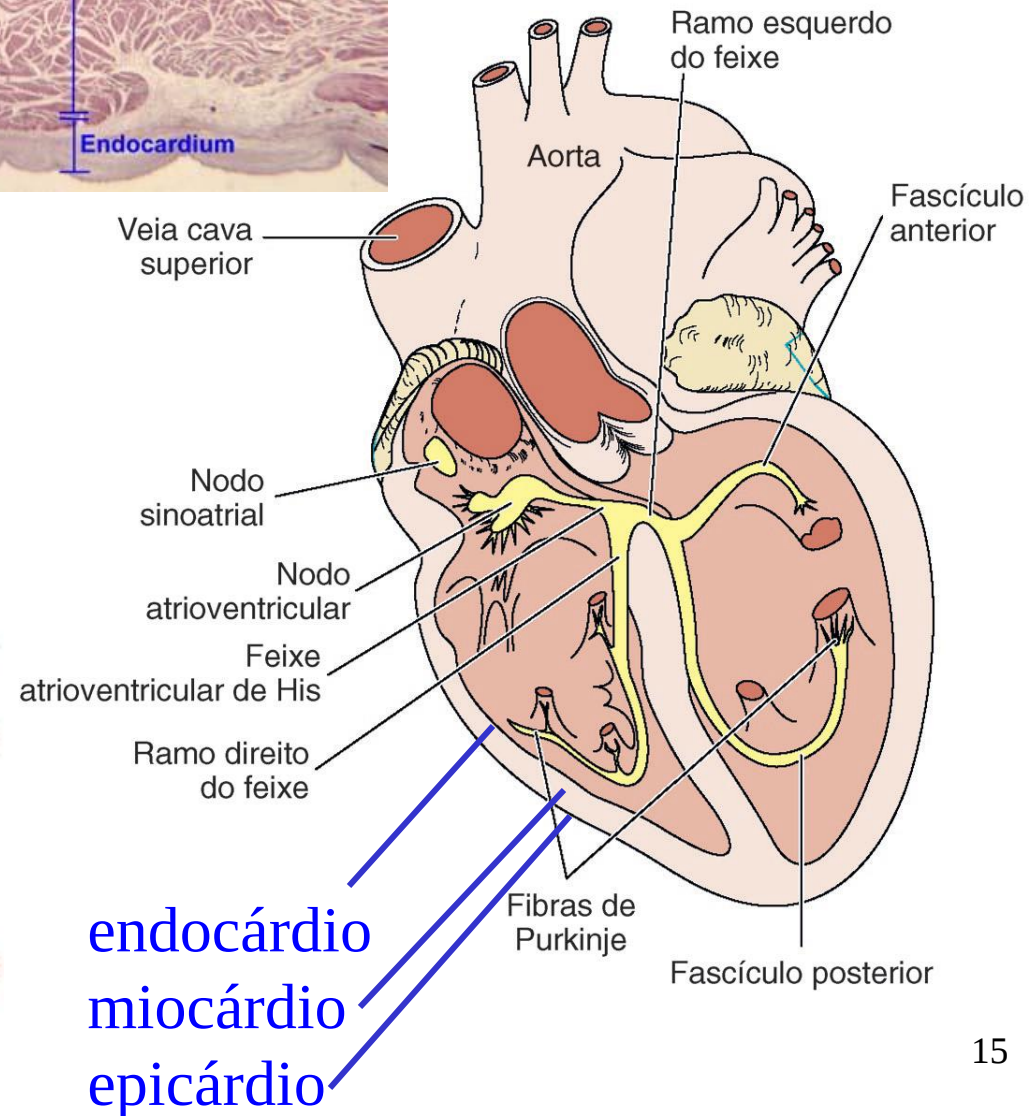
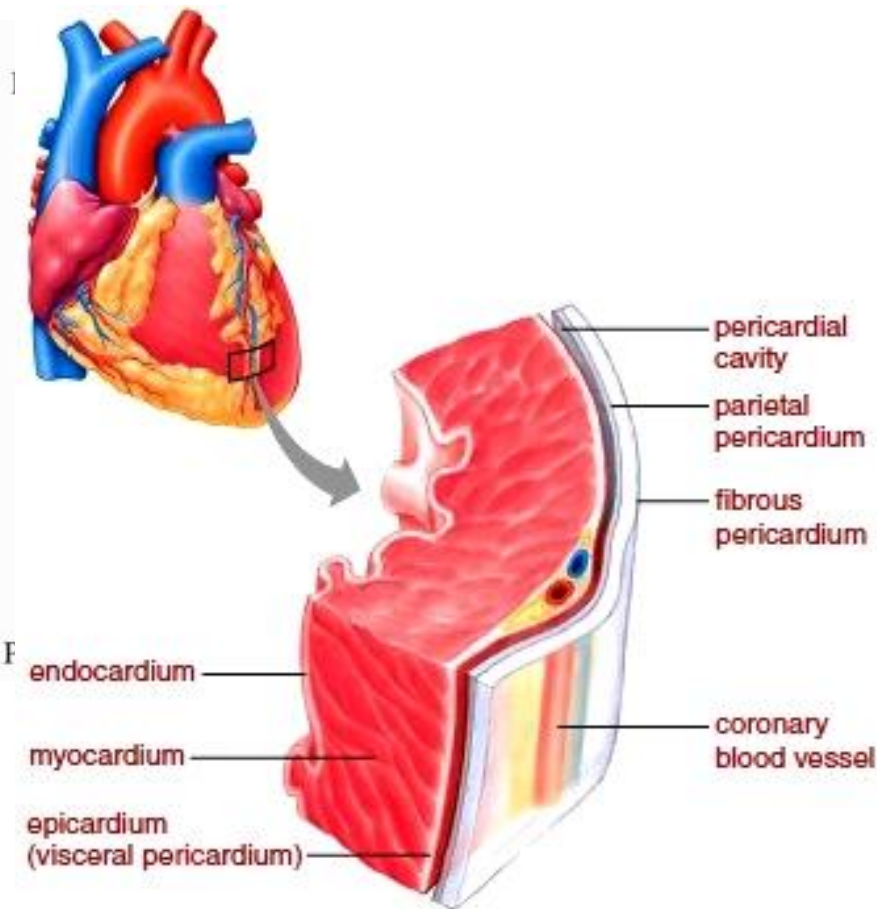
ARTÉRIA

