



Extra Histo practice
— Endocrine —

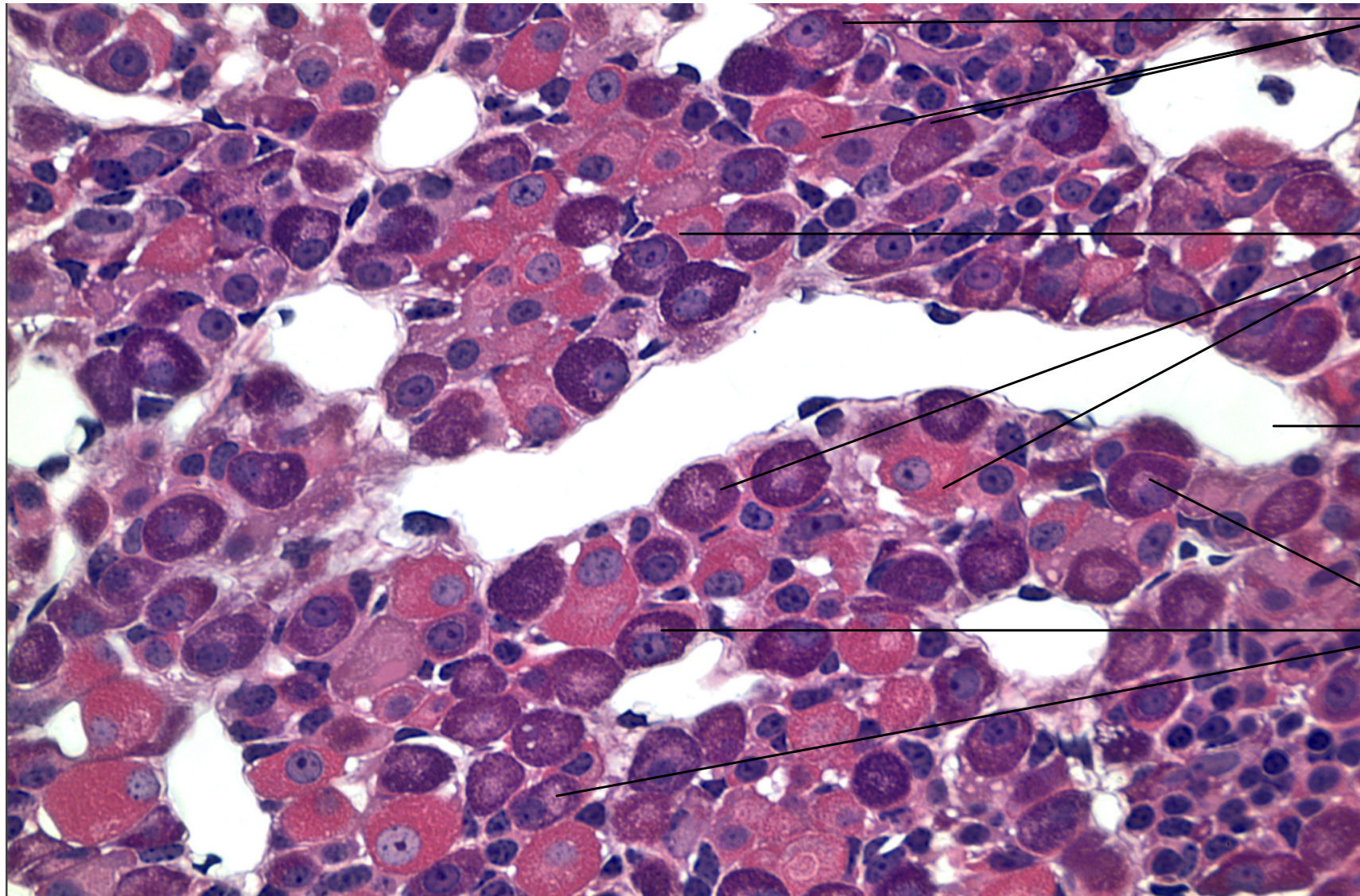
اللهم إني أبدأ دراستي بنية خالصة لك، فوفقني يا أرحم الراحمين، وارزقني التوفيق في كل ما أقرأ وأدرس، اللهم اجعل دراستي هذه سبباً لرفع درجتي في الدنيا والآخرة، وبارك لي في وقتي، وارزقني التوفيق في امتحاناتي، اللهم اجعلني من الذين يسهل عليهم العلم، واجعل لي من كل صعوبة في الدراسة سهولة، ومن كل عائق في الطريق إزالة

