Disciplina: BIOMATERIAIS PARA USO DIRETO (ODB 400)

HISTOLOGIA DOS TECIDOS DENTÁRIOS
Esmalte / Dentina / Polpa

Prof. Dr. VICTOR ARANA

Departamento de Biomateriais e Biologia Oral

Moléculas



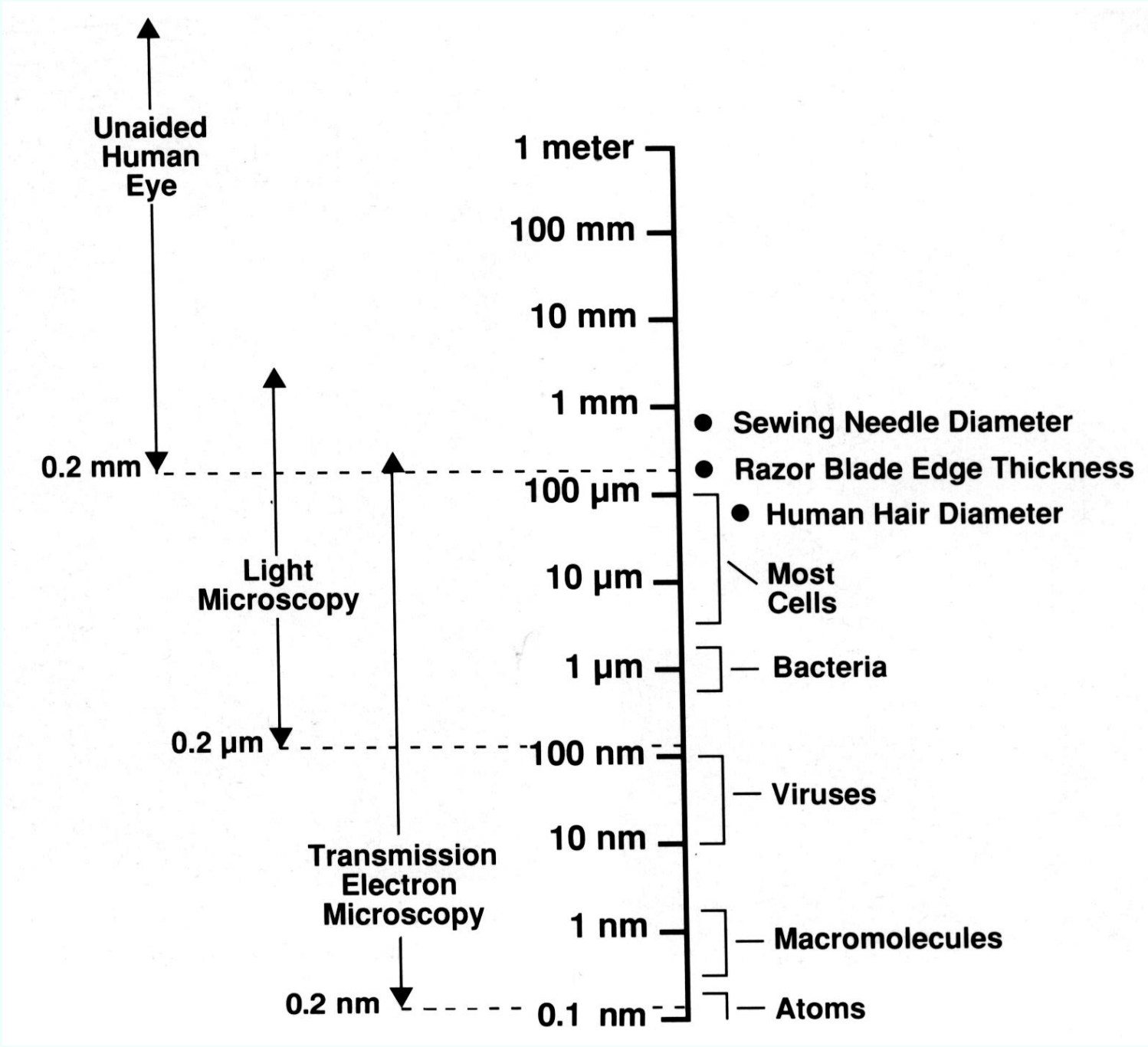
Células



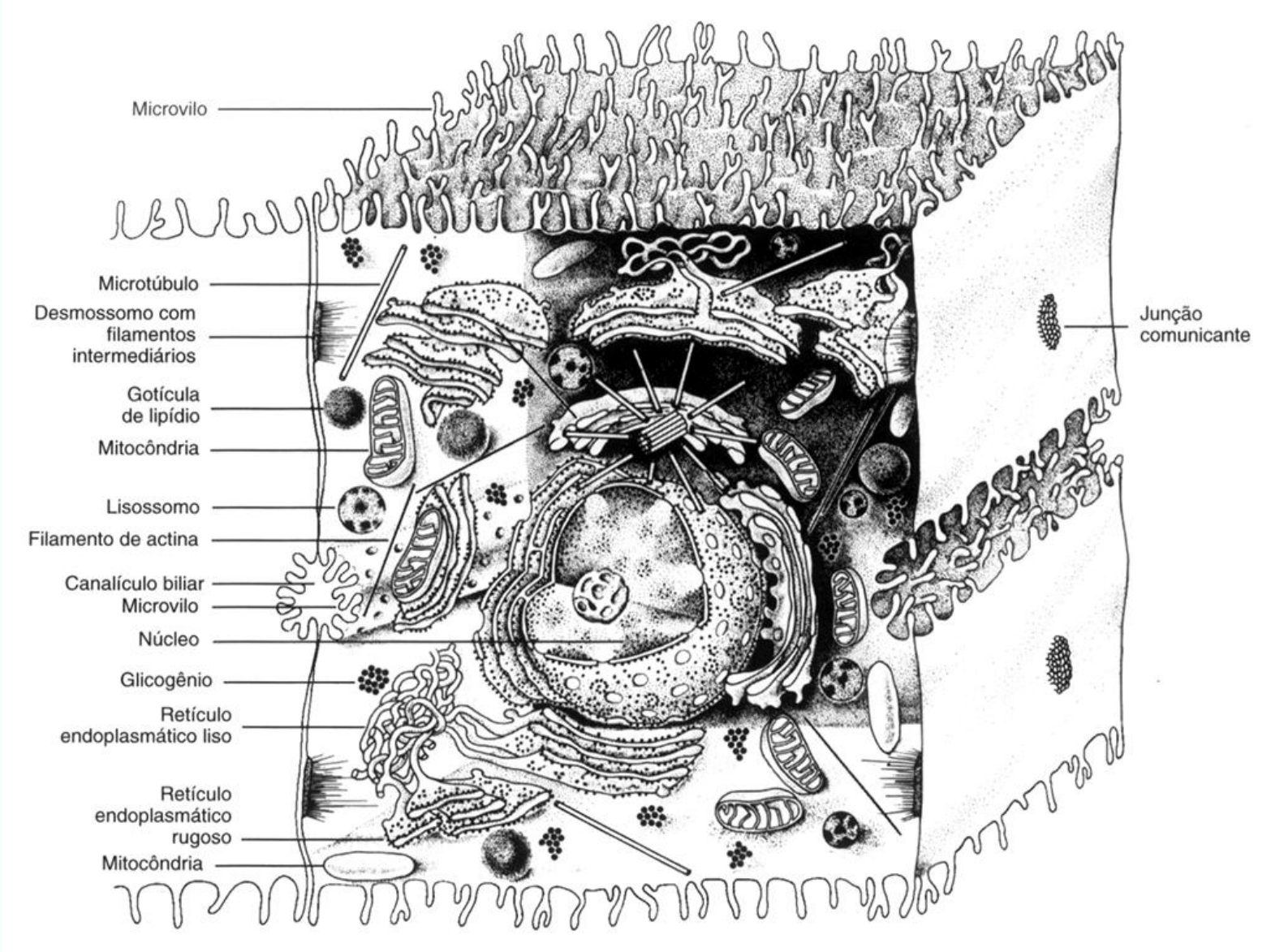
Tecidos



Estruturas, Órgãos e Sistemas


Unaided Human Eye
0.2 mm
Light Microscopy
0.2 µm
Transmission Electron Microscopy
0.2 nm
1 meter
100 mm
10 mm
1 mm
100 µm
10 µm
1 µm
100 nm
10 nm
1 nm
0.1 nm
Sewing Needle Diameter
Razor Blade Edge Thickness
Human Hair Diameter
Most Cells
Bacteria
Viruses
Macromolecules
Atoms

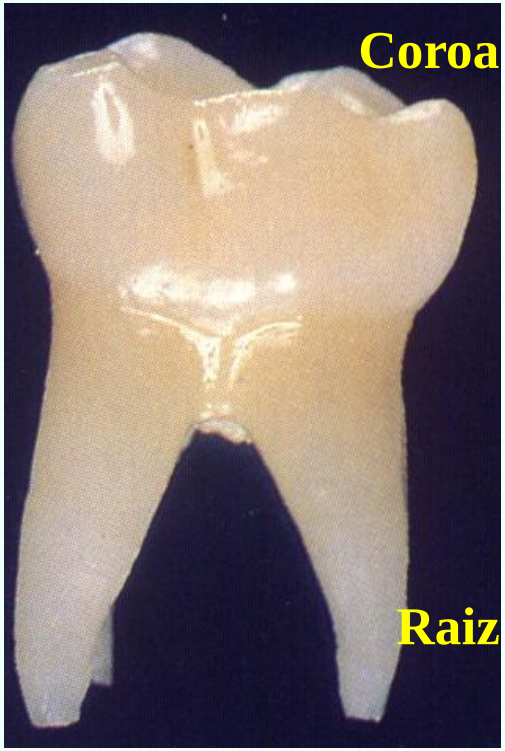
A Célula

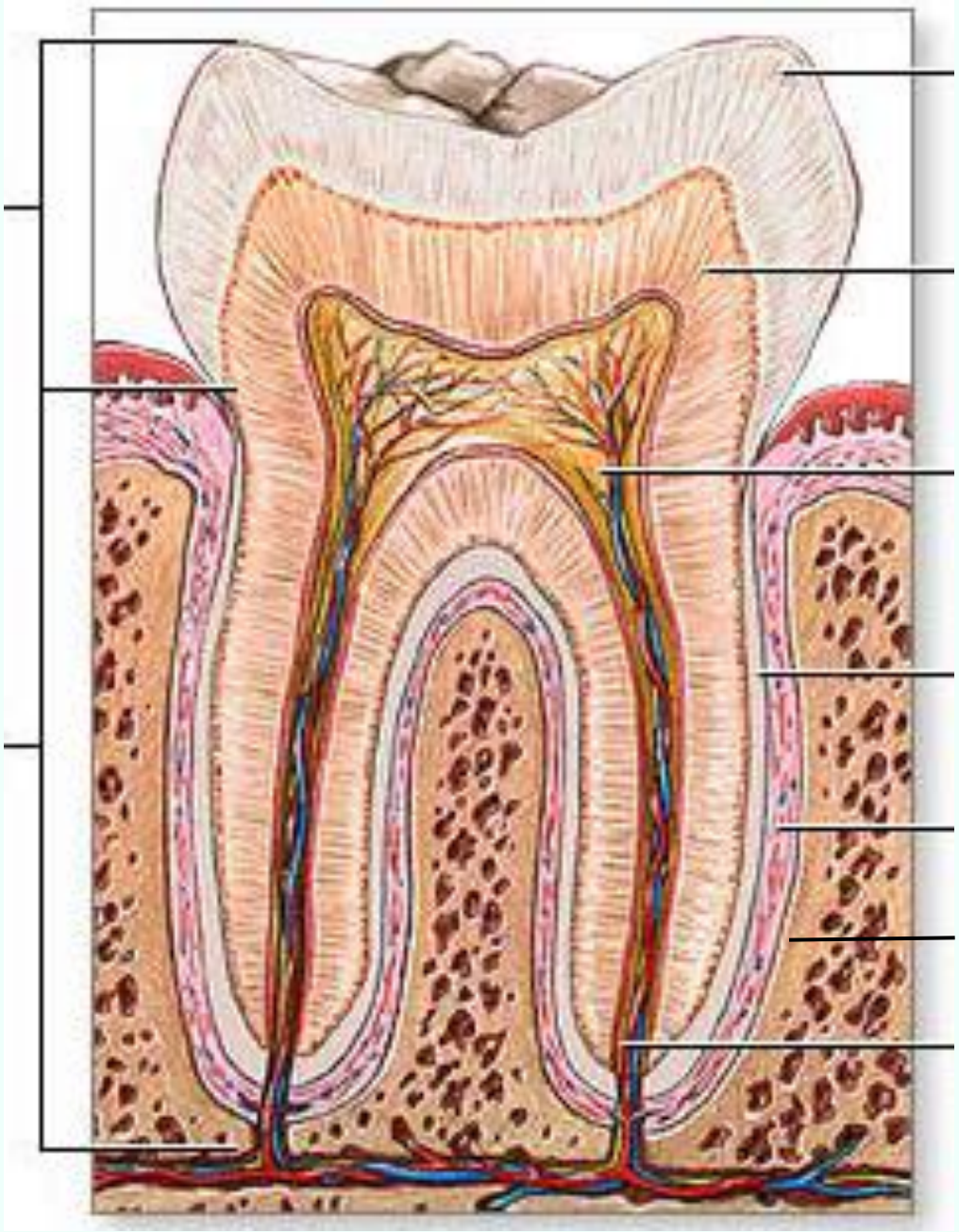


Junqueira & Carneiro, Biologia Celular e Molecular, 2005

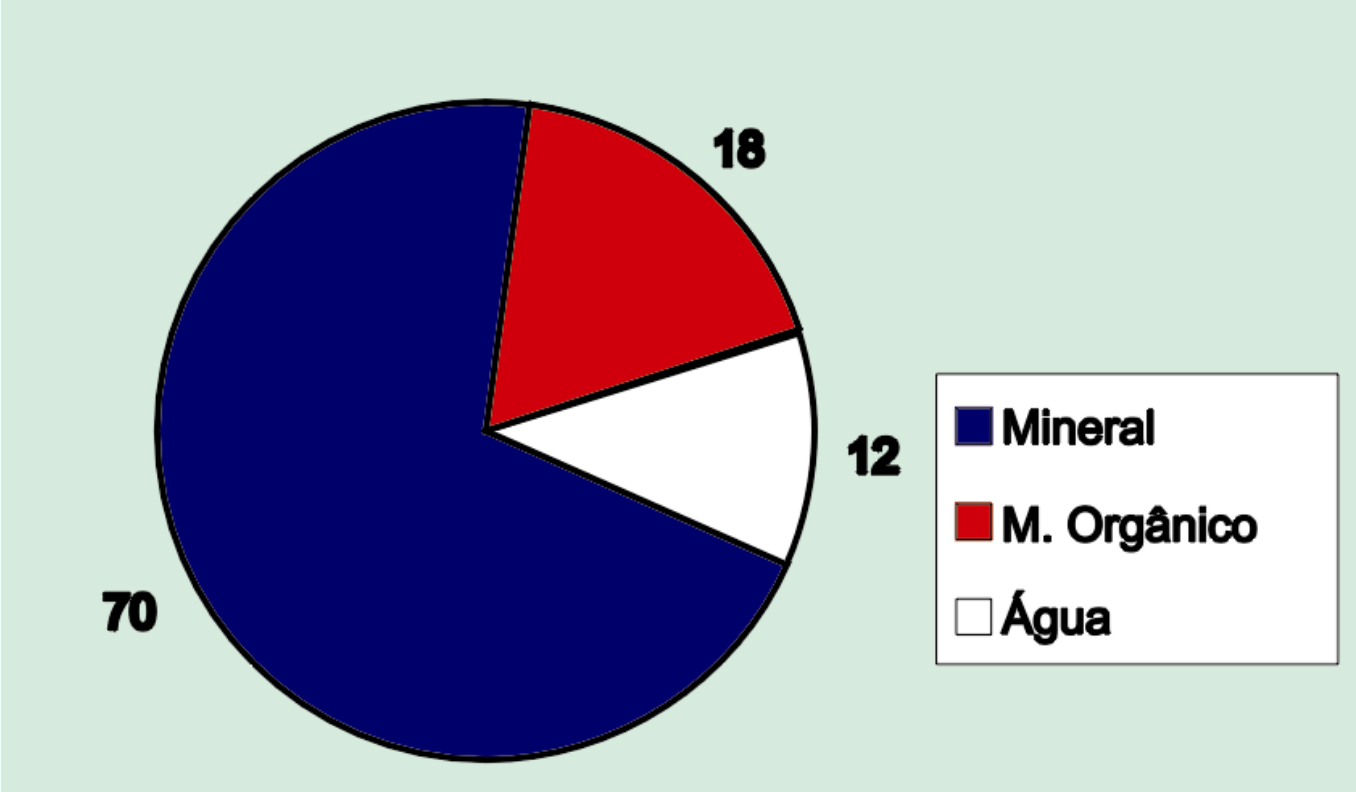
Os Tecidos Básicos

- TECIDO EPITELIAL
  (Revestimento e Glandular)
- TECIDOS CONJUNTIVOS
  (T. C. propriamente dito e T.C. Especiais)
- TECIDO MUSCULAR
  (Esquelético, Liso e Cardíaco)
- TECIDO NERVOSO