VEIA

- **Função**
- **Componentes**
 - túnicas



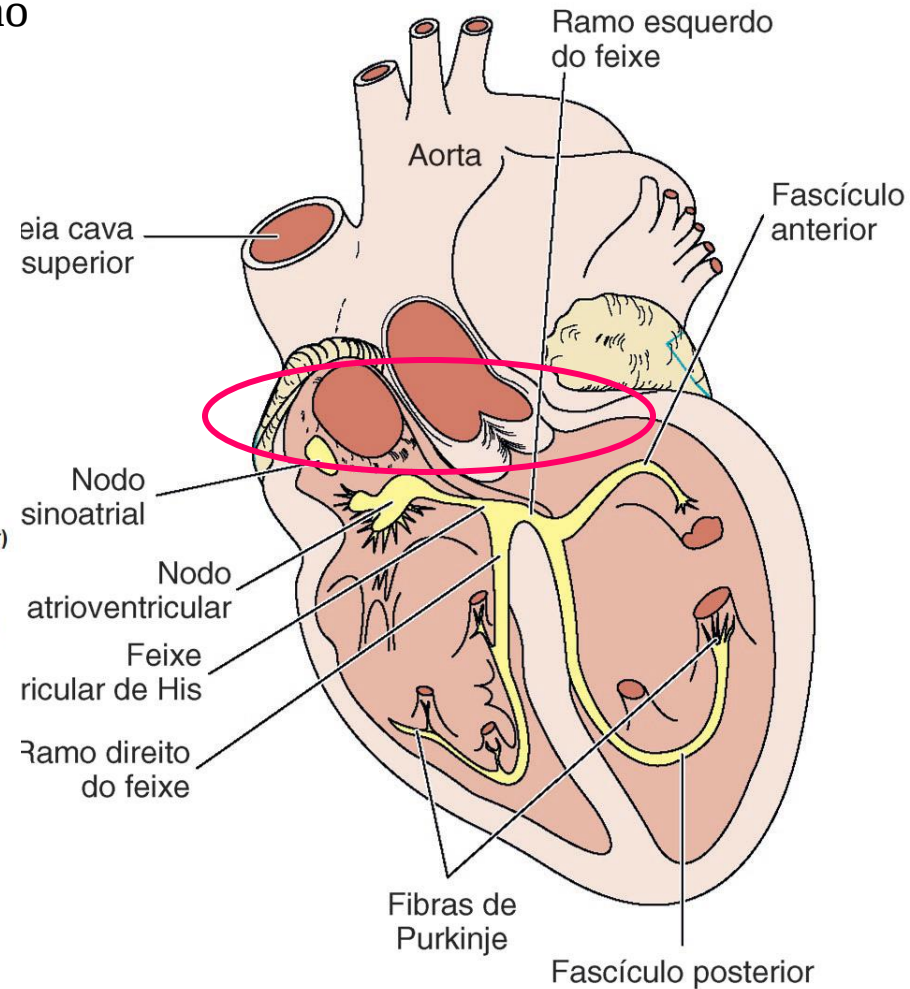
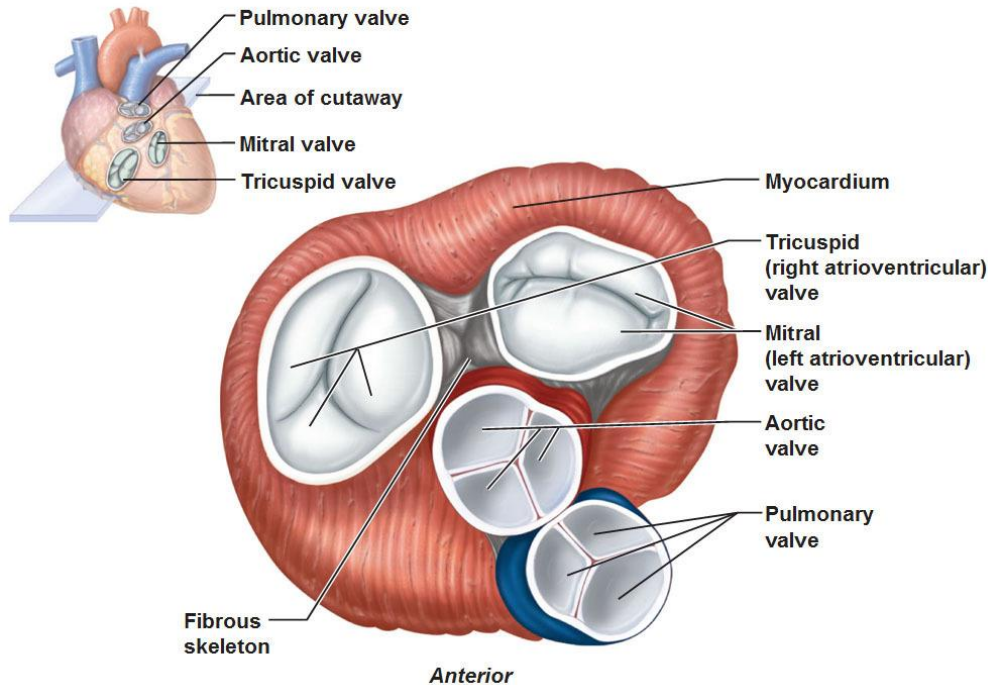
Coração



- Função
- Componentes

- túnica
 - esqueleto fibroso
- conj. denso não modelado = felino, suíno
cart. fibrosa = canino
cart. hialina = equino
ósseo = bovino

Heart Valves and the Fibrous Skeleton (dense CT)