* Overview

Endocrine

→ #1: Peptide hormones

→ #2: lipid / steroids



Secretory
granules

Peptide
secreting
cells

Fenestrated
Capillaries

Golgi

→ Pars distalis of Ant pit

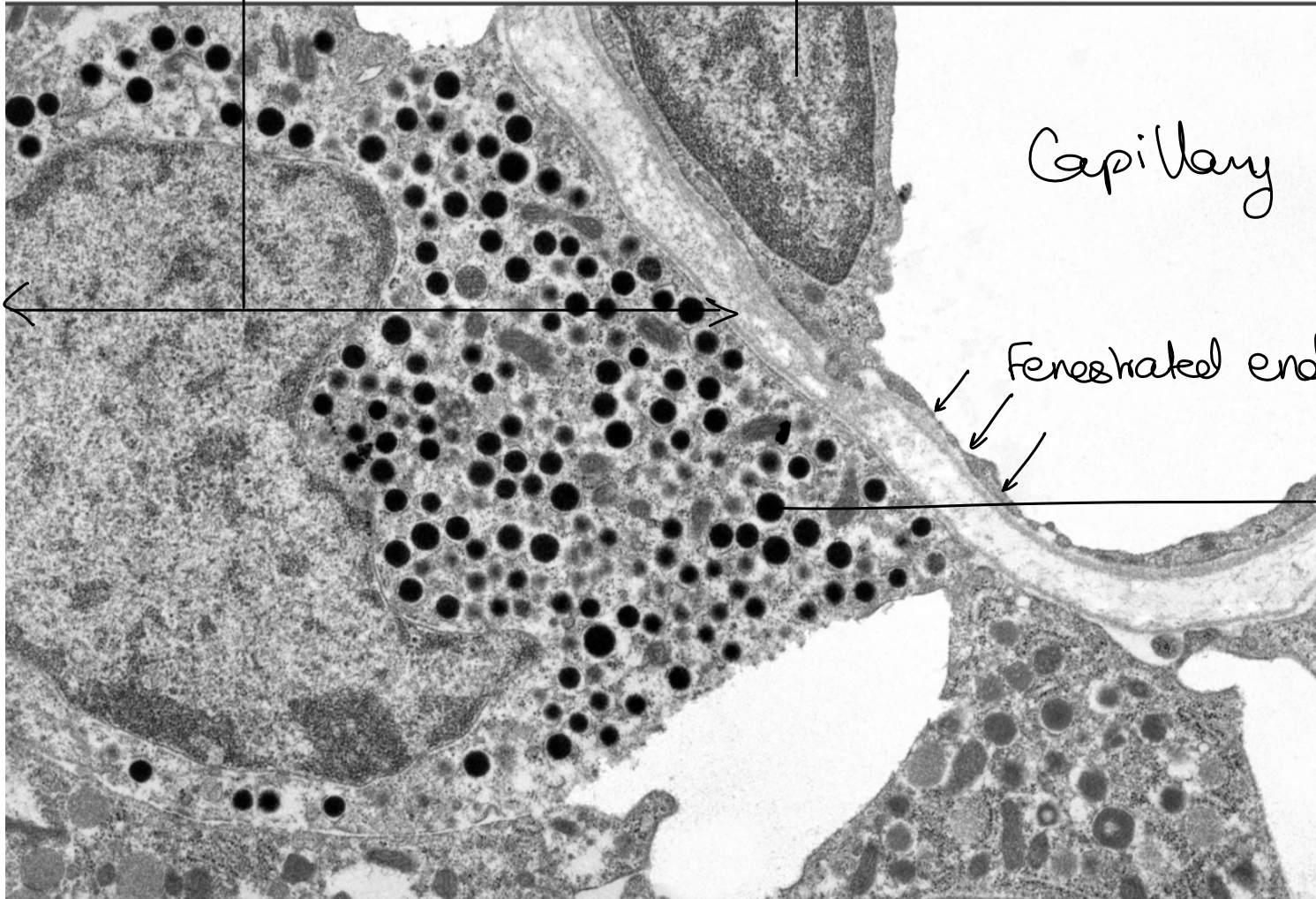
Endocrine cell

Endothelial nucleus