Coroa
Raiz

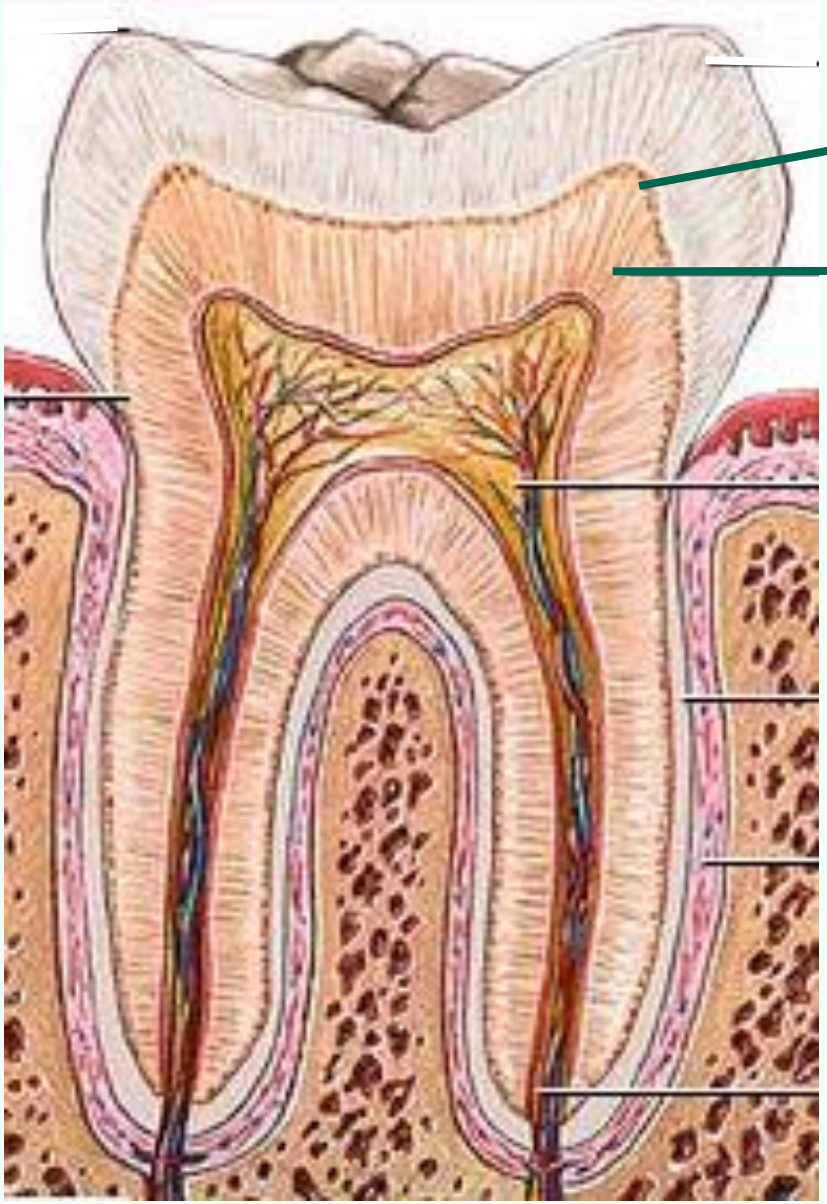

Esmalte
Dentina
Polpa
Cemento
Ligamento Periodontal
Osso Alveolar

DENTINA: Composição



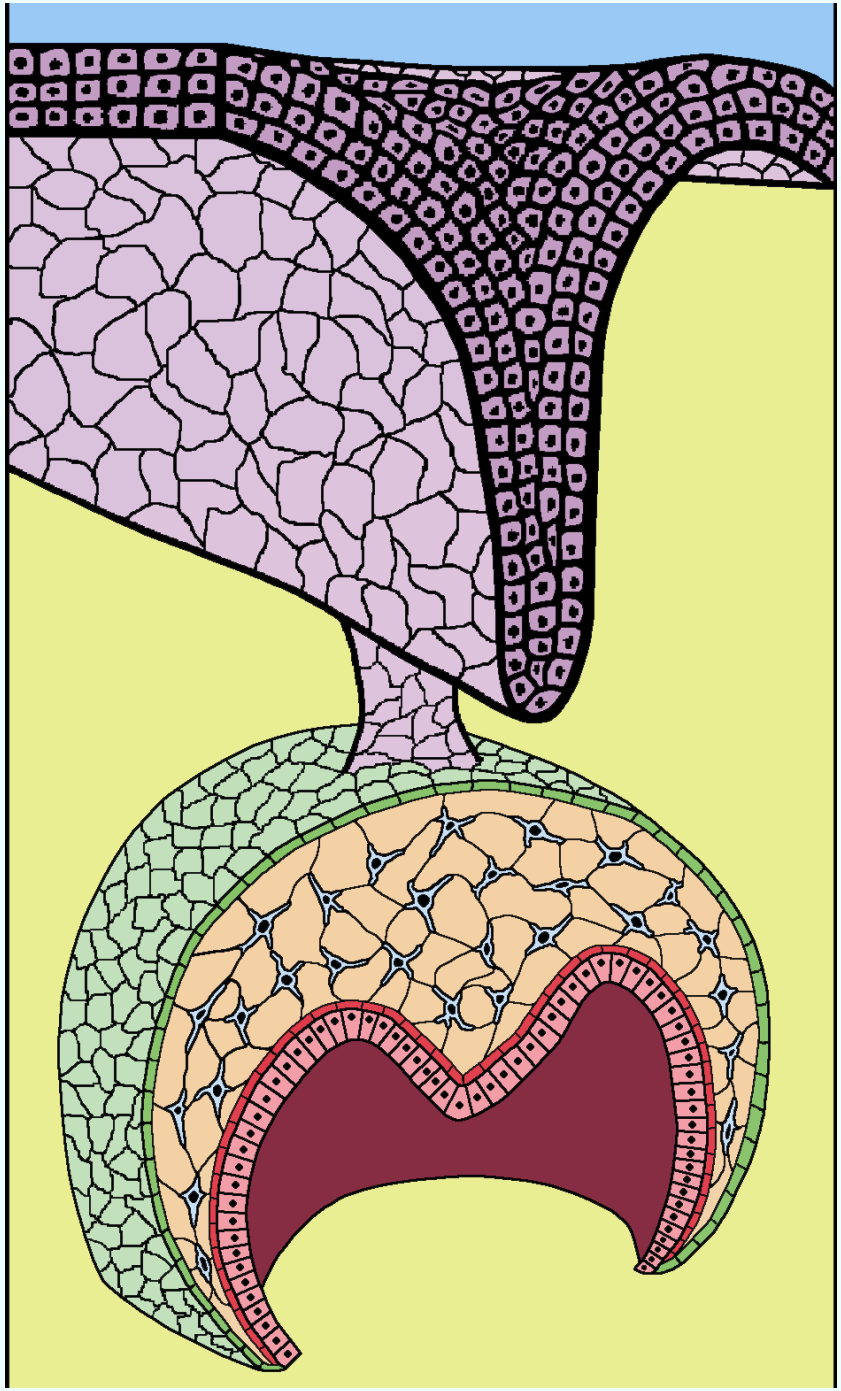
Constituintes Orgânicos da Dentina

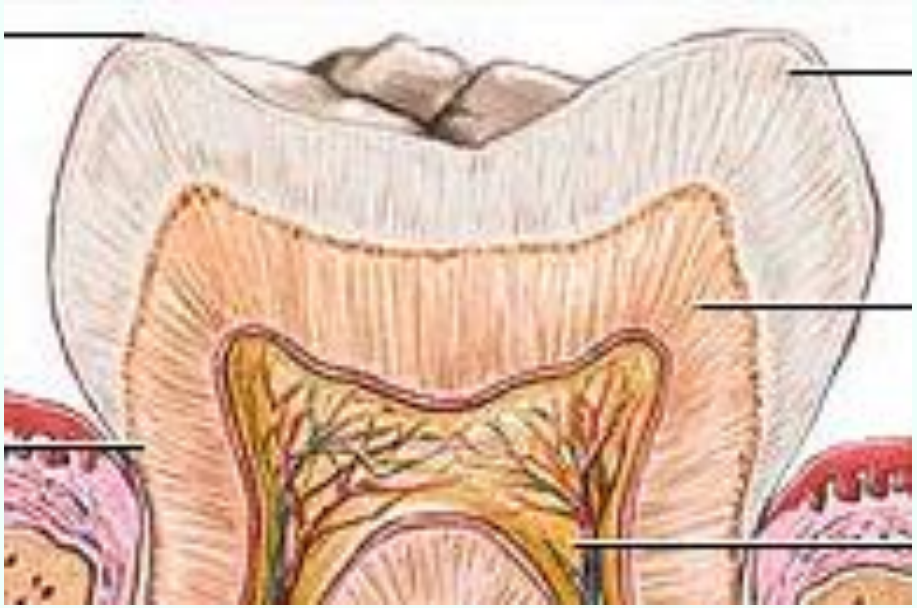
- **Componentes colágenos** **90%**
  - Colágeno tipo I (85%)
  - Colágeno tipos III e V (5%)
- **Componentes não colágenos** **10%**
  - Sialofosfoproteína dentinária (DSPP): Sialoproteína dentinária (DSP) e Fosfoproteína dentinária (DPP)
  - Fosfoproteínas (fosfoforinas): proteína da matriz dentinária 1, 2, 3 e 4 (DMP1, DMP2, DMP3 e DMP4)
  - Osteopontina (OPN), Sialoproteína óssea (BSP), Osteonectina (ON), Osteocalcina (OC)
  - Proteoglicanos (decorin, biglican, osteoaderin)
  - Metaloproteinases (MMPs)

