

組織學實驗：內分泌系統

Histology laboratory : Endocrine system

Please study these slides before coming to the class!

Sources of the Pictures & Text

- **Histology: A Text and Atlas (4-7th ed) ,
M.H. Ross & W. Pawlina**
- **Wheater's Functional Histology (5-6th
ed), B. Young & J.W.Heath**

Photomicrograph Taken by

**Department of anatomy,
Kaohsiung Medical University**

Endocrine System

- **Pituitary gland**
K-2-a, Pituitary Gland, HE
- **Thyroid gland & parathyroid gland**
NK-1-a, Thyroid gland (parathyroid gland), HE
- **Pineal gland**
A007, Pineal body, HE
- **Adrenal gland**
NK-5-a, Adrenal gland, HE

Learning Objective

- Identify the main components of thyroid tissue (follicles and colloid) and the main cell types of parathyroid glands.
- Understand the main divisions of the pituitary (adenohypophysis and neurohypophysis) and its major cell types.
- Identify the zones of the adrenal cortex, as well as the cells of the adrenal medulla.
- Recognize the structure of the pineal gland.

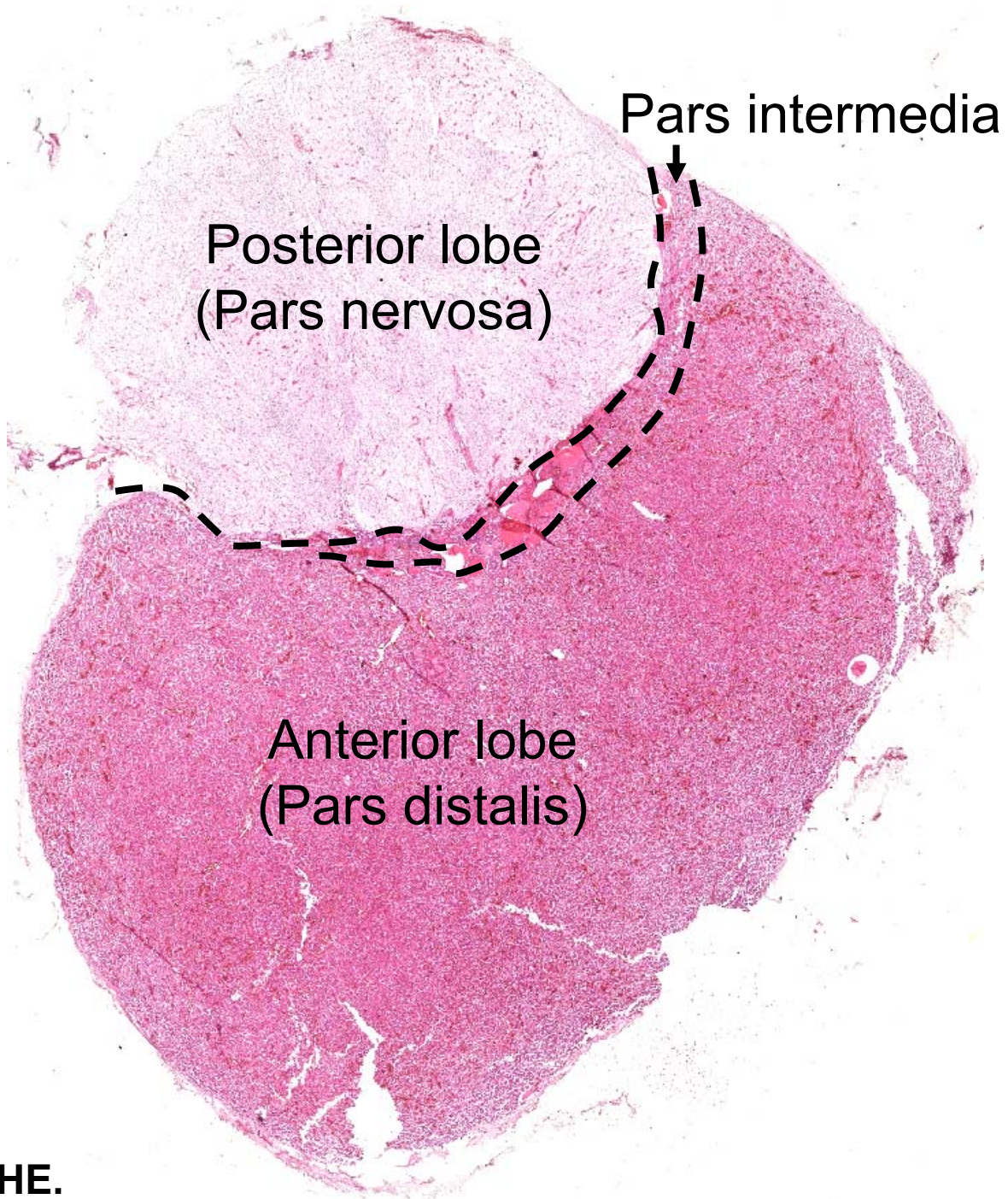
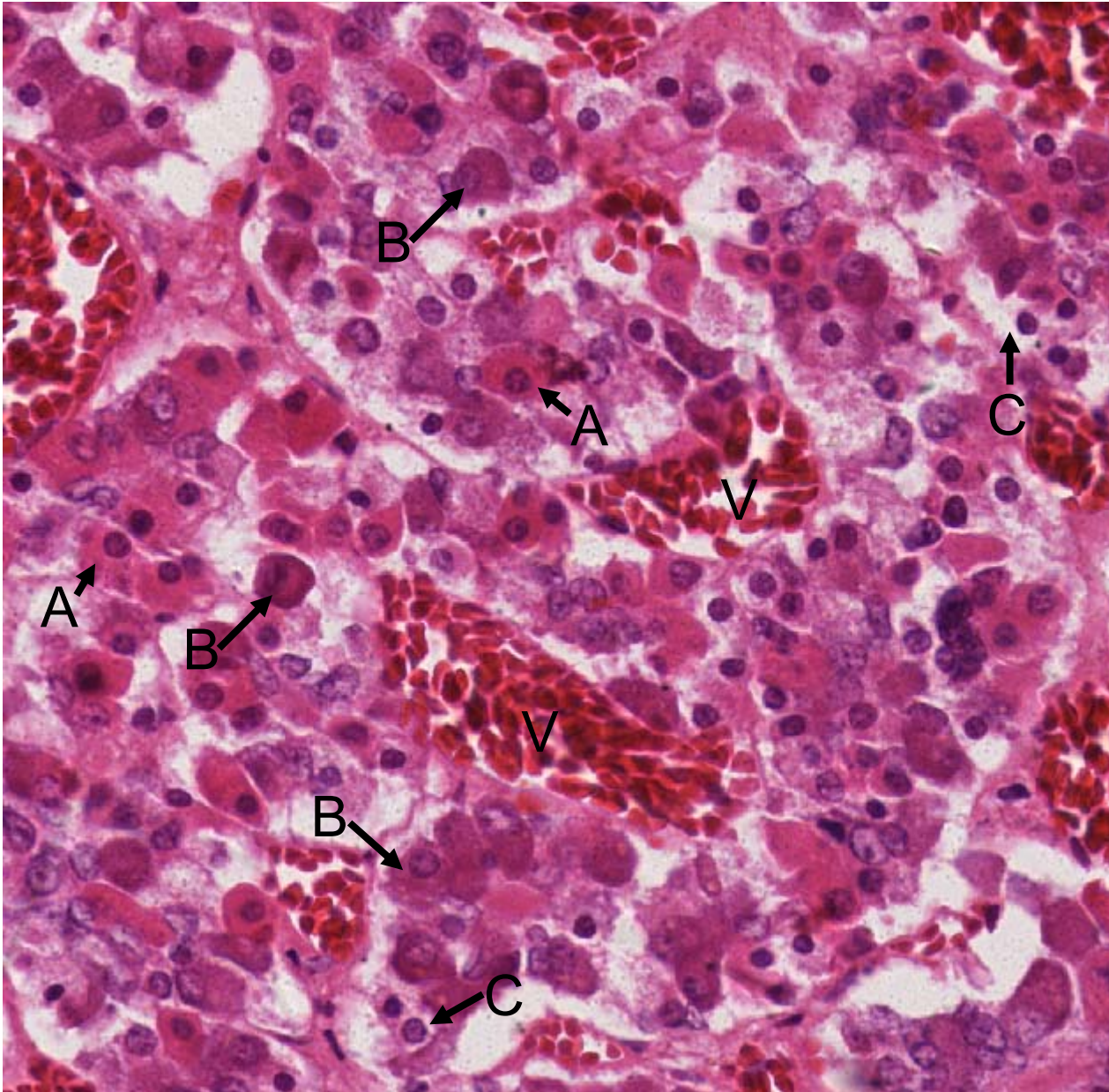