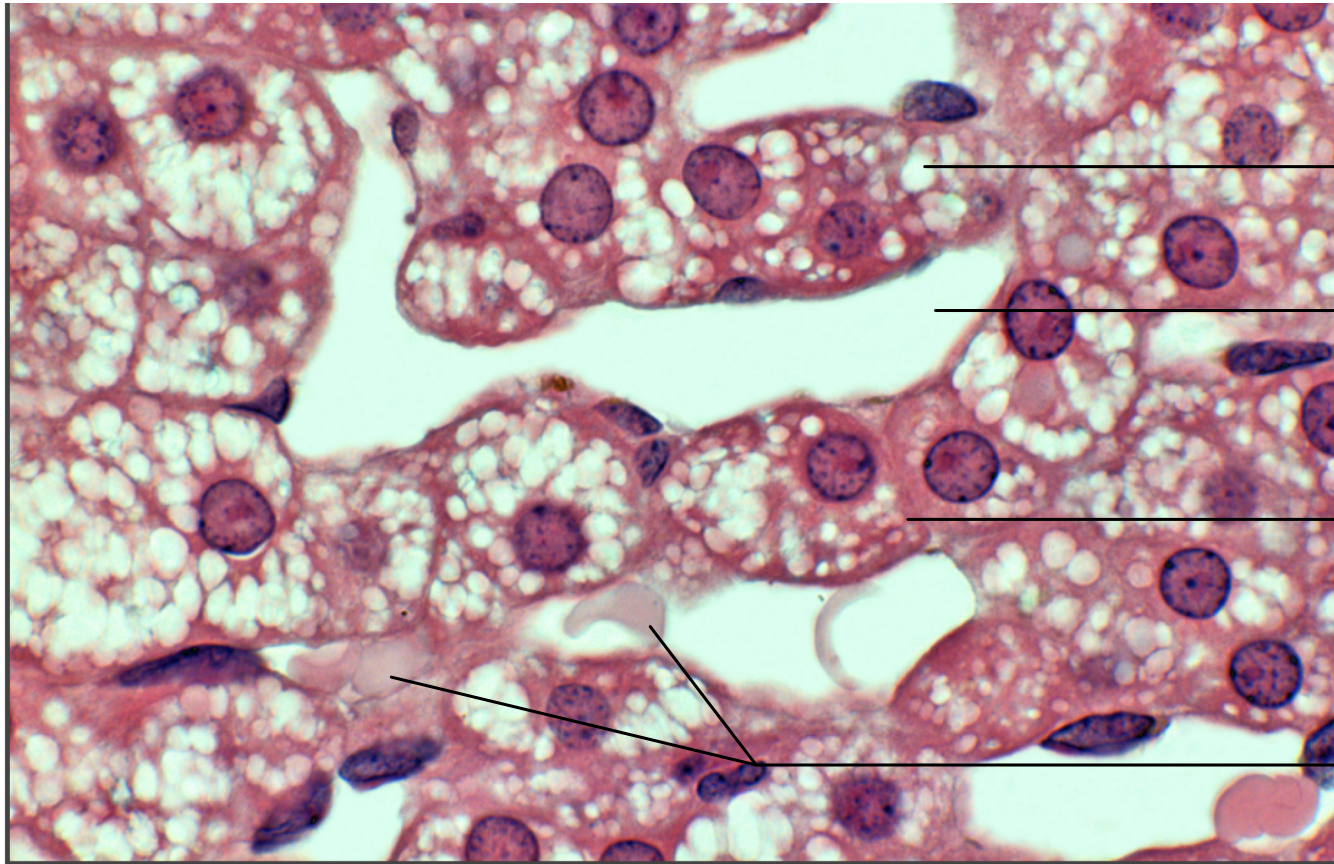
Capillary

Fenestrated endothelium

Secretory granules



2: lipid secreting



Lipid droplets

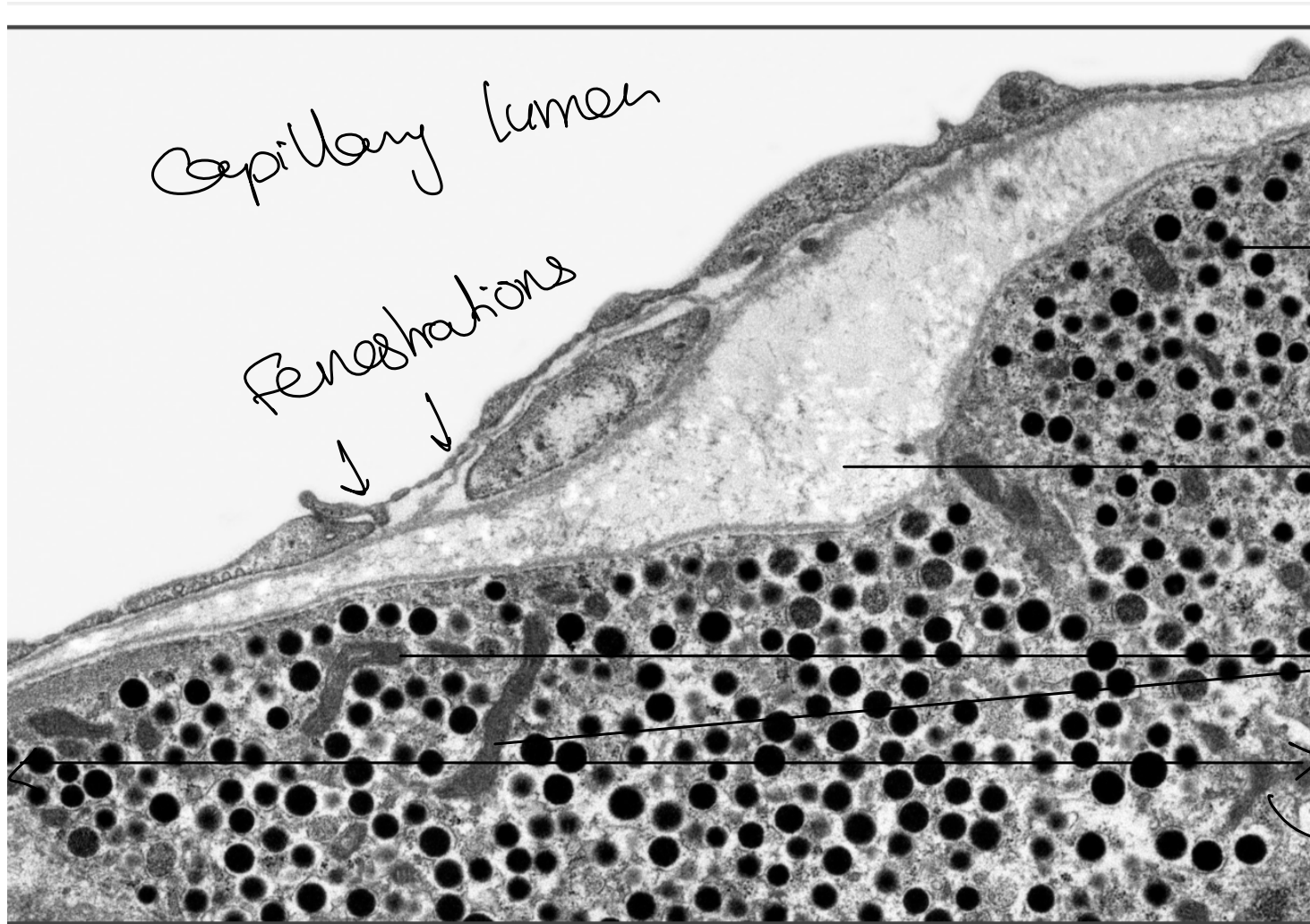
Fenestrated
capillaries

Steroid secreting
cells

RBCs

Overview

Steroids are a second major type of hormone. Steroid-secreting cells are common in the adrenal gland, ovary and testis. Steroid hormones are derived from cholesterol, so these cells are filled with lipid droplets, giving the cells a frothy appearance. Adrenal cortex 1000x