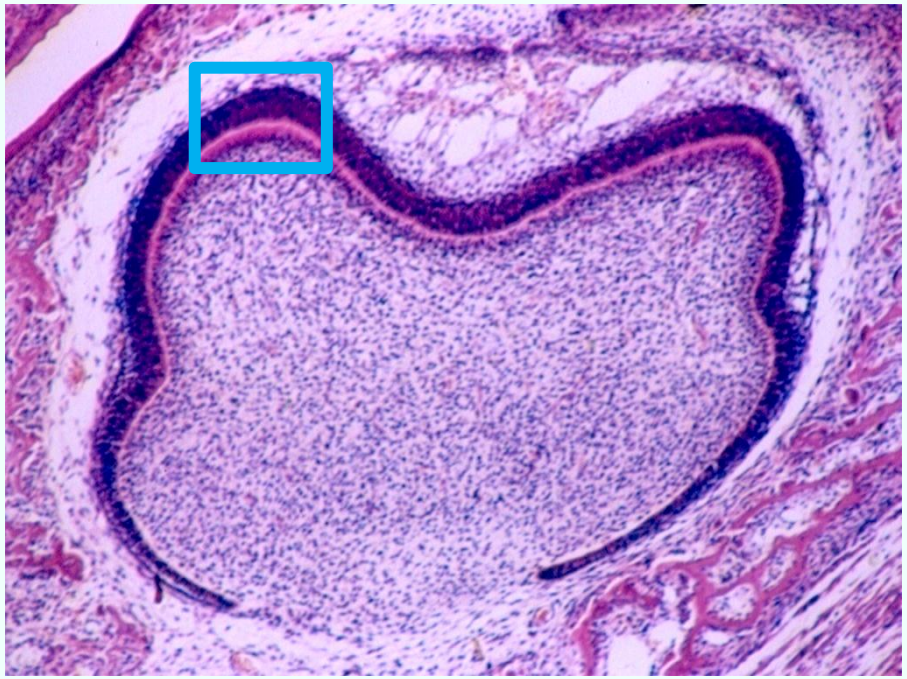


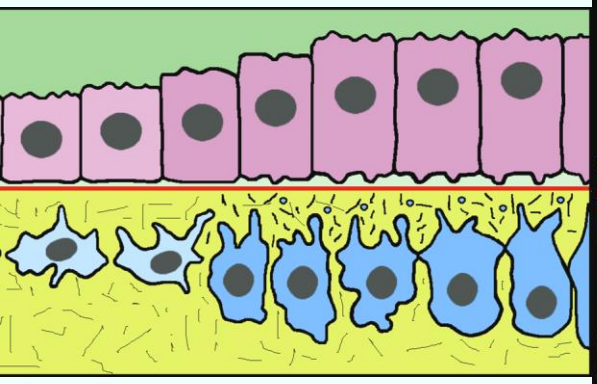
Dentina do manto

Dentina circumpulpar



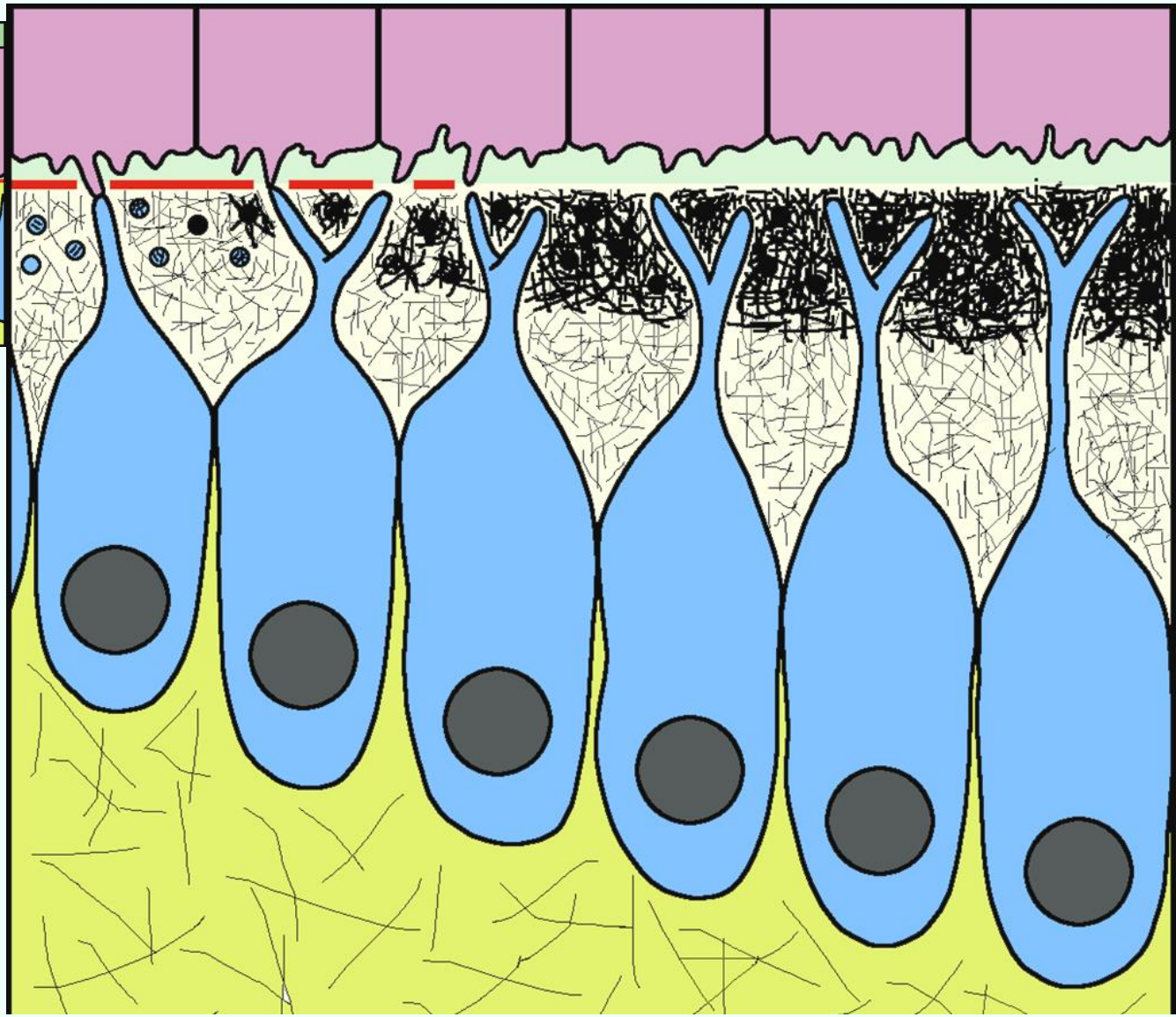






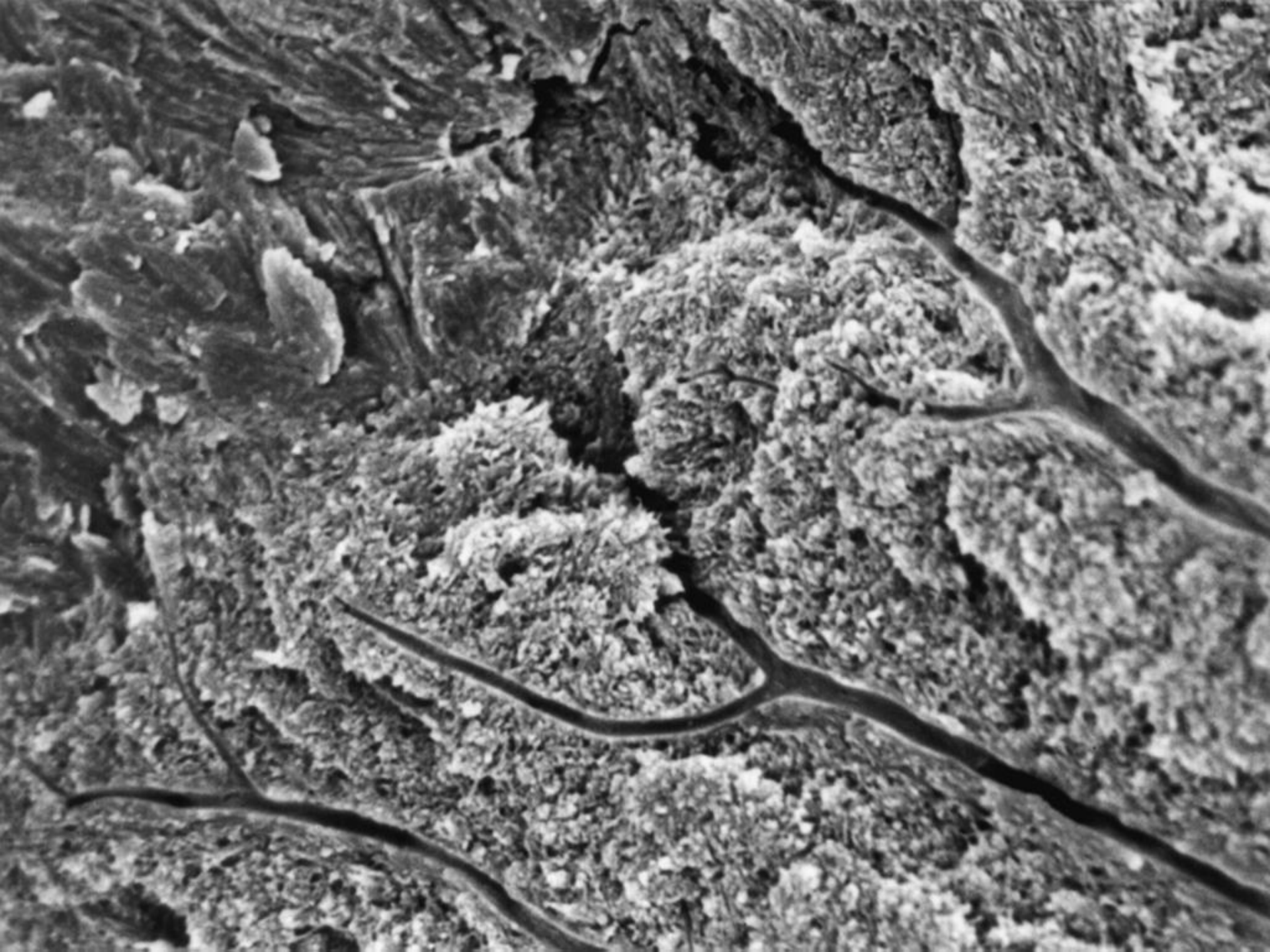
Odontoblastos em diferenciação

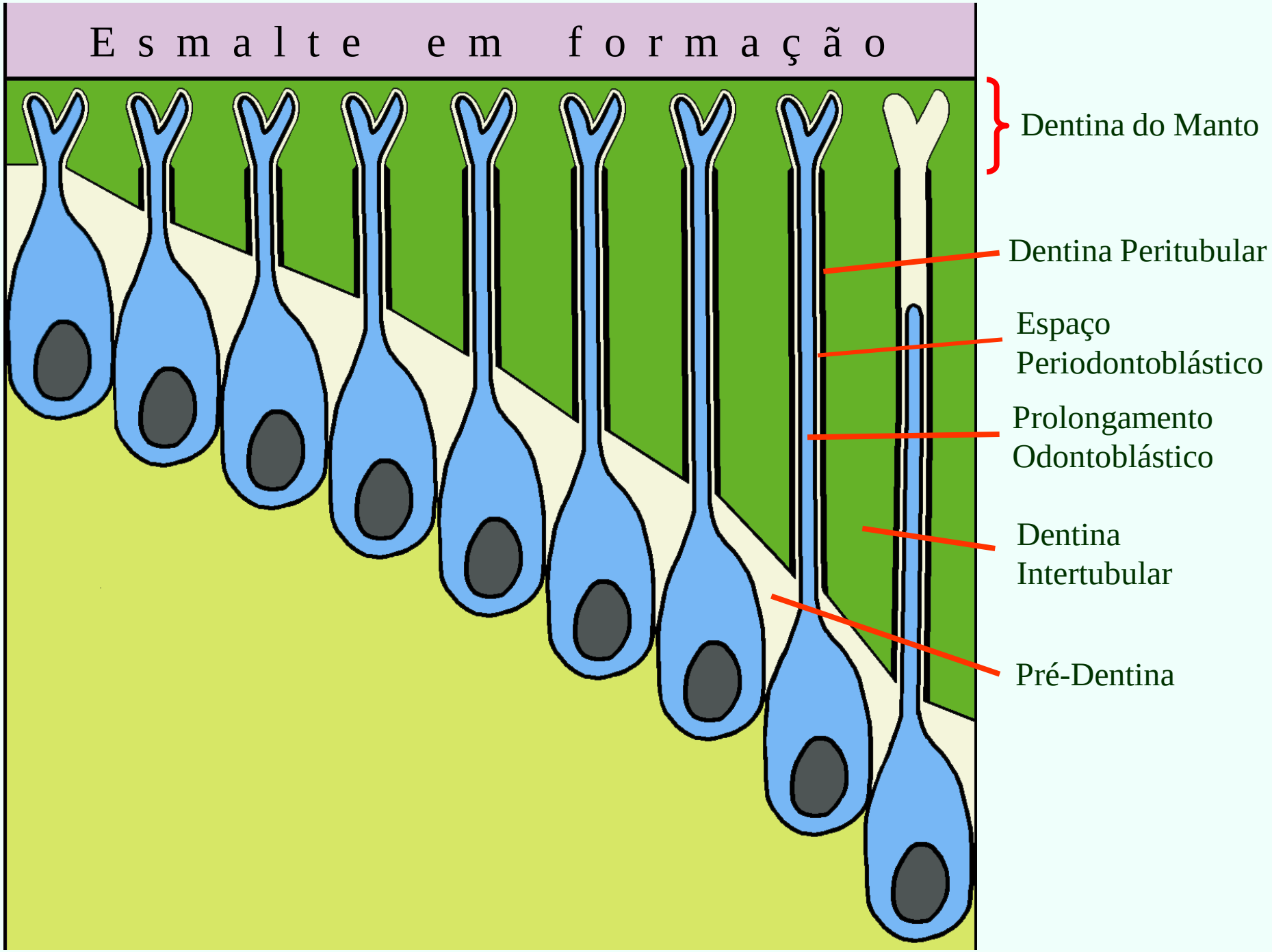
Secretam a dentina do manto

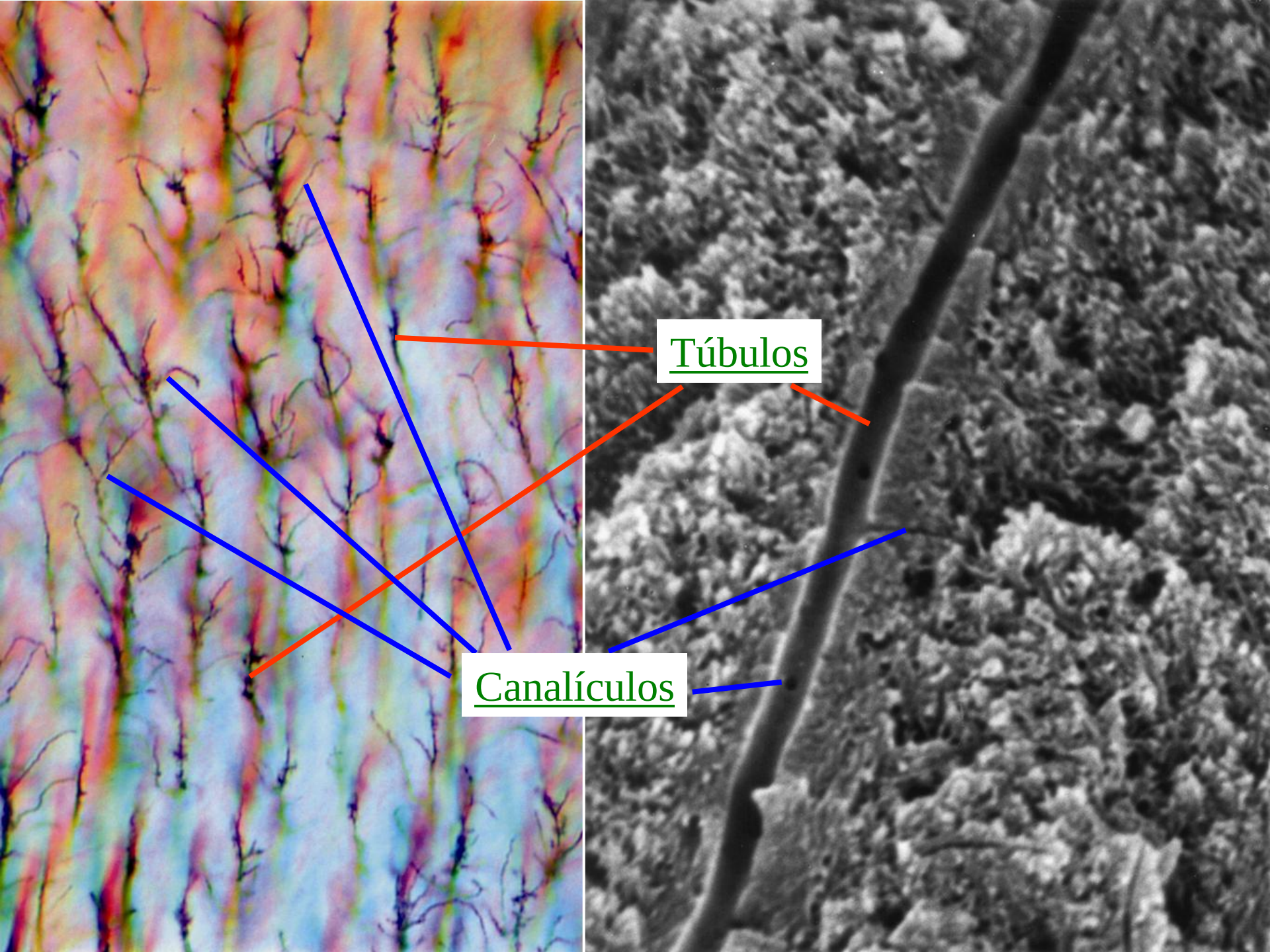