Fig.1 k-2-a, Pituitary Gland, HE.

Fig. 1, k-2-a, Pituitary Gland, HE. This specimen is an oblique section of the pituitary gland. The pars nervosa (posterior lobe) is the expanded portion of the neurohypophysis. The pars distalis is the largest part of the gland. It contains a variety of cell types that are not uniformly distributed. This accounts for differences in staining (light and dark staining areas) that are seen throughout the pars distalis.



A: Acidophil

B: Basophil

C: Chromophobe

V: Blood vessels

Fig.2 k-2-a, Pituitary Gland, anterior lobe, HE

Fig. 2, k-2-a, Pituitary Gland, anterior lobe, HE. This photomicrograph shows a region of the anterior lobe. The acidophils are readily identified by the acidophilic staining of their cytoplasm, in contrast to the basophils whose cytoplasm is clearly basophilic. Chromophobes are also very numerous in this field. The cytoplasm stains poorly in contrast to that of the acidophils and basophils. The cells are arranged in cords and clumps, between which are blood vessels.

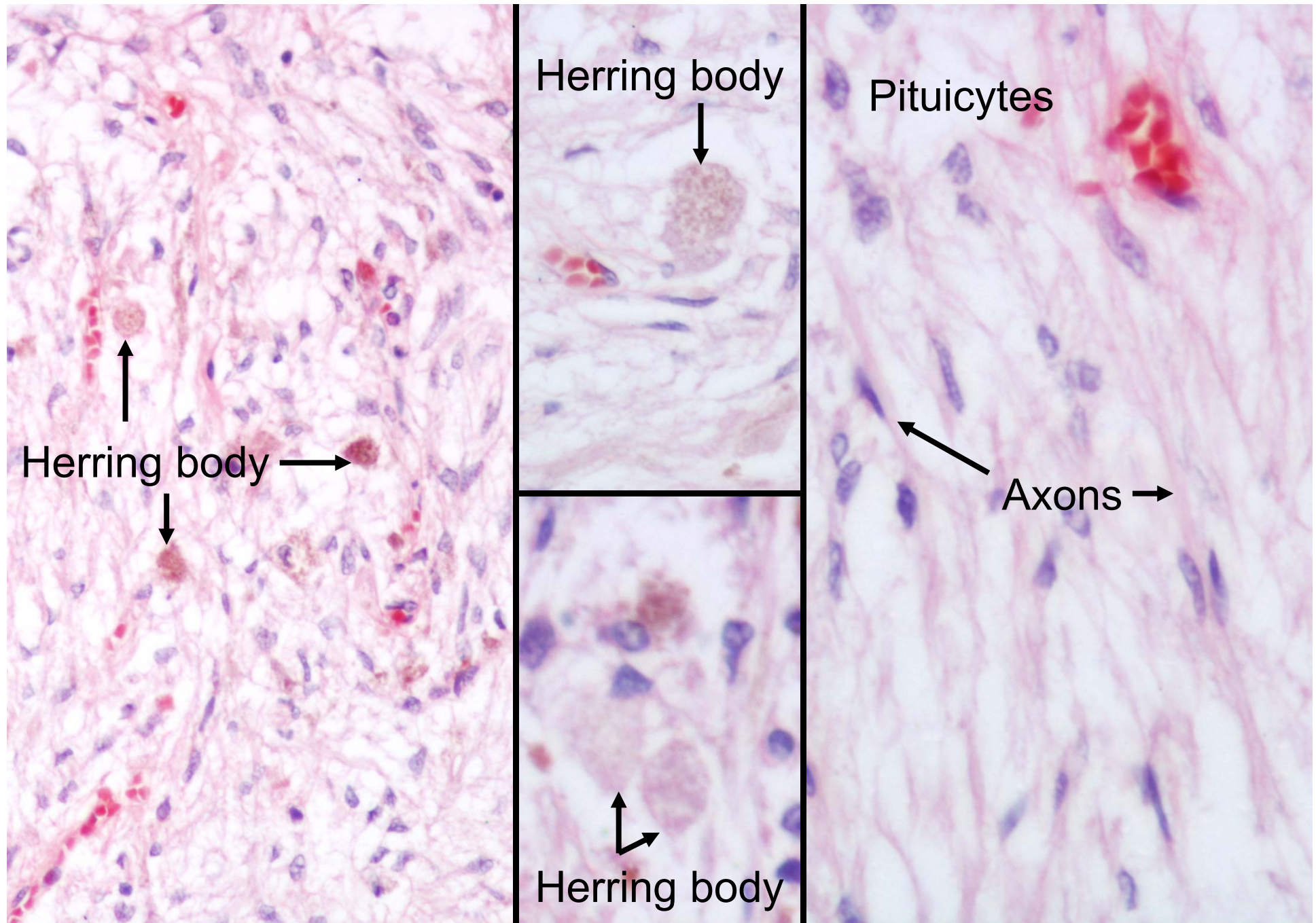


Fig.3 k-2-a, Pituitary Gland, posterior lobe, HE

