Bio& 242, Unit 4 Lab 1
Endocrine Histology

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Slide #75 = Adrenal Gland:
Adrenal Cortex (Superior to deep) contains three distinct zones:

1. *Zona glomerulosa*: Cells in this zone produce mineralcorticoids (aldosterone)
   Cells are tightly packed and arranged in spherical clusters.

2. *Zona fasciculata*: Cells in this zone produce glucocorticoids (cortisol)
   Widest of the three zones; cells are arranged in long strait cords.

3. *Zona reticularis*: Cells in this zone produce androgens, largely (DHEA)
   Cells are arranged in branching cords.

Adrenal medulla centrally located tissue

1. *Chromaffin cells*: which secrete epinephrine and norepinephrine.

Slide #72 = Pituitary Gland
Posterior pituitary (neurohypophysis):

1. *Neuroglia cells called pituicytes*. You can see the nuclei of these pituicytes dispersed thoughout the tissue.

2. *Neurosecretory neurons*. The linear pattern to the tissue on the slide is due to the presence of axons from neurosecretory neurons. These axons ending release ADH. The neurosecretory cell bodies are found in the Hypothalamus where they produce the ADH which is released for the axons.

Anterior pituitary (adenohypophysis):

1. *Acidophils* (reddish staining) cells are either *Somatotrophs* that secrete hGH (human growth hormone) or *Lactotrophs* that secrete PRL (prolactin).

2. *Basophils* (which contain deep blue granules) cells are either *Thyrotrophs* that secrete TSH, *Gonadotrophs* that secrete FSH and LH, or *Cortiotrophs* that secrete ACTH.

3. *Chromophobes* = dull colorless cells in anterior pituitary. Their function is not understood.

Slide #76 = Pancreas

1. *Acinar cells*. These cells make up 99% of pancreas. This tissue stains purple and forms the irregular shaped clocks of tissue seen throughout the pancreas.

2. *Islet of Langerhans*. Island of cells found within Acinar tissue. Cells within these islands stain lighter pink.
    1. *Alpha cells* = 20% of the islet cells, located on the outside perimeter of islet, and stain lighter. Alpha cells secrete the hormone glucagon
    2. *Beta cells* = 70% of islet cells, these cells stain darker. Beta cells secrete the hormone insulin which:

    Note: The other 10% of the islet cells are either Delta or F-cells:

    1. *Delta cells* = secrete somatostatin which inhibits the release of both glucagon and insulin and slows absorption of nutrients from the GI tract.
    2. *F cells* = secrete pancreatic polypeptide which inhibits somatostatin secretion, gallbladder contraction, and secretion of pancreatic digestive enzymes.

Slide #73 = Thyroid Gland.

1. *Follicular cells*. These cells surround large round structures called thyroid follicles. Large round smooth appearing area inside of the follicles contains thyroglobulin, which stores iodine. Follicular cells secrete T3 and T4.

2. *Parafollicular cells*. Islands or clusters of cells sandwiched between follicles. These cells secrete calcitonin.

Slide # 73 and #74 =Parathyroid Gland.

1. *Chief or Principal cells*. Tissue looks like Peyers patches on scanning power. Chief cells are small (6-8 microns), polygonal in shape with central round nucleus. Cyoplasm contain granules of parathyroid hormone which causes chief cells to staining darkly. These cells secrete PTH (parathyroid hormone).

2. *Oxyphil cells*. Slightly larger than chief cell (12 microns), contain acidophilic cytoplasm, due to mitochondria (hence the name Oxyphil), with no secretory granules; These cells first appear at puberty as single cells, then though mitosis double into pairs, then nodules at age 40. These cells function is not well understood. They are more common in women and increase in hyperparathyroid events. Recent studies suggest they are capable of parathyroid hormone secretion

Organs and special Structures of the Endocrine system

Make sure that you can find the following organs and structures on the models and charts. Also review the hormones produced by each of these organs and the cells that produce the hormones.

Hypothalamus
    Neurosecretory cells
Infundibulum
Hypophyseal portal veins
Posterior pituitary
Anterior pituitary
Thyroid gland
Pancreas
    Islets of Langerhans
Adrenal glands
Testes
Ovaries
Parathyroid glands