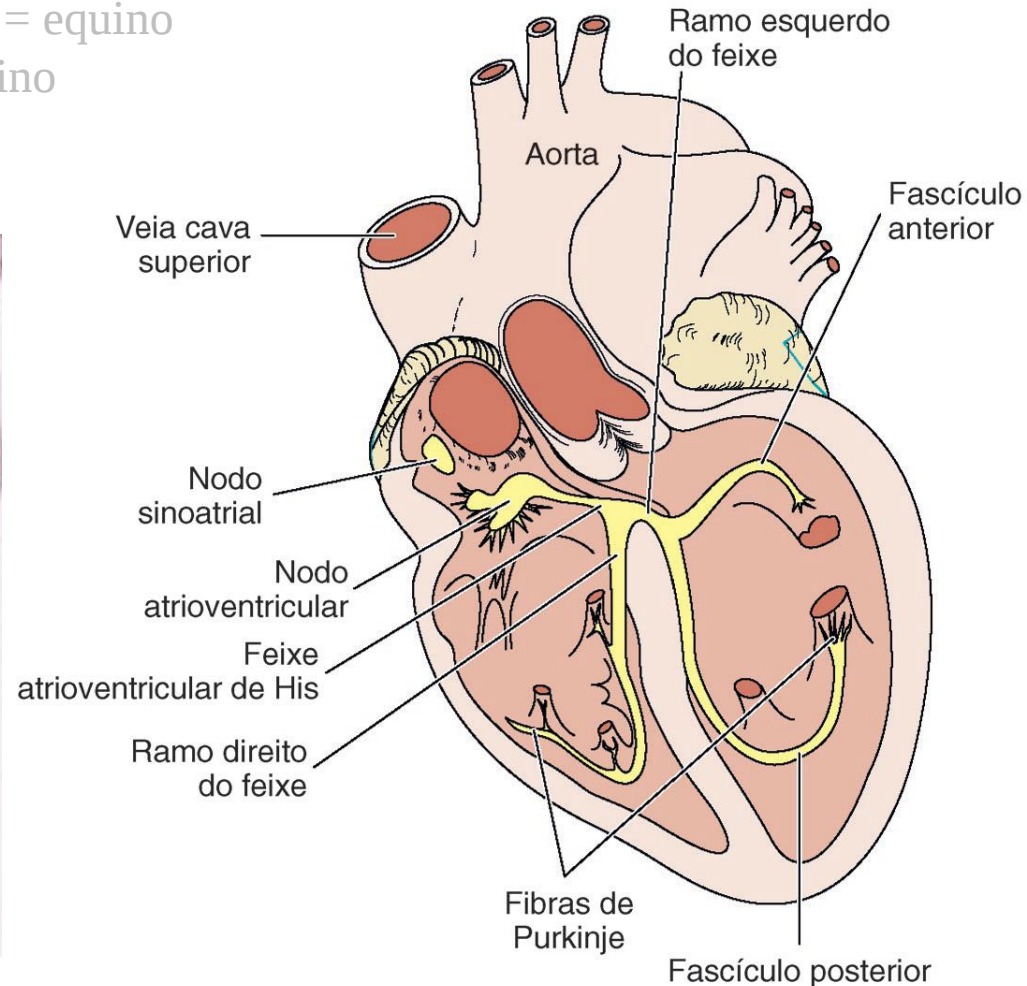


- **Função**
- **Componentes**

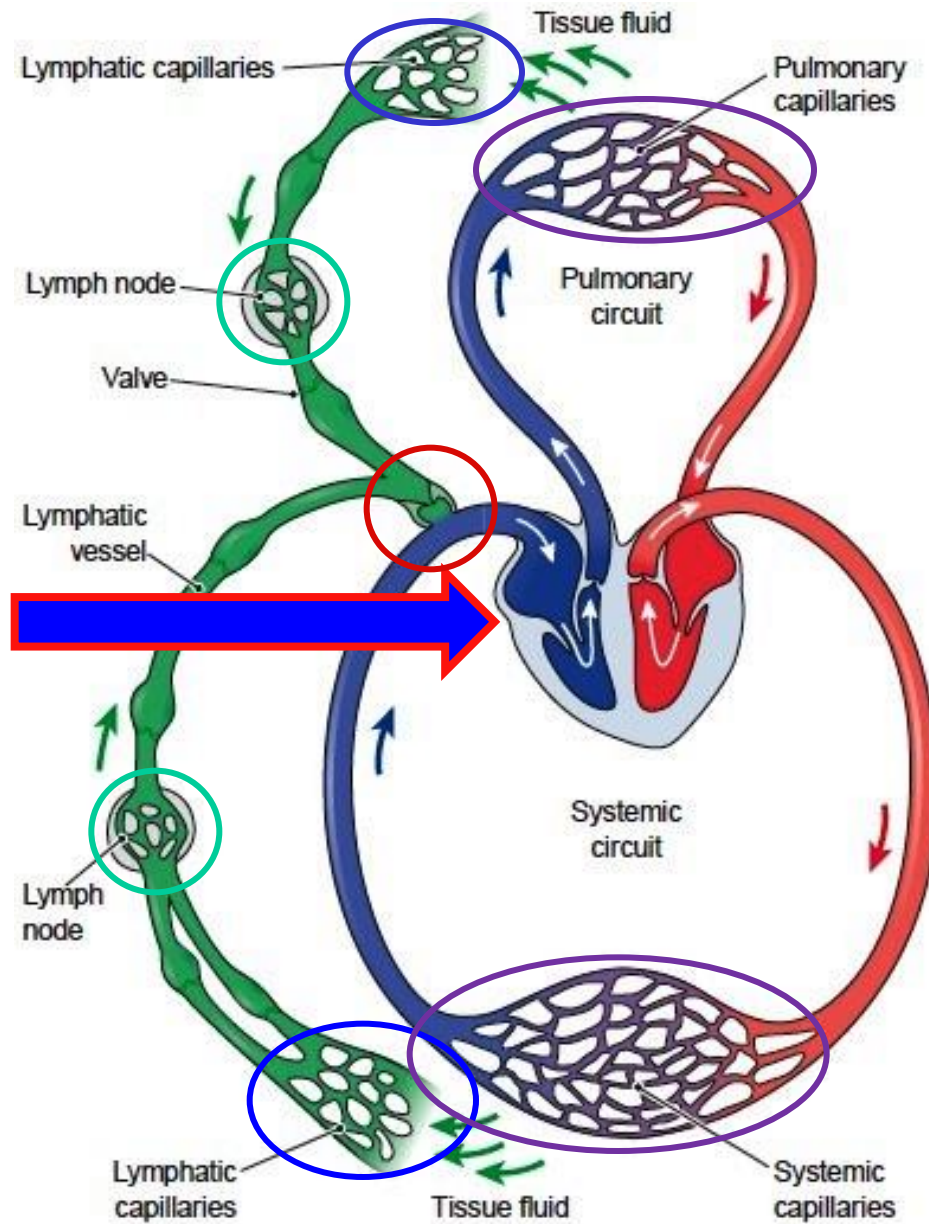
- túnicas
- esqueleto fibroso
- sistema gerador

conj. denso não modelado = felino, suíno
 cart. fibrosa = canino
 cart. hialina = equino
 ósseo = bovino

