

# SISTEM DIGESTIVUS

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DESY ANDARI

LAB. HISTOLOGI

FK-UMM

# Sistem Digestivus

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1. Tractus Digestivus
2. Kelenjar Pencernaan

# Kelenjar Kelenjar GIT

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- Intrinsic Gland
- Kelenjar Saliva
- Hepar
- Pancreas

# Sistem digestivus

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1. Rongga mulut → mengunyah makanan, melembabkan dan membentuk bolus → sal.cerna
2. Sal. Cerna → perubahan fisik dan kimiawi makanan agar dapat diserap.
3. Kelenjar → menyediakan cairan, enzim dan membentuk emulsi.
4. Eksresi di anus → feces

# Fungsi:

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- Memasukkan makanan, mencerna (molekul besar → kecil) dan mengabsorpsi makanan sekaligus pembuangan bagian yang tidak berguna.
- Sekresi enzim-enzim yang berfungsi dalam proses di atas.
- Sawar pelindung

# CAVUM ORIS (RONGGA MULUT)

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- Bibir
- Palatum (durum dan molle)
- Gigi geligi
- Penyokong gigi (ligamentum, gingiva dan tulang)
- Lidah

# Bibir

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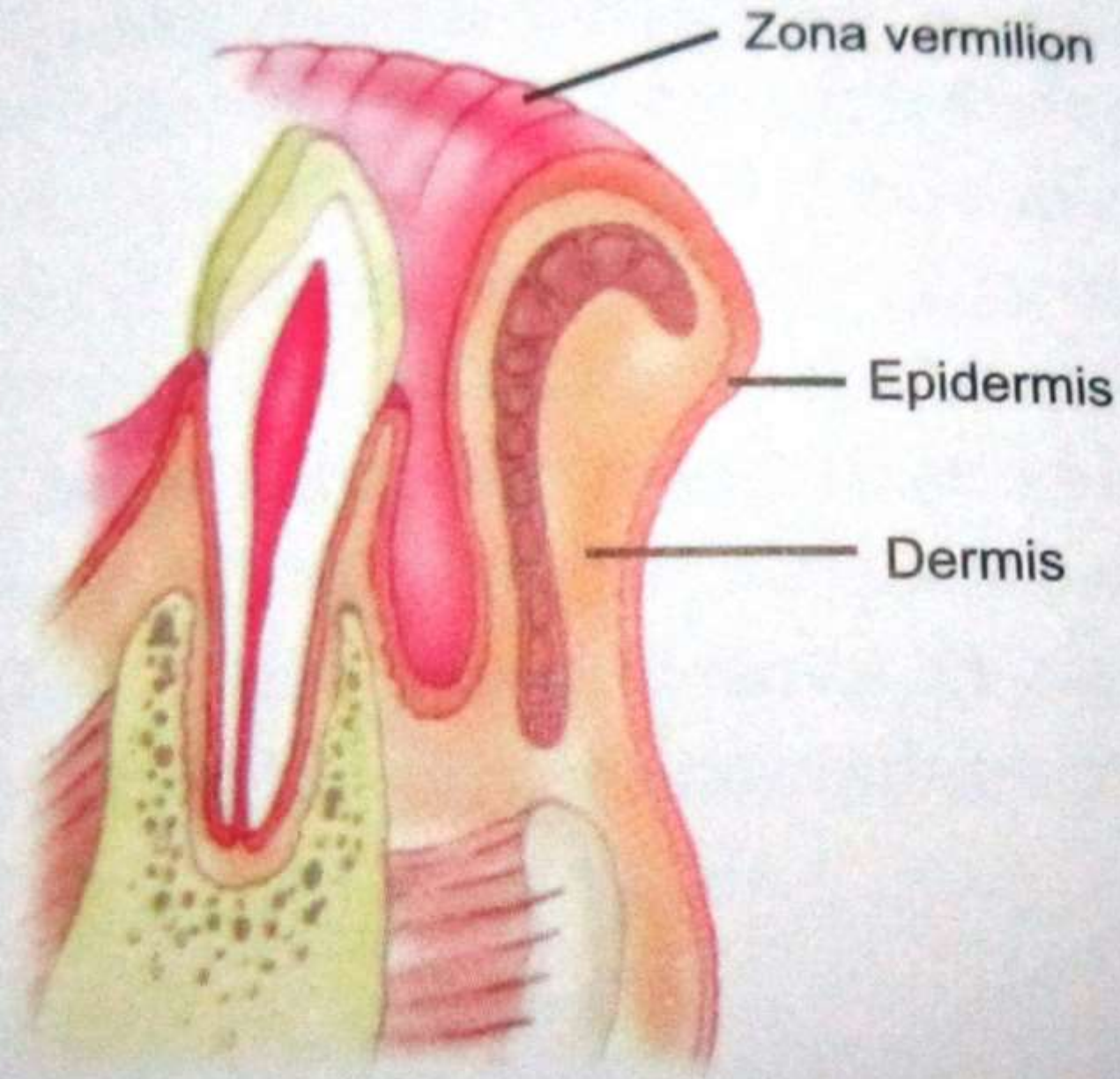
- Pars Cutanea (bagian kulit): ep.sq.complex cornifikasi, fol.rambut +, kelj.sudorifera + & sebacea +.
- Pars Marginalis: ep.sq.complex, corn<<, fol rambut -, kelj.sudorifera - & sebacea -.

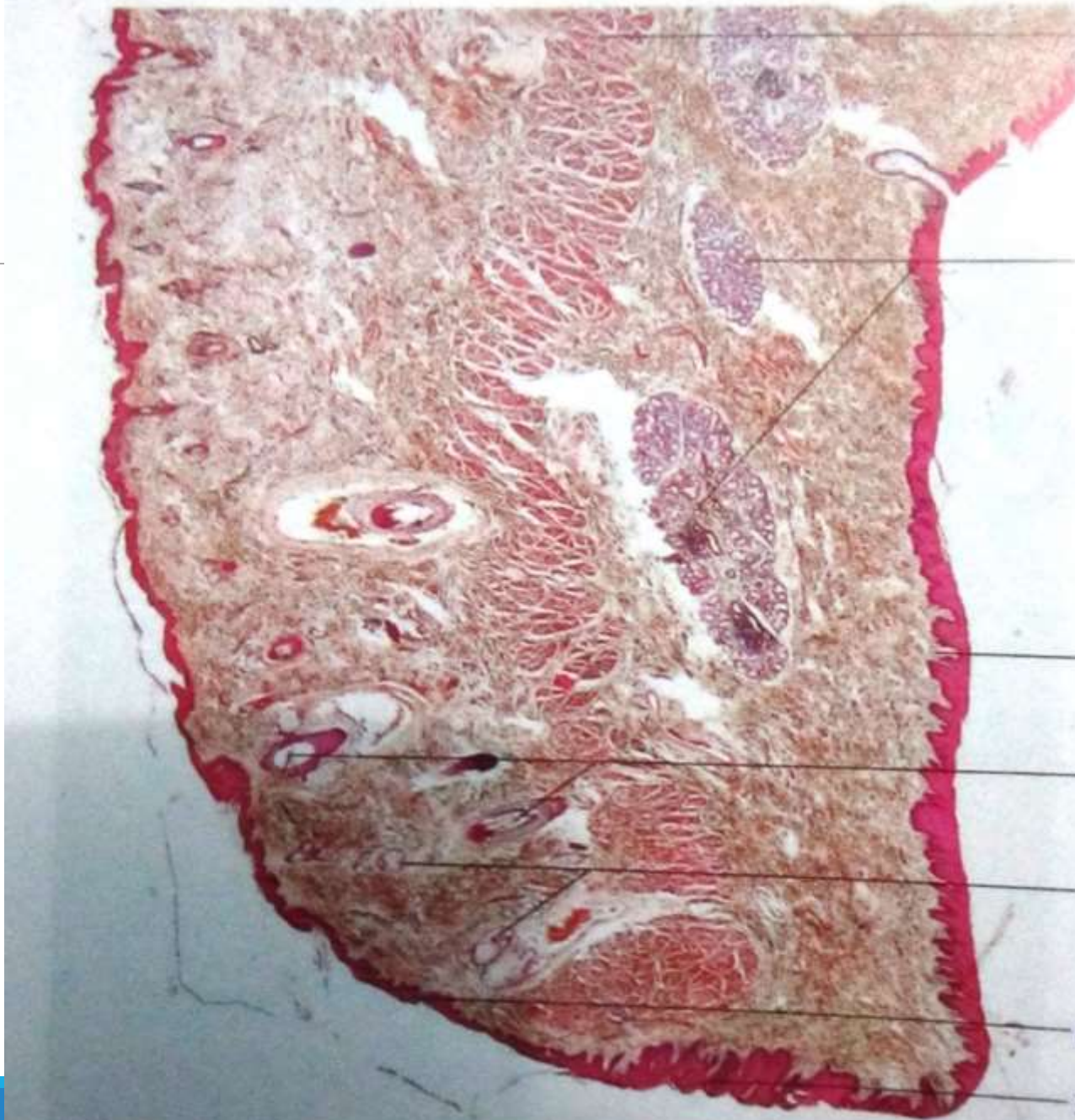
# Bibir ...lanj

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- Pars Rubra (zona vermillion): transisi kulit ke mukosa, ep.sq.compl, corn<<, kapiler >>>, kelj -
- Pars Mucosa: =mukosa pipi, ep.sq.compl non corn, kelj.mucous di submukosa.
- Di bagian tengah tdd jaringan ikat tdk beraturan dan m.orbicularis oris.







