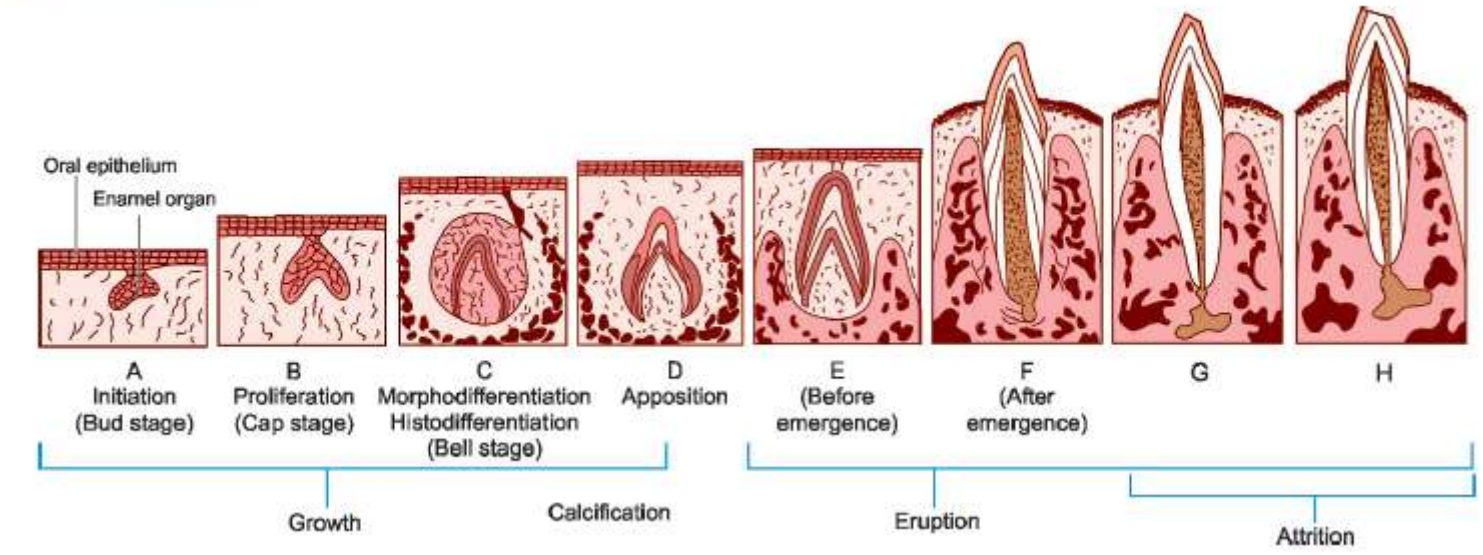
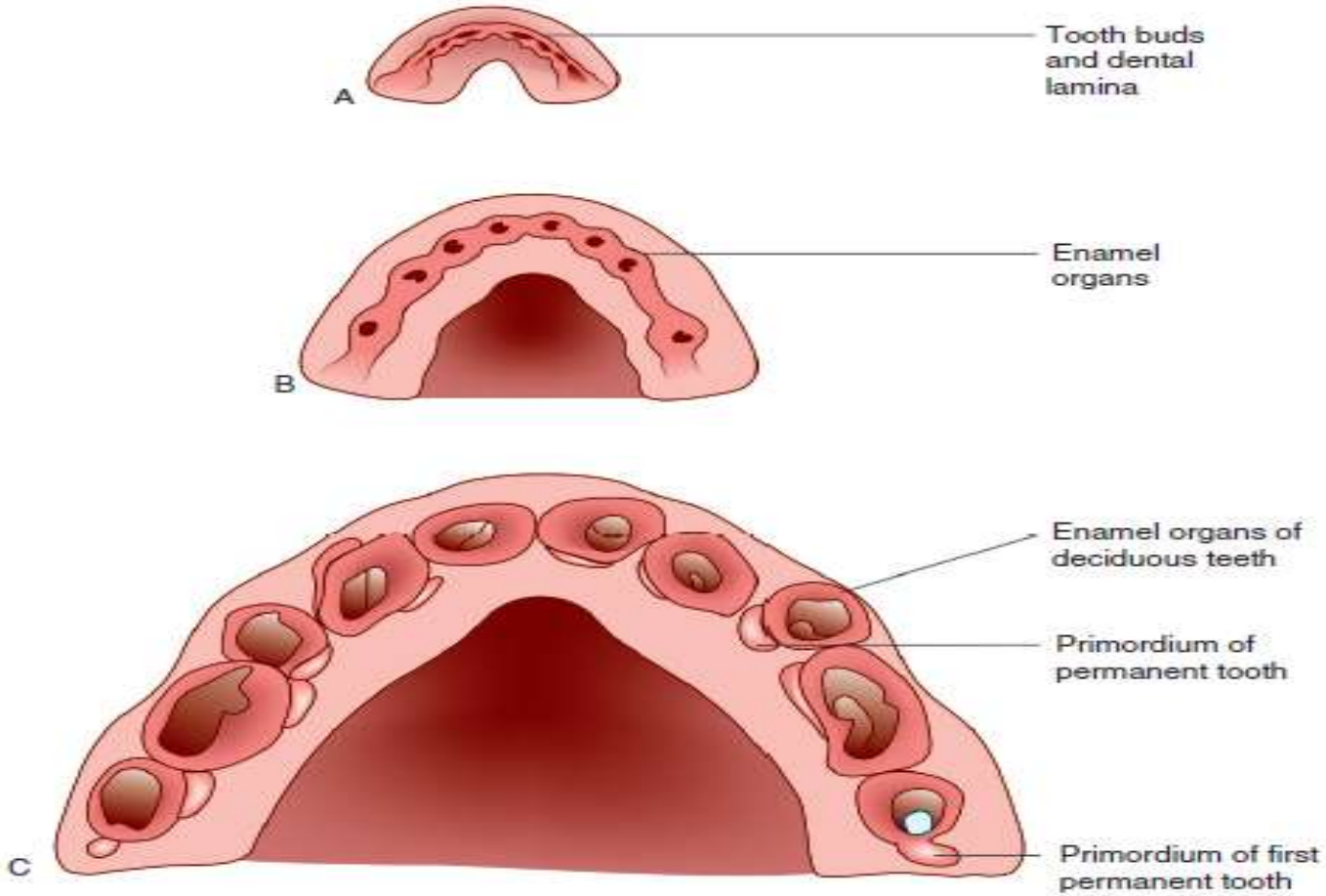
# Tooth development

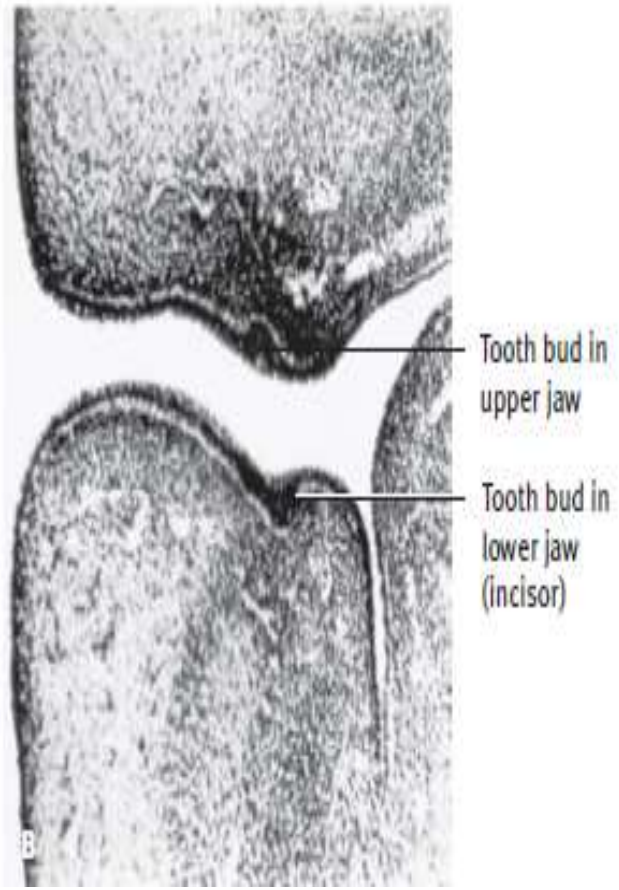
***Senior lecturer***
***Dr Sura Talal Kadhim***
***Department of prosthodontics technology***
***Lab 6***