Coração



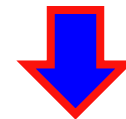
Organização do sistema vascular linfático



não “circula”

**capilares linfáticos
(fundo cego/fundo de saco)**

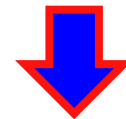
drenam os tecidos



**vasos linfáticos
recolhem dos capilares linfáticos**

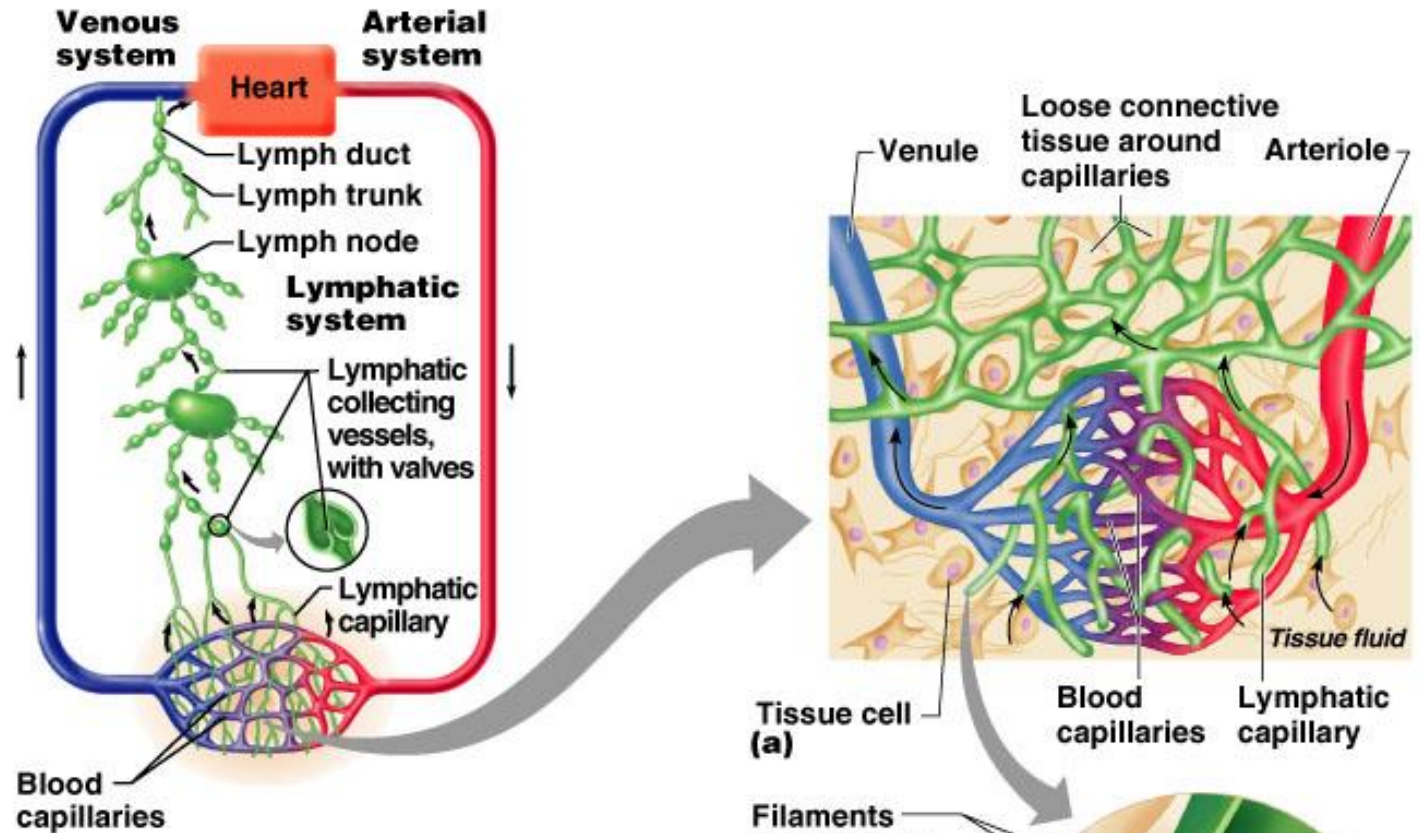


**duto
(torácico e linfático direito)**
recolhem dos vasos linfáticos

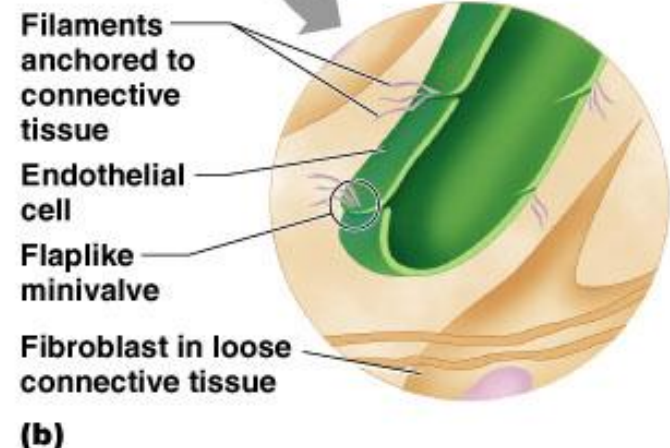


**veias próximas ao coração
(subclávia esquerda e direita)**
linfa retorna ao sangue

Organização do sistema vascular linfático



Tissue cell (a)