# Palatum

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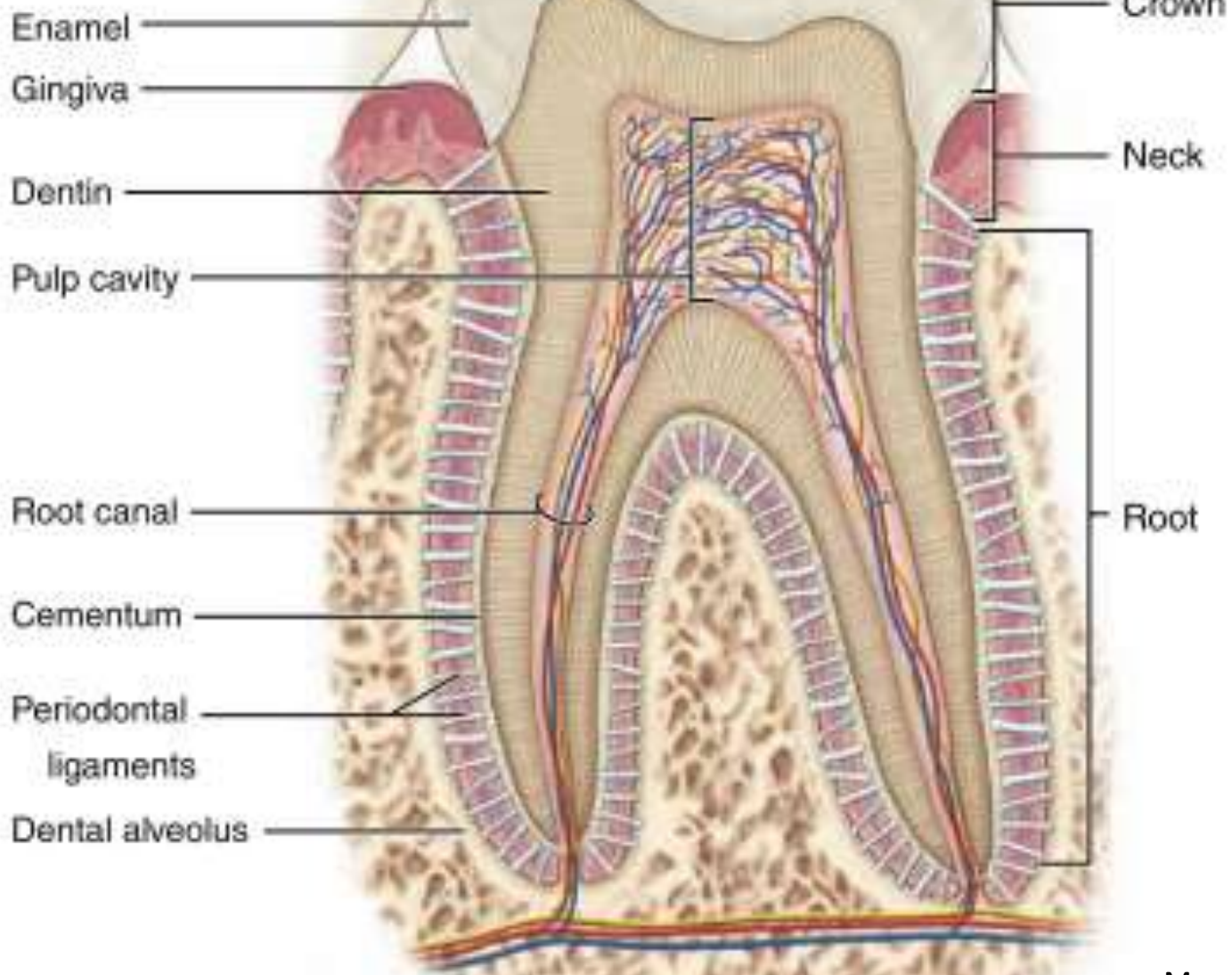
- Palatum durum (langit-langit keras): anterior, ep.sq.compl corn, rangka tulang, jar.lemak, kelenjar mukosa.
- Palatum molle (langit-langit lunak): posterior, ep.sq.compl non corn, otot skelet, jar.ikat, kelenjar ludah kecil.
- Bagian oral dan nasal (ep.respirasi)

# Gigi

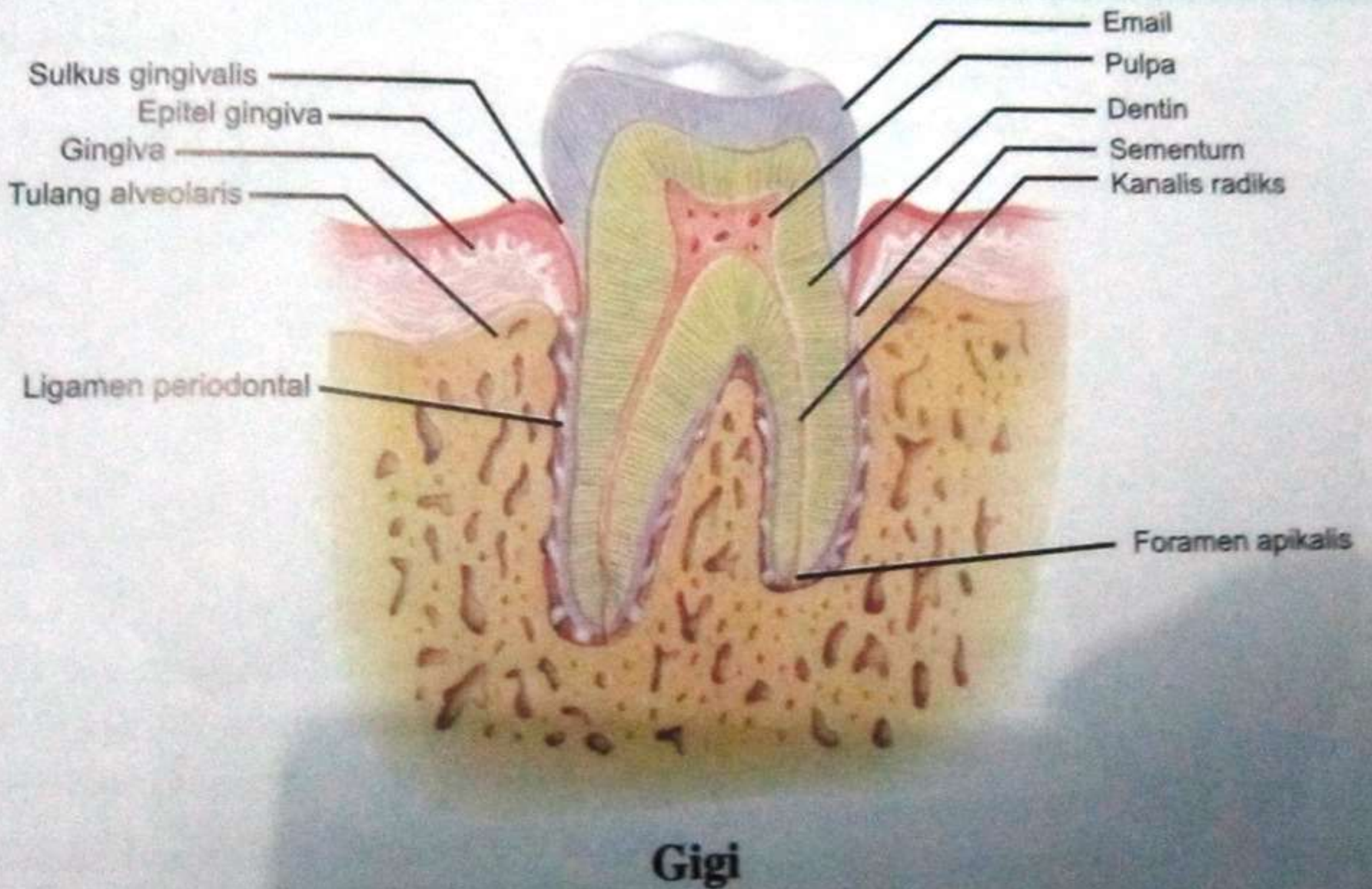
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- Tdd mahkota dan akar.
- Kalsifikasi: email, dentin, sementum.
- Pulpa dentis: rongga pulpa berisi pembuluh darah, pembuluh limfe, saraf dan jaringan ikat.
- Ameloblas → email
- Odontoblas → dentin





Mescher, A. (2016)



# Penyokong gigi

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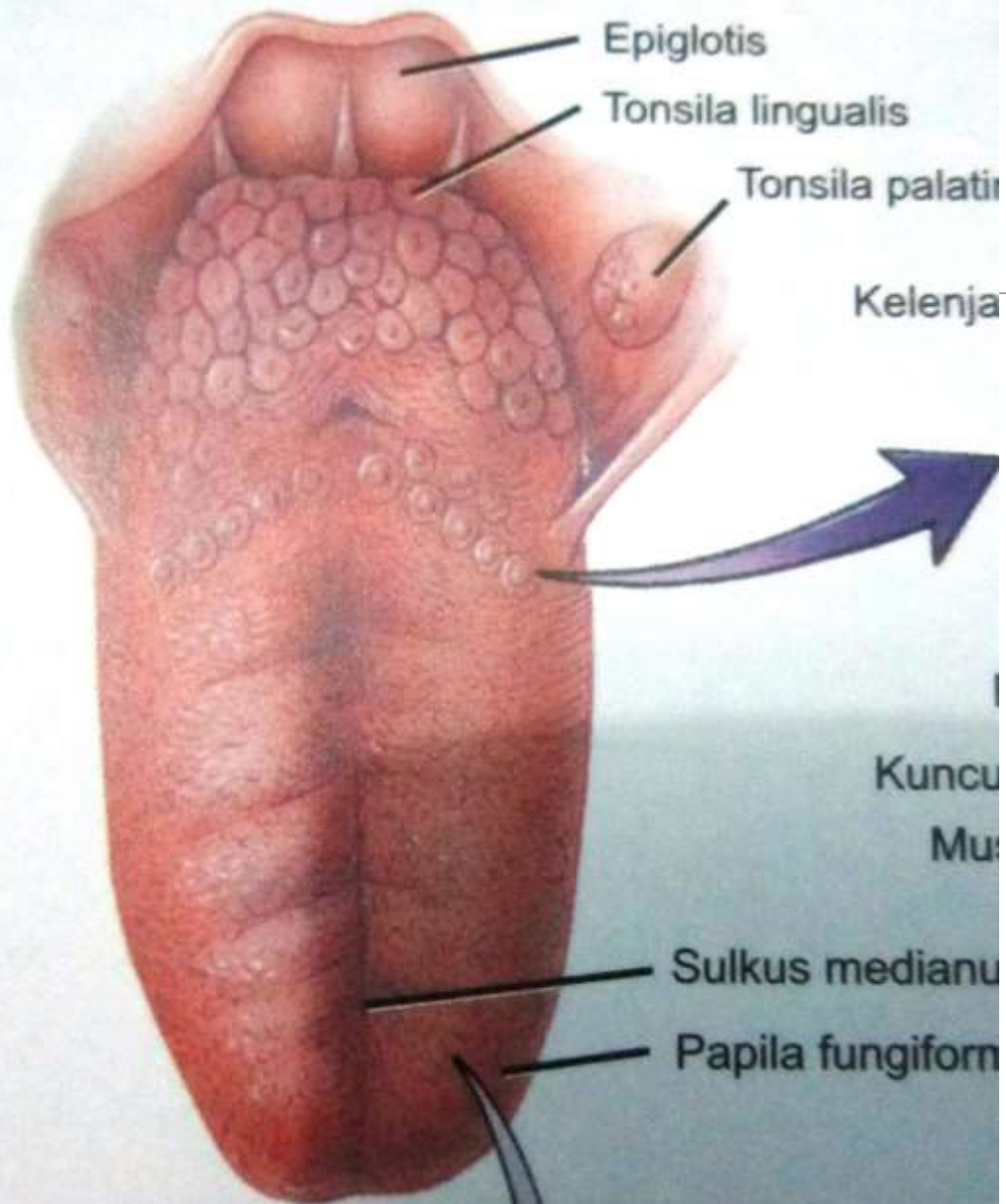
- Ligamentum periodontal: j.i padat kolagen tdk beraturan → alveolus.
- Ginggiva: ep.sq.compl corn, j.i.padat kolagen tdk beraturan.
- Tulang alveolaris: tulang kompakta (dalam dan luar) dan tulang spongiosa (luar).