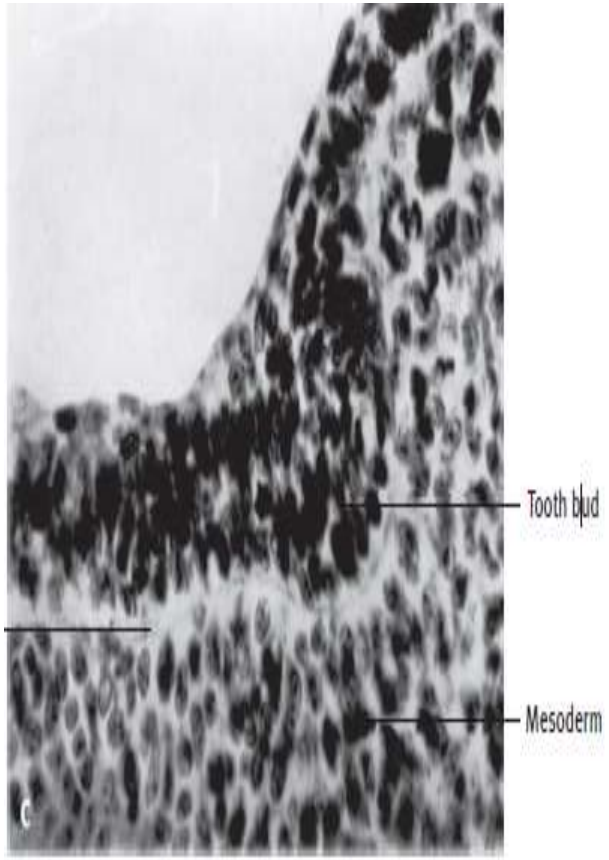
كلية آشور الجامعة
Ashur University College


Oral epithelium
Enamel organ
A
Initiation
(Bud stage)
B
Proliferation
(Cap stage)
C
Morphodifferentiation
Histodifferentiation
(Bell stage)
D
Apposition
E
(Before
emergence)
F
(After
emergence)
G
H
Growth
Calcification
Eruption
Attrition


Tooth buds and dental lamina
A
Enamel organs
B
Enamel organs of deciduous teeth
Primordium of permanent tooth
Primordium of first permanent tooth
C

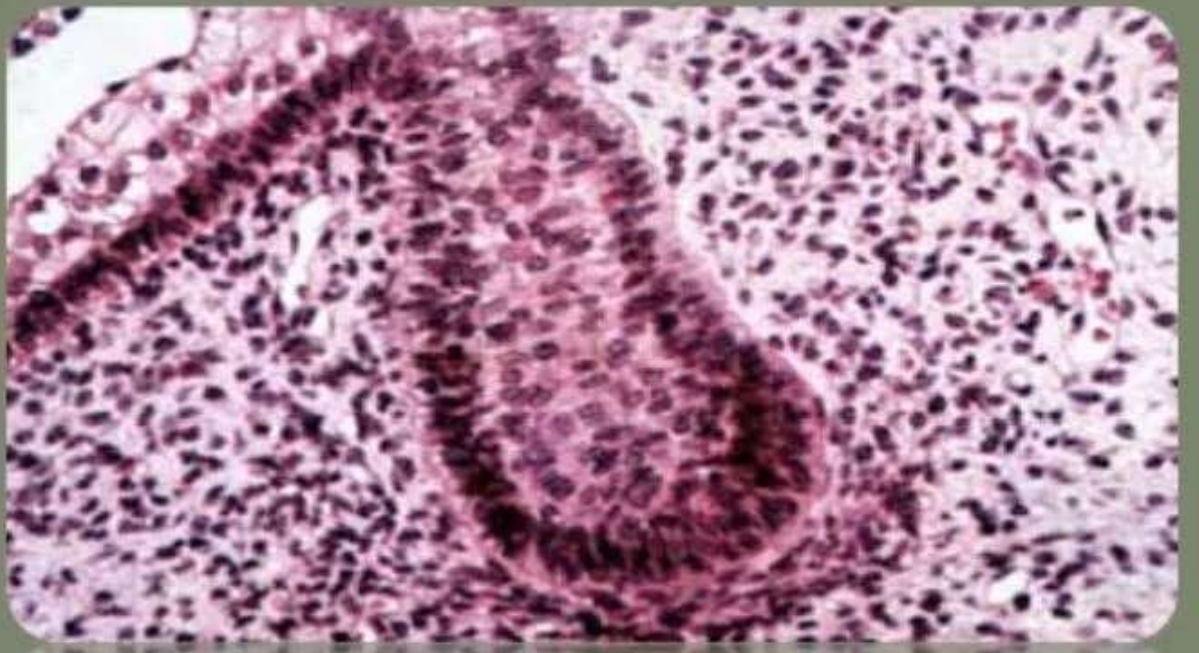
# Bud stage


Tooth bud in upper jaw
Tooth bud in lower jaw (incisor)