Fig. 3, k-2-a Pituitary Gland, posterior lobe, HE. The posterior lobe seen here contains the nuclei inside the cells called pituicytes, and unmyelinated nerve fibers extended from the nuclei of the hypothalamus. The pituicytes are comparable with neuroglial cells of the central nervous system. The nuclei are round to oval. In H&E preparations such as this, the cytoplasm of the pituicyte cannot be distinguished from the unmyelinated nerve fibers. The hormones of the posterior lobe are formed in the hypothalamic soma and pass via the nerve fibers to the posterior lobe, where they are stored in the expanded nerve terminal portion of the nerve fibers. The stored neurosecretory material appears as Herring bodies. In H&E preparations, the Herring bodies simply appear as small islands of eosin-stained substance.

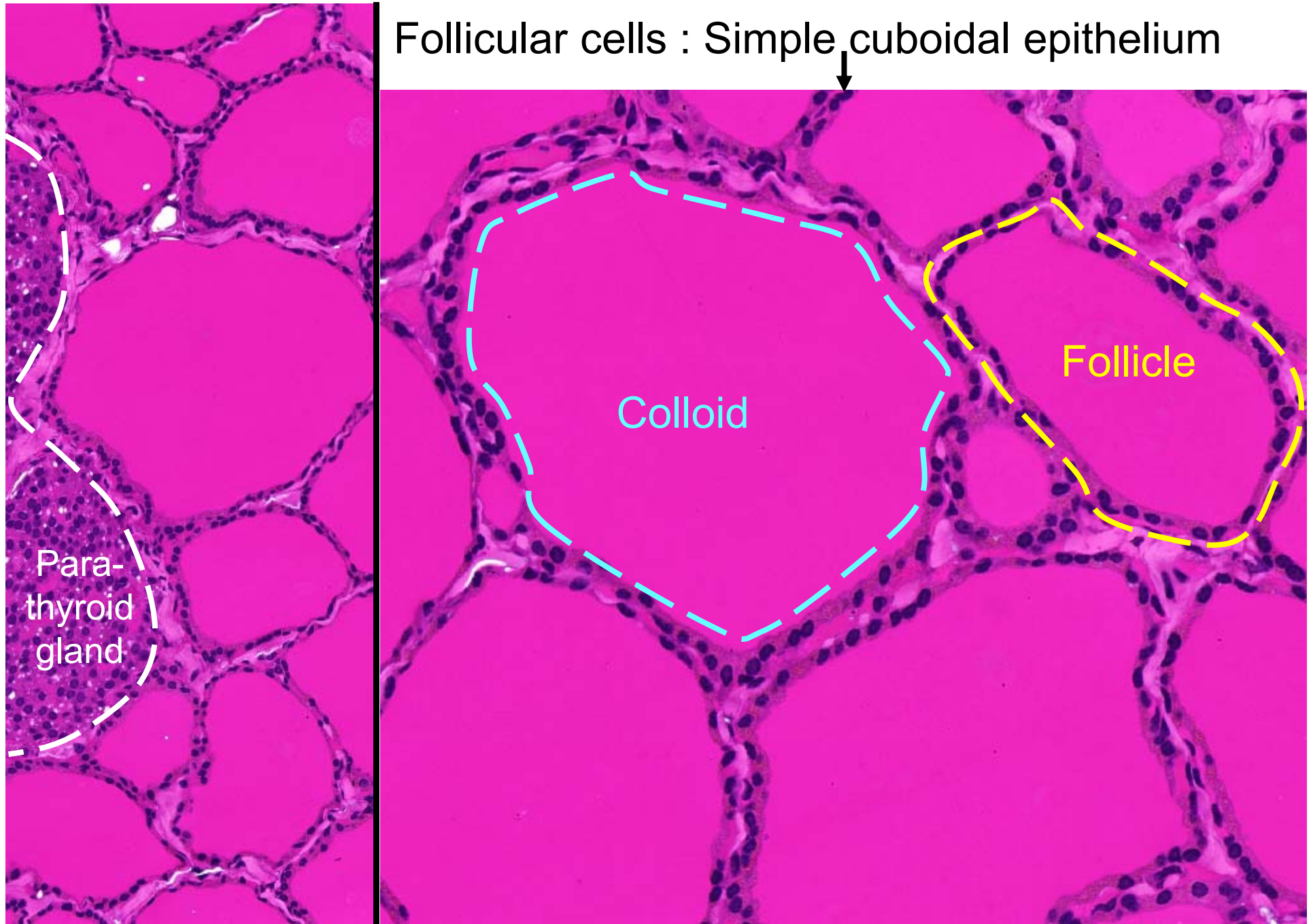


Fig. 4, NK-1-a, Thyroid gland, HE.

Fig. 4, NK-1-a, Thyroid gland, HE. A histologic section of the thyroid gland is shown here. The follicles vary somewhat in size and shape and appear closely packed. The homogeneous mass in the center of each follicle is the colloid. The follicular cells appear to form a ring around the colloid and the nuclei of the cells serve as an indication of their location and arrangement.