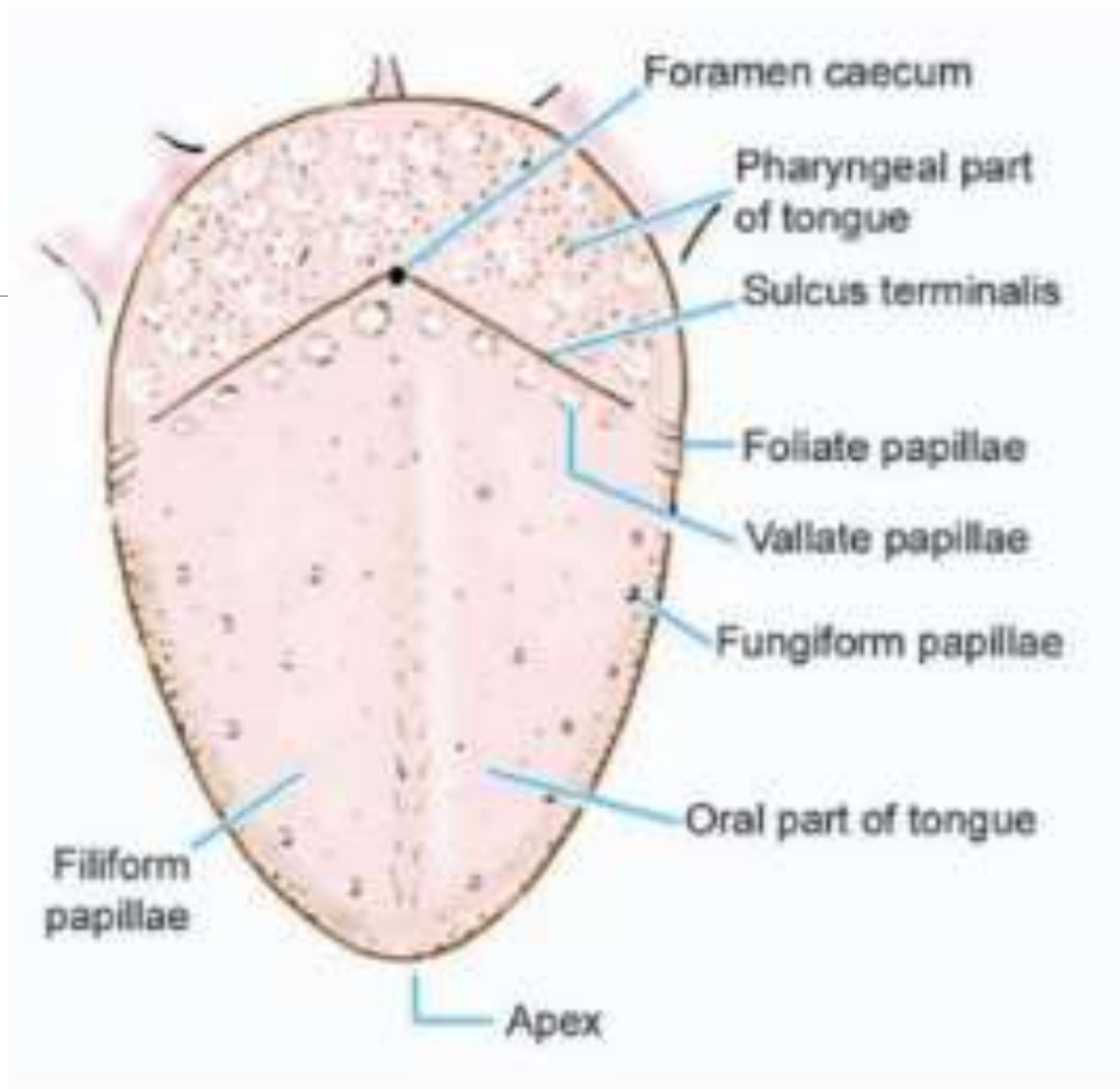
# Lidah=lingua

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- 2/3 anterior dan 1/3 posterior → sulcus terminalis (V terbalik)
- Anterior:
  - Dorsal: ep.sq.compl corn, papil linguae
  - Ventral: ep.sq.compl non corn
- Posterior: tonsila lingualis dan nodul limfoid
- Tengah: otot skelet dan jaringan ikat.
- Lapisan: epitel, lamina propria, submukosa dan muskularis







(Singh, 2014)

# Dorsum Lidah

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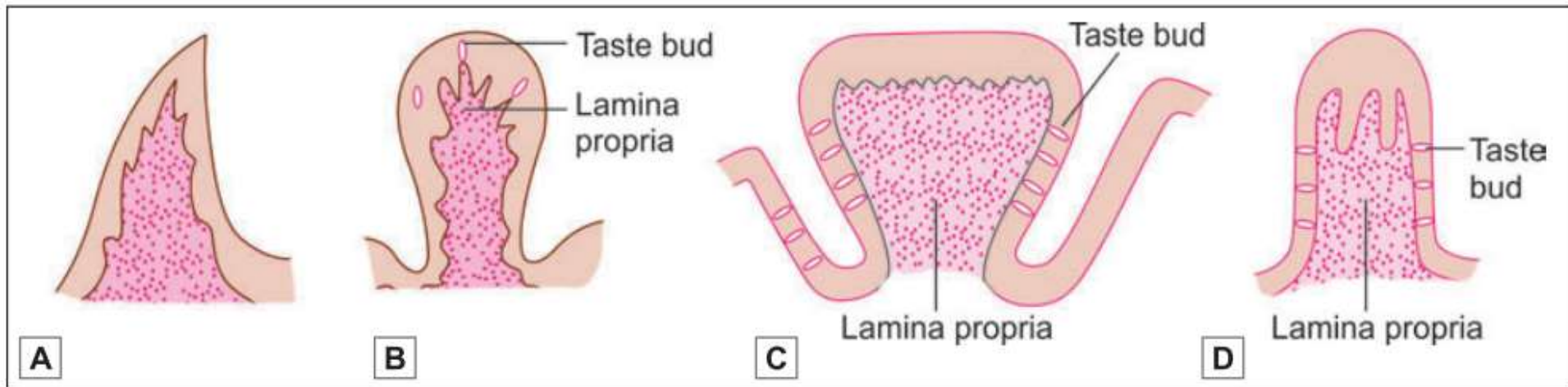
Papilla Lingualis:

Papila Filiformis

P. Fungiformis

P. Circumvalata

P. Foliata



**Fig. 15.6:** Papillae, **A.** Filiform; **B.** Fungiform; **C.** Circumvallate; **D.** Foliate (Schematic representation)

(Singh, 2014)

## **P Filiformis**

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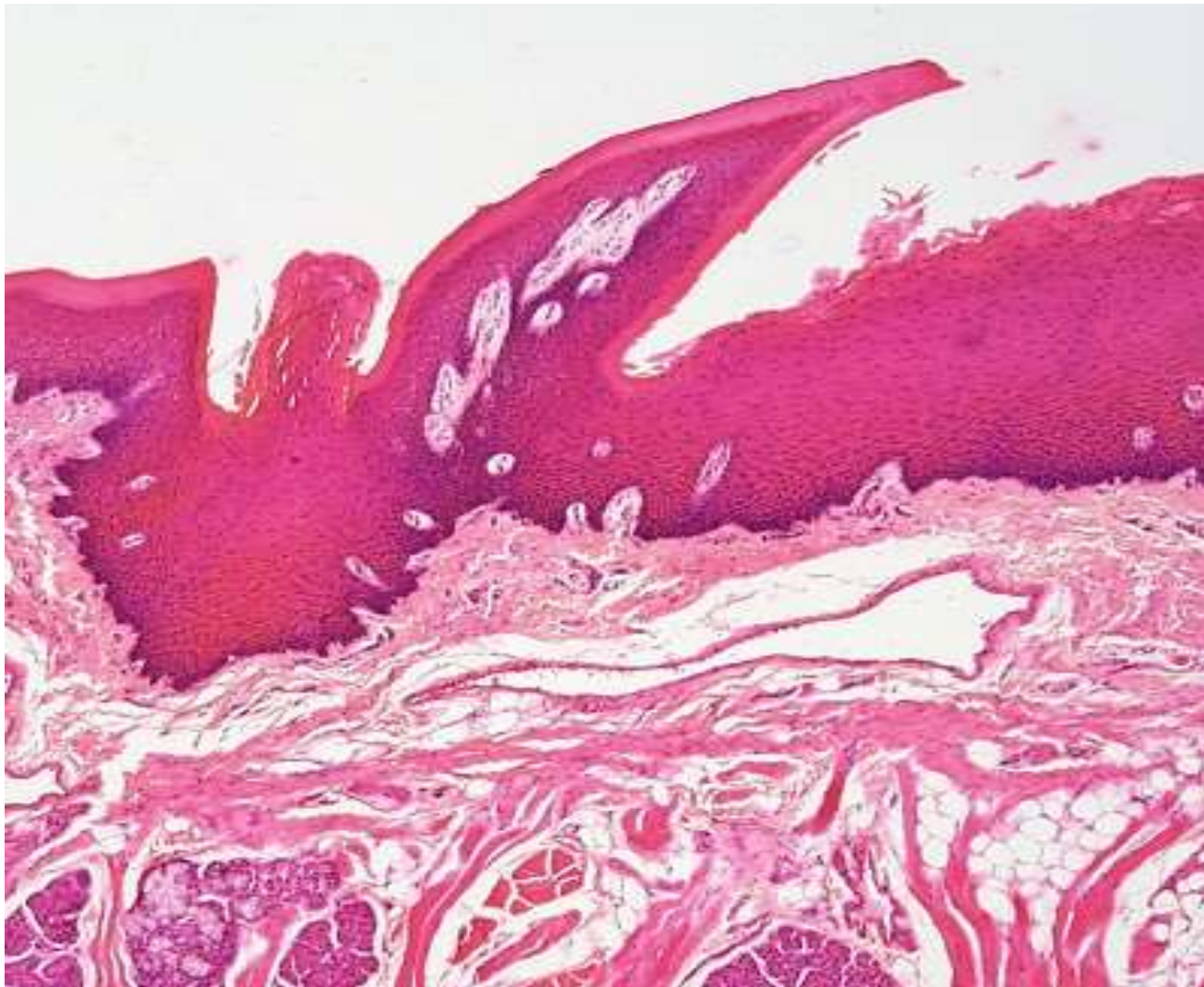
- Tersebar di bag. Ant dorsum lidah
- Terbanyak
- Bentuk lancip, kecil
- Ep. Sq. Complex
- Cornifikasi (++)
- Taste bud (-)