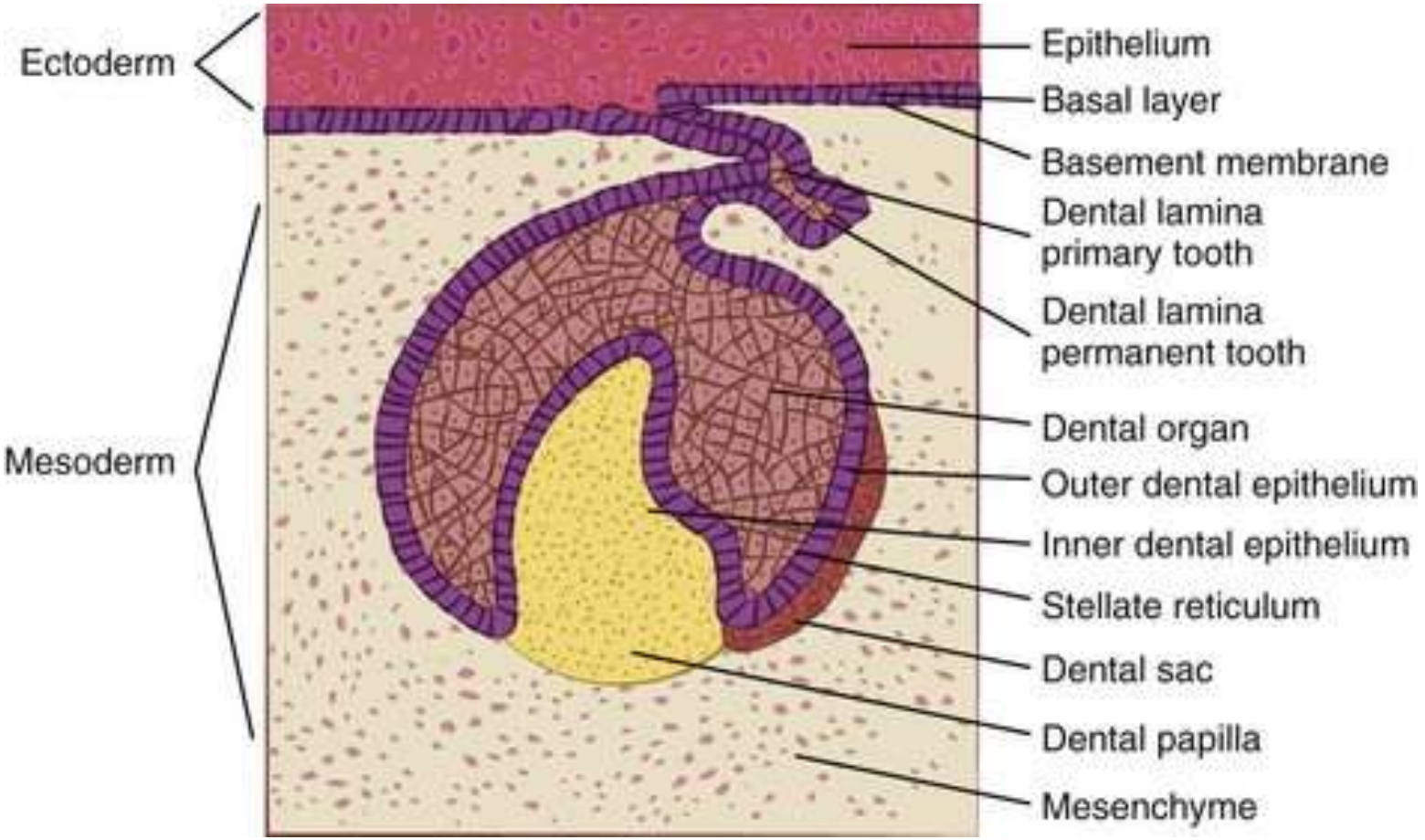

Tooth bud
Mesoderm

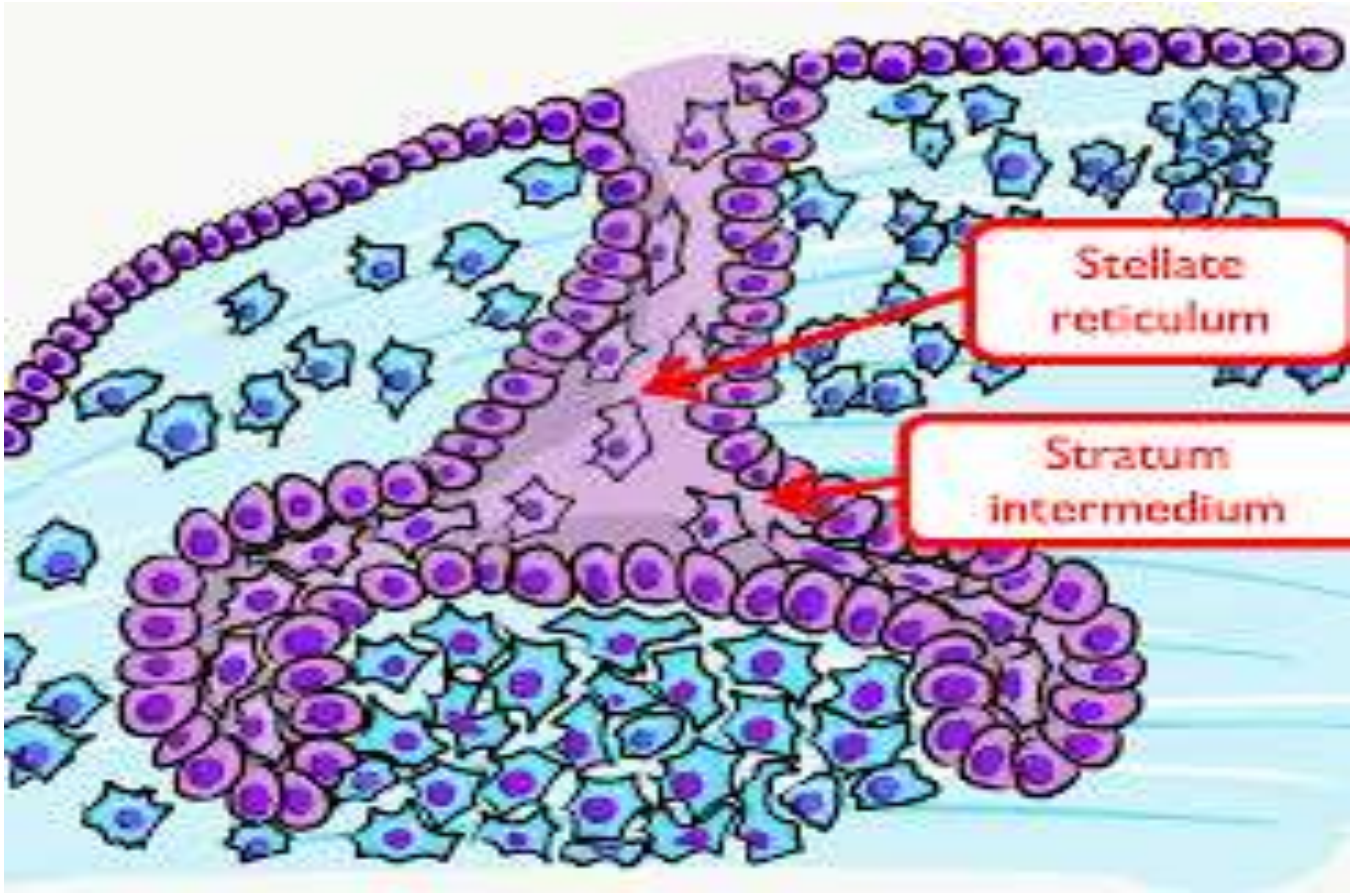


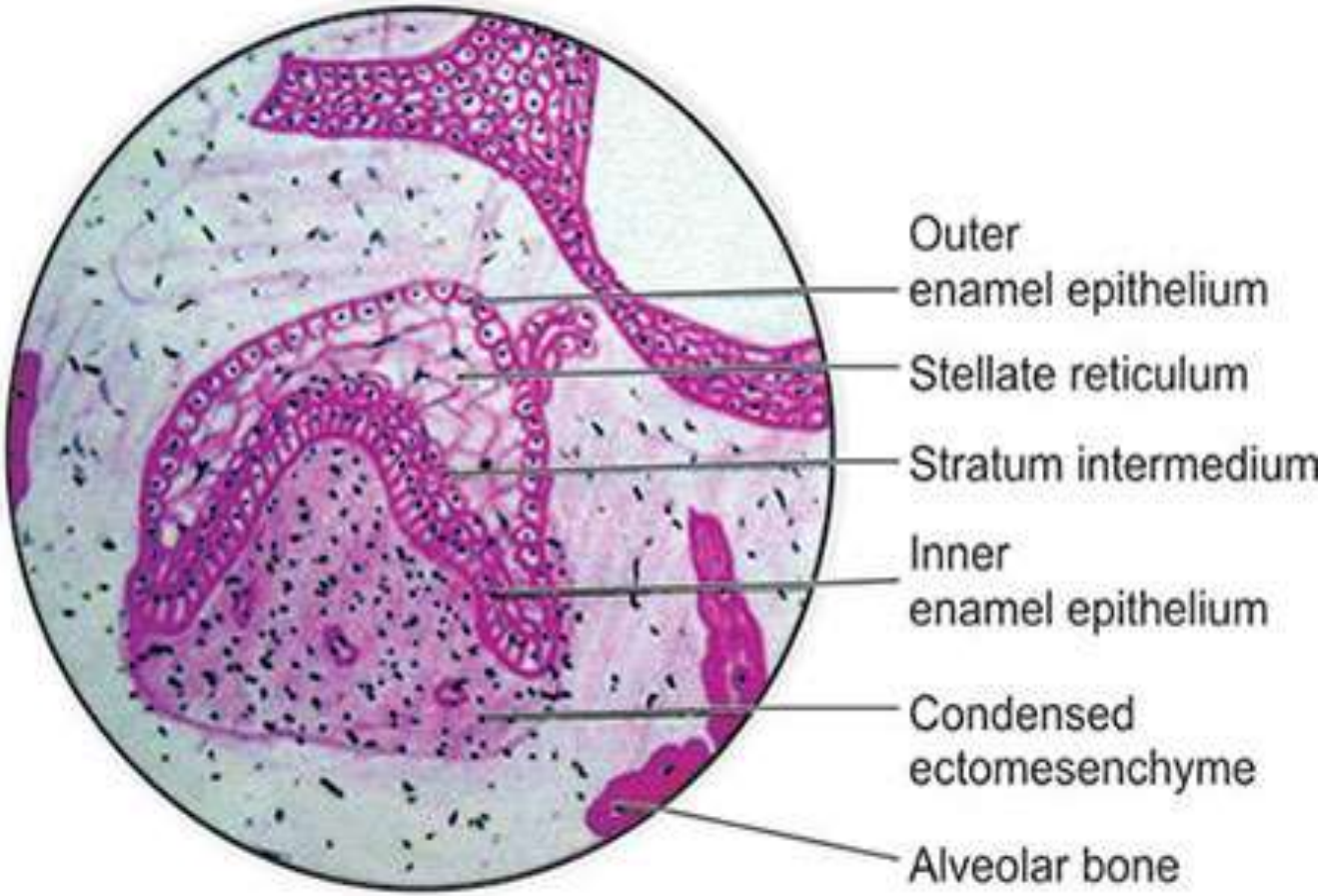
**Bud stage: is characterized by rounded, localized growth of epithelium surrounded by proliferating mesenchymal cells, which are packed closely beneath and around the epithelial buds**