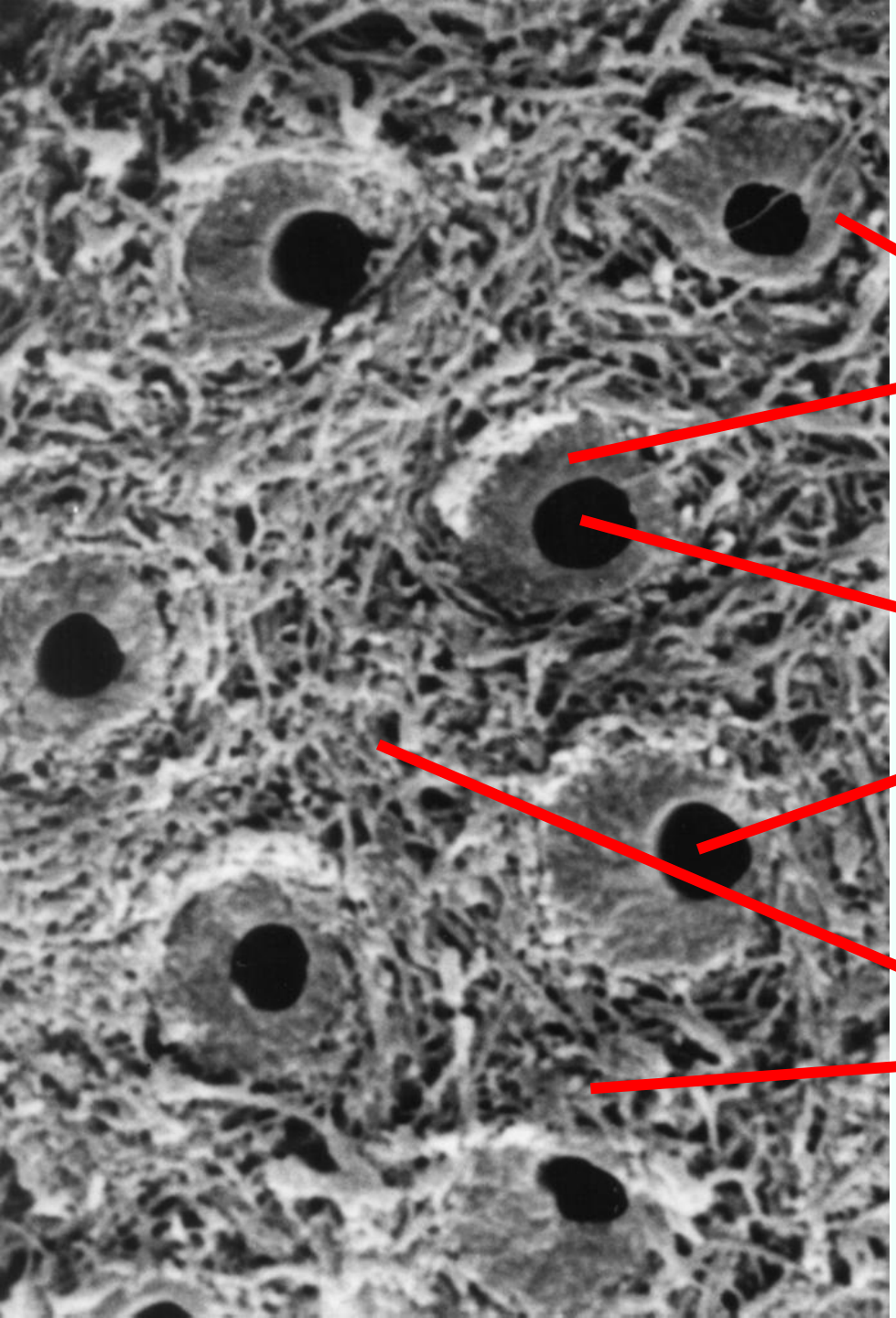
Odontoblastos diferenciados

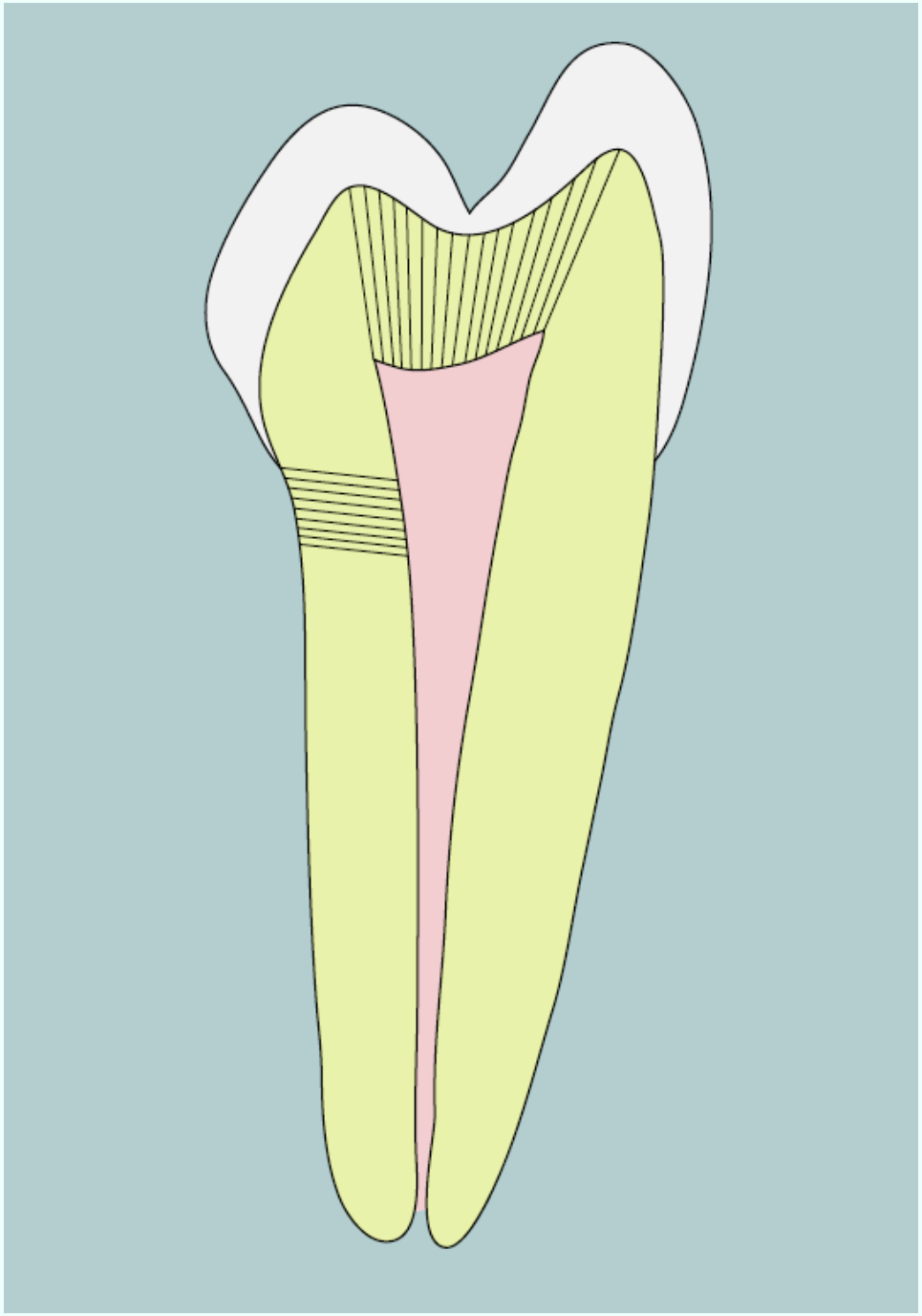
Secretam a dentina circumpulpar



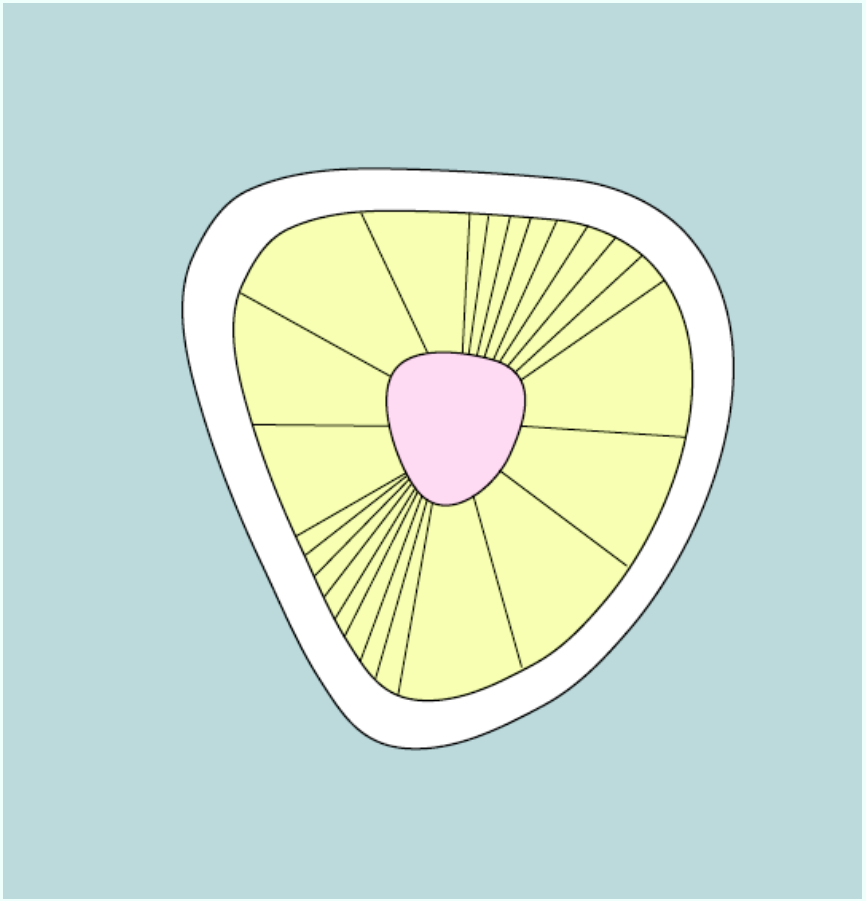

Esmalte em formação
Dentina do Manto
Dentina Peritubular
Espaço Periodontoblástico
Prolongamento Odontoblástico
Dentina Intertubular
Pré-Dentina