## **P Fungiformis**

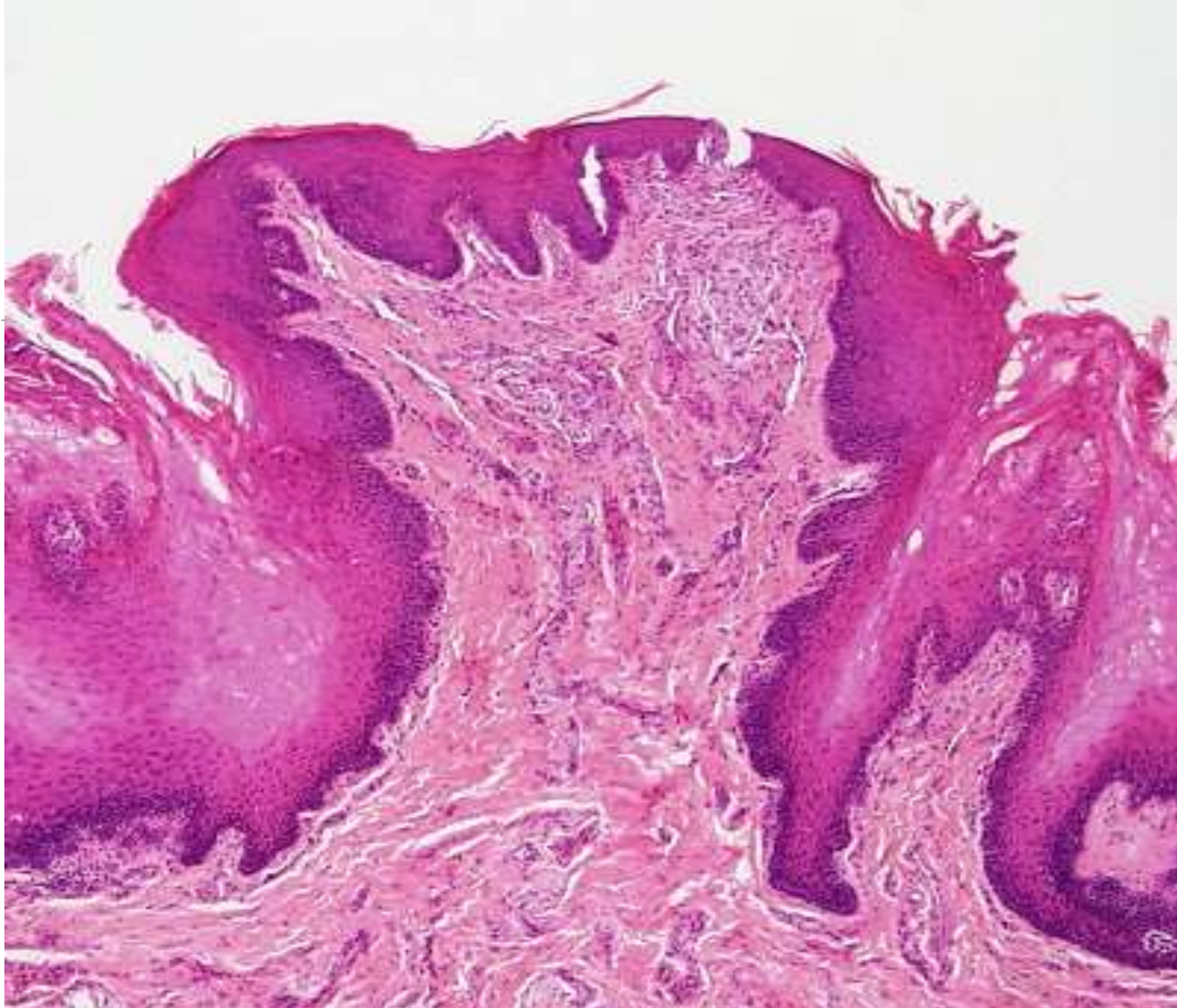
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- Diantara p filiformis, sedikit
- Menonjol, lebih besar
- Bentuk spt. Jamur
- Ep. Sq. Complex, corn (+)
- Taste Bud (+) dipermukaan atas





Papila filiformis



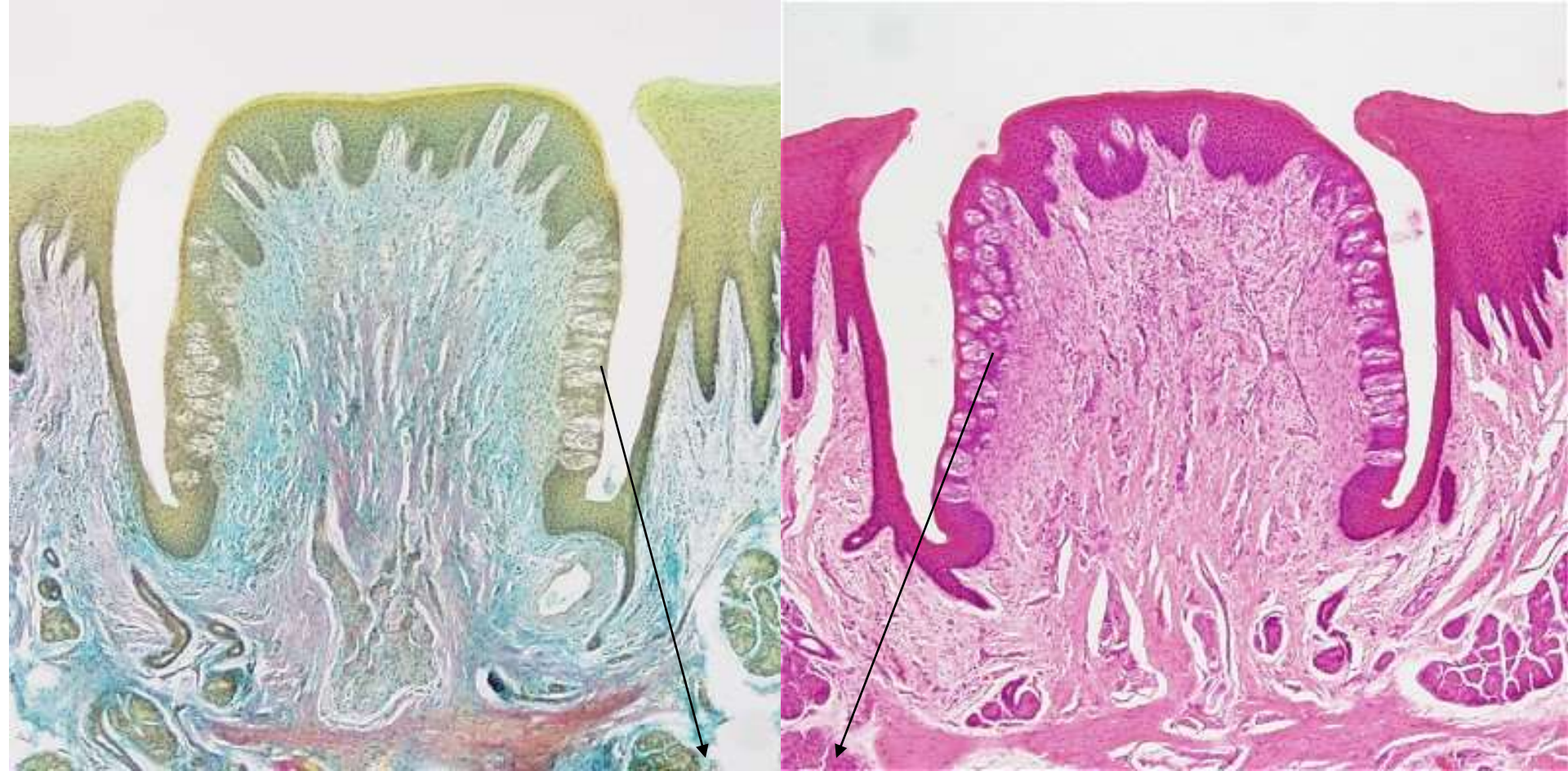
Papila fungiformis

# PAPILLA CIRCUMVALATA

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- Jumlah: 9 – 11
- Terbesar ( $\emptyset$  1-3 mm)
- Sulcus terminalis (huruf V).
- Ep. Sq. complex
- Sulcus circularis
- Kelj. Von Ebner: kelj. serosa, muara di dasar sulcus sirc.
- Taste bud: lateral +++