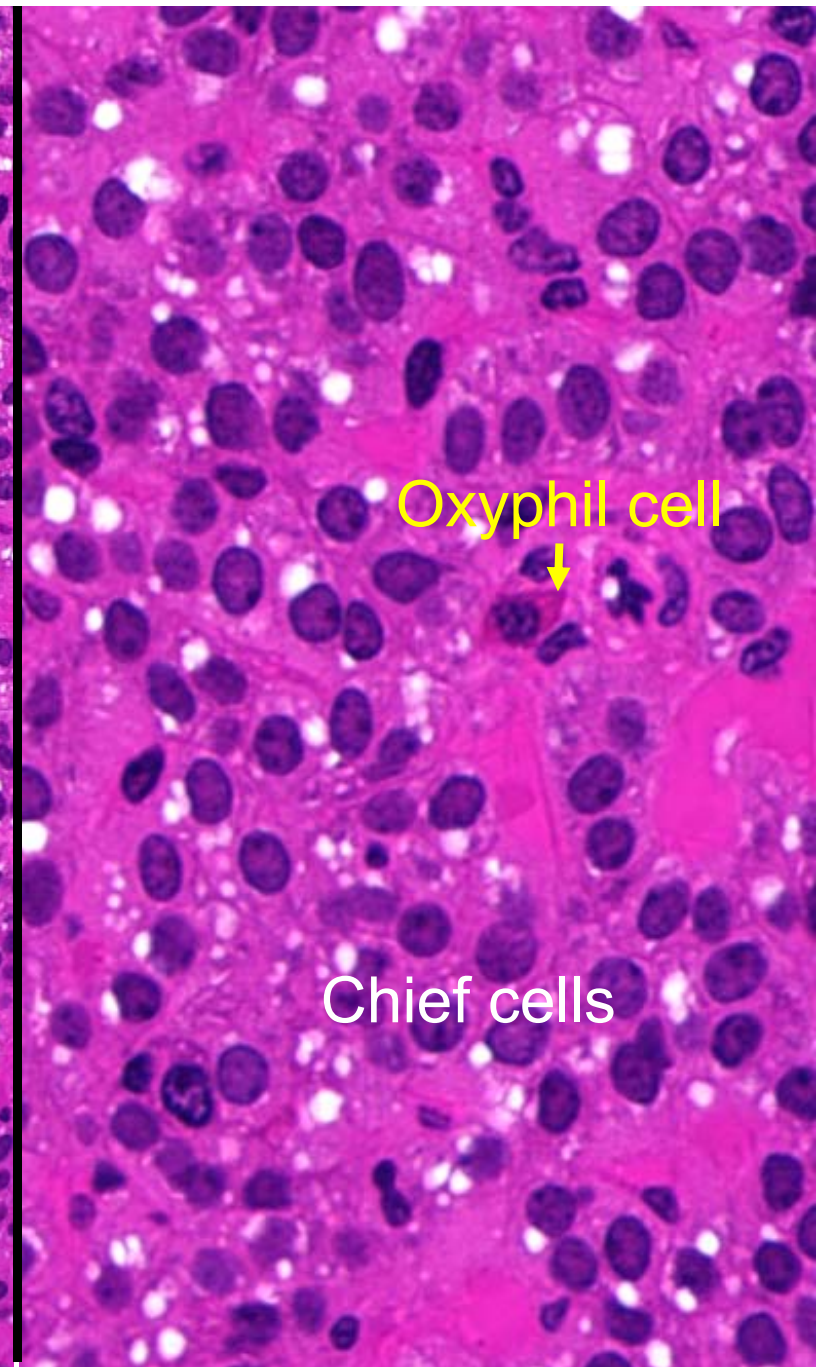
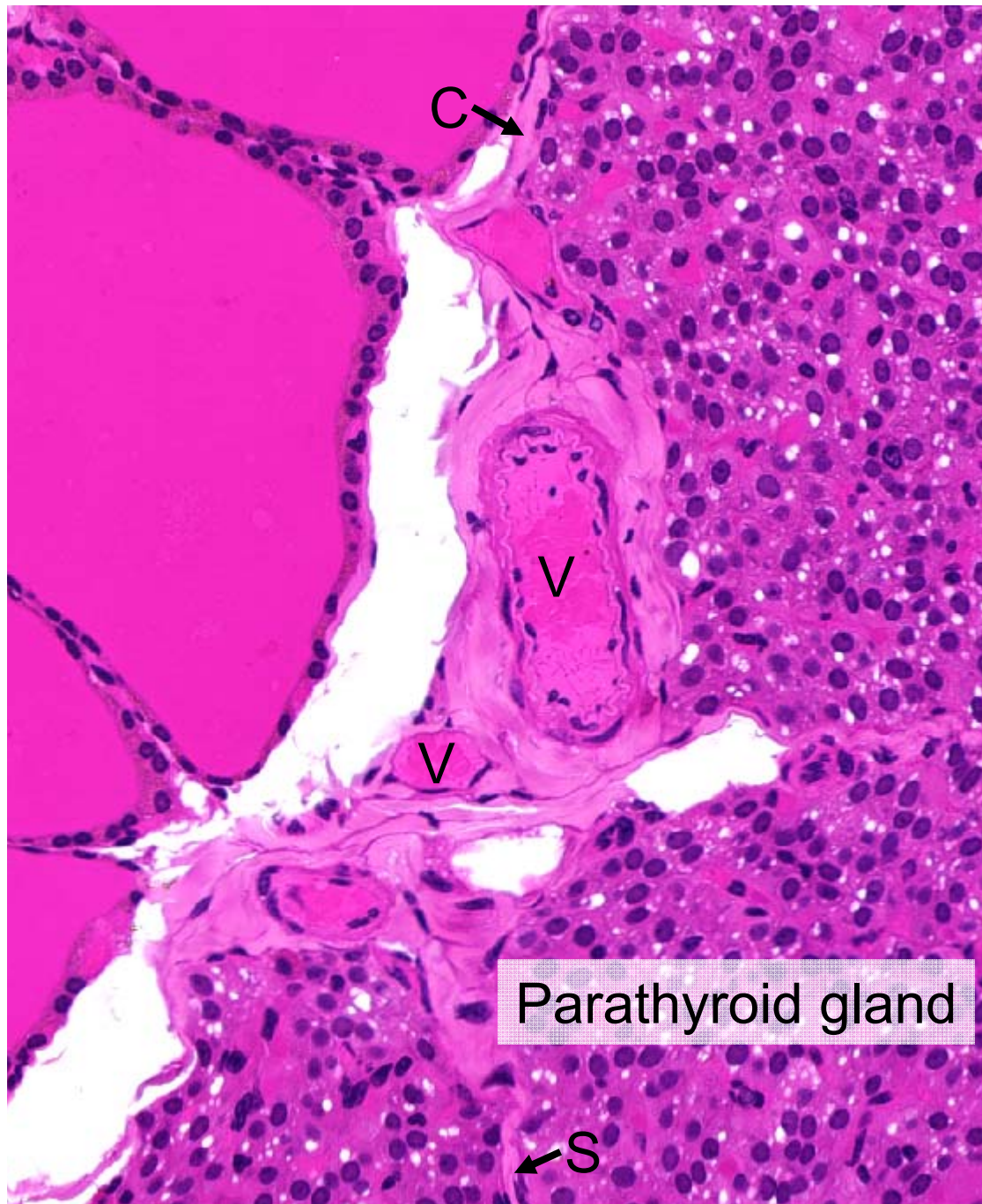