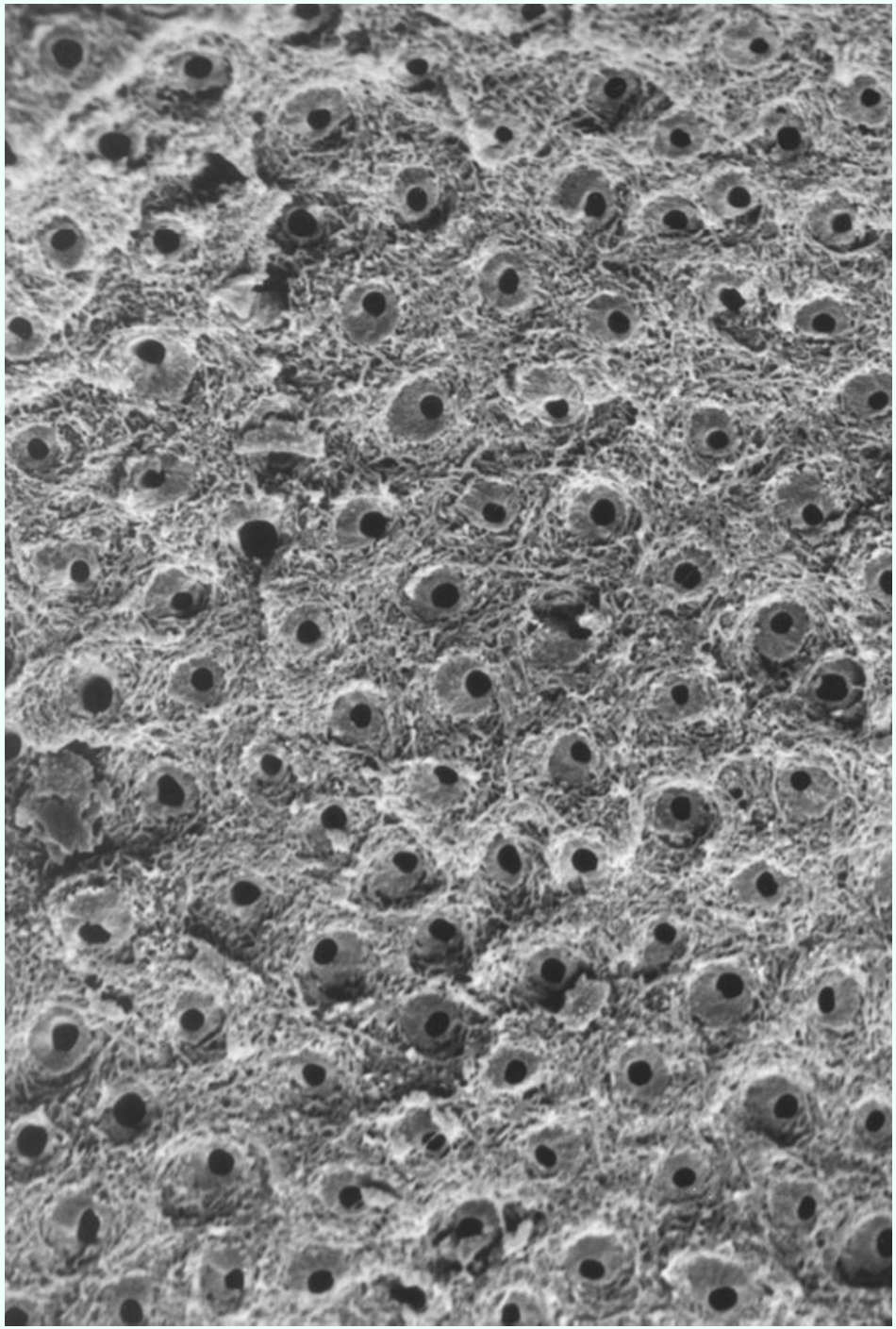

Túbulos
Canalículos

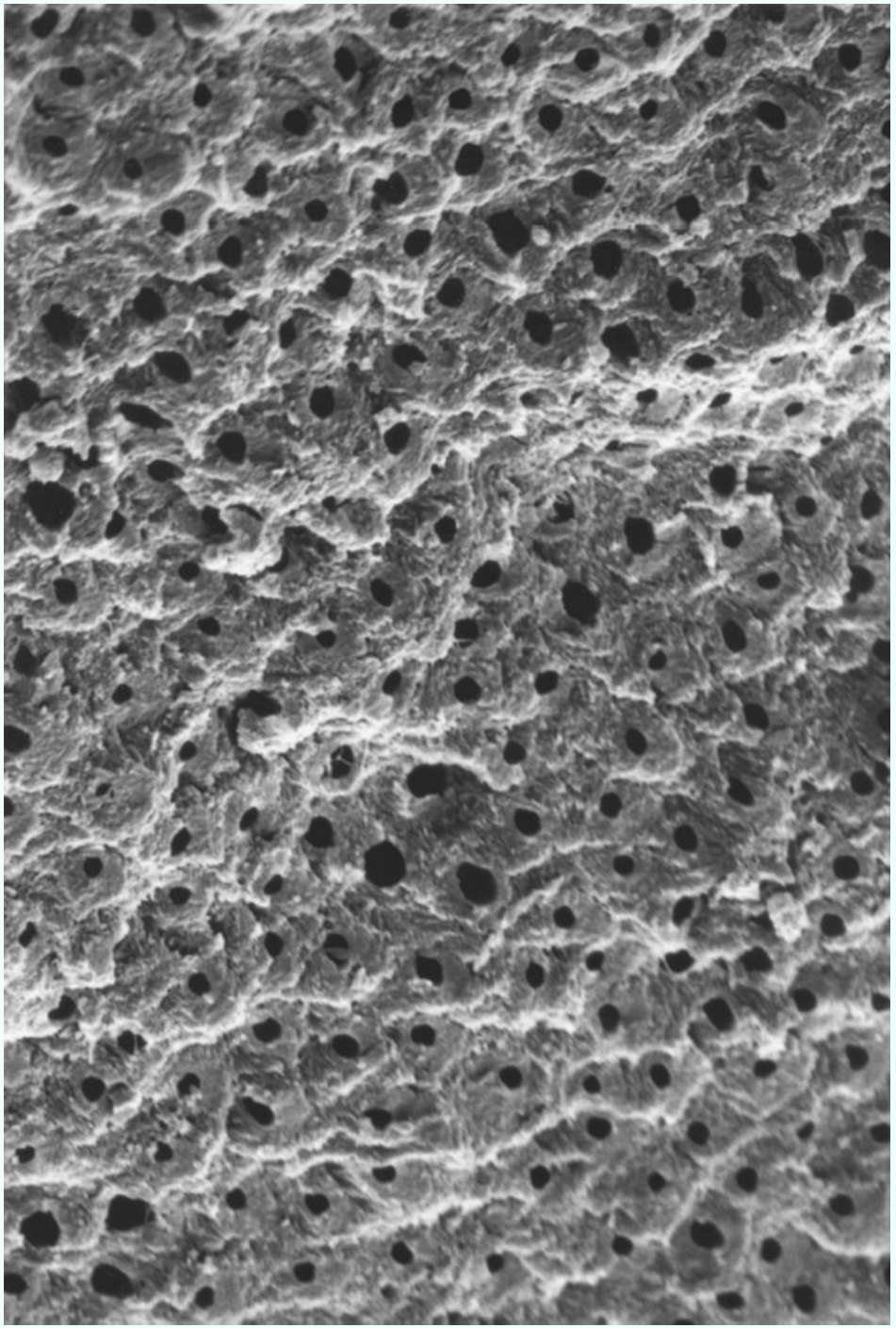

Dentina Peritubular
Túbulos
Dentina Intertubular

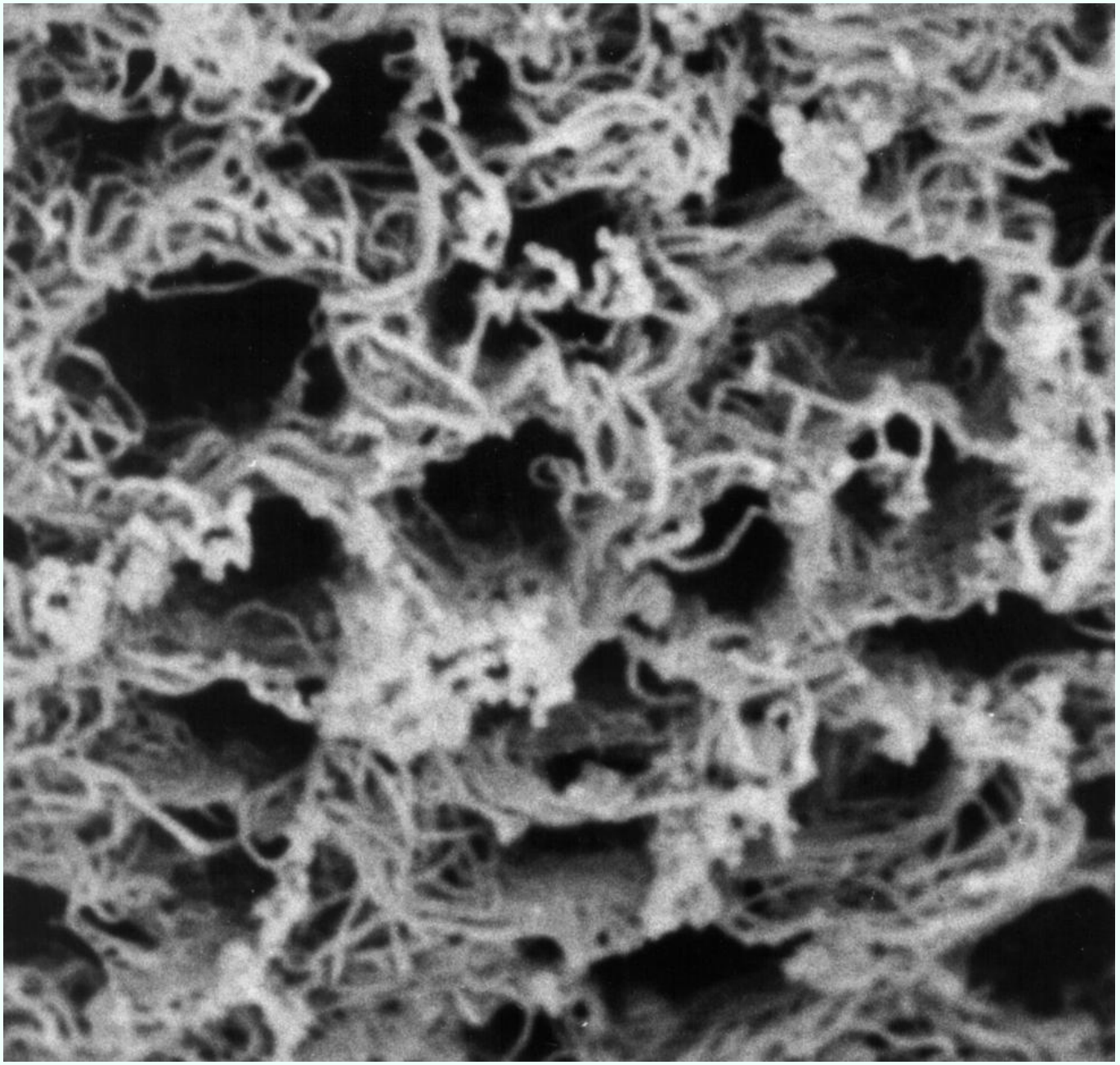


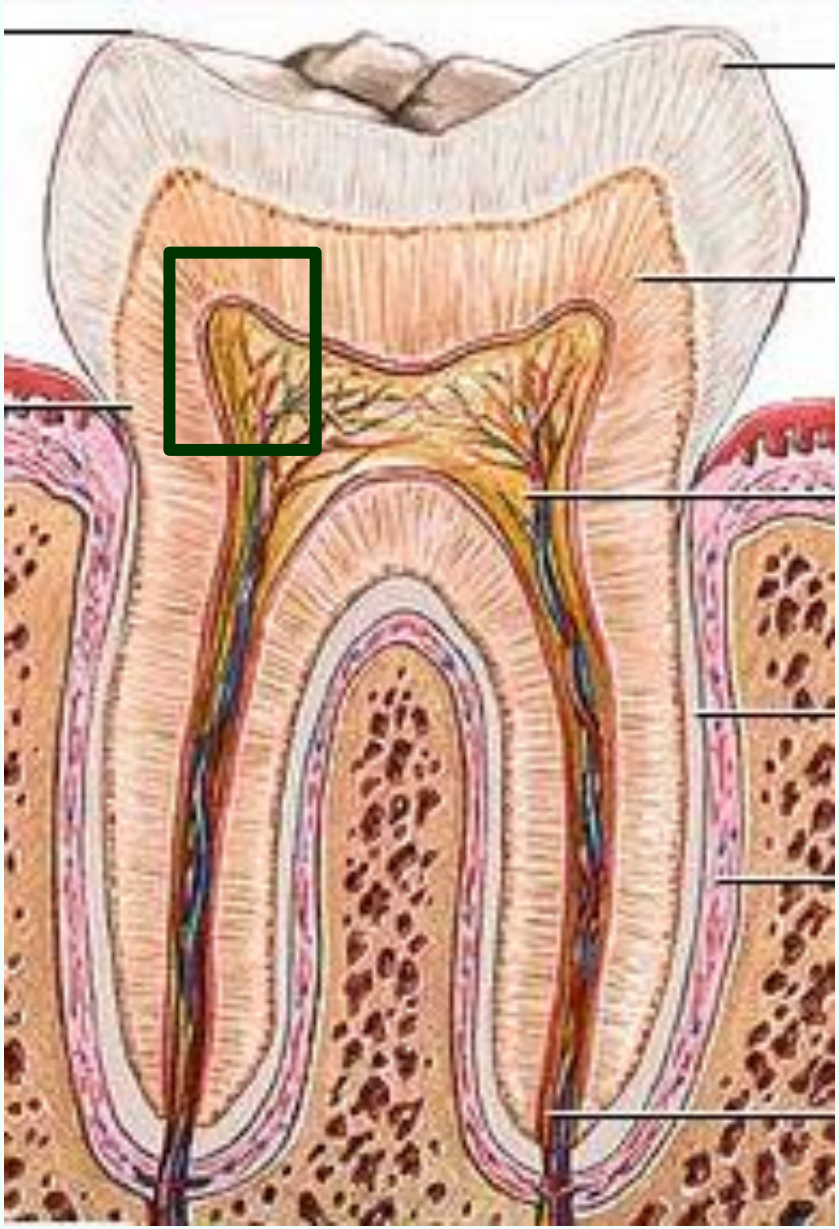
A convergência dos túbulos no sentido da polpa determina maior densidade tubular nas regiões mais profundas da dentina