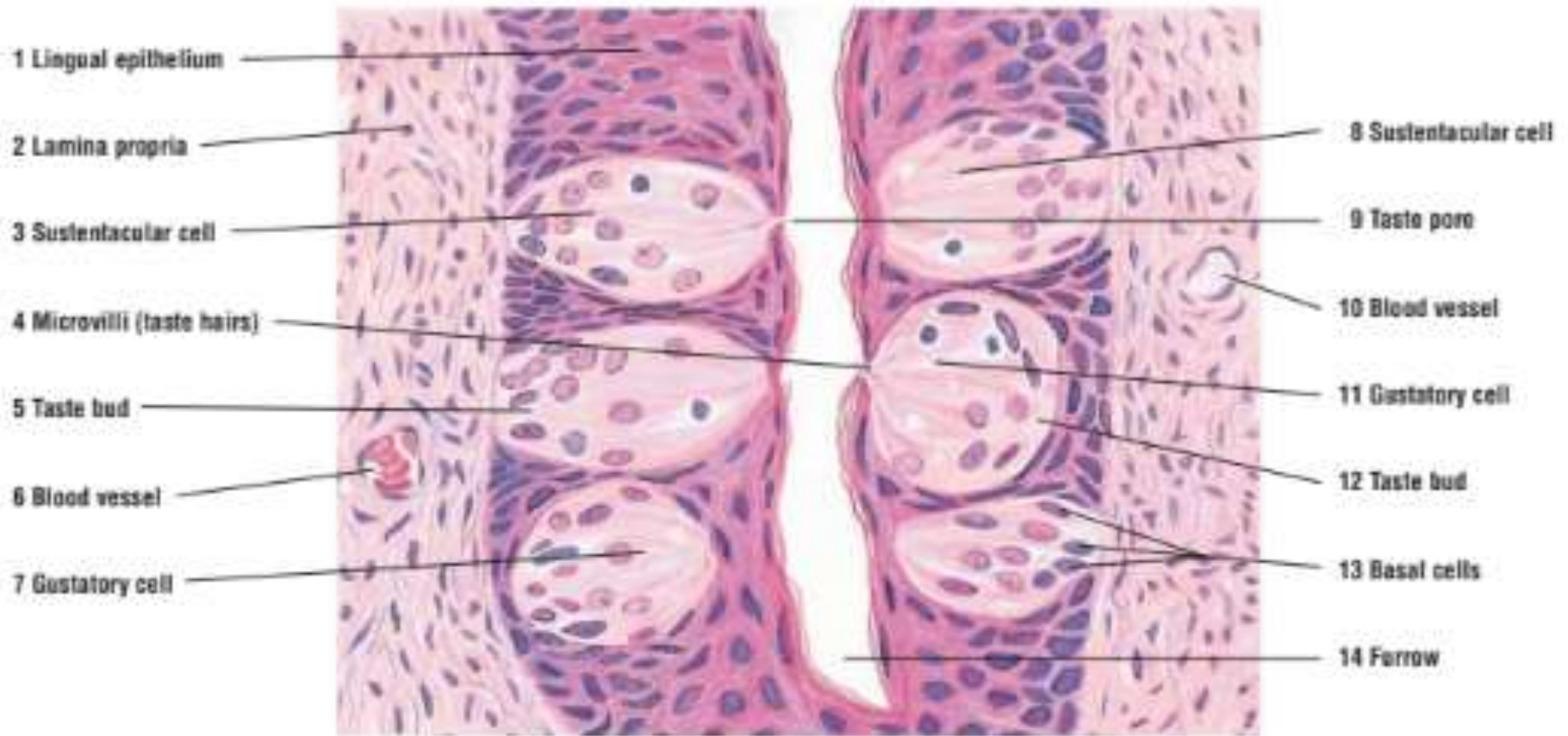
Taste bud

Papila circumvalata

# TASTE BUD (kuncup kecap)

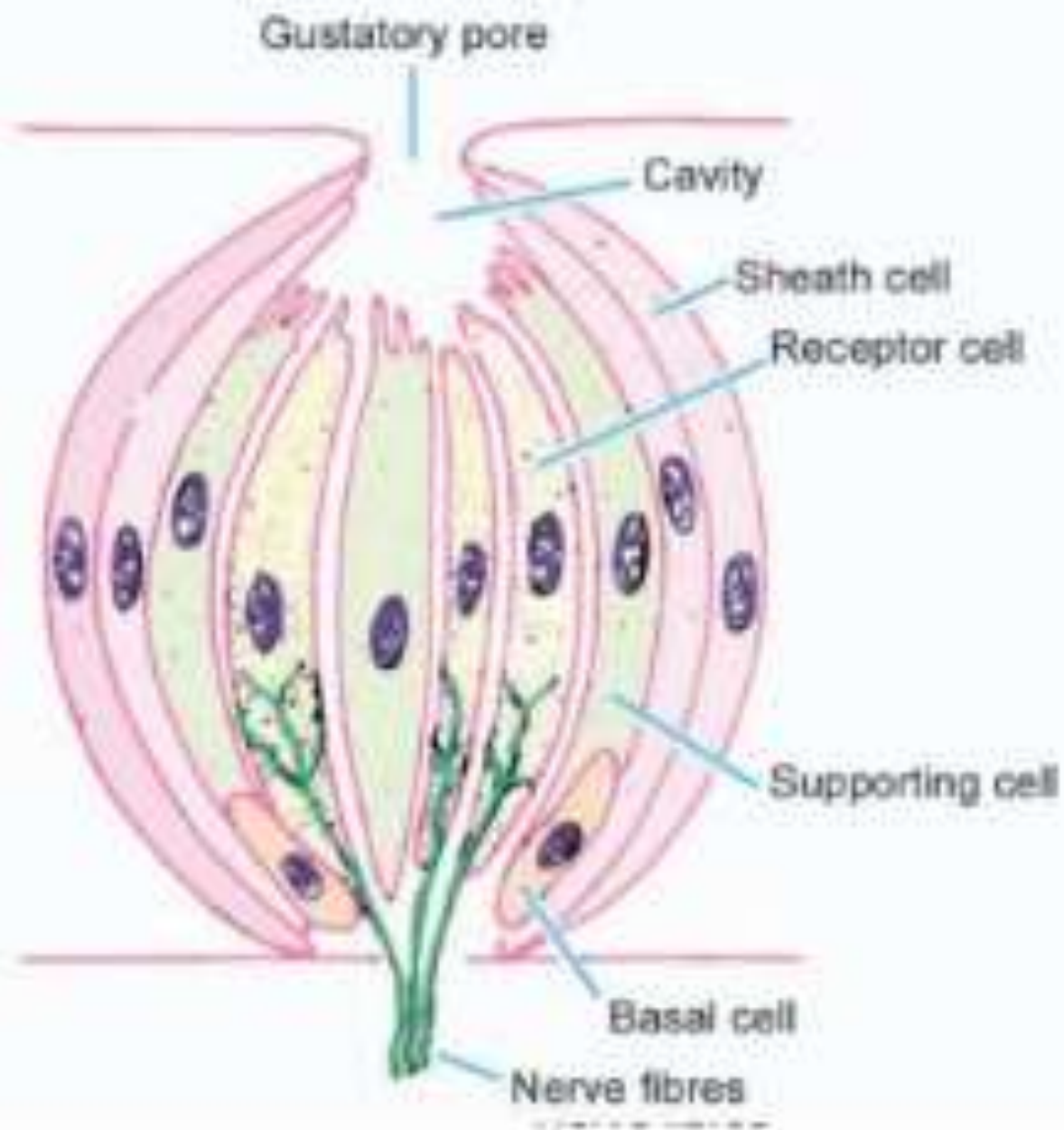
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- = guma gustatorial
- Papilla fungiformis, circum valatta, palatum mole, pharynx dan oesophagus
- Sel neuroepitelial/gustatorik cells → reseptor
- Supporting/sustentacular cells
- Mikrovilli di apex → pori kecap



Eroschenko, 2008





(Singh, 2011)

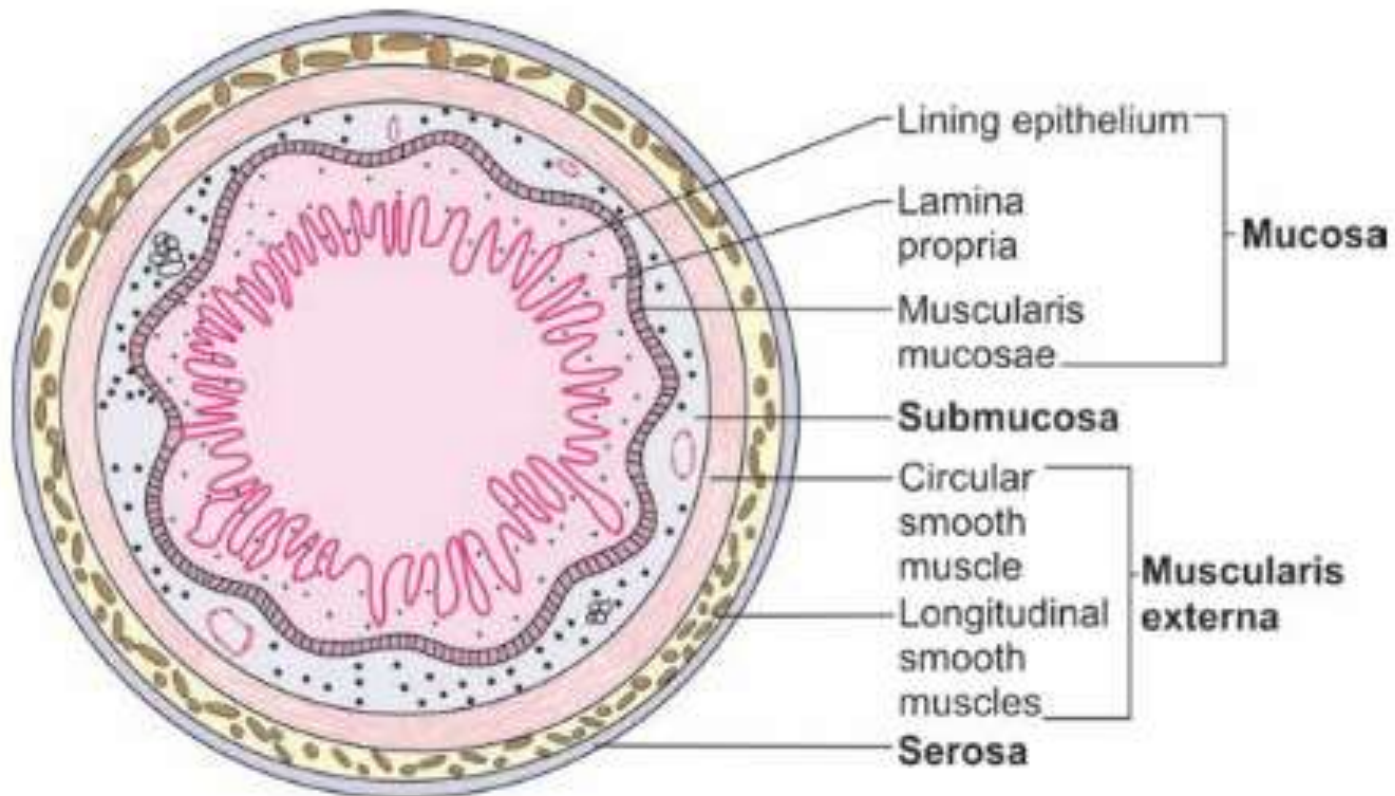
# Saluran cerna

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Memanjang  $\pm$  9 m dr rongga mulut-anus dgn perubahan sesuai fungsi.

Lapisan:

1. Mukosa : epitel, lamina propria dan tun.muskularis mukosa
2. Submukosa
3. Muskularis eksterna
4. Tunika serosa = tunika adventisia



(Singh, 2014)

Layers of the gut (Schematic representation)

# Sal.Cerna....lanj

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- Mukosa: epitel yg berfungsi sekresi dan absorpsi, lam.propria berisi kelenjar dan musk.mukosa berisi otot polos sir-long).
- Submukosa: jar.ikat padat tdk teratur, saraf (Meissner), pemb. Limfe dan p.d, **kelenjar**.

# Sal.Cerna....lanj

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- Muskularis eksterna: otot polos sirkular (dlm) dan longitudinal (luar), pleksus p.d dan pleksus saraf (Auerbach) di antaranya.
- Serosa/adventisia: jaringan ikat longgar dilapisi mesotel



# Plexus Saraf GIT

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1. Plexus Auerbach (ANS)
  - Sifat Parasimpatis
  - Letak di Muscularis Externa
    - (Antara Lap. Circ. & Longit.)
2. Plexus Meissner (ANS)
  - Sifat Simpatis
  - Letak di Lap. Submucosa

# Sal.Cerna....lanj

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- Oesophagus
- Gaster:
  - Cardia, Fundus, Pylorus
- Intestinum Tenue:
  - Duodenum, Jejunum, Ileum
- Intestinum Crasum:
  - Colon, Appendix

# Esofagus

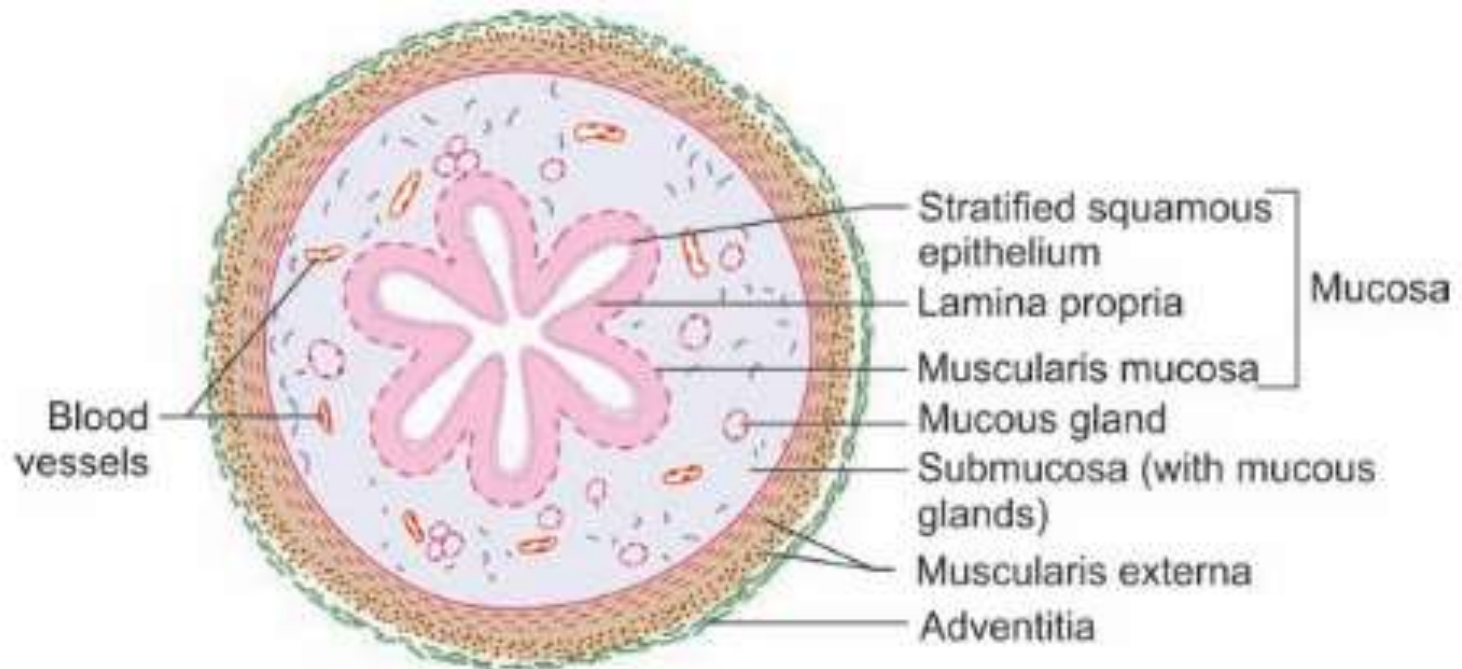
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- Ep.sq.compl non corn
- ± 10 inch
- Belakang trakea

