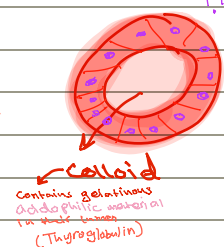
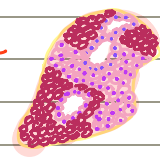


Organ	Embryo	Histo Hallmark
pituitary	Ant pit:- Oral Ectoderm (Rathke's pouch) post pit:- Neuroectoderm * Begins during week 4 end by week 6-8	Ant pit:- ① pars Distalis → chromophores (pale unstained) → chromophils: ① Acidophil (pink cytoplasm (strong eosinophilic staining / larger than RBCs (R))) cell types:- Somatotrophs (GTH), Lactotrophs (PRL) ② Basophil (Blue purple, Granular cytoplasm, Basophilic stain) cell type:- Corticotrophs, Thyrotrophs, Gonadotrophs ③ pars intermedia (colloid-filled cysts, Remnants) Mainly corticotrophs cells (Dense Basophilic cells) ③ pars Tuberculis (small funnel-shaped) mostly gonadotrophs (lightly stained Basophilic) post pit:- (No secretory cells, No Neurocyte body / axon) (pale appearance) ① pituicytes (specialized glial cells) (pale cytoplasm located between Neurofiber(axons)) ② Herring Bodies (axon ending dilated) Large Eosinophilic
Thyroid	* the earliest Endocrine gland to become fully functional. * Originates from Endoderm between 1 st /2 nd pharyngeal pouches. * para follicular cells ↳ ultimobranchial bodies arise from 4/5 pharyngeal pouch. 5 th week → migrates, division of thyroid into left and Rt, hollow (lateral become solid follicles develop), para follicular cell developed. 7 th week → final destination in the neck 10 th week → Thyroglossal duct disappears 12 th week → Functionally mature ↳ (incomplete descent lead to lingual thyroid)	polypeptides secretion cells. ① Follicular cell (T ₃ , T ₄) Basophilic columnar → Active ✓ squama → inactive (inactive) ② para follicular cell Fx: synthesis of calcitonin LM: Larger than follicular cells pale cytoplasm 
parathyroid	* superior parathyroid glands:- ↳ derived from the fourth pharyngeal pouch. Related to Recurrent laryngeal N and inf thyroidal A associated with ultimobranchial body. * Inferior parathyroid glands ↳ derived from third pharyngeal pouch. , associated with thymus	① chief cells → Fx: secretion of parathyroid hormone → LM:- Basophilic Round central nuclei with pale cytoplasm. → with increasing age the chief cells are replaced by fat cells and the N of oxyphil cells increase. ② Oxyphil cells (Fx: Unknown) LM:- deep Eosinophilic, larger than chief cells. 

Adrenal

Adrenal Cortex

Origin: Mesoderm

There are 2 waves of mesodermal cells:

1. First wave — around 5th week

Mesodermal cells migrate from the area between the root of the hindgut mesentery and gonadal ridge.

Form the fetal/primitive cortex.

Cells are large and acidophilic.

2. Second mesodermal wave

Smaller mesodermal cells surround the fetal cortex.

Forms the definitive (permanent) cortex → mainly zona glomerulosa + zona fasciculata.

After birth:

Fetal cortex rapidly regresses.

Its outermost remaining part contributes to the zona reticularis.

*Adult cortical structure is fully established around puberty.

Adrenal Medulla

Origin: Neural crest → Neuroectoderm

Neural crest cells migrate into the developing adrenal gland around the 7th week.

They migrate toward the center → form the medulla.

They differentiate into chromaffin cells.

Chromaffin cells = modified sympathetic postganglionic neurons:

Lose their axons and dendrites.

Release epinephrine + norepinephrine into blood instead of releasing them across a synapse.

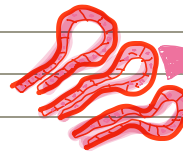
They are stimulated directly by preganglionic sympathetic fibers → ACh.

Therefore, medulla is controlled by the ANS, not ACTH.

Adrenal cortex: yellow in color

① Zone glomerulosa (15%)

- secretes mineralocorticoids (Aldosterone)
- Arched cluster



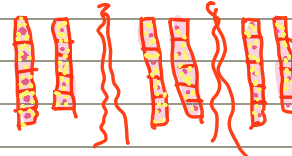
* columnar cell

* Acidophilic cytoplasm and slightly vacuolated (few lipid droplets)

② Zone Fasciculata (60 - 80%)

↳ glucocorticoids → cortisol

LM: Long straight cords



① polyhedral shape

② pale acidophilic highly vacuolated cytoplasm (spongiocytes)

③ Zone Reticularis (The inner layer)

↳ Androgen

irregular cords, Acidophilic slightly vacuolated.

② Medulla

① chromaffin cells

↳ secrete catecholamines

cytoplasm → pale basophilic.

② Sympathetic ganglion cells