Capillary lumen

Fenestrations

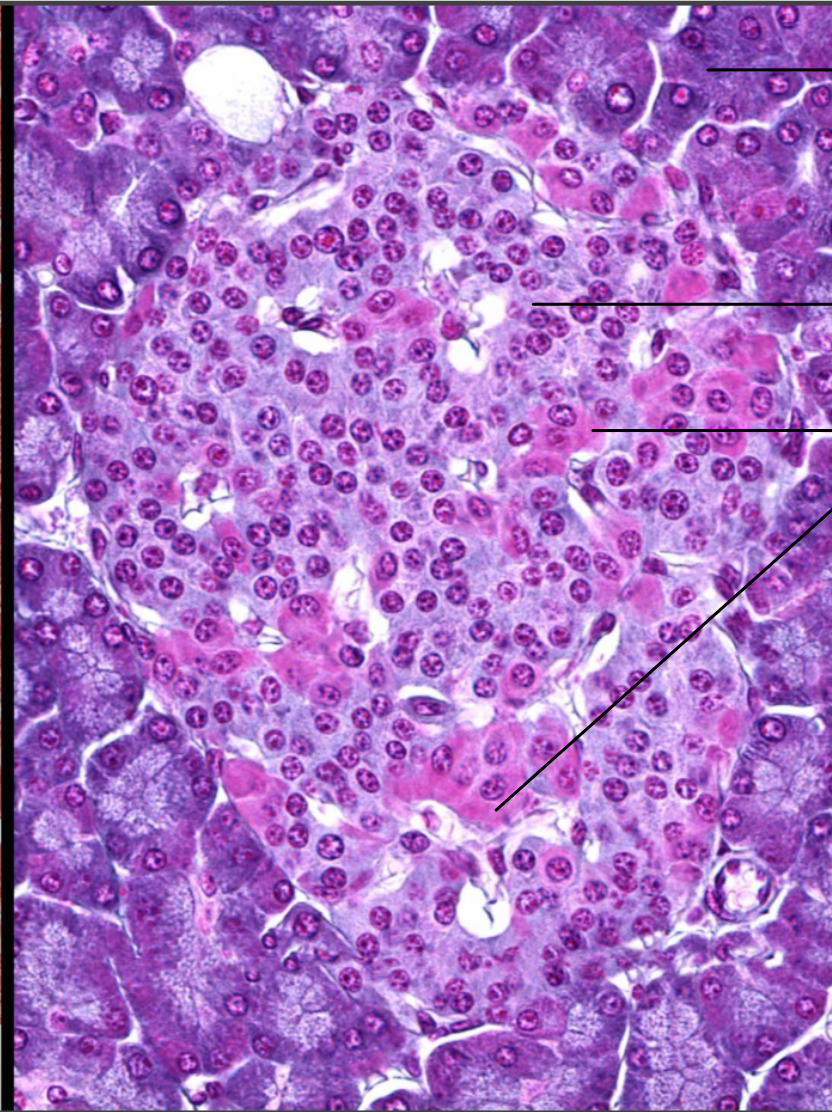
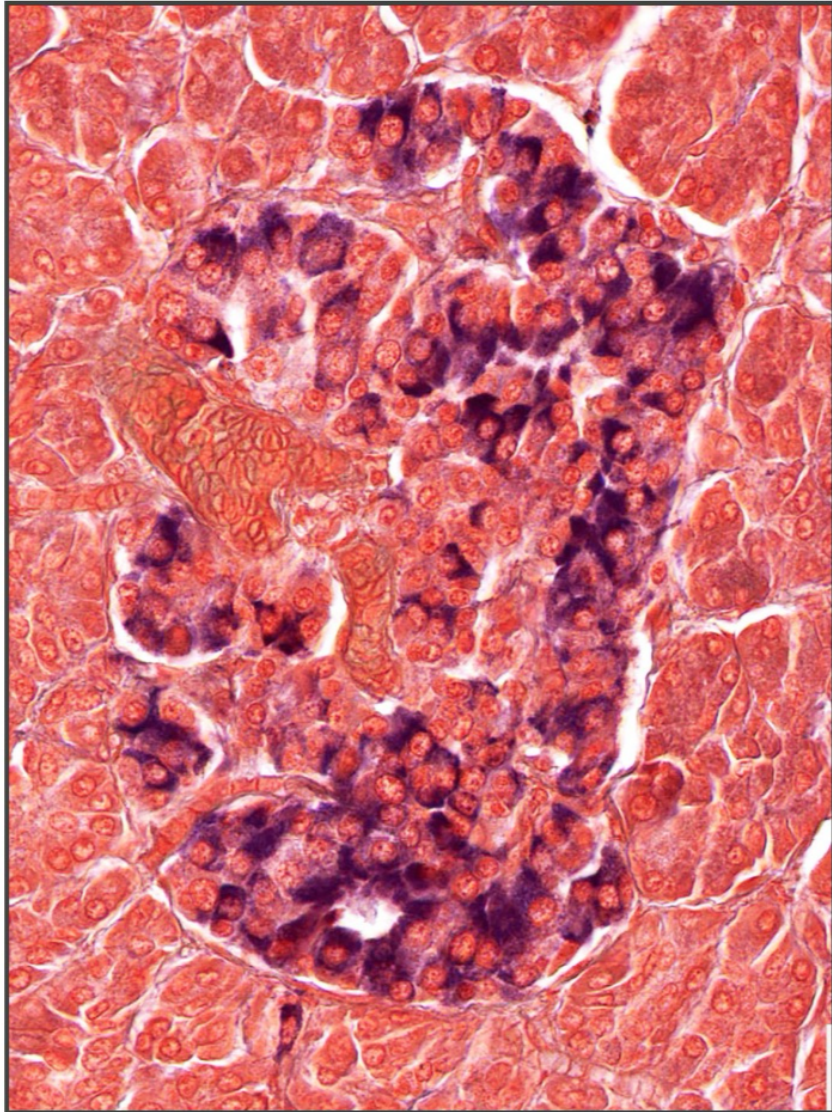
Secretory granules