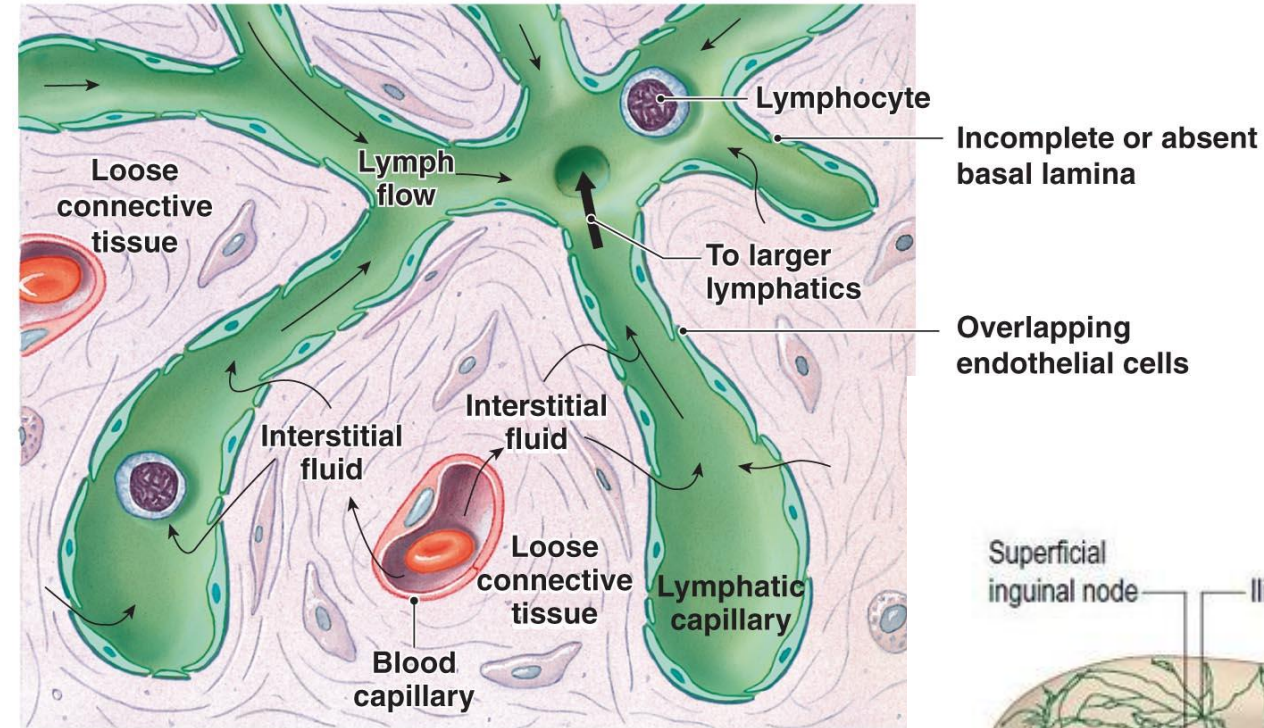


- **Funções**

- recolher fluidos tissulares
- defesa
- absorção de lipídios (intestinos)