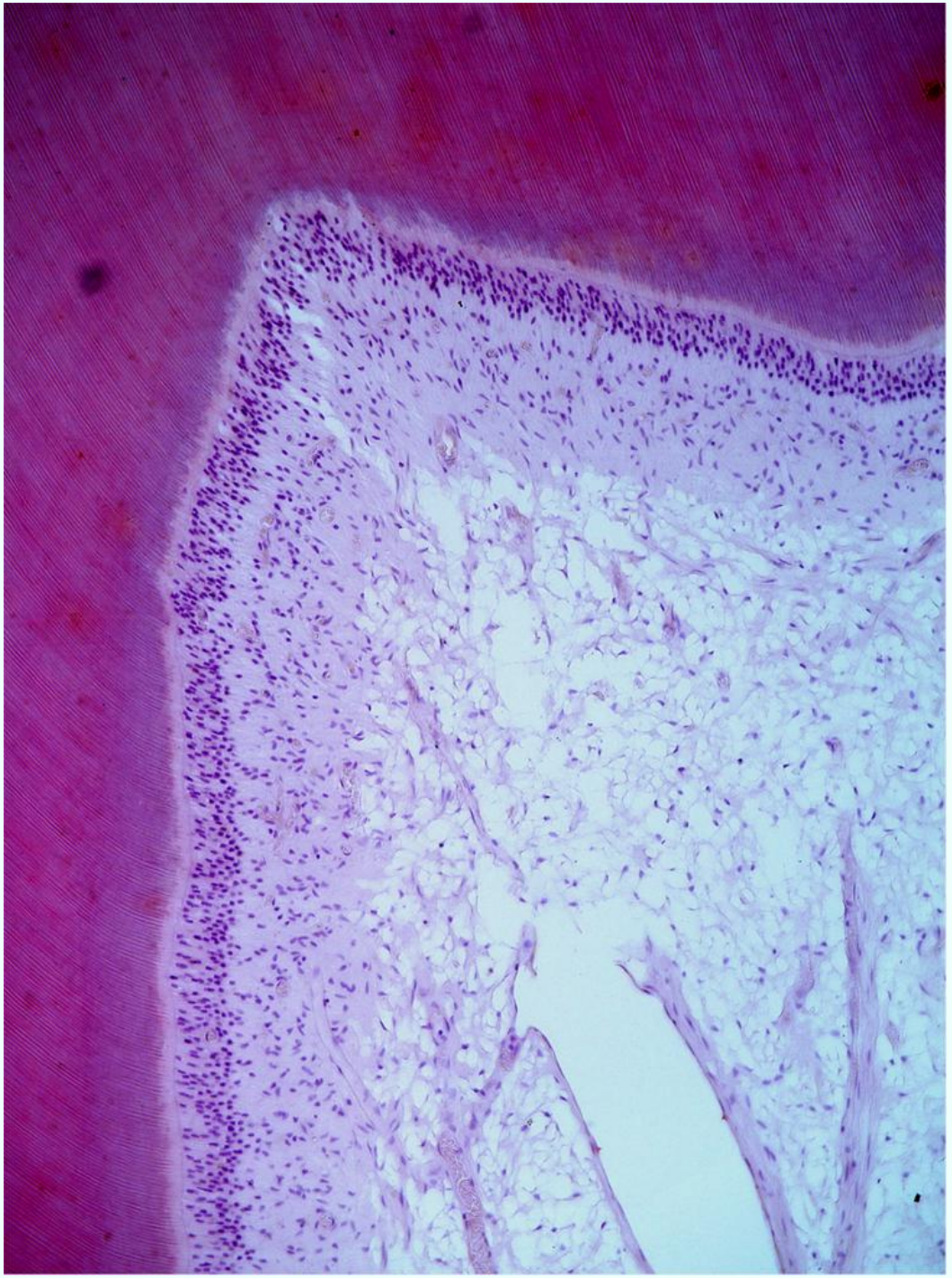


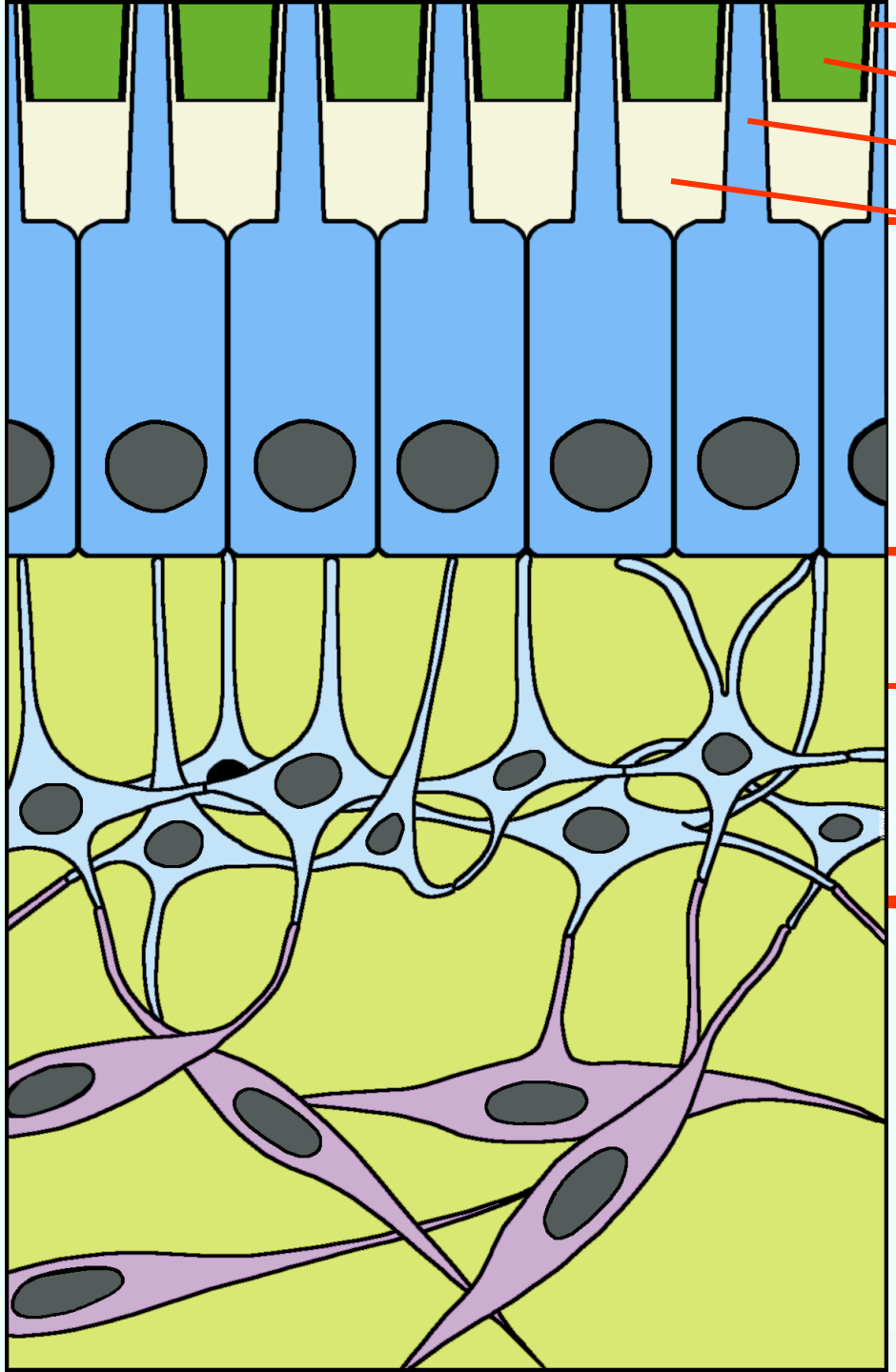












Dentina Peritubular

Dentina Intertubular

Prolongamento Odontoblástico

Pré-Dentina

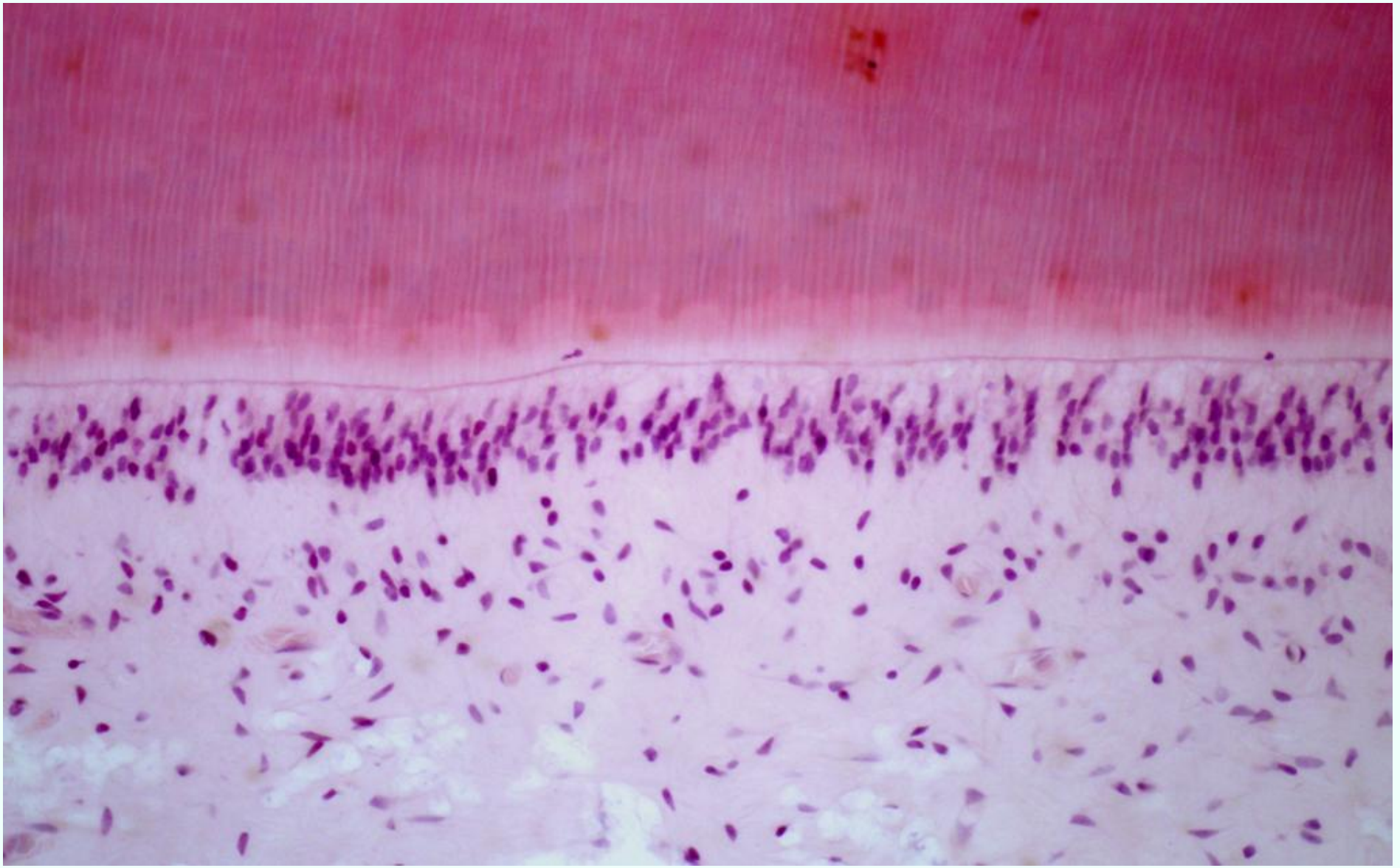
Camada Odontoblástica
(Corpos dos Odontoblastos)