Fig. 5a , NK-1-a C: Capsule; S:Septa; V: Vessel

Fig.5b, parathyroid gland, HE.

Fig. 5a, NK-1-a. The blood vessels are associated with the capsule of the parathyroid gland. The parenchyma of the parathyroid glands appears as cords or sheets of cells separated by capillaries and delicate connective tissue septa.

Fig. 5b, NK-1-a, parathyroid gland, HE. Two parenchymal cell types can be distinguished in routine H&E sections: chief cells (principal cells) and oxyphil cells. The chief cells are more numerous. They contain a spherical nucleus surrounded by a small amount of cytoplasm. Oxyphil cells are less numerous. They have a slightly smaller and more intensely staining nucleus. Their cytoplasm stains with eosin, and the boundaries between the cells are usually well marked.

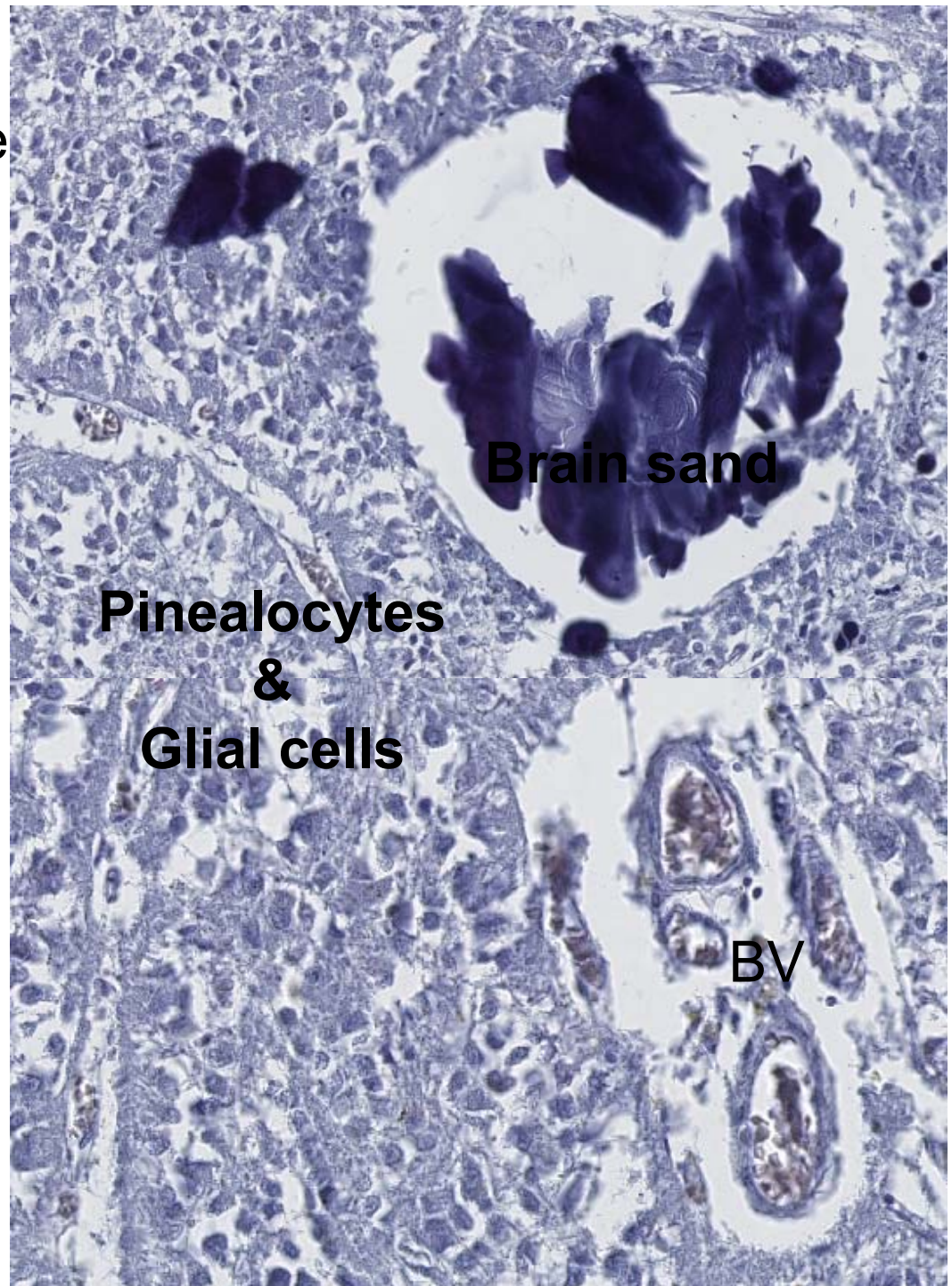
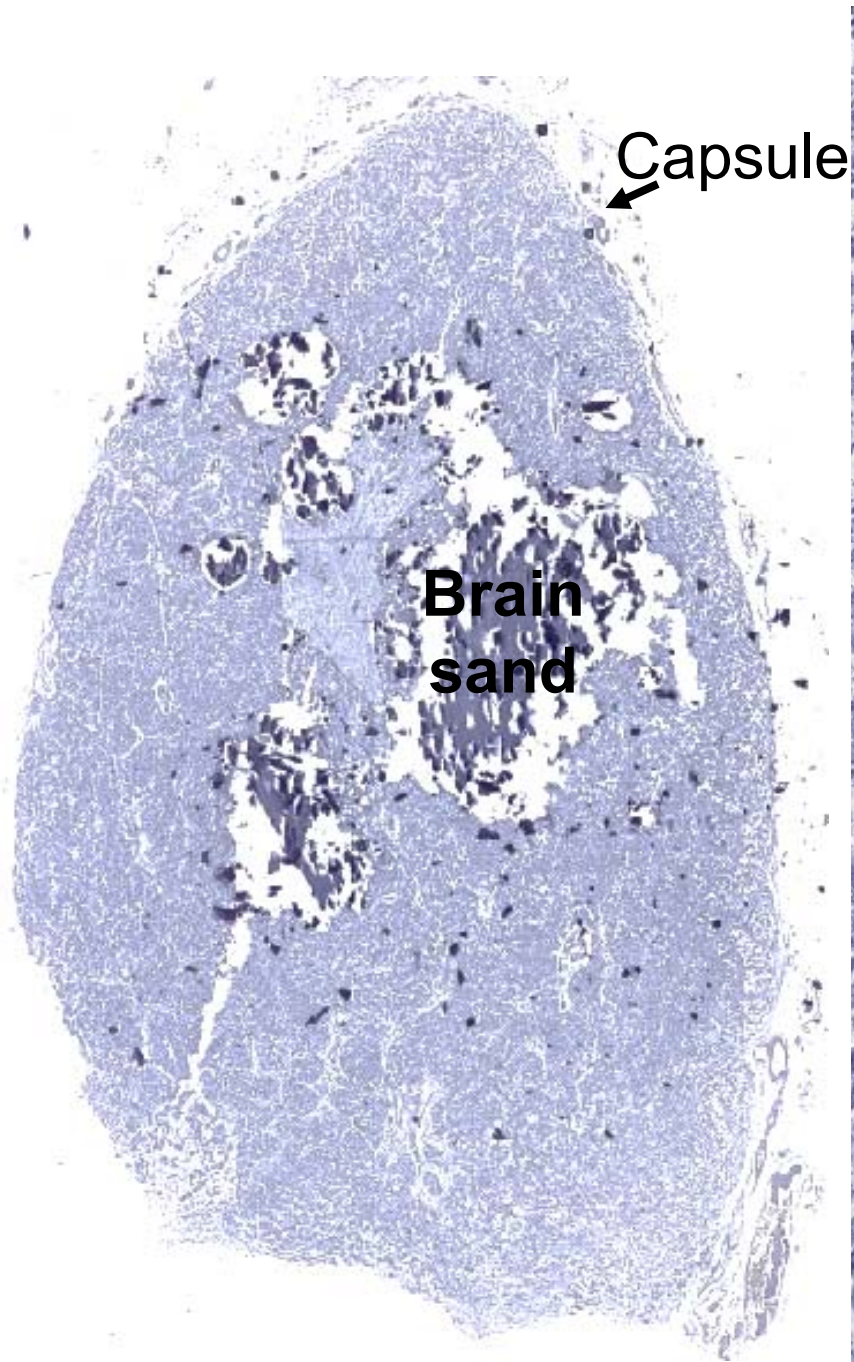