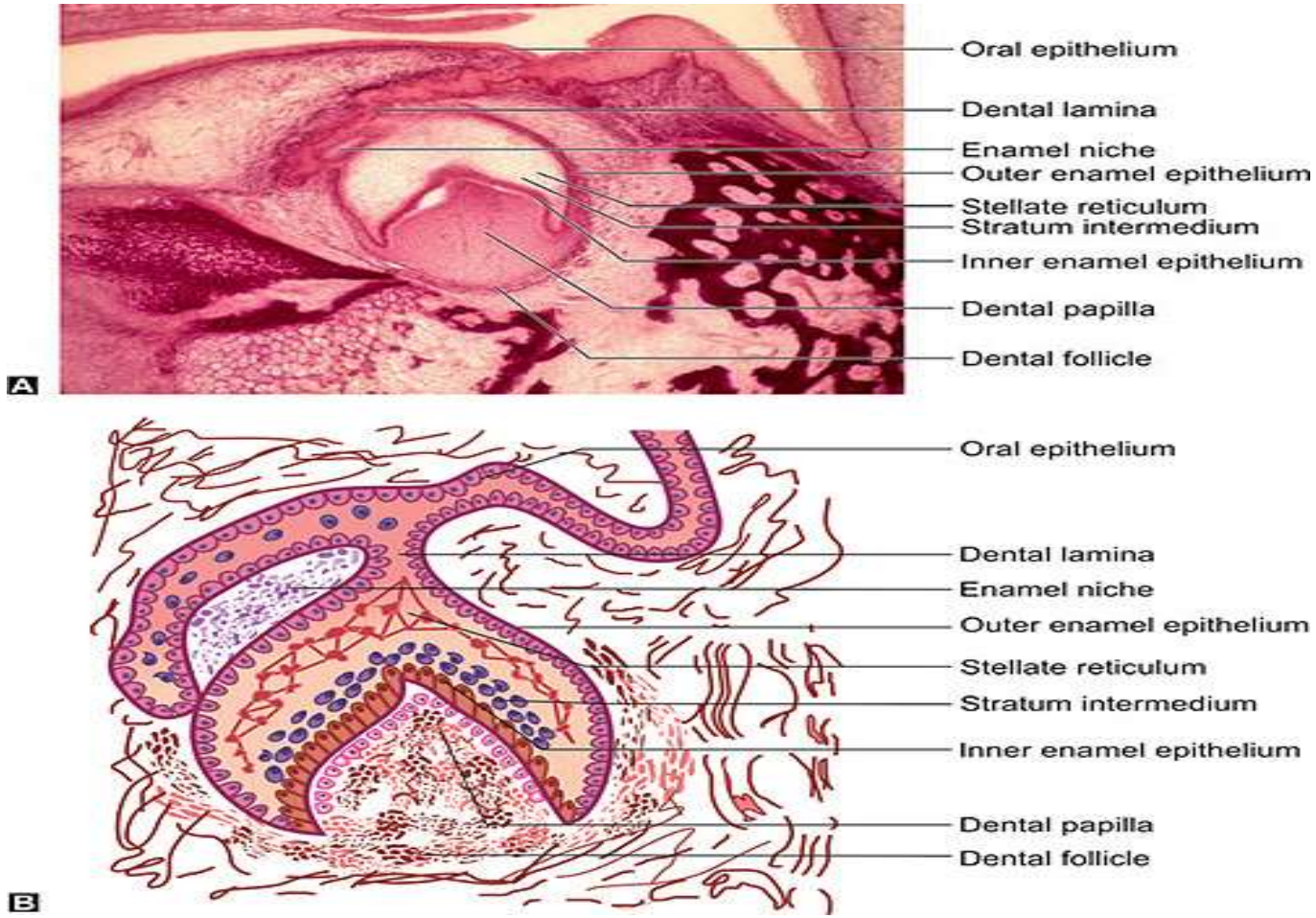


In the bud stage, the enamel organ consists of peripherally located
low columnar cells and centrally located polygonal cells


Ectoderm
Mesoderm
Epithelium
Basal layer
Basement membrane
Dental lamina primary tooth
Dental lamina permanent tooth
Dental organ
Outer dental epithelium
Inner dental epithelium
Stellate reticulum
Dental sac
Dental papilla
Mesenchyme


Stellate reticulum
Stratum intermedium


Outer
enamel epithelium
Stellate reticulum
Stratum intermedium
Inner
enamel epithelium
Condensed
ectomesenchyme
Alveolar bone


A
Oral epithelium
Dental lamina
Enamel niche
Outer enamel epithelium
Stellate reticulum
Stratum intermedium
Inner enamel epithelium
Dental papilla
Dental follicle
B
Oral epithelium
Dental lamina
Enamel niche
Outer enamel epithelium
Stellate reticulum
Stratum intermedium
Inner enamel epithelium
Dental papilla
Dental follicle



Cap Stage



# The bell stage

**Differential growth** accompanied by Histodifferentiation & Morphodifferentiation leads to increase in size & shape of the enamel organ to exhibit a bell shape.

It is divided into:

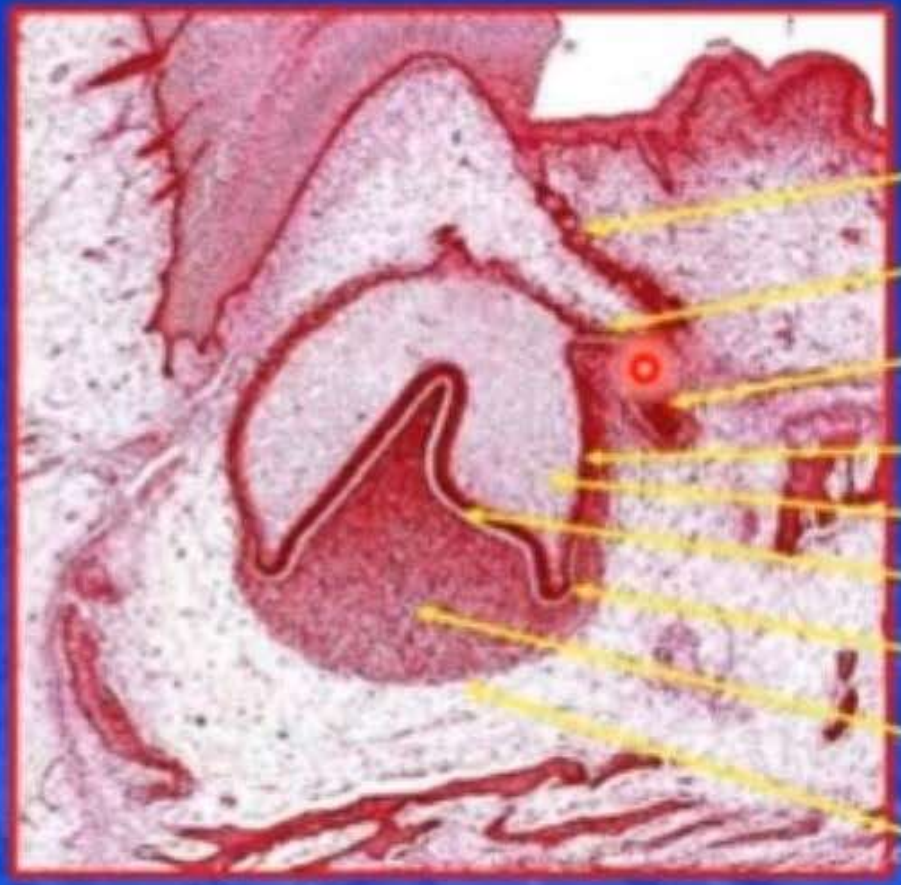
**Early bell stage:** before any hard tissue formation