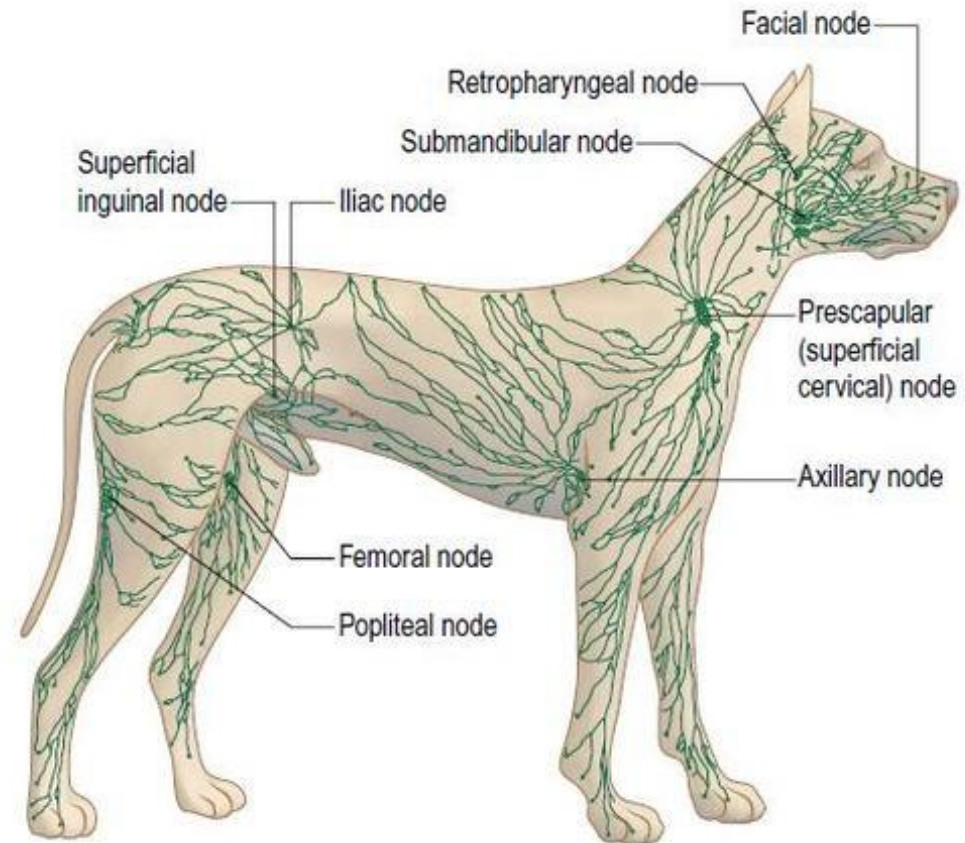
Vasos linfáticos

The structure of lymphatic capillaries



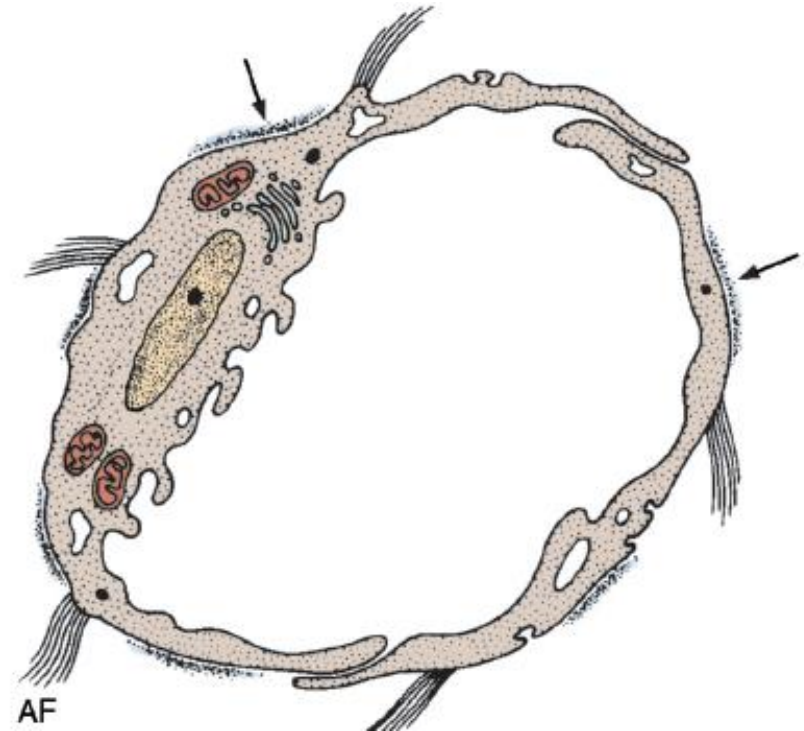
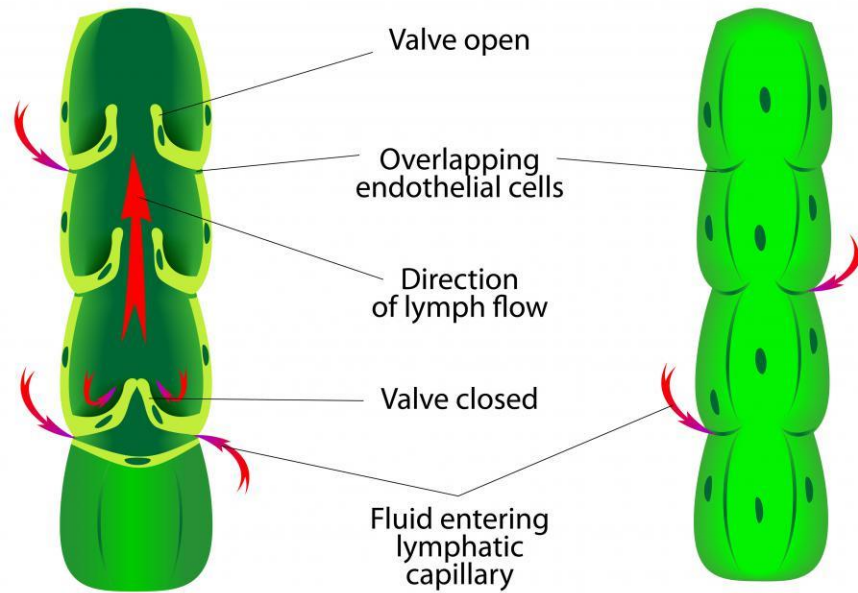
Sectional view