Fig. 6, A007, Pineal body, HE.

Fig. 6, A007, Pineal body, HE. This slide shows the pineal gland is surrounded by a very thin capsule that is formed by the pia mater. Connective tissue extends from the capsule into the substance of the gland. Within the gland there are two specific cell types: pinealocytes and glial cells, can't be distinguished in the slide. Brain sand is calcified structures whose function is unknown. Concentrations of brain sand increase with age. They are sometimes used as anatomical landmarks in radiological examinations.

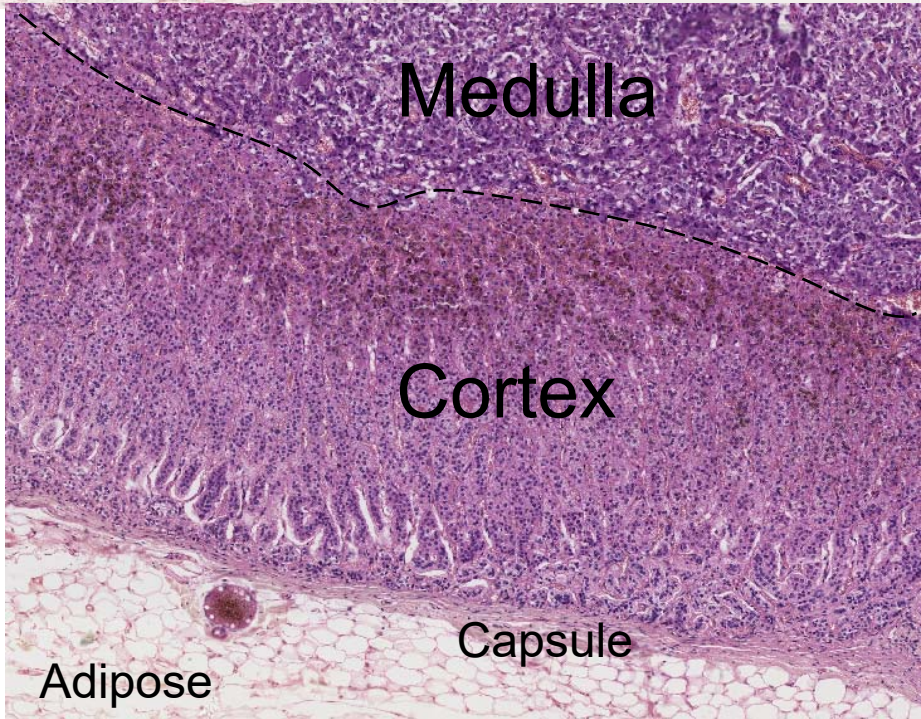


Fig. 7, NK-5-a, Adrenal gland, HE.

Fig. 7, NK-5-a, Adrenal gland, HE. This low-magnification micrograph of a section through the adrenal gland shows the outer capsule, which consists of dense connective tissue, the cortex and the underlying medulla. The cortex has a distinctly different appearance in both structural organization and staining characteristics of the medulla. A small amount of adipose tissue surrounds the capsule is seen at the lower portion of the micrograph. The corticomedullary boundary (dashed lines) has a wave-like contour. Within the medulla are a number of relatively large blood vessels. These are the medullary veins that drain both the cortex and the medulla.