**Advanced or late bell stage:** which begins by formation of the first layer of dentin.



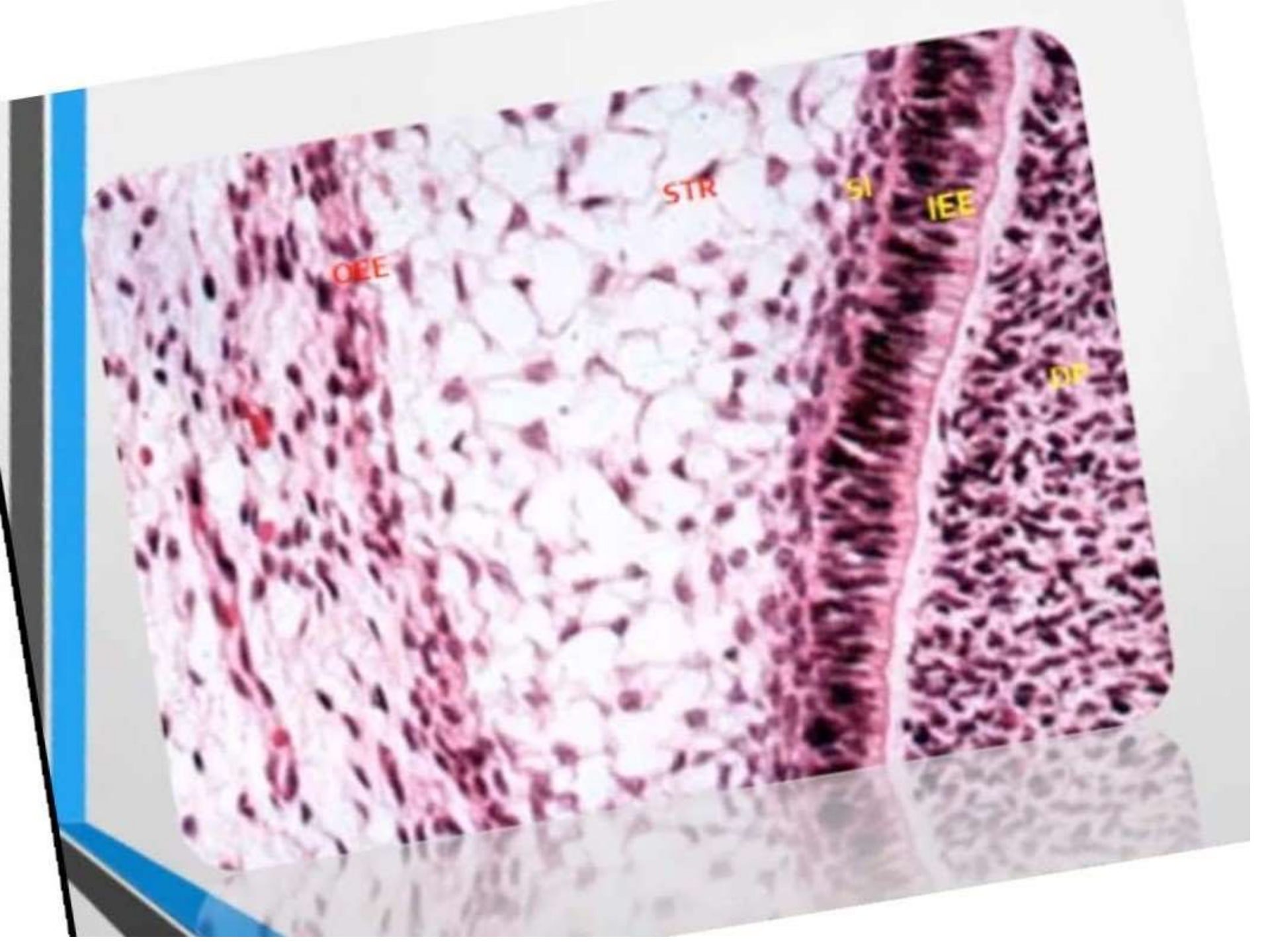


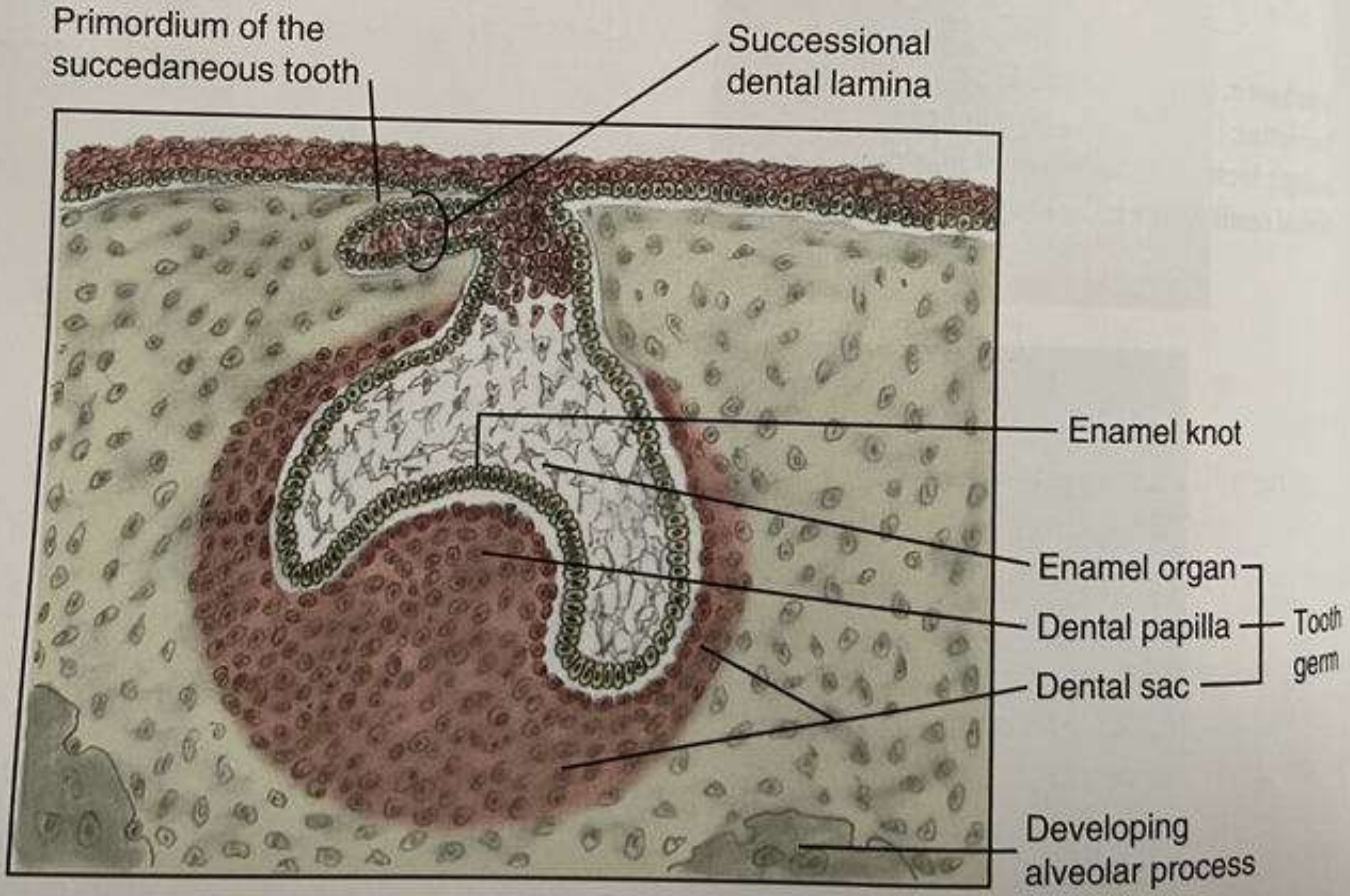
# Early Bell Stage

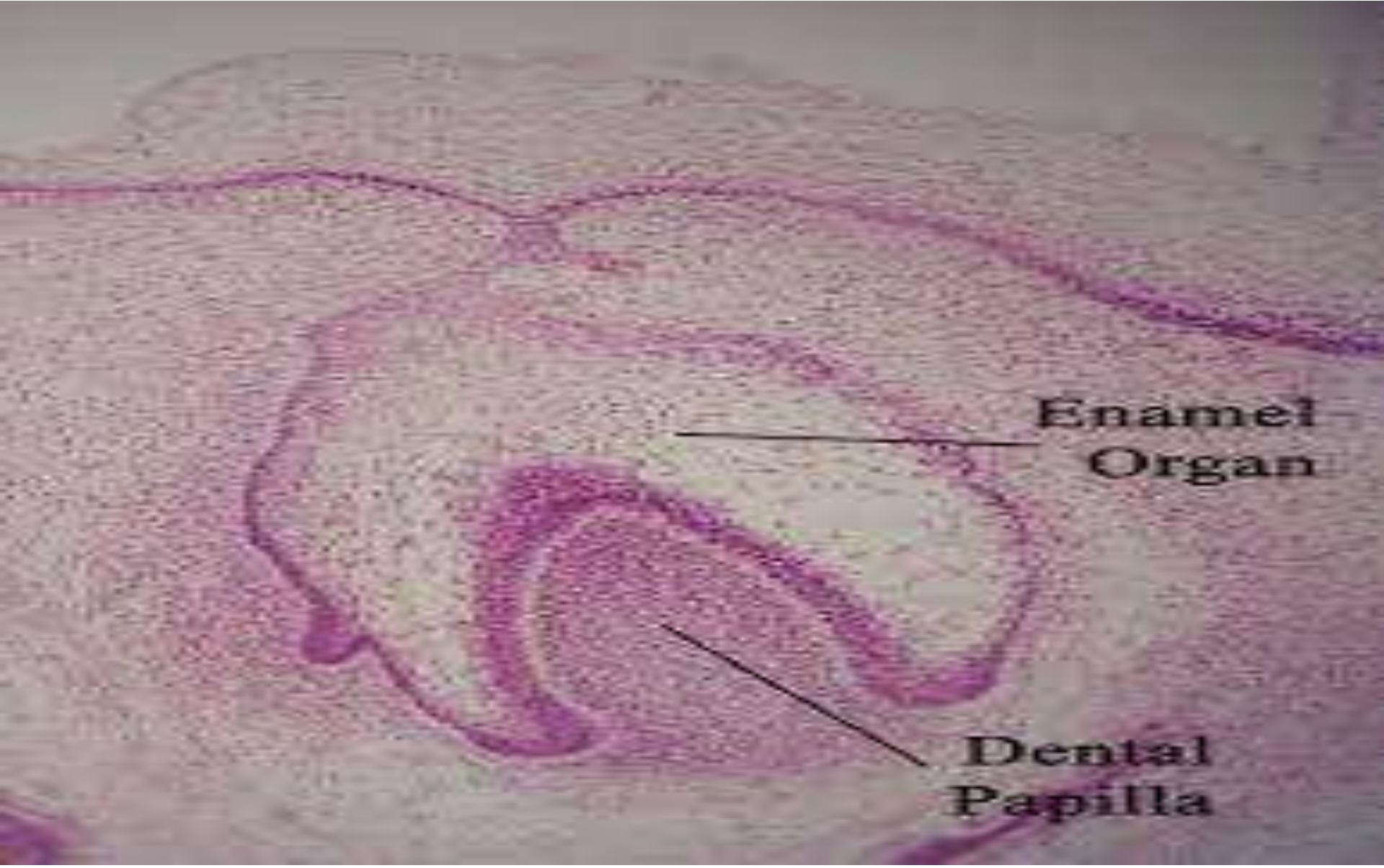


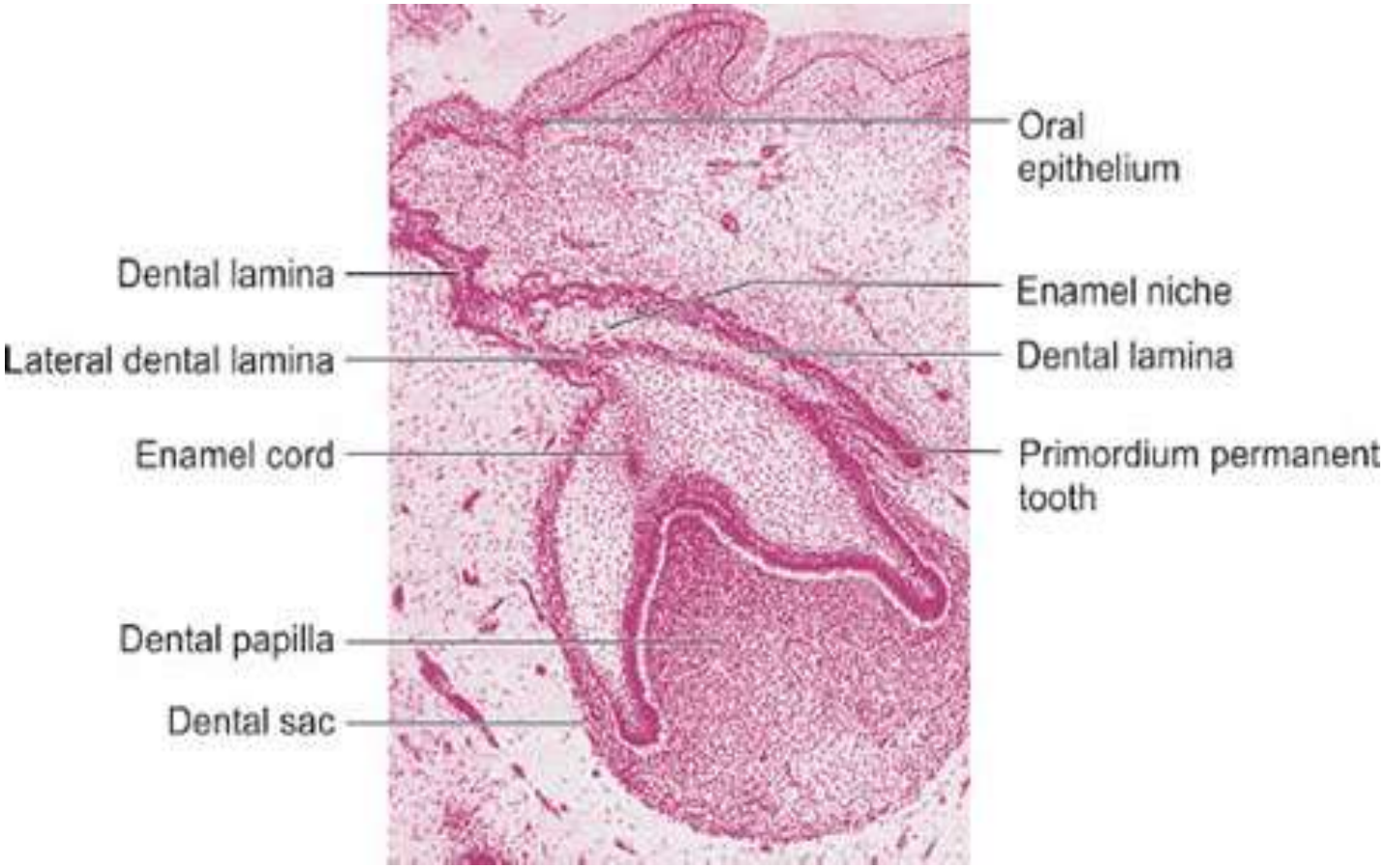