CT

mt

Endocrine cell

* Islets of Langerhans



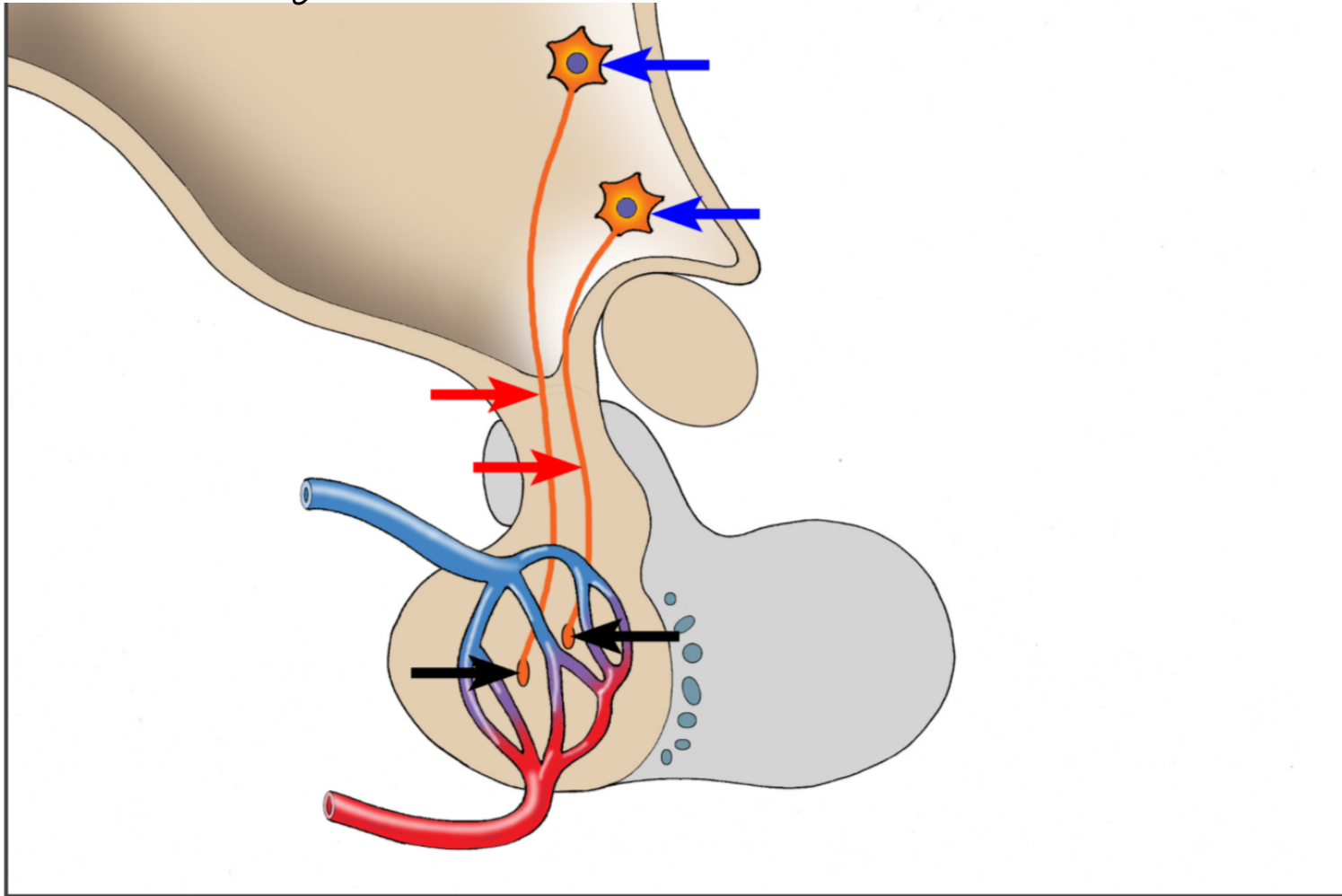
Exocrine
acini

β cells

α cells

Clusters of endocrine cells

x Pituitary



- Secretion >

Axons (red arrows) of neurons originating in supraoptic and paraventricular nuclei (blue arrows) of the hypothalamus terminate in the pars nervosa as enlargements called Herring bodies (black arrows). The hormones produced by these neurons, vasopressin and oxytocin, are stored in and released from the Herring bodies into the blood stream for distribution throughout the body.