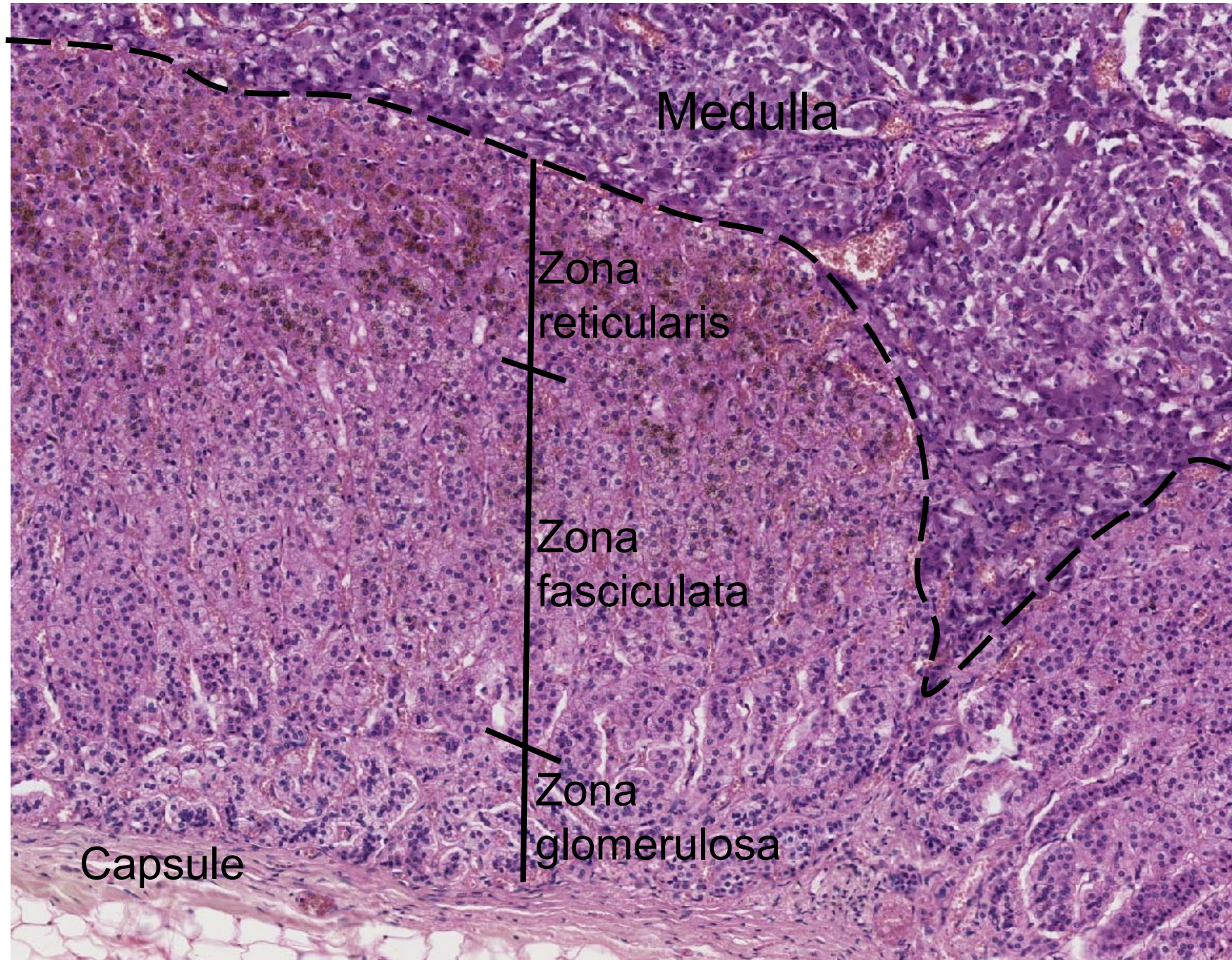


Fig. 8, NK-5-a, Adrenal gland, HE.

Fig. 8, NK-5-a, Adrenal gland, HE. The zona glomerulosa is located at the outer part of the cortex, immediately under the capsule. The parenchyma of this zone consists of small cells that appear as oval groups of cells. The zona fasciculata consists of radially oriented cords and sheets of cells, usually two cells in width, that extend toward the medulla. Poor staining characteristic of cytoplasm of the zona fasciculata reflects more lipid droplets than those of the zona glomerulosa. The cells of the zona reticularis are arranged in irregular anastomosing cords.