**Morpho-differentiation**
**Proliferation**
**Histodifferentiation**
**Induction**

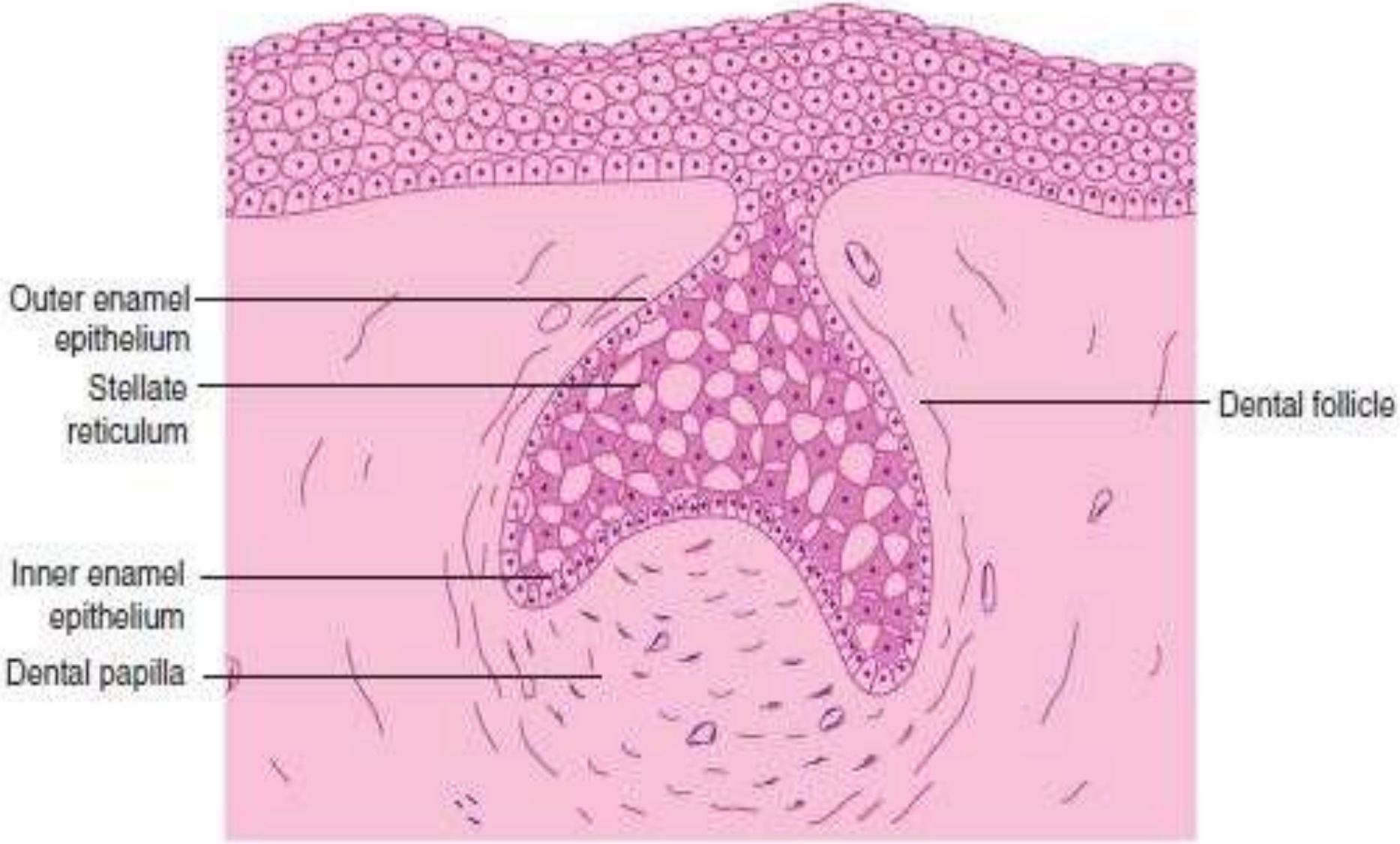
- main dental lamina
- lateral dental lamina
- successional dental lamina
- outer dental epithelium
- stellate reticulum
- inner dental epithelium
- cervical loop
- Dental papilla
- "Dental sac "follicle