# Esofagus...lanj

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- Mukosa: lipatan longitudinal (temporer)
- Muskularis mukosa → selapis otot polos
- Submukosa → kelenjar esofagus
- Muskularis ext: skelet-mixed-smooth



(Singh, 2014)

Transverse section of oesophagus showing all the four layers of wall.  
The lumen of oesophagus is star shaped (Schematic representation)

# Lambung

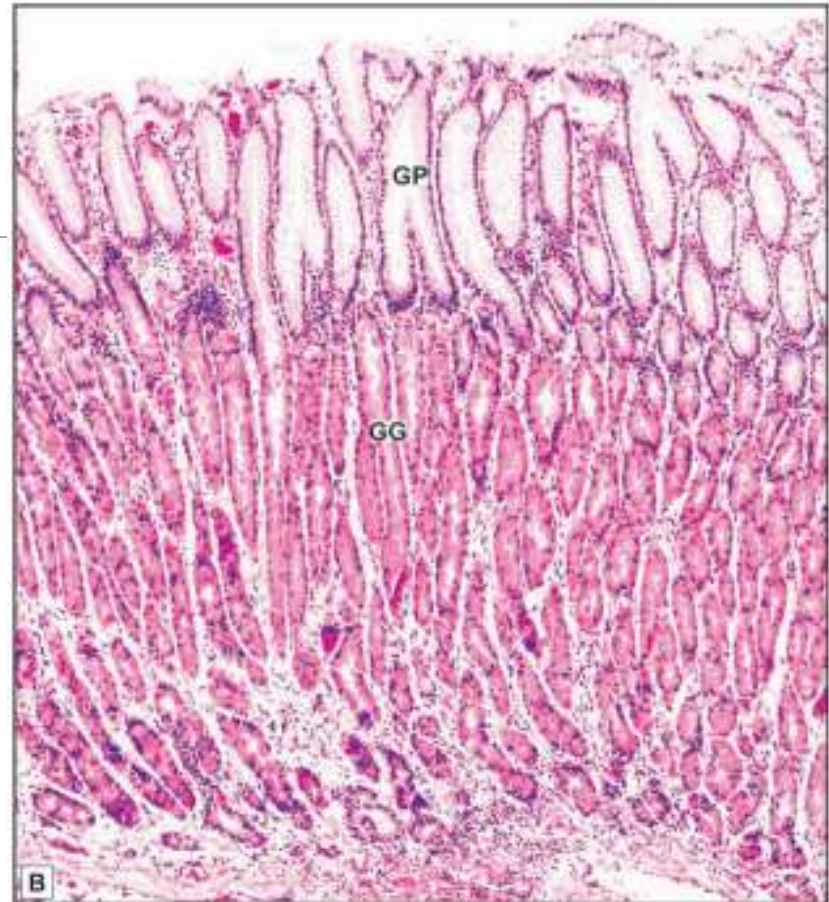
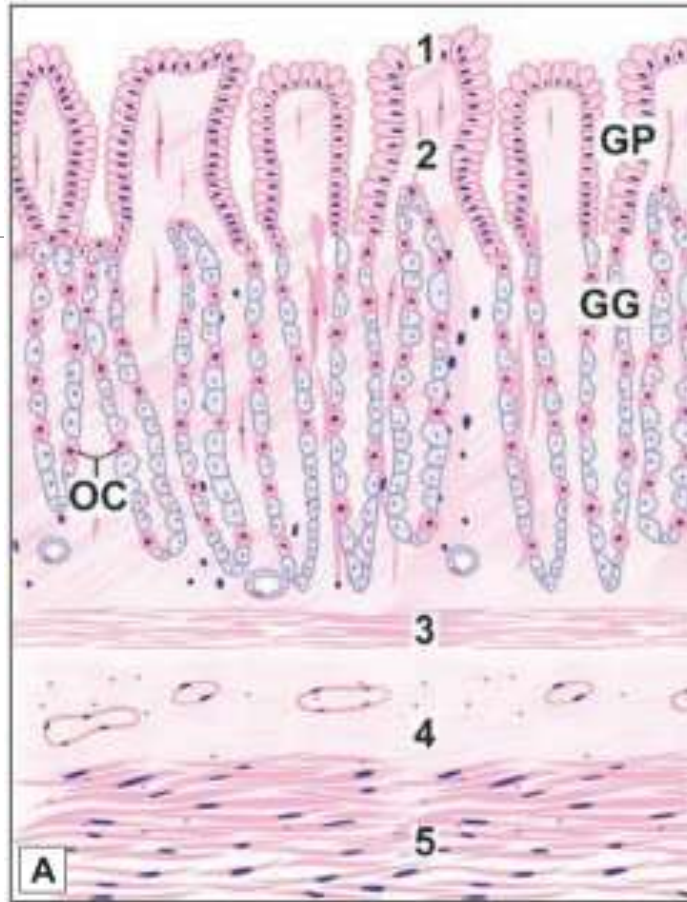
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- Mengasamkan dan mengubah bolus menjadi cairan kental (kimus).
- Kardia, fundus=corpus(histo) dan pilorus.
- Lipatan mukosa dan submukosa → rugae (temporer)
- Produksi enzim dan hormon.

# Lambung.....

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- Ep.selapis silindris
- Foveola gastrica + → muara gland. gastrica
- pilorus dalam, kardia dangkal.
- Submukosa: p.d >>>, saraf >>>
- Muskularis eksterna: 3 lapisan



(Singh, 2014)

1. Columnar epithelium lining
  2. Lamina propria
  3. Muscularis mucosa
  4. Submucosa
  5. Muscularis externa
- GP. Gastric pit GG. Gastric gland OC. Oxyntic cells



# Intrinsic Gland GIT

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- Bentuk Kelenjar: Tubular
- Kelenjar Oesophageal
  - Sekresi Mucous
  - Letak di submucosa
- Kelenjar Cardia (gaster)
  - Sekresi Mucous
  - Letak di lamina propria

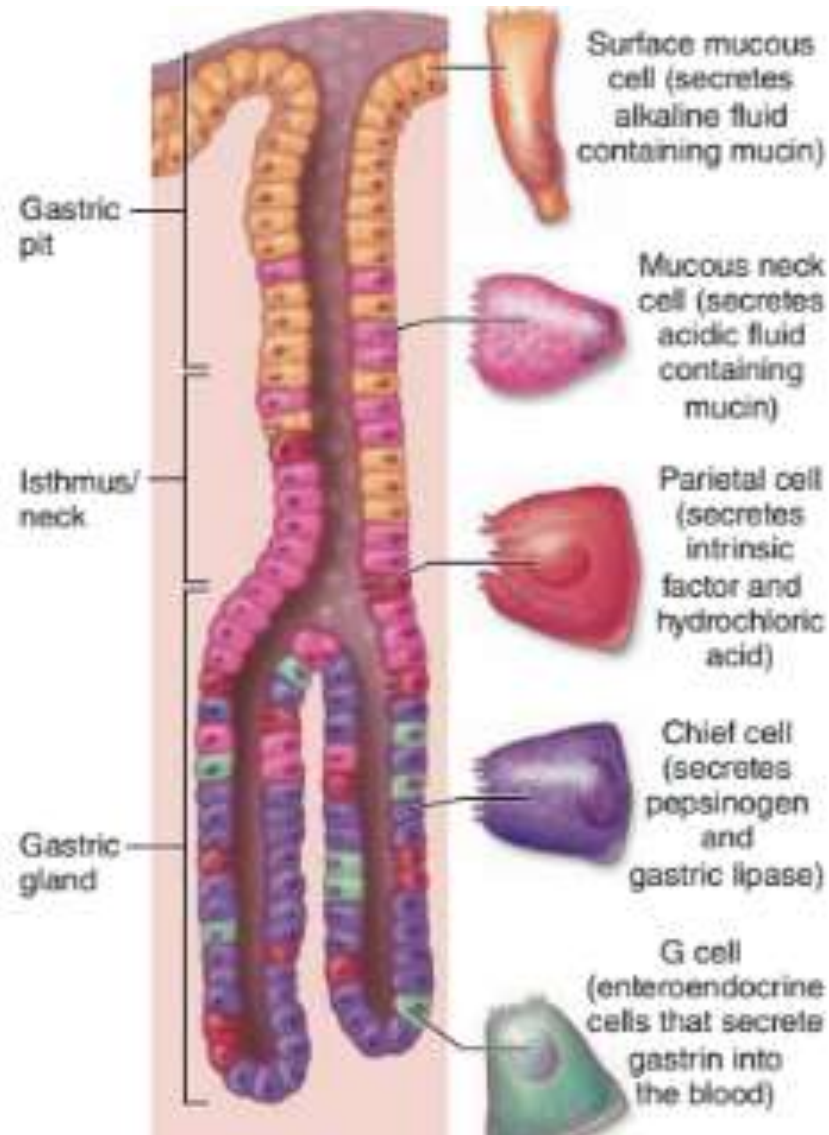
# Continue

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Kelenjar Fundus Gaster:

Letak di lamina propria

- Surface mucous cell → alkali
- Mucous Neck Cell → less alkali
- Parietal/oxyntic cell: H Cl → acid
- Chief cell/zimogenik sel: pepsinogen (renin dan lipase)
- Enteroendocrin cells → gastrin



Mescher, A. (2016)

Diagram showing general morphology and functions of major gastric gland cells.

**Table 16.1: Salient features of each region of stomach**

<b>Cardia</b>	<b>Fundus and body</b>	<b>Pylorus</b>
Presence of cardiac glands (mucous secreting glands) in lamina propria of mucosa. Cardiac glands are either simple tubular, or compound tubulo alveolar	Presence of gastric glands in the lamina propria of mucosa. Gastric glands are simple or branched tubular glands. They secrete enzymes and hydrochloric acid	Presence of pyloric glands in the lamina propria of mucosa. Pyloric glands (mucous glands) are simple or branched tubular glands that are coiled.
Shallow gastric pits	Shallow gastric pits occupying superficial 1/4th or less of the mucosa	Deep gastric pits occupying 2/3rd of the depth of the mucosa
Change of epithelium from stratified squamous of the oesophagus to simple columnar epithelium in stomach	Epithelium is simple columnar.	Epithelium is simple columnar. Circular muscle layer is thick and is called as pyloric sphincter.