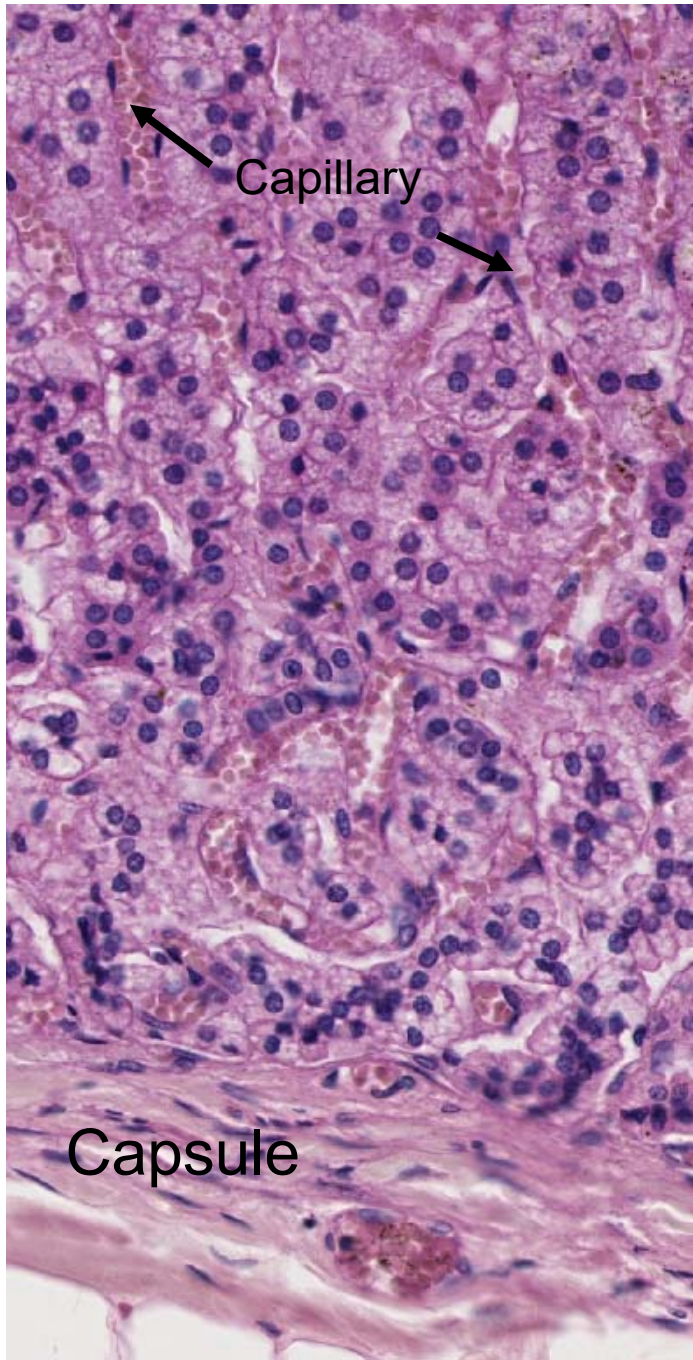


Fig. 9a

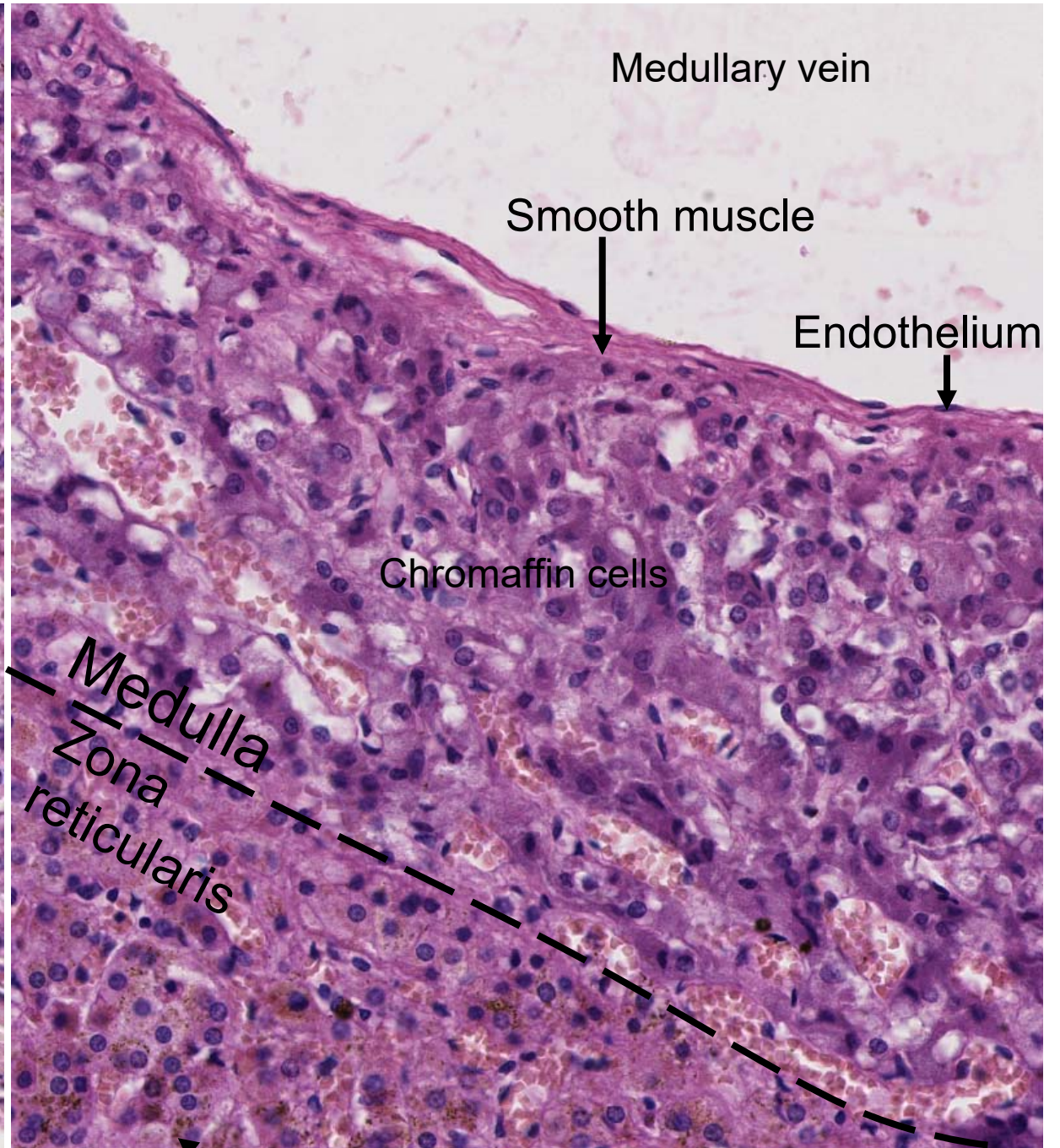


Fig. 9b

Brown lipofuscin pigments in cytoplasm

Fig. 9a Capillaries are located within the thin connective tissue and with the presence of red blood cells in the lumina.

Fig. 9b, NK-5-a, Adrenal gland, HE. The zona reticularis cells contain relatively small quantities of cytoplasm and lipid droplets, and sometimes display brown lipofuscin pigment. The chromaffin cells in medulla may stain with different intensity. One of medullary veins is surrounded by chromaffin cells and has thin vessel wall. The smooth muscle of the tunica media of the vessel is readily seen here as being arranged in bundles and appears in cross section.

Summary

k-2-a Pituitary gland	Anterior lobe (pars distalis), Posterior lobe (pars nervosa), Pars intermedia, Acidophil, Basophil, Chromophobe, Pituicytes, Herring bodies, Blood vessels
NK-1-a Thyroid gland & parathyroid gland	Follicle, Colloid, Follicular cells, Parafollicular cells, Capsule, Chief cells, Oxyphil cells
A007 Pineal body	Pinealocytes & glial cell, Brain sand, Blood vessels
NK-5-a Adrenal gland	Capsule, Cortex, Medulla, Adipose tissue, Zona glomerulosa, Zona fasciculata, Zona reticularis, Capillaries, Medullary vein, Endothelium, Smooth muscle, Chromaffin cells, Lipofuscin