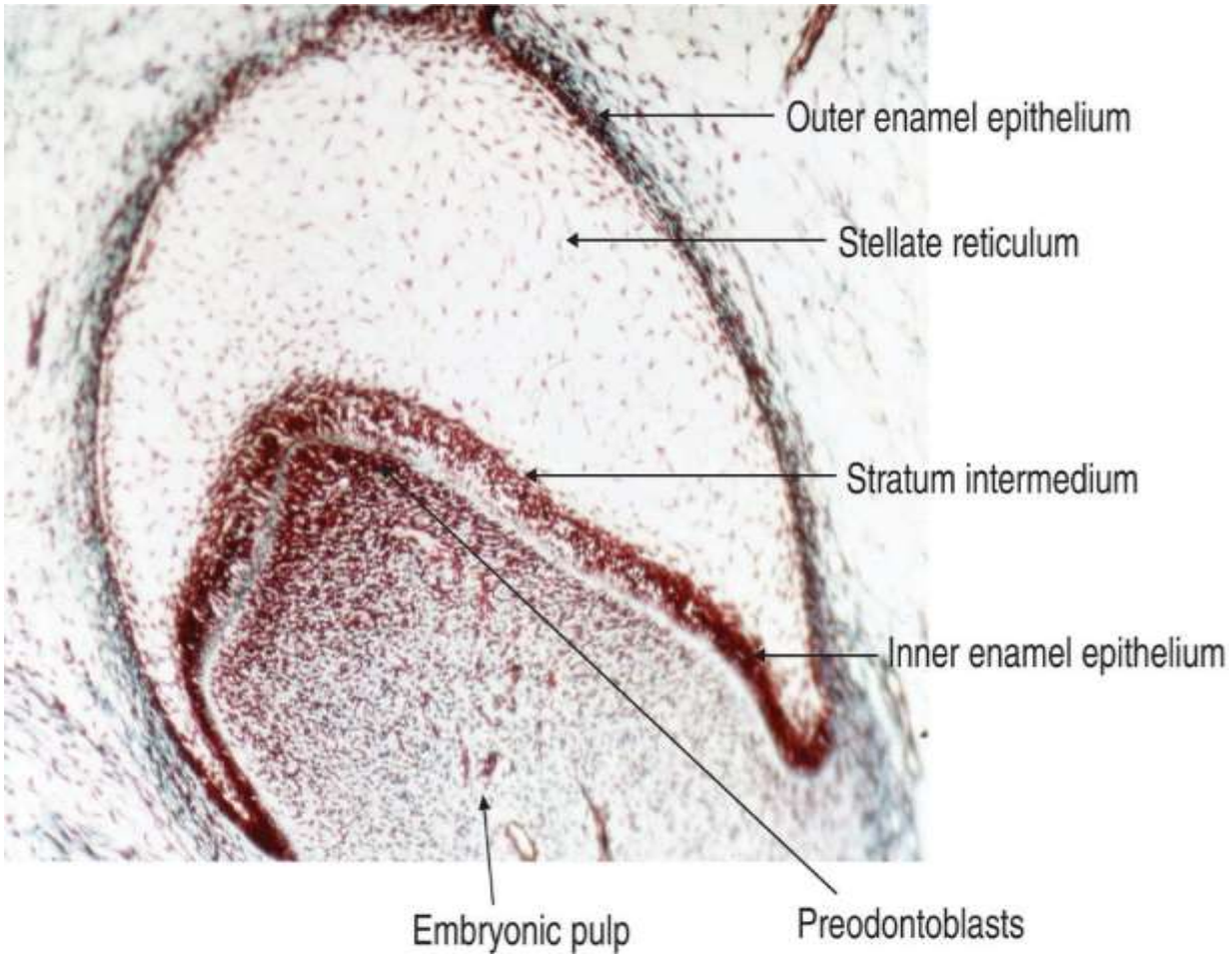

STR
SI
IEE
OEE

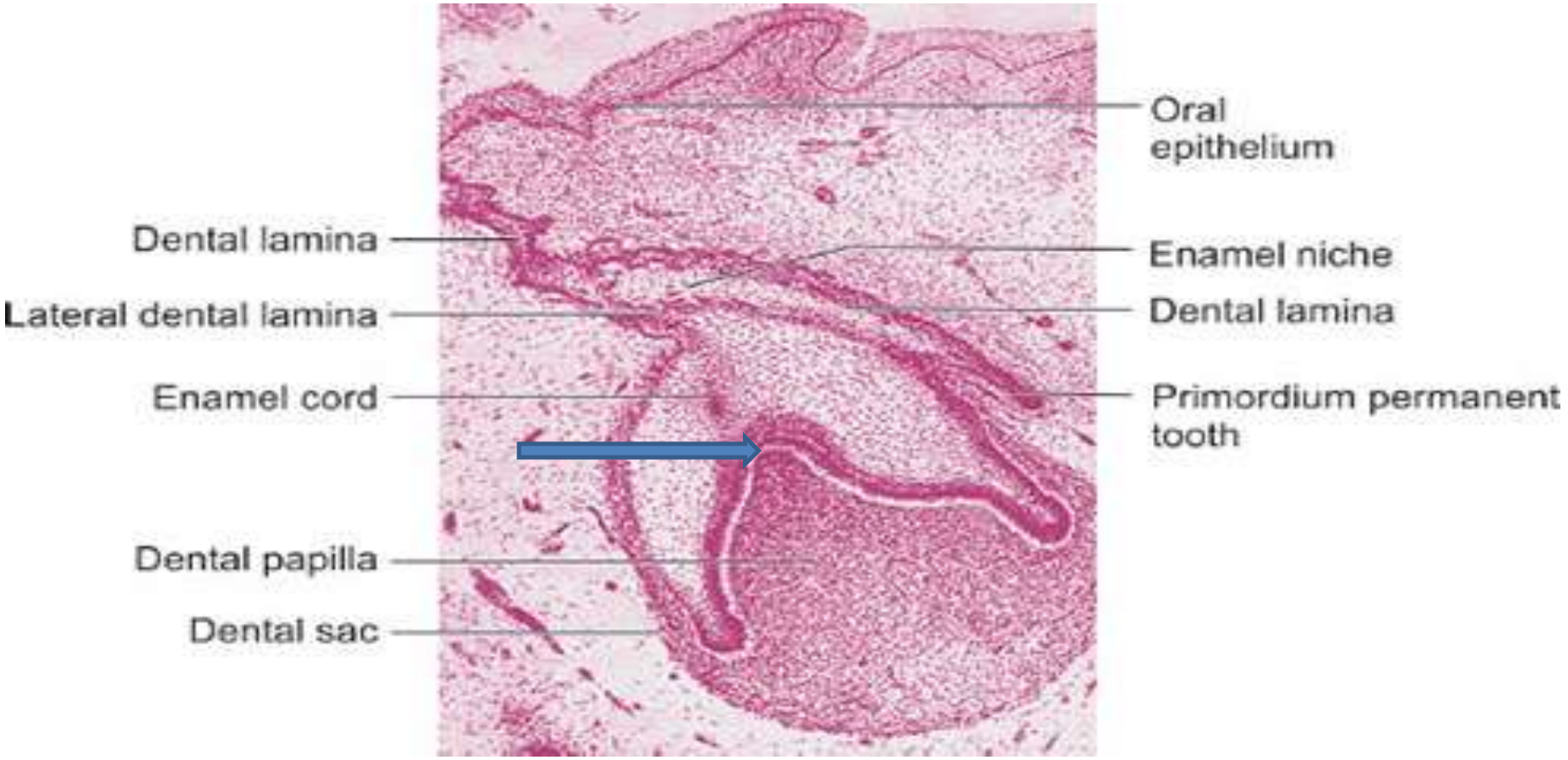

Primordium of the succedaneous tooth
Successional dental lamina
Enamel knot
Enamel organ
Dental papilla
Dental sac
Tooth germ
Developing alveolar process