(Singh, 2014)

# Intestinum Tenue

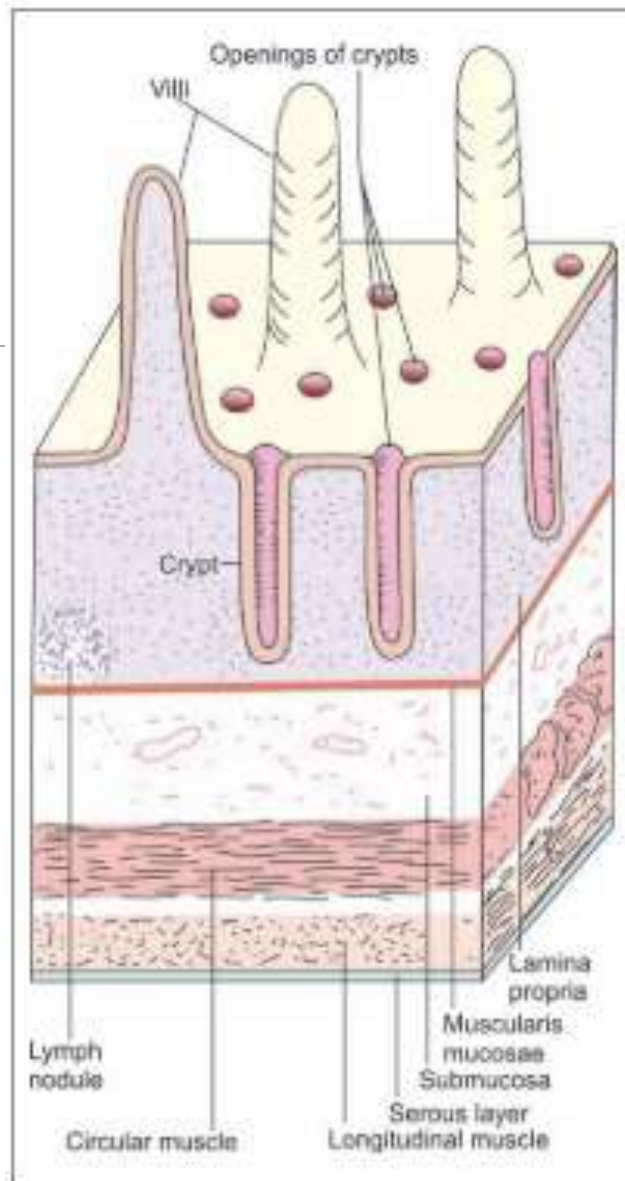
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- Panjangnya  $\pm$  5-7 m, berkelok-kelok
- Duodenum, jejunum dan ileum.
- Sekresi hormon, absorpsi metabolit nutrisi.
- Plika sirkularis, villi dan mikrovilli  $\rightarrow$  luas perm 400-600x
- Ep.selapis silindris (enterocyte  $\rightarrow$  absorbtif), sel goblet, sel Paneth (imun) dan sel enteroendokrin (hormone).

# Intestinum Tenue...lanj

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- Plika sirkularis: lipatan mukosa dan submukosa, tetap → 3x (duodenum > ileum)
- Villi intestinalis: tonjolan lam. propria mukosa → 10x (duo > ileum)
- Mikrovilli: juluran sitoplasma epitel perm apikal sel epitel → 20x
- Mikrovilli → enzim2 pencernaan



(Singh, 2014)

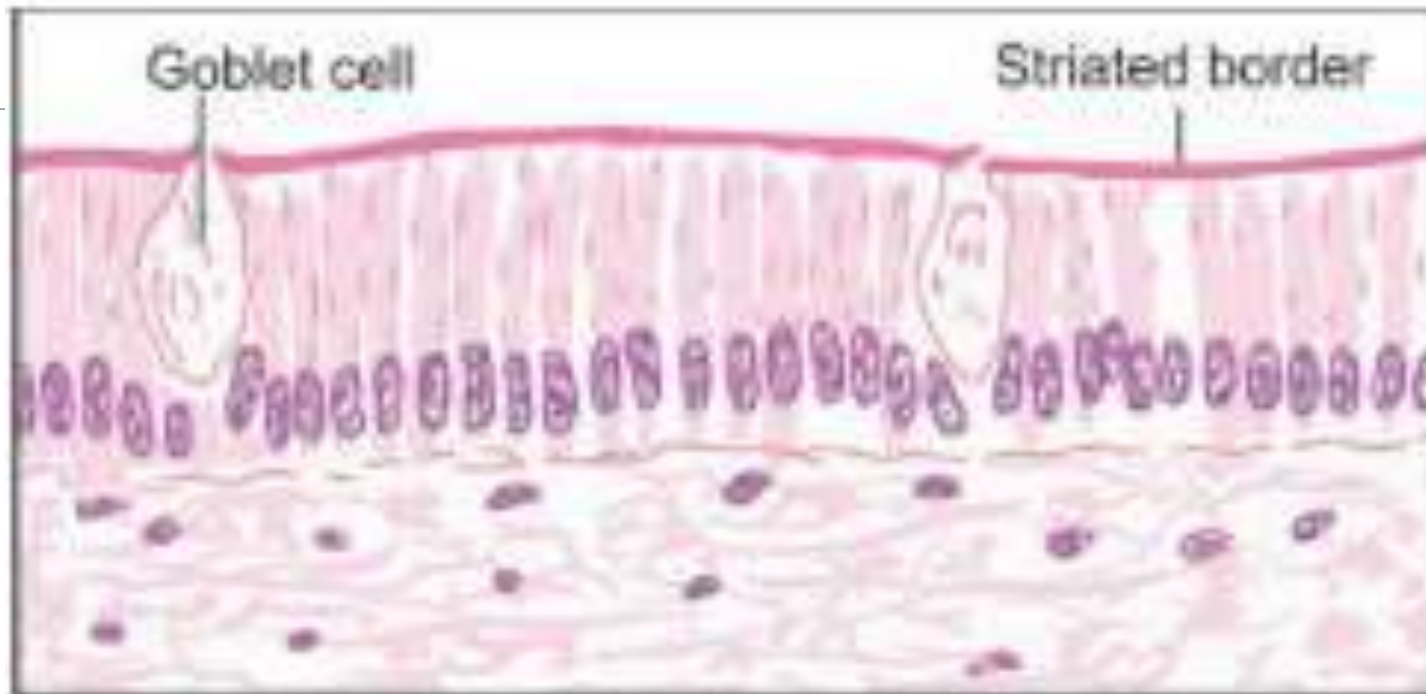
Basic structure of the small intestine (Schematic representation)



# Intestinum Tenue...lanj

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- Lam.propria: kel. Lieberkuhn (sel paneth), Patch of Peyer.
- Musk.mukosa: sirkular dan longitudinal
- Submukosa: Meissner, kel. Brunner (duodenum saja, bersifat alkalis),
- Muskularis eksterna: sirkular dan longitudinal (Auerbach di antaranya).



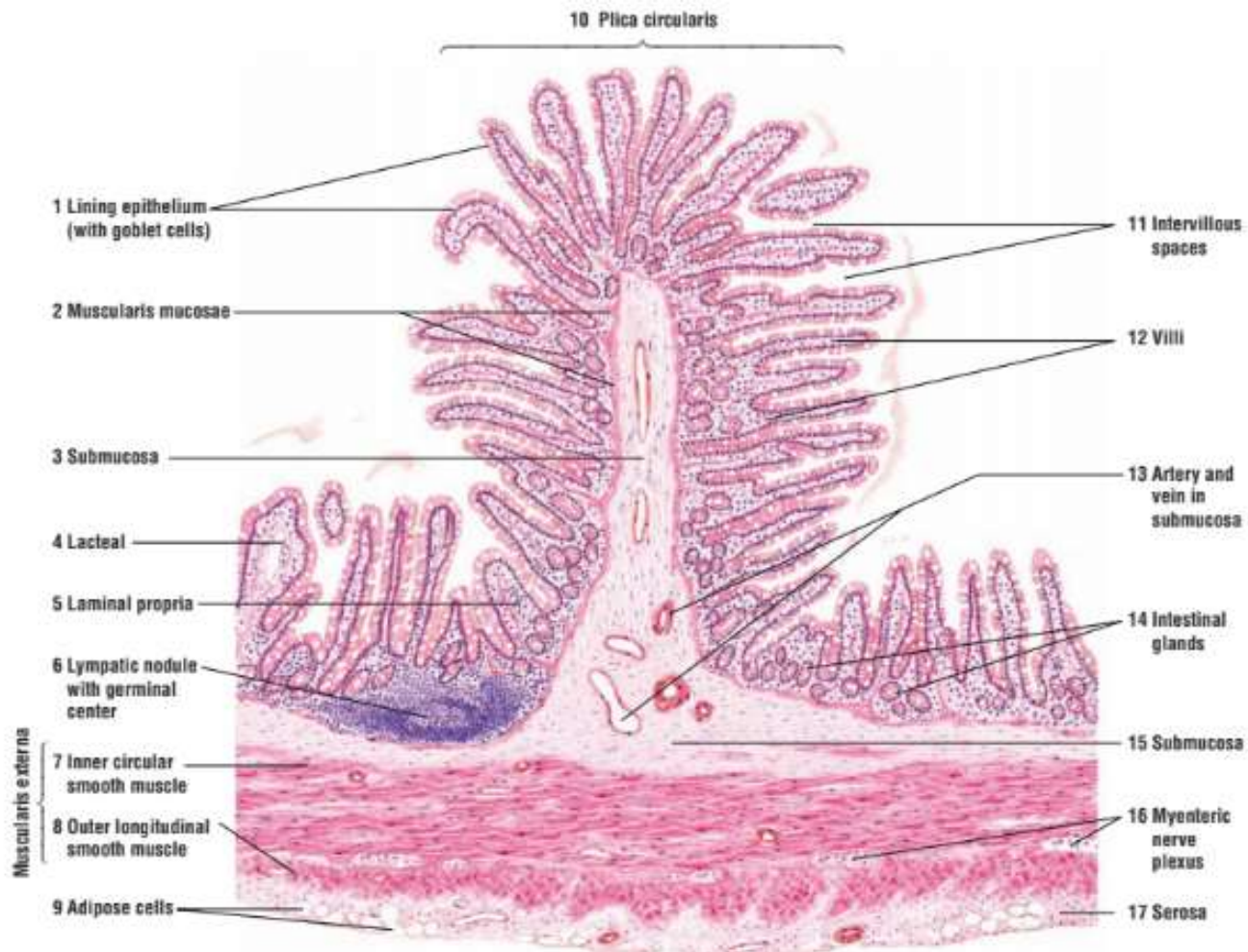
(Singh, 2014)

Columnar epithelium lining the small intestine. Note the striated border and some goblet cells (Schematic representation)