Zona Pobre
em Células

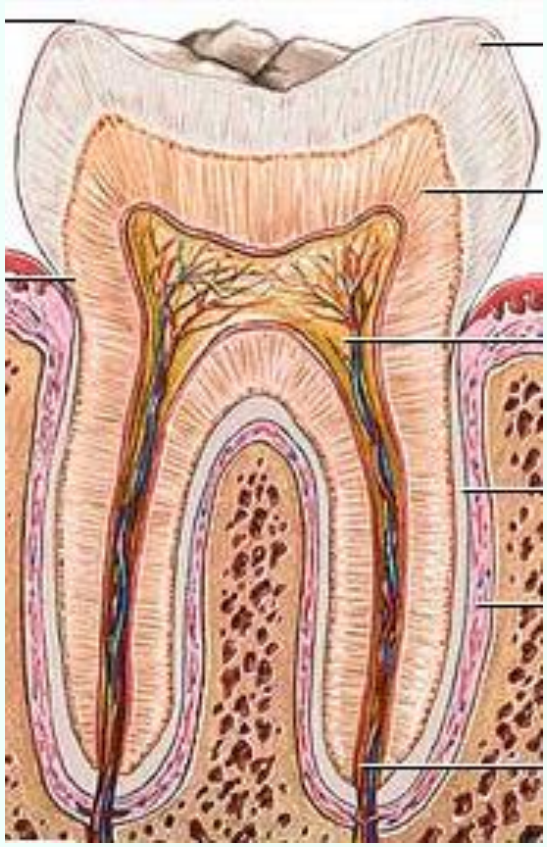
Zona Rica
em Células

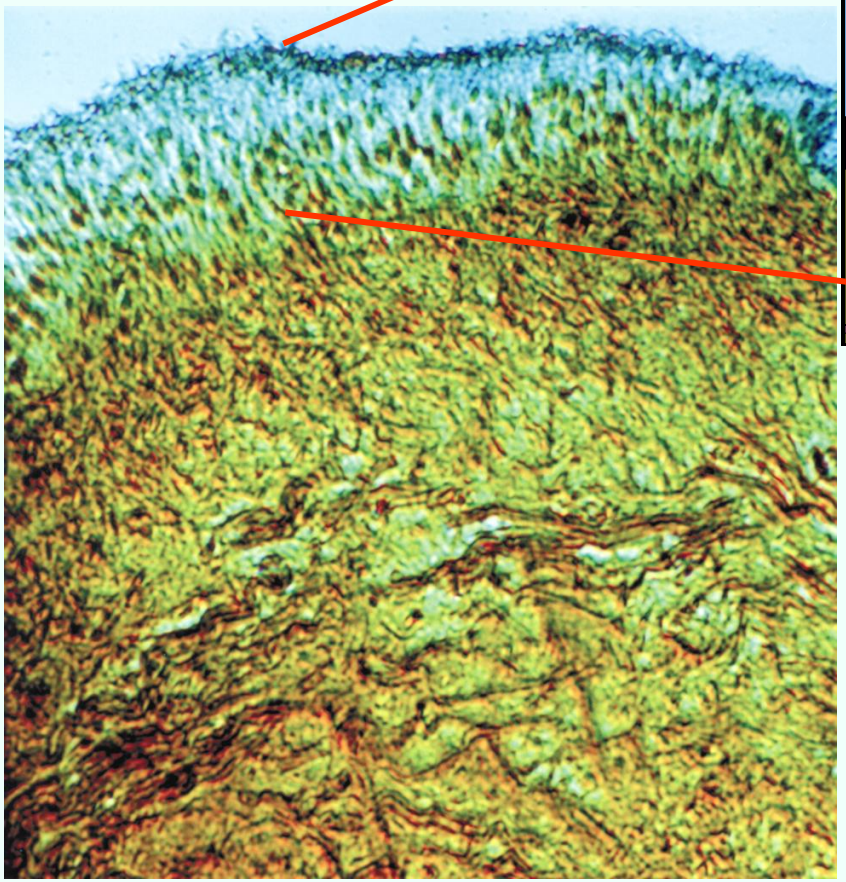
Região
Sub-Odontoblástica

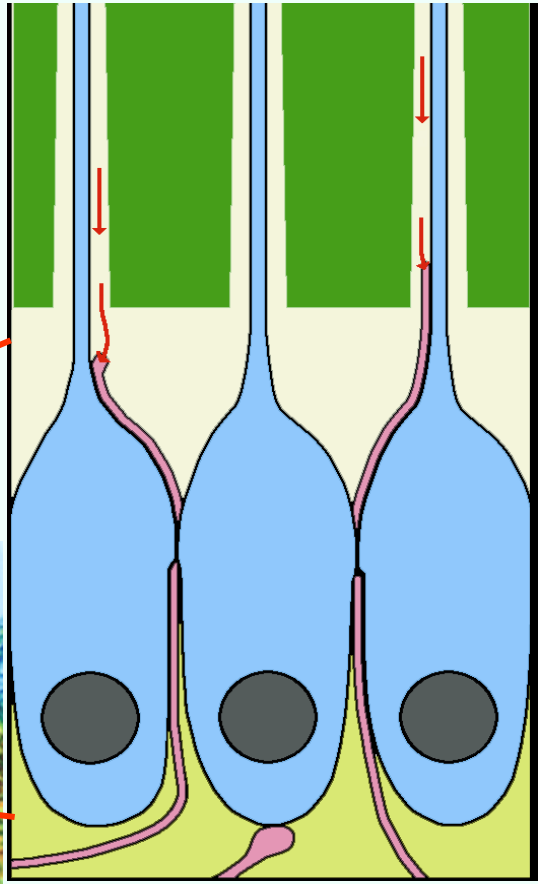
Região Central
da Polpa

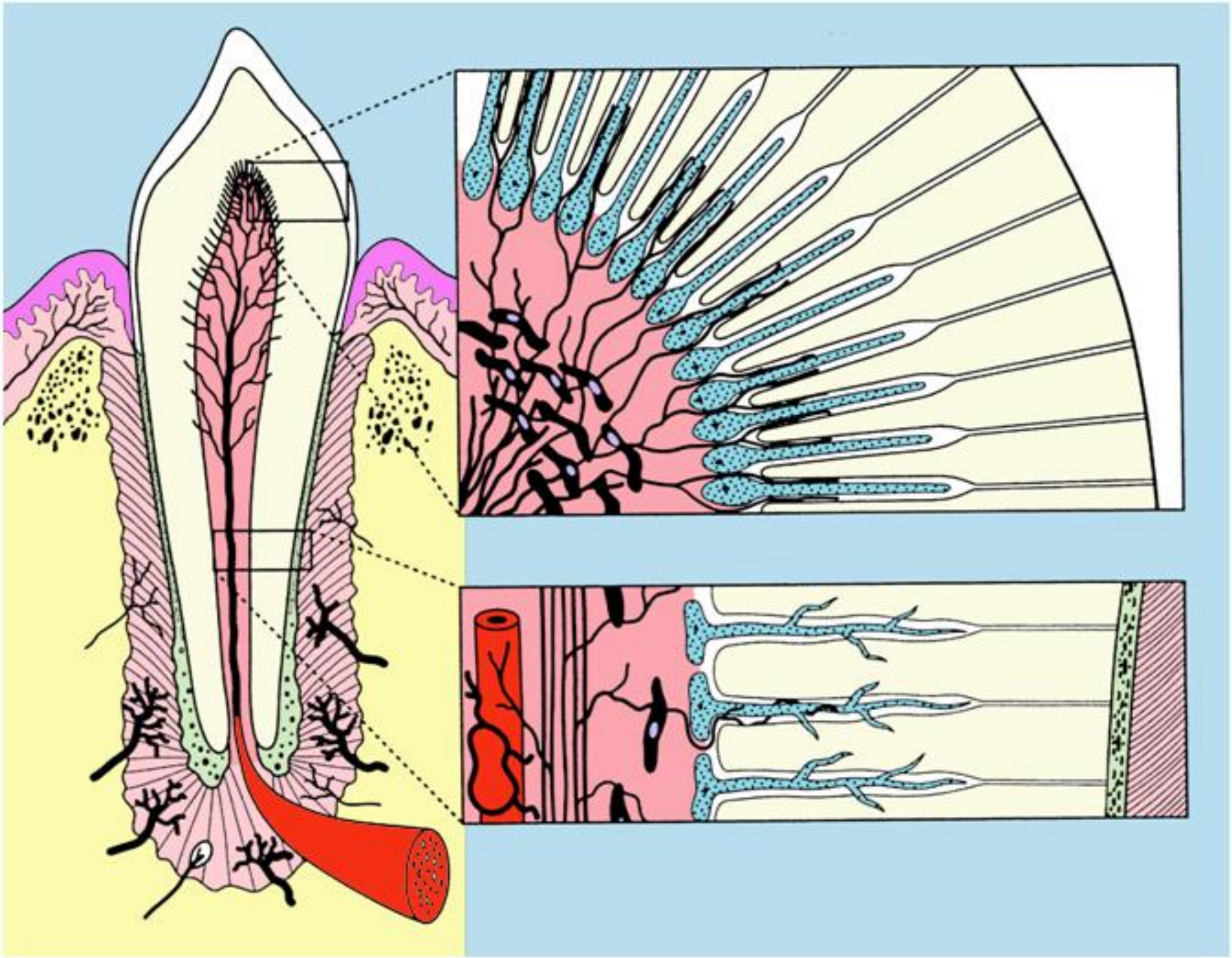


Inervação







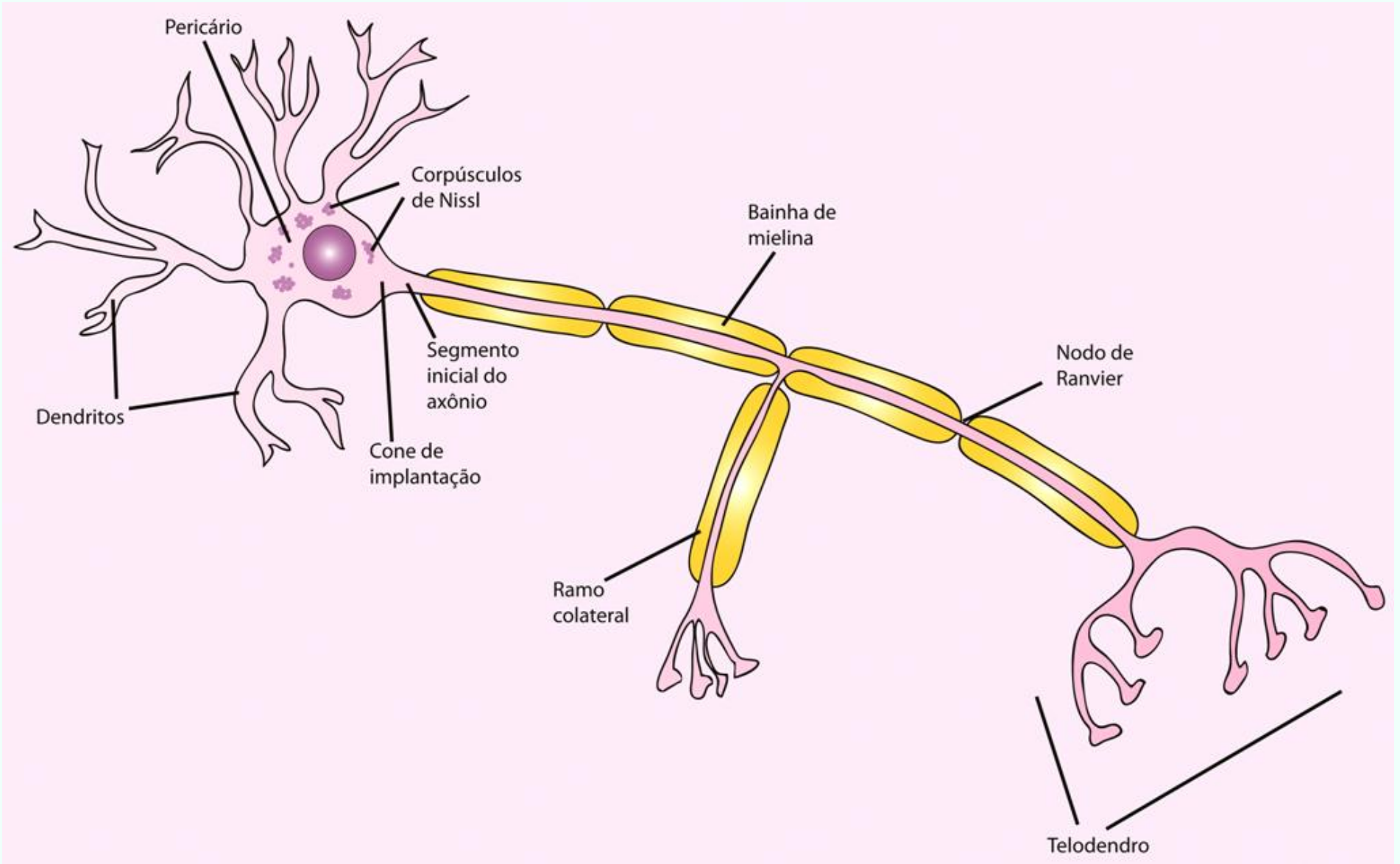


Tipos de Fibras Nervosas

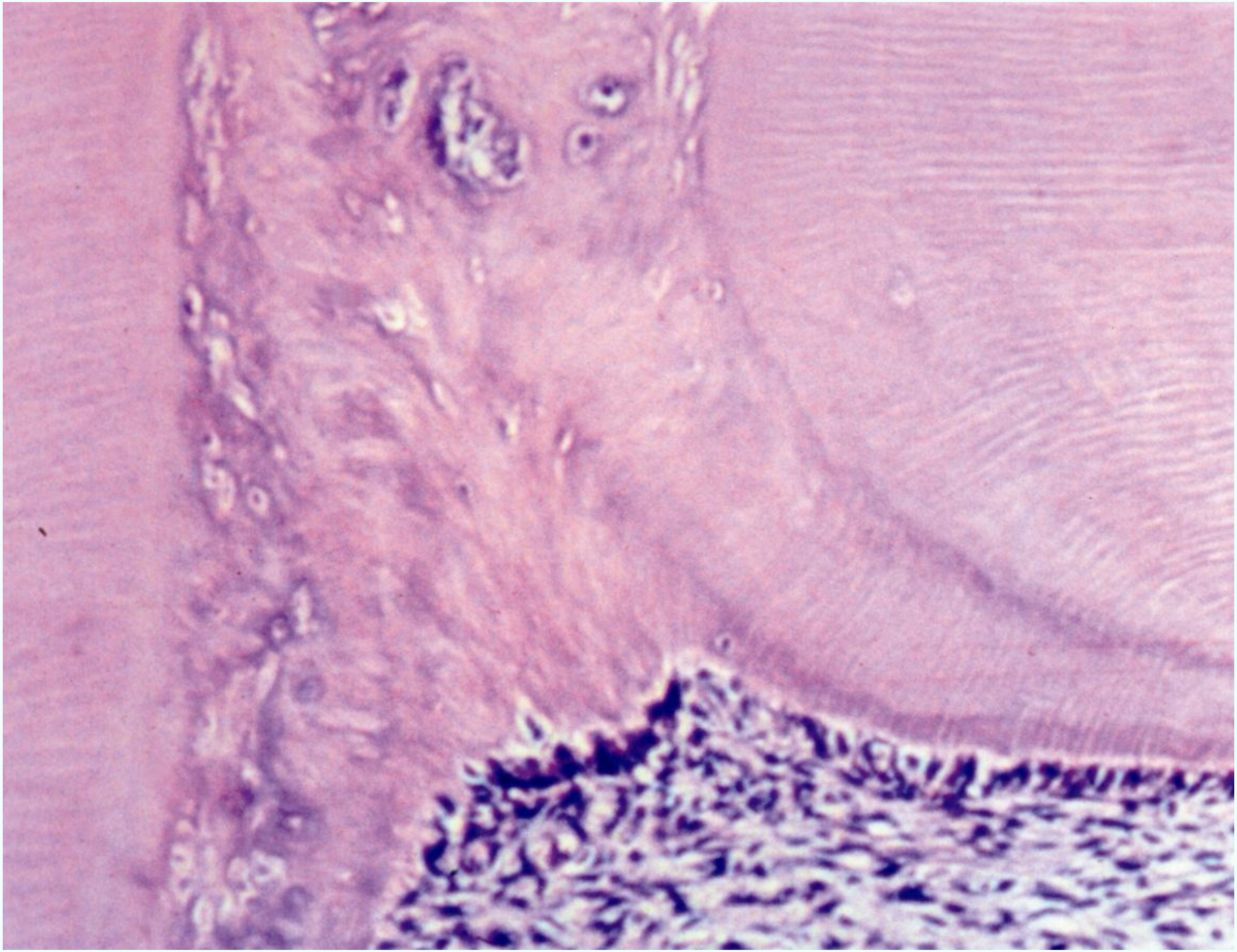
Tipo de Fibra	Diâmetro (µm)	Velocidade (m/s)
A - α	12 - 21	70 - 120
A - β	6 - 12	30 - 70
A - γ	2 - 8	12 - 48
A - δ	**1 - 6**	**3,0 - 30**
B	1 - 3	2,5 - 15
C (amielínicas)	**0,4 - 1,2**	**0,5 – 3,0**

Fibras nervosas presentes no complexo dentina-polpa

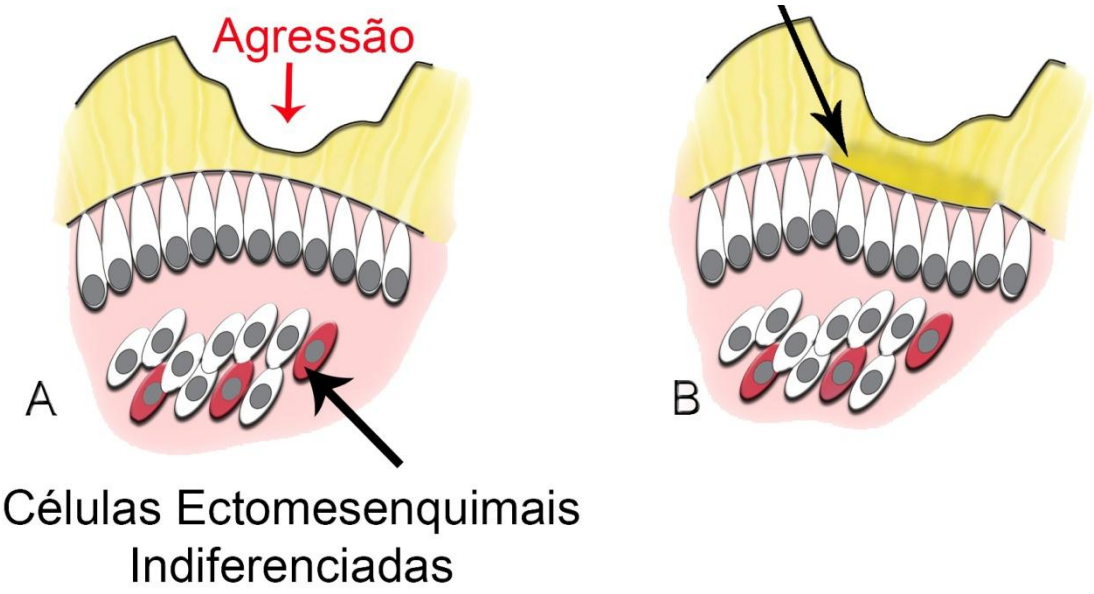
O neurônio


Pericário
Corpúsculos de Nissl
Bainha de mielina
Segmento inicial do axônio
Nodo de Ranvier
Dendritos
Cone de implantação
Ramo colateral
Telodendro

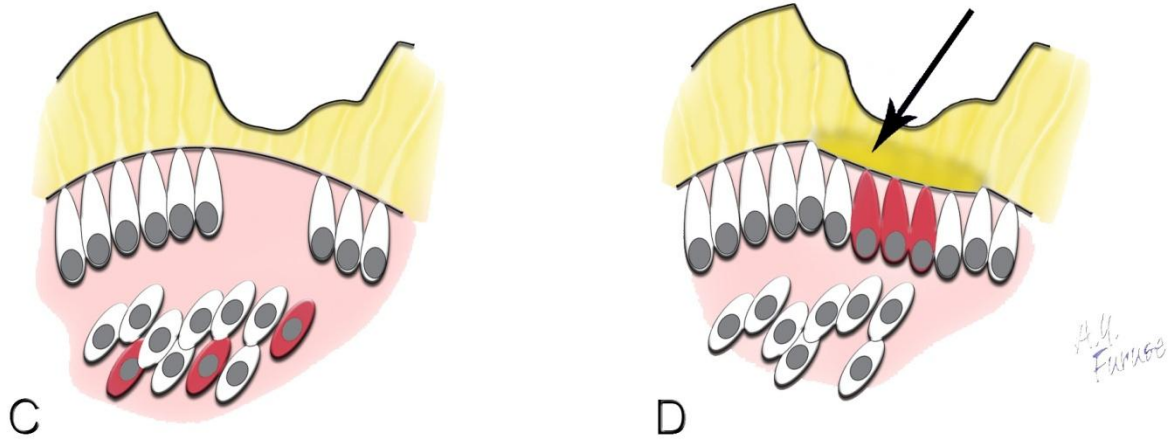
- Dentina primária
- Dentina secundária
- Dentina terciária
  - Dentina reacional
  - Dentina reparativa