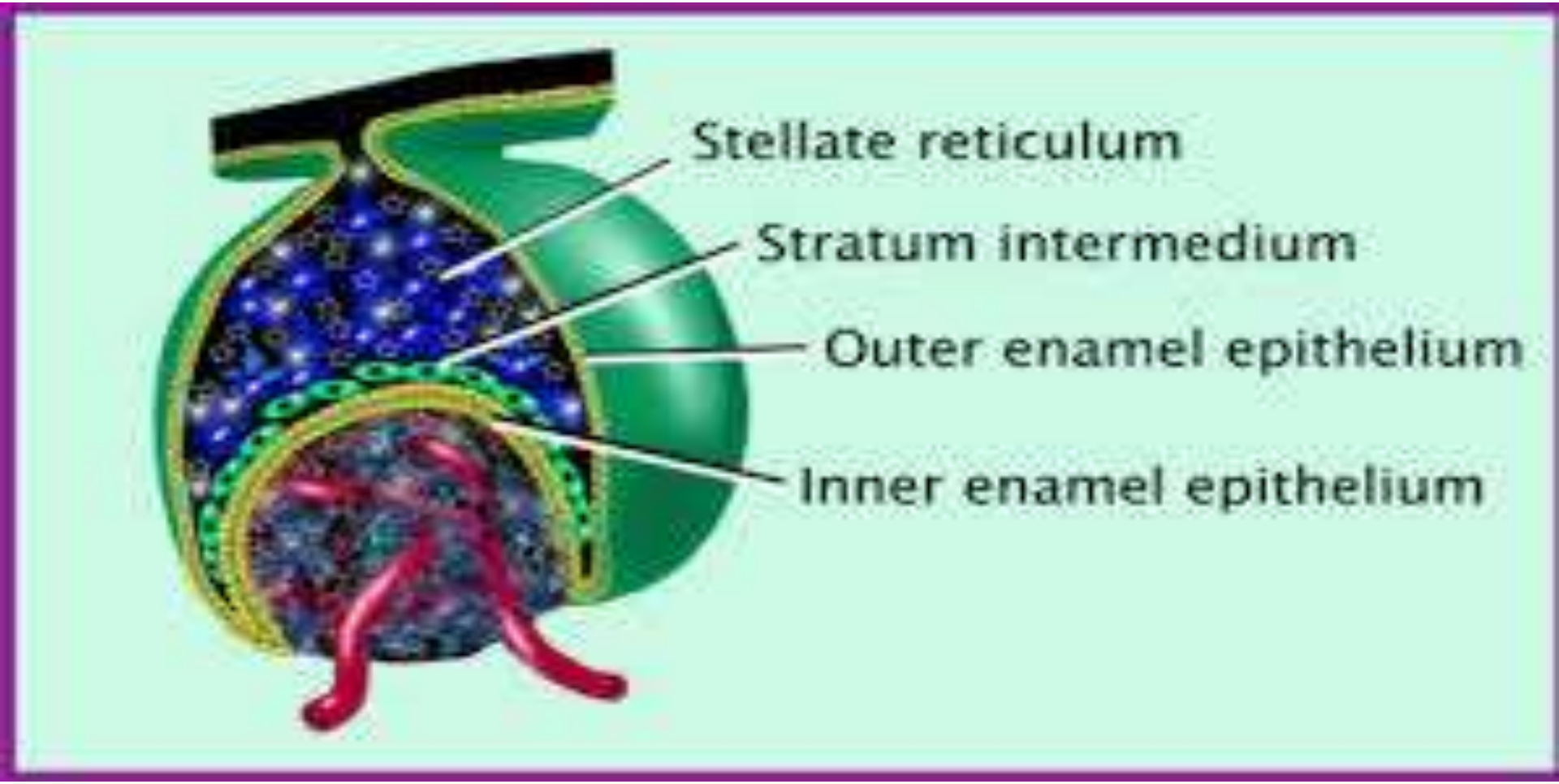

Enamel
Organ
Dental
Papilla

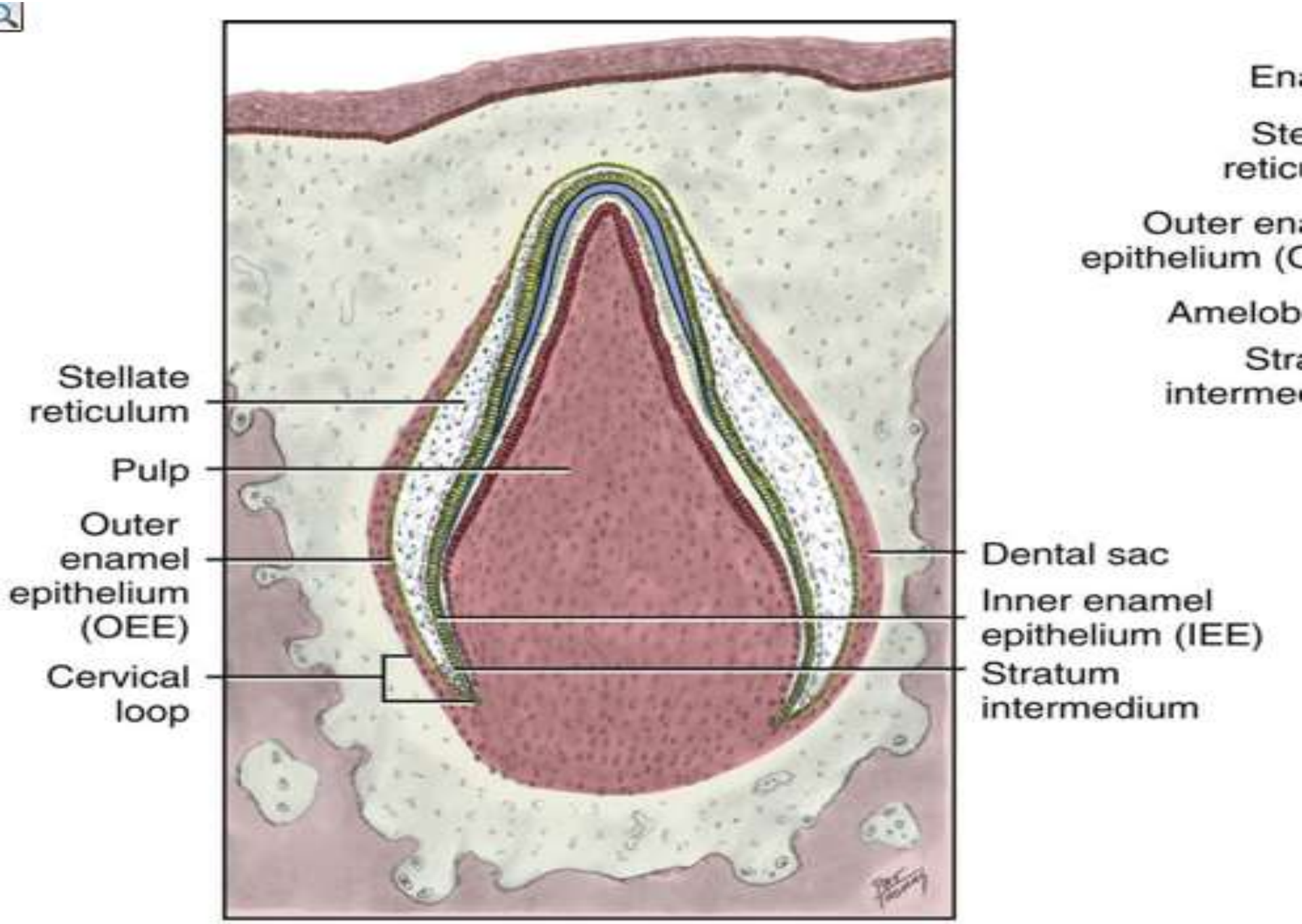

Oral epithelium
Dental lamina
Enamel niche
Lateral dental lamina
Dental lamina
Enamel cord
Primordium permanent tooth
Dental papilla
Dental sac


Outer enamel epithelium
Stellate reticulum
Inner enamel epithelium
Dental papilla
Dental follicle


Outer enamel epithelium
Stellate reticulum
Stratum intermedium
Inner enamel epithelium
Embryonic pulp
Preodontoblasts


Oral epithelium
Dental lamina
Enamel niche
Lateral dental lamina
Dental lamina
Enamel cord
Primordium permanent tooth
Dental papilla
Dental sac


Stellate reticulum
Stratum intermedium
Outer enamel epithelium
Inner enamel epithelium


Stellate reticulum
Pulp
Outer enamel epithelium (OEE)
Cervical loop
Dental sac
Inner enamel epithelium (IEE)
Stratum intermedium

- Thank you