Infundibulum

Pars tuberalis

Capsule

Neurohypophysis

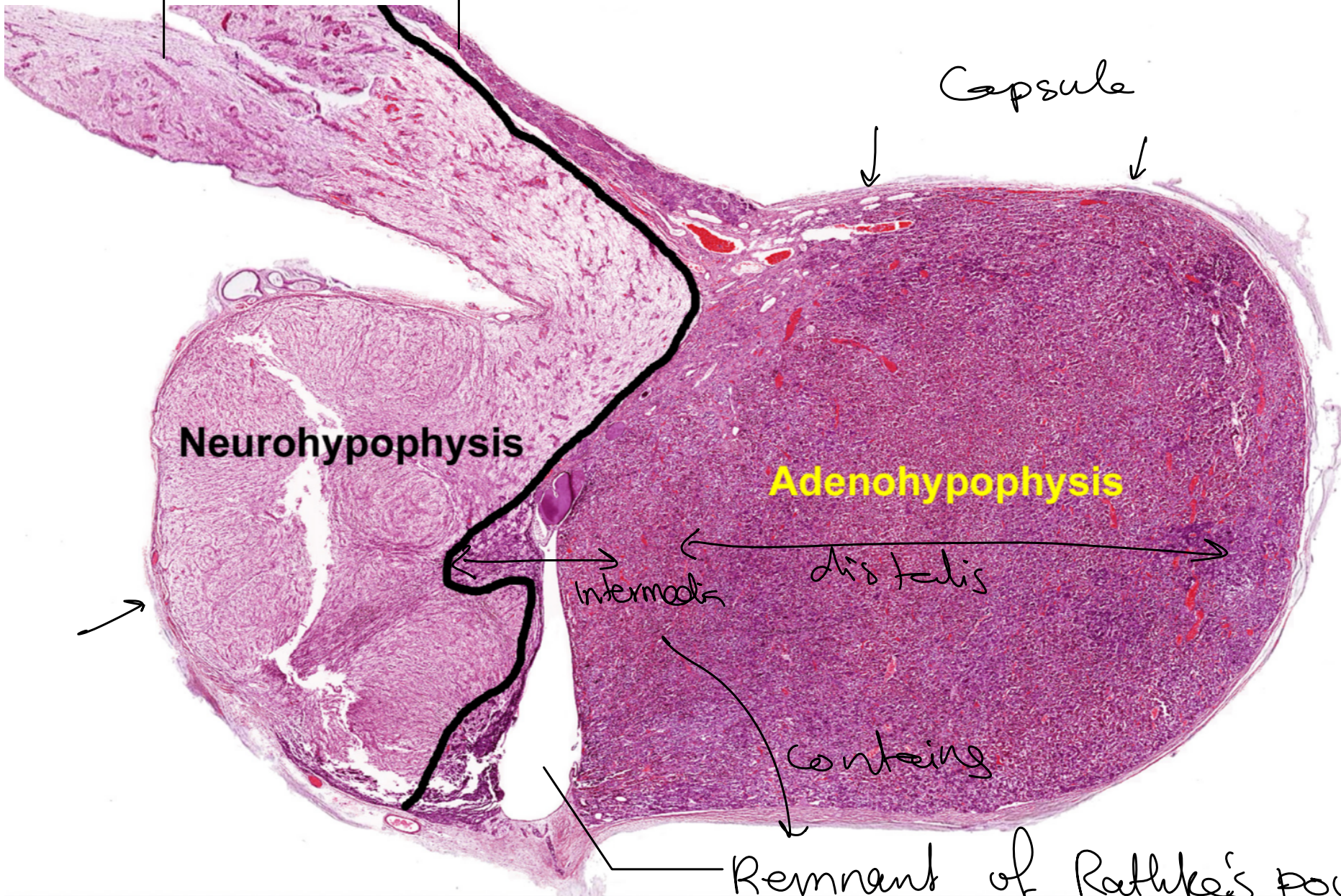