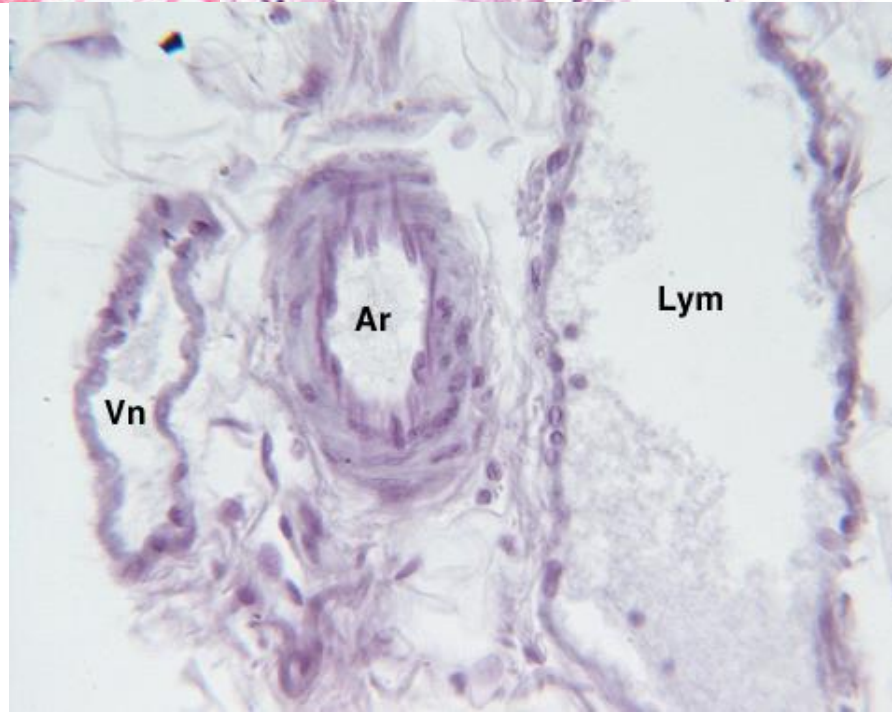
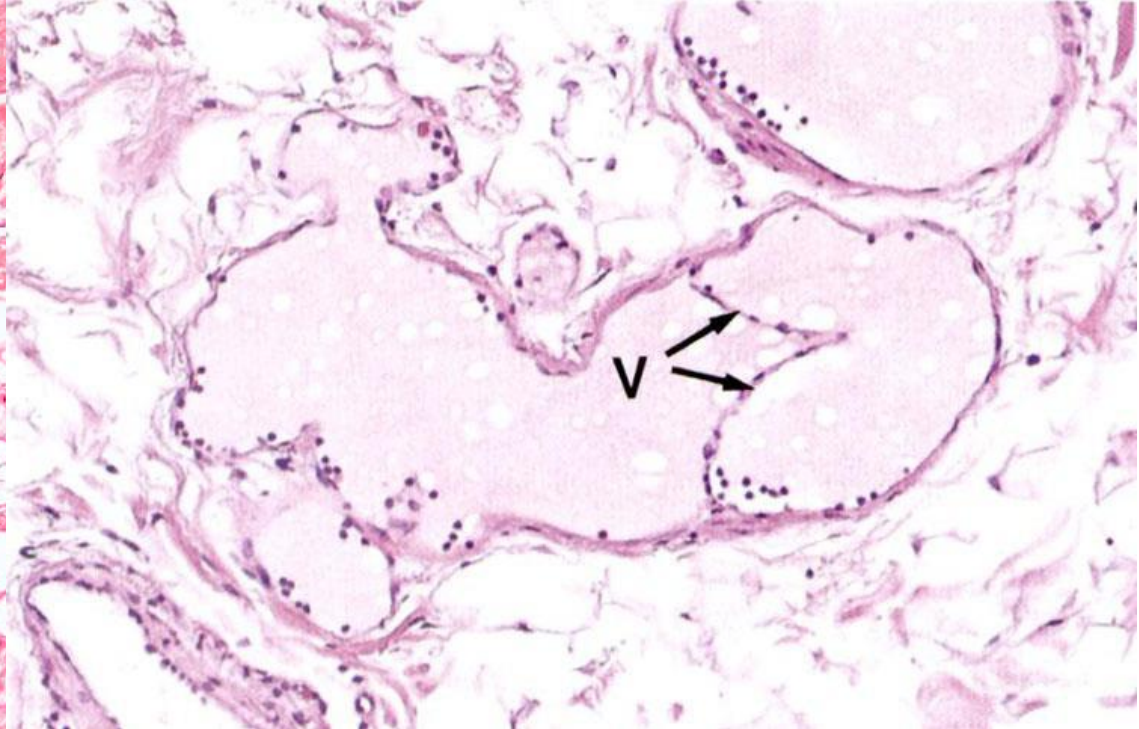
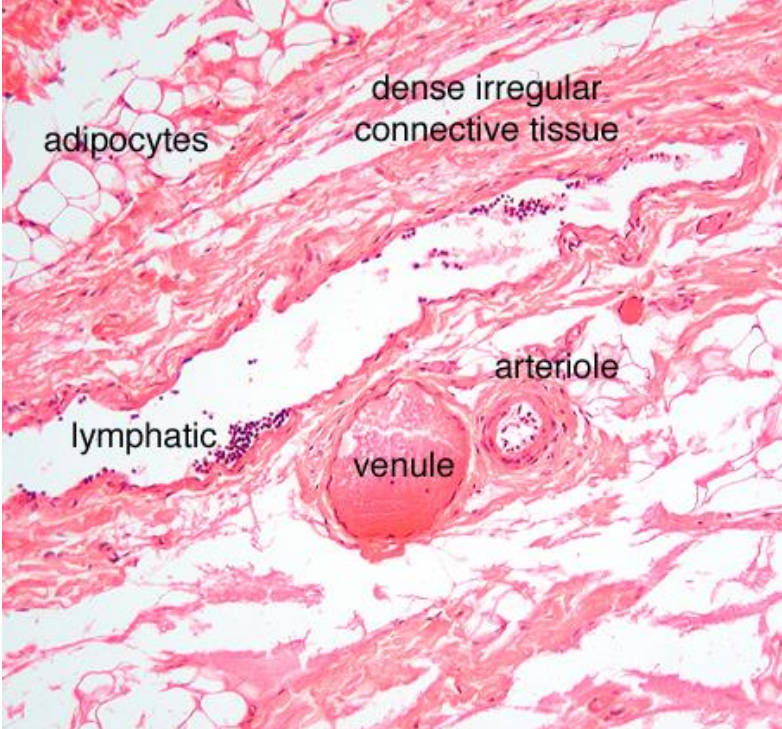
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Vasos linfáticos

