histology

- upper part : oral cavity , esophagus , pharynx = stratified squamous non keratinized .
- lower part : simple columnar ciliated or non-ciliated .
- Gi tube = 4 layers : mucosa >> submucosa >> muscularis externa >> serosa or Advantica .
- mucosa = epithelial lining >> lamina propria (gland = secretion) >> muscularis mucosae .
- submucosa = dense connective = glands in (esophagus & duodenum) = Meissner's plexus .
- muscularis = inner circular & outer longitudinal >only stomach most inner is oblique > myenteric plexus (peristaltic) (vagus parasympathetic) .
- outer layer : (abdomen = serosa simple squamous mesothelium) , thoracic = Advantica just connective tissue .
- stomach = secretion tubular glands ,small intestine = Absorptive crypts , large intestine mixed .
- gum = keratinized , dorsum of tongue = Para keratinized , lips middle layer = transitional.
- posterior third of tongue = lymphoid tissue = no taste buds .
- dorsum of tongue : Papillae = no taste buds - increase surface .
- Fungiform Papillae = mushrooms , / Foliate Papillae = many taste buds .
- taste buds : bipolar cell - stem cells .
- Circumvallate Papillae : surrounded by groove of taste buds (glossopharyngeal .n) ,von Ebner's glands = secretion .
- capsule = surrounds the large salivary glands = separates them into lobes & lobules .
- most outer capsule from the deep facia of the neck .
- Serous cells = pyramidal in shape , narrow lumen , central nuclei , secret in the duct .
- intercalated duct : simple cuboidal .
- Mucous cells = basement membrane - wide lumen - flattened basal nuclei .
- myoepithelium cells (basket) = contraction > secretion .
- striated duct = intralobular - lots of mitochondria . collect secretions of intercalated ducts .
- Parotid Gland = serous acinar , 2 ducts , striated .
- Submandibular = serous acinar & mucus acinar (foamy appearance) & serous demilune .
- Sublingual Gland = mostly mucus - serous demilune .
- von Ebner's glands = serous = dorsum of the tongue .

- esophagus = stratified squamous non keratinized , mitosis , complete healing , lamina propria = cardiac gland (prominent before stomach) .
- upper third = skeletal third, peripheral nuclei, voluntary.
- middle third = mix muscles ////// lower third = smooth muscle, involuntary, central nuclei.
- esophageal glands = submucosa

stomach

- stomach = simple columnar no goblet cells - with rouge , 3 layers of muscle till pyloric .

- lamina propria = many cell = protect mucosa .
- pylorus sphincter = inner circular muscle .
- cardia = " 50/50 " glands + gastric pits .fewer parietal & chief cells .
- body = wide and short gastric pits , the most of it is glands (thickness) , numerous parietal & chief cells .
- body glands = chief cells at the base, parietal at upper part , stem cells at the middle4-7 .
- these glands secrete mucus = hydrophobic protective gel (protection) .
- Parietal Cells = acidophilic - faint - 2 nuclei - secret HCL - active stage (intracellular canaliculus) - resting stage (tubulovesicular) .
- Chief (Zymogenic) Cells = base - dark - basophilic - secret pepsinogen - granules .
- Enteroendocrine Cells = secret gastrin hormone & serotonin , granules - large nuclei .
- Pylorus = lymphatic nodule - **mostly mucus to reduce acidity** - long narrow pits - short glands .

Small Intestine

- = simple columnar with goblet cells , finger like = villi .
- duodenum = microvilli (brush surface) , leaf like villi ,
- duodenal Brunner's glands= **neutralization of acid** .
- crypts / glands of Lieberkühn = simple columnar with goblet cells .
- Paneth's cells = base of glands - lysozyme enzyme kills bacteria - in jejunum .
- lacteal = blind lymphatic vessel - absorb fat - in villi .
- M (microfold) cells = on Peyer's patches - in ileum - ingulfing of microbes .
- gut-associated lymphoid tissue(GALT) = antibody-secreting plasma cells & M (microfold) cells .