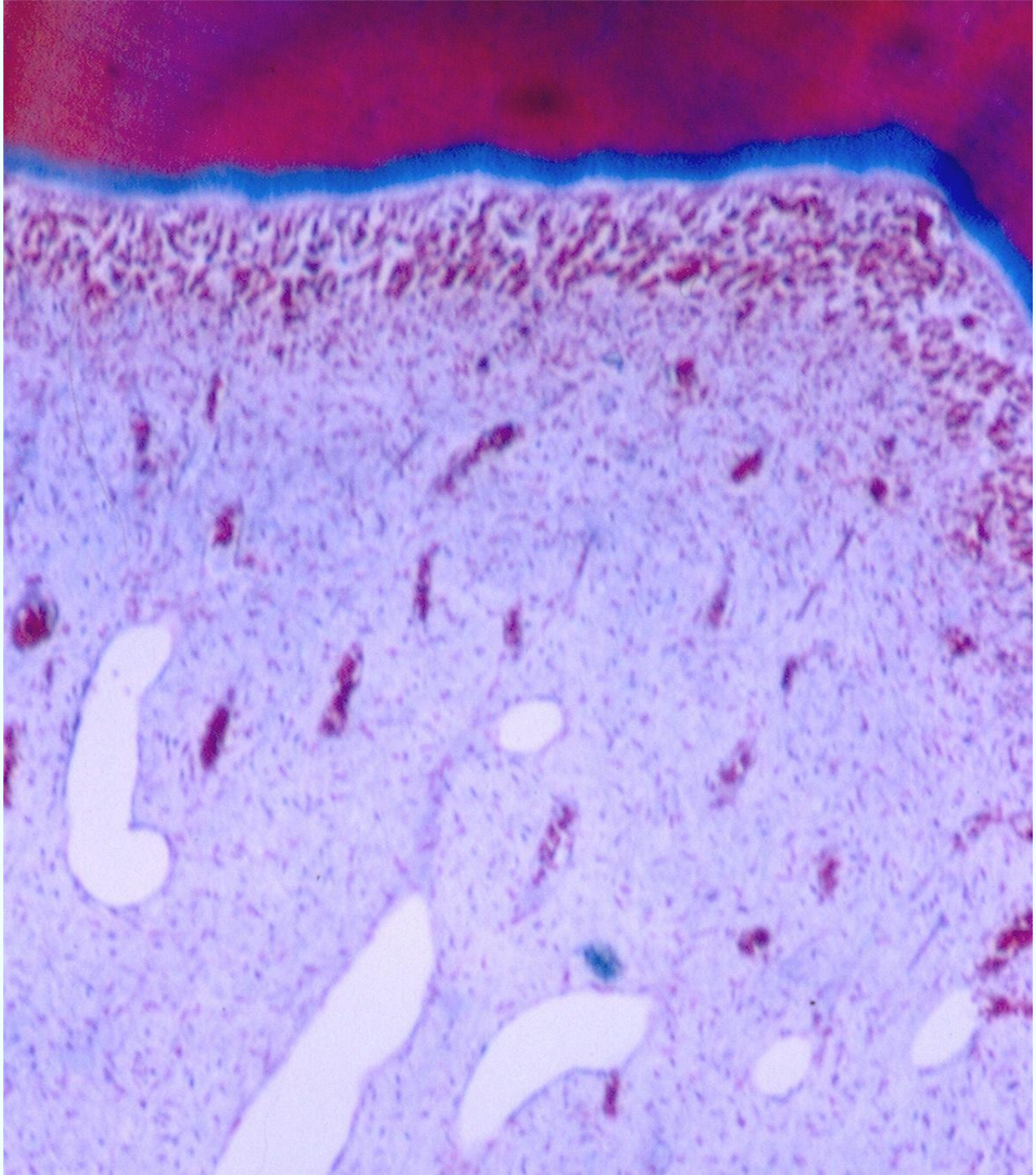


Dentina Reacional



Dentina Reparativa







E S M A L T E

Prof. Dr. VICTOR ARANA

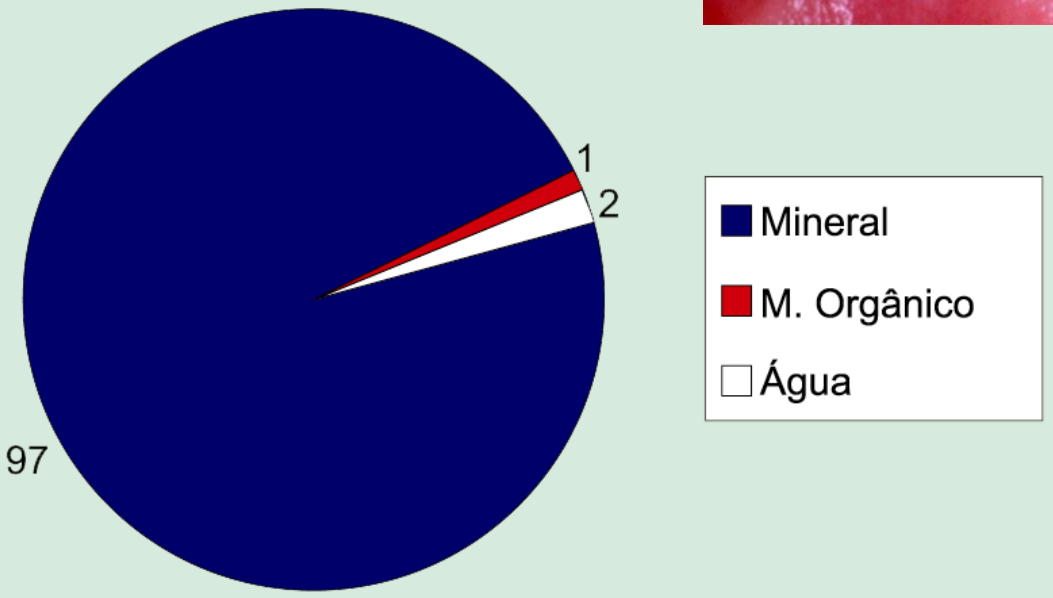
Departamento de Biomateriais e Biologia Oral

TECIDOS MINERALIZADOS

- **Matriz colágena**
  - **Osso**
  - **Dentina**
  - **Cemento**
  - **Cartilagem calcificada**
- **Matriz não colágena**
  - **Esmalte**

ESMALTE





CONSTITUINTES ORGÂNICOS DO ESMALTE

- **Amelogeninas** ~25kDa

- **Não amelogeninas**

  Fosfoproteínas glicosiladas acídicas

  - Enamelina 143kDa

  - Tufelina 60kDa

  Glicoproteínas sulfatadas

  - Ameloblastina 62kDa

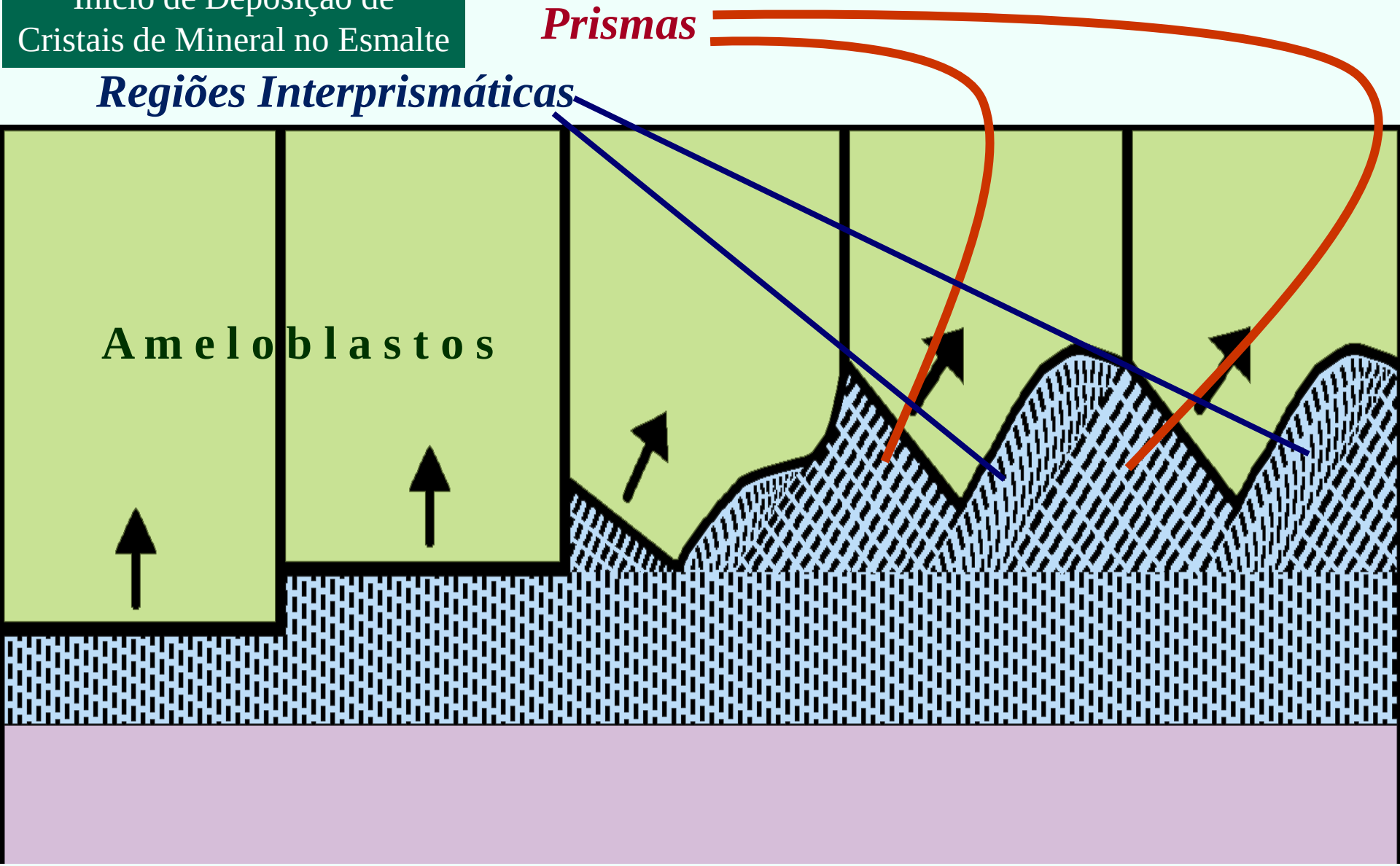
  - Amelina 40kDa

  - Bainhalina 13-17kDa

  - Amelotina

  - Apina

Início de Deposição de Cristais de Mineral no Esmalte

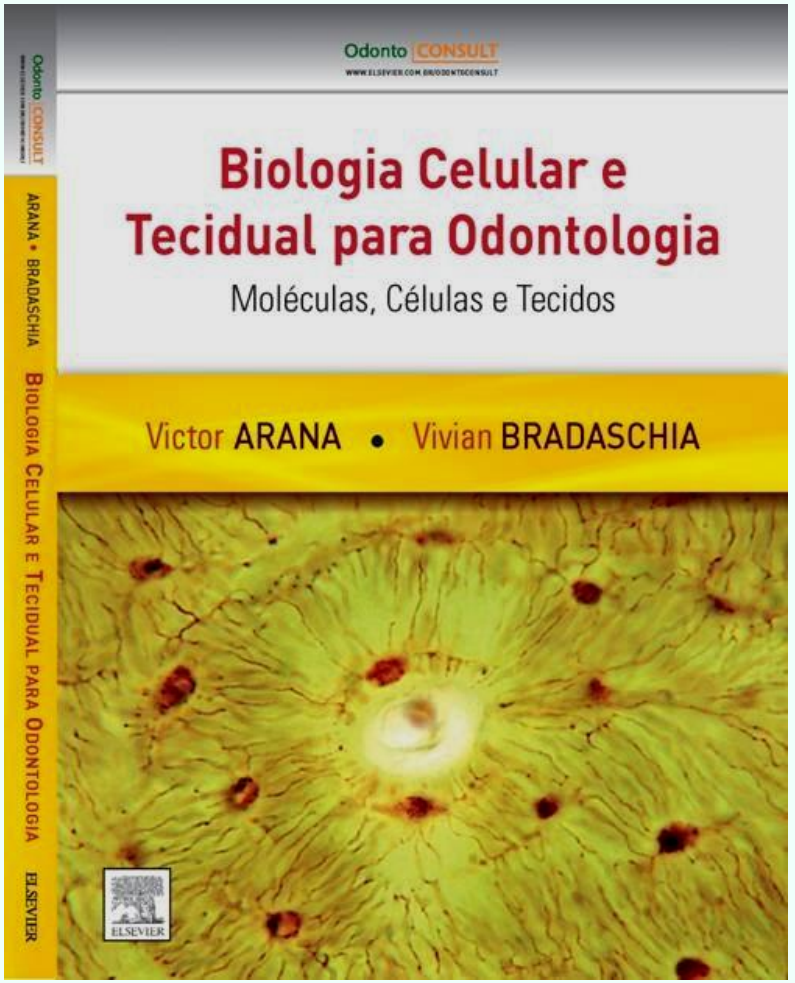


Após os primeiros 40 μm, na junção com a dentina, os ameloblastos desenvolvem os processos de Tomes, mudando a orientação do seu deslocamento e, com isso, dos cristais de mineral

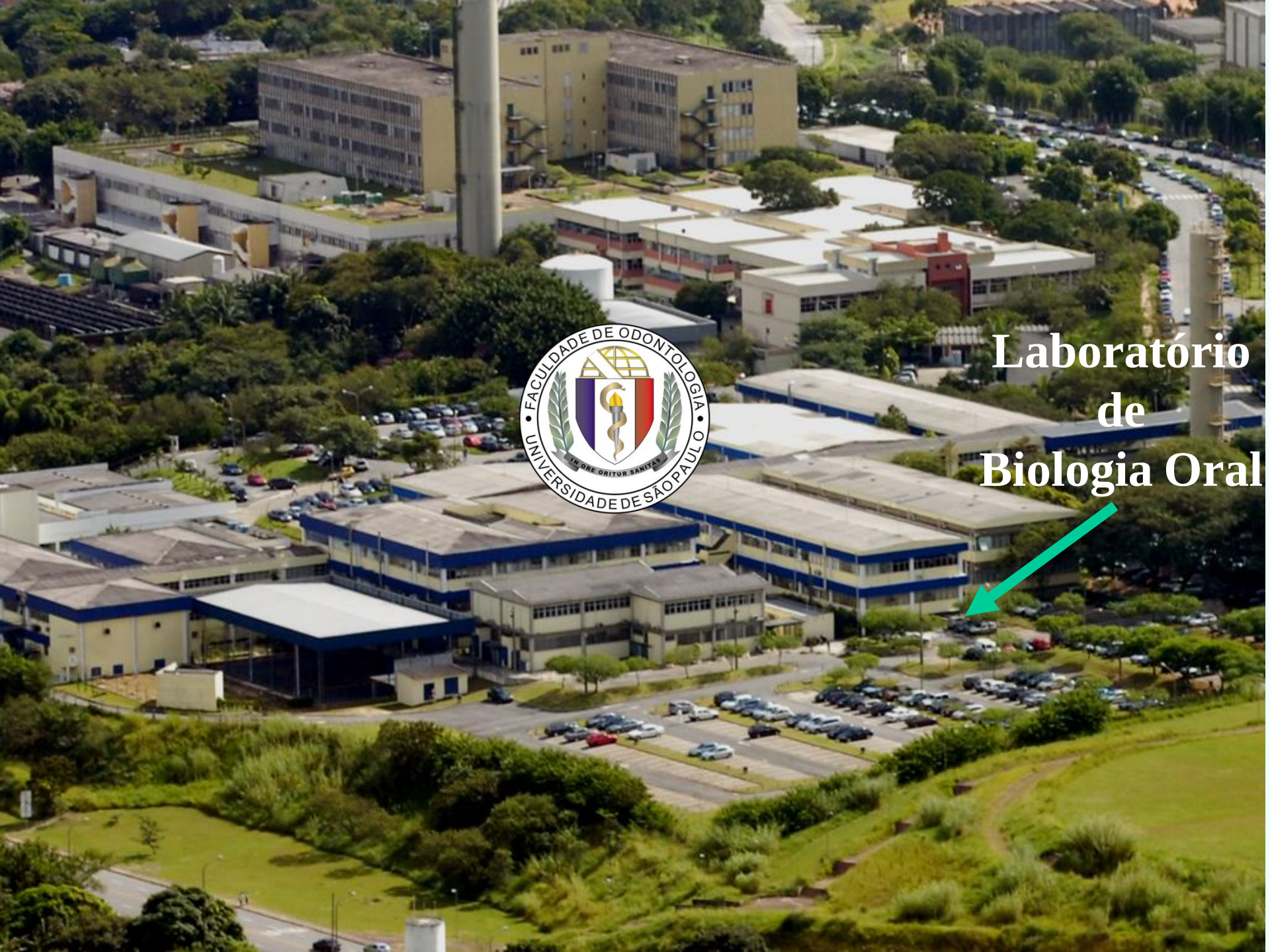
Bibliografia



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1ª Edição - 2012


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UNIVERSIDADE DE SÃO PAULO
IN ORE ORITUR SANITAS
Laboratório
de
Biologia Oral