# Intestinum Tenue...lanj

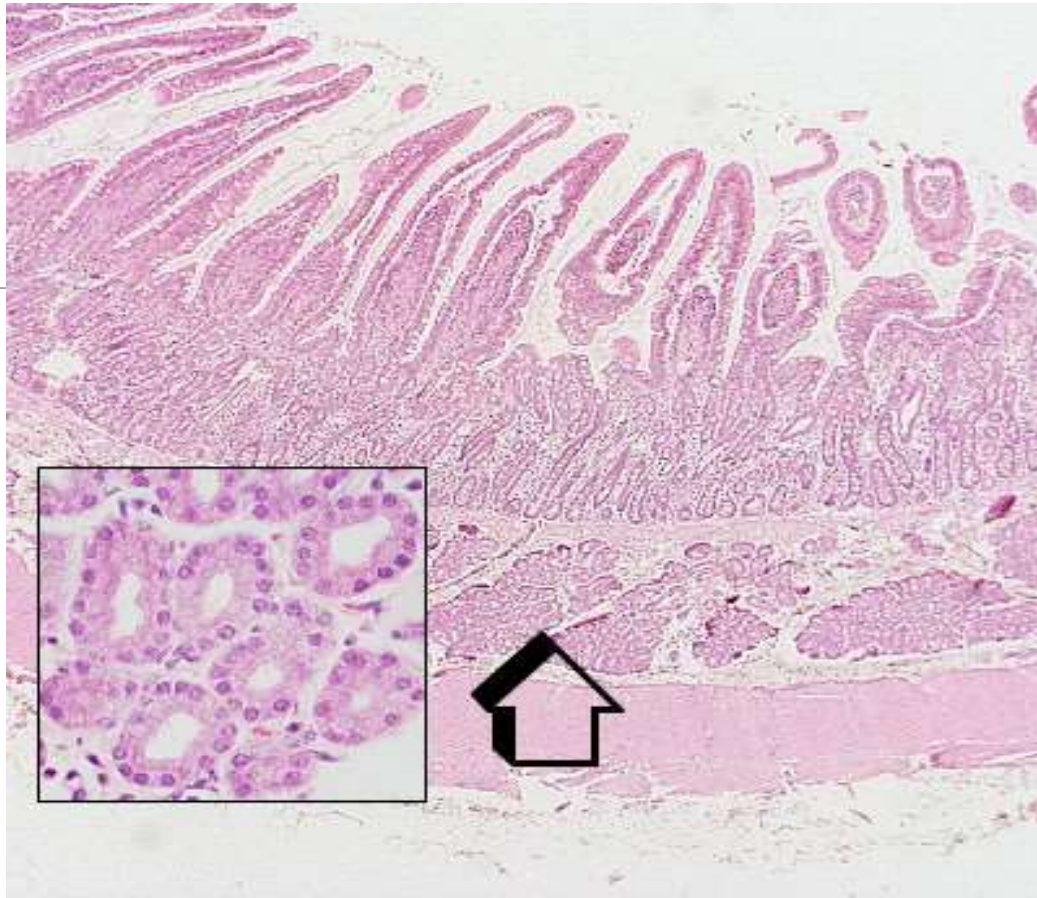
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- Duodenum: terpendek, villi terbanyak, lebar dan tinggi, kelenjar (Brunner) di submucosa, sel goblet +.
- Jejunum: villi lebih pendek dan kecil, sel goblet ++.
- Ileum: villi sedikit dan kecil, sel goblet +++, nodulus limfatikus banyak dan besar (Peyer's Patch)



Eroschenko, 2008

Plica sirkularis: mulai duodenum (2,5-5 cm distal pilorus), maksimal di akhir duodenum dan awal jejunum, berkurang dan menghilang di setengah distal ileum.



Kelj submucosa

# Intestinum Crassum

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- Pendek, kelokan <<.
- Caecum, colon (asc-trans-desc), sigmoid, rektum, can.ani dan appendix.
- Bakteri → vit.B12 dan vit K
- Absorpsi elektrolit, cairan dan gas → sisa pencernaan → feces
- Prod mukus banyak sekali (goblet cells +++)
- Ep.selapis silindris, vili -, kripte Lieberkuhn padat, sel paneth -.

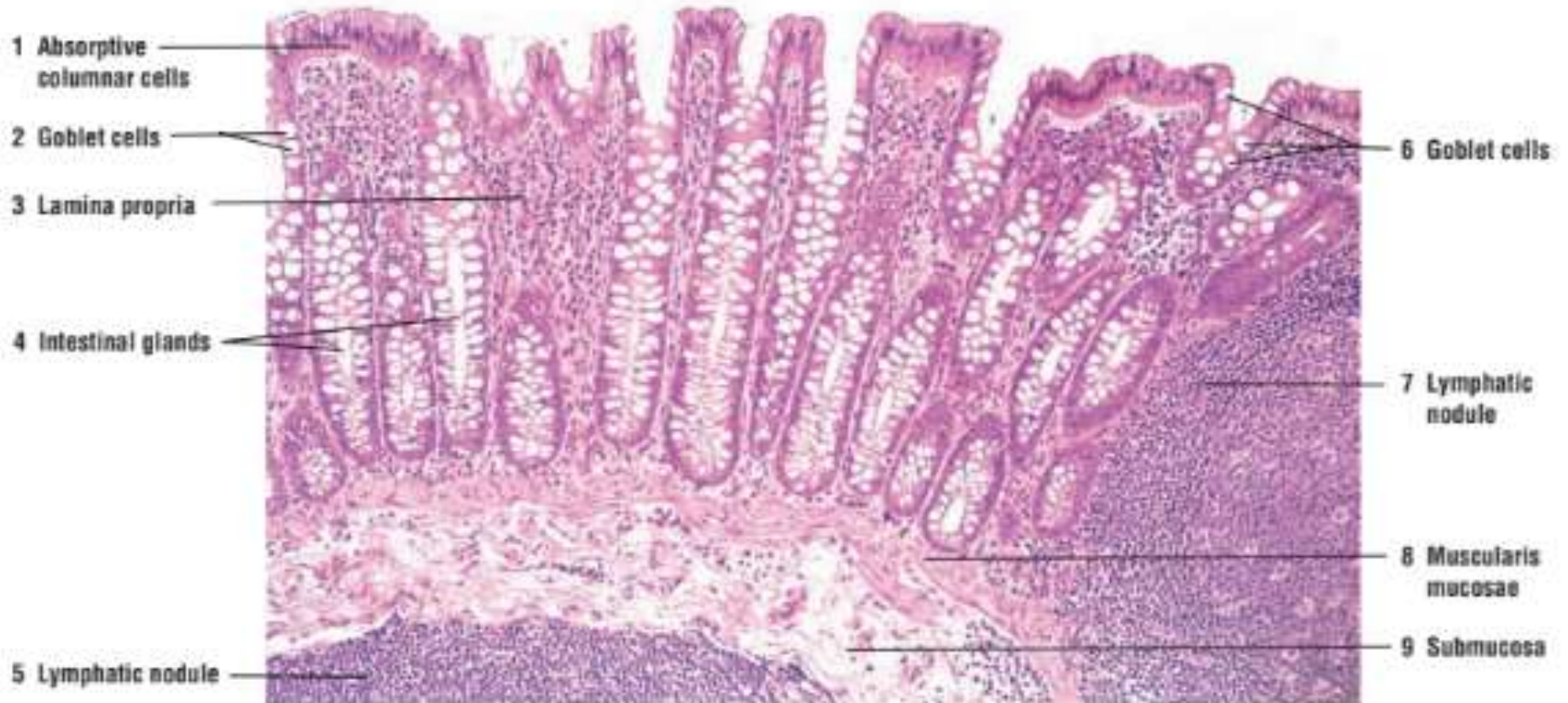
# Intestinum Crassum....lanj.

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Kanalis ani: ep.selapis kubis → ep.berlapis gepeng non corn → ep.berlapis gepeng corn

Sfingter ani externus; otot skelet.





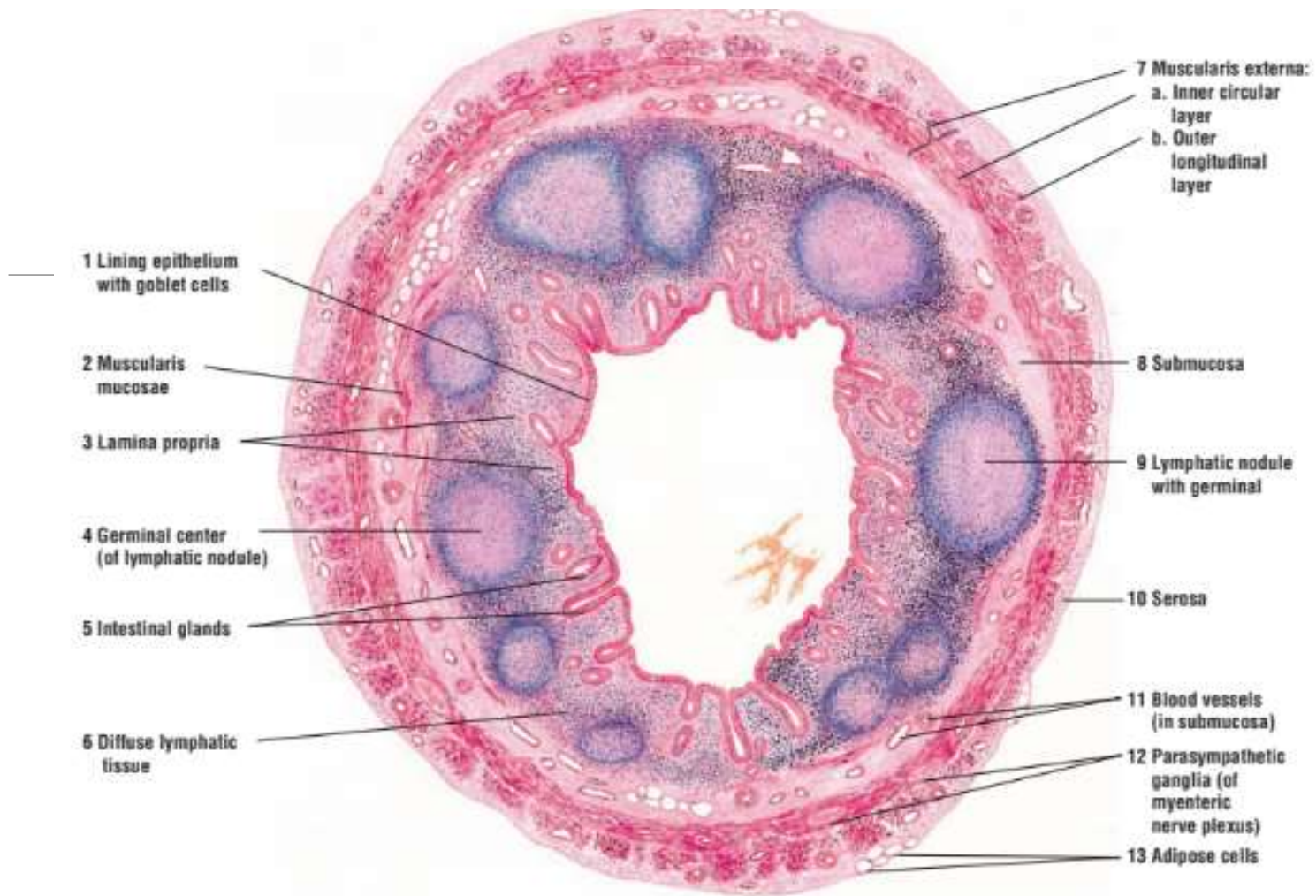
Eroschenko, 2008

Usus besar: dinding kolon (potongan transversal).  
Pulasan: hematoksilin dan eosin.30 X.

# Appendix

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- ❑ Divertikulum dr ujung buntu caecum.
- ❑ Ep.selapis silindris.
- ❑ Lumen sempit, bentuk bintang/tdk beraturan.
- ❑ Dinding tebal, nodulus limfatikus +++
- ❑ Villi -, kripte Lieberkuhn dangkal



Eroschenko, 2008

Apendiks (pandangan menyeluruh, potongan transversal). Pulasan: hematoksilin dan eosin. Pembesaran lemah.

# Refferensi:

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WASSALAM