Lymphatic vessel





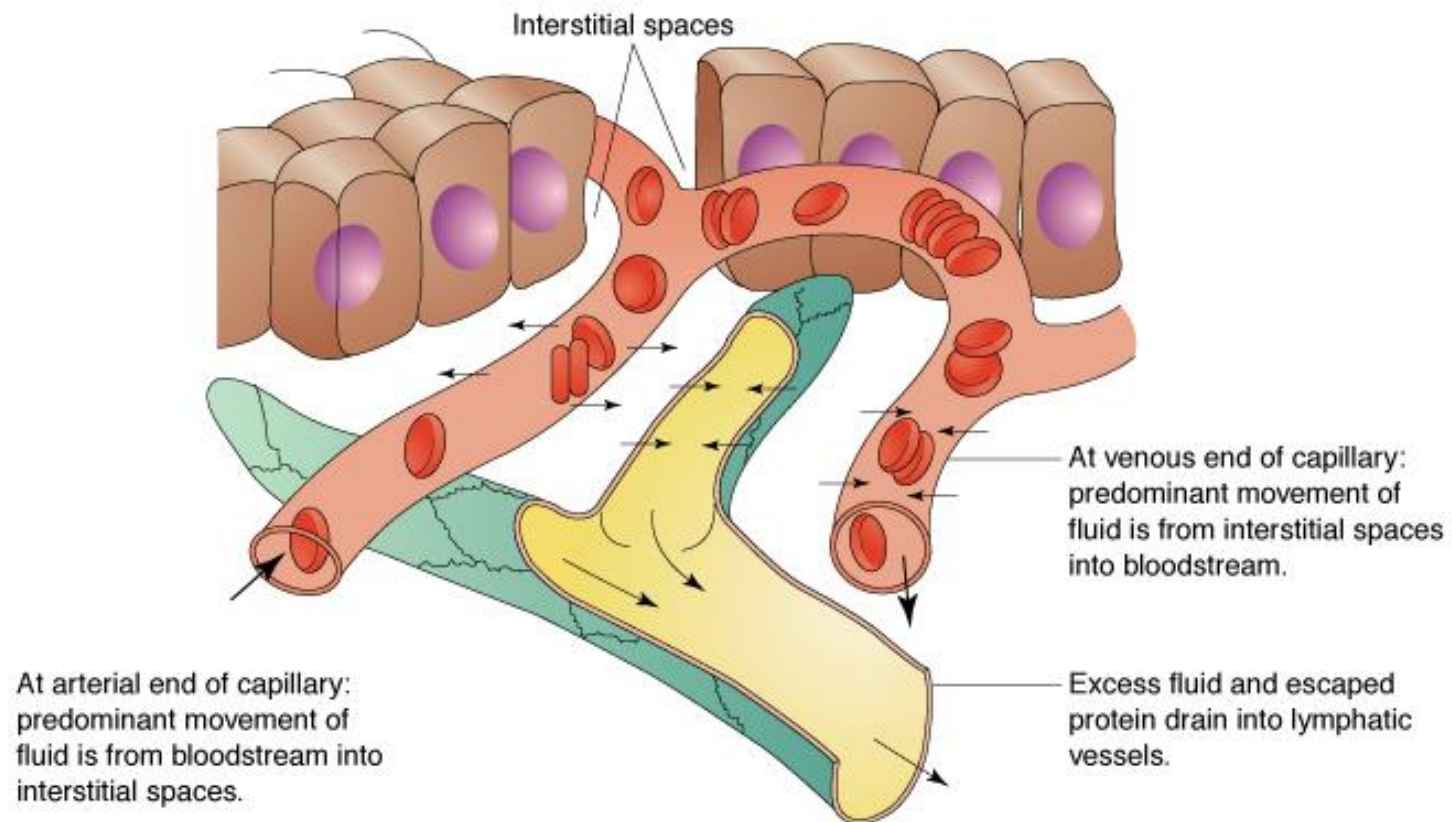
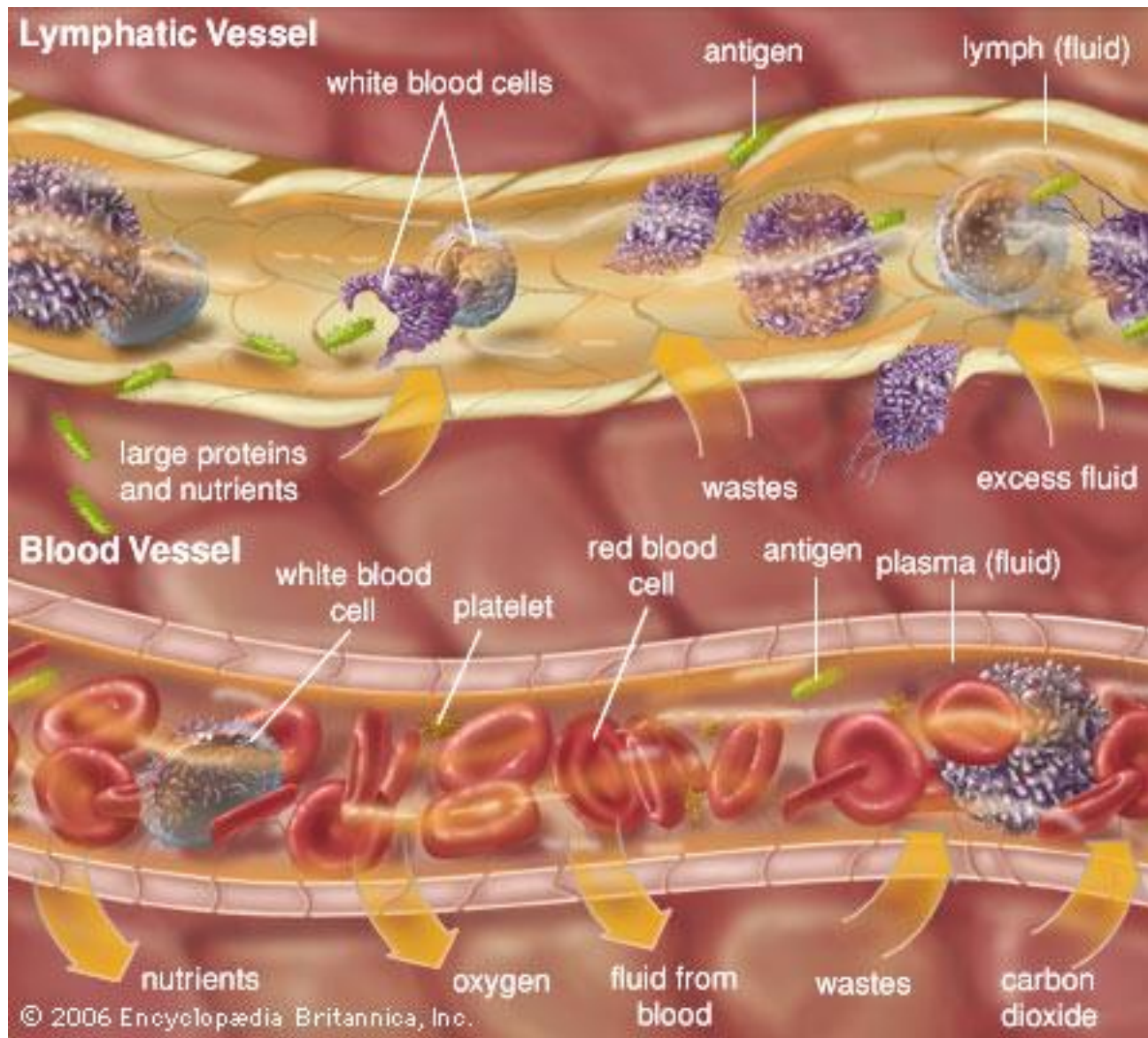


Figure 23-24 Exchanges through capillary membranes in the formation and removal of interstitial fluid.

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Tarefas para 02 e 03/05

- **Estudar para as provas teórica e prática!!!**
- **Teórica 02/05 terça-feira 10:00 às 12:00 h**
 - **Local: BDNA 01**
- **Prática 03/05 quarta-feira 14:00 às 14:30 h**
 - **Local: BDNA 01**
 - **Todos juntos - Turmas A e B!!**