Adenohypophysis

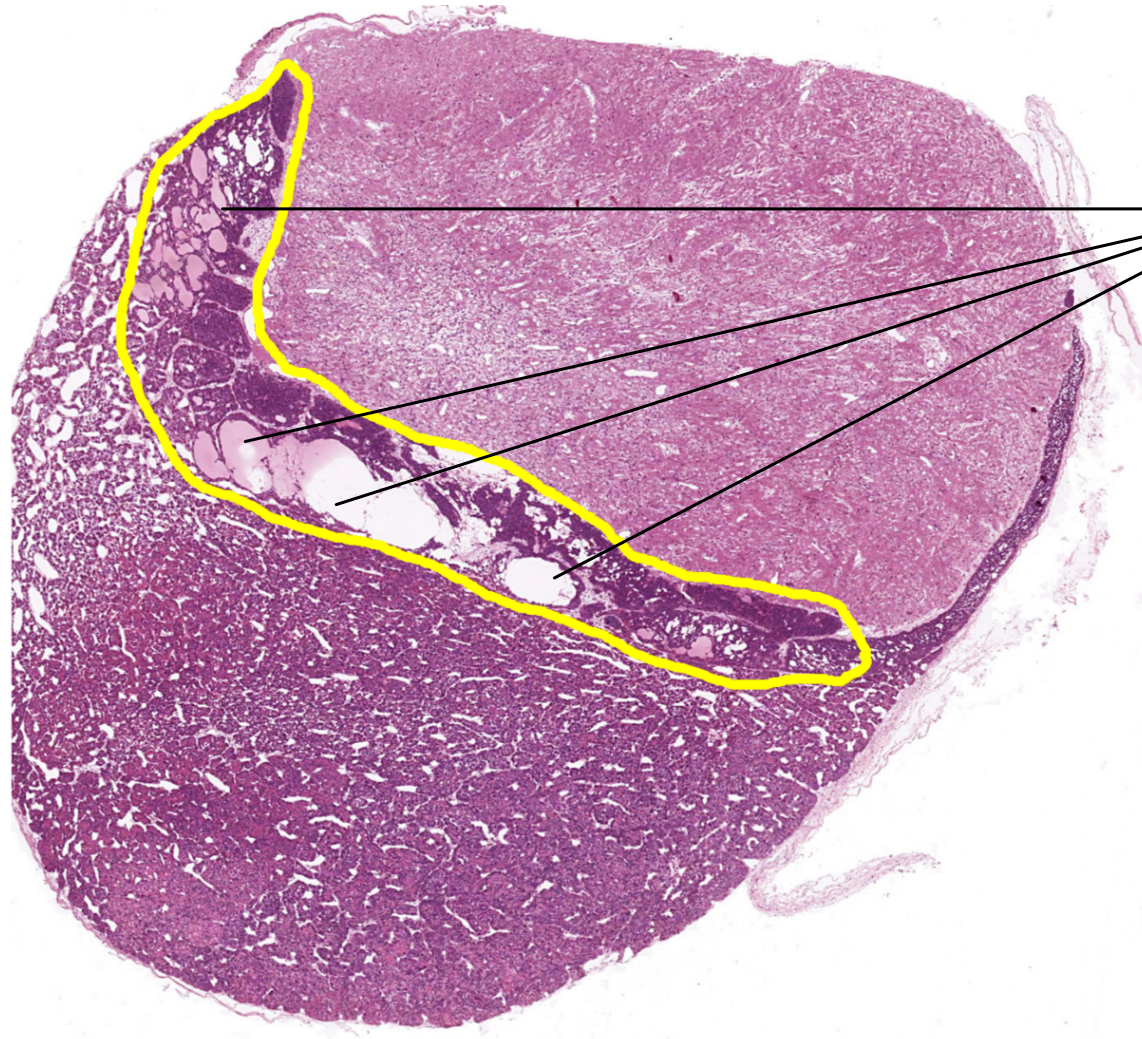
Intermediate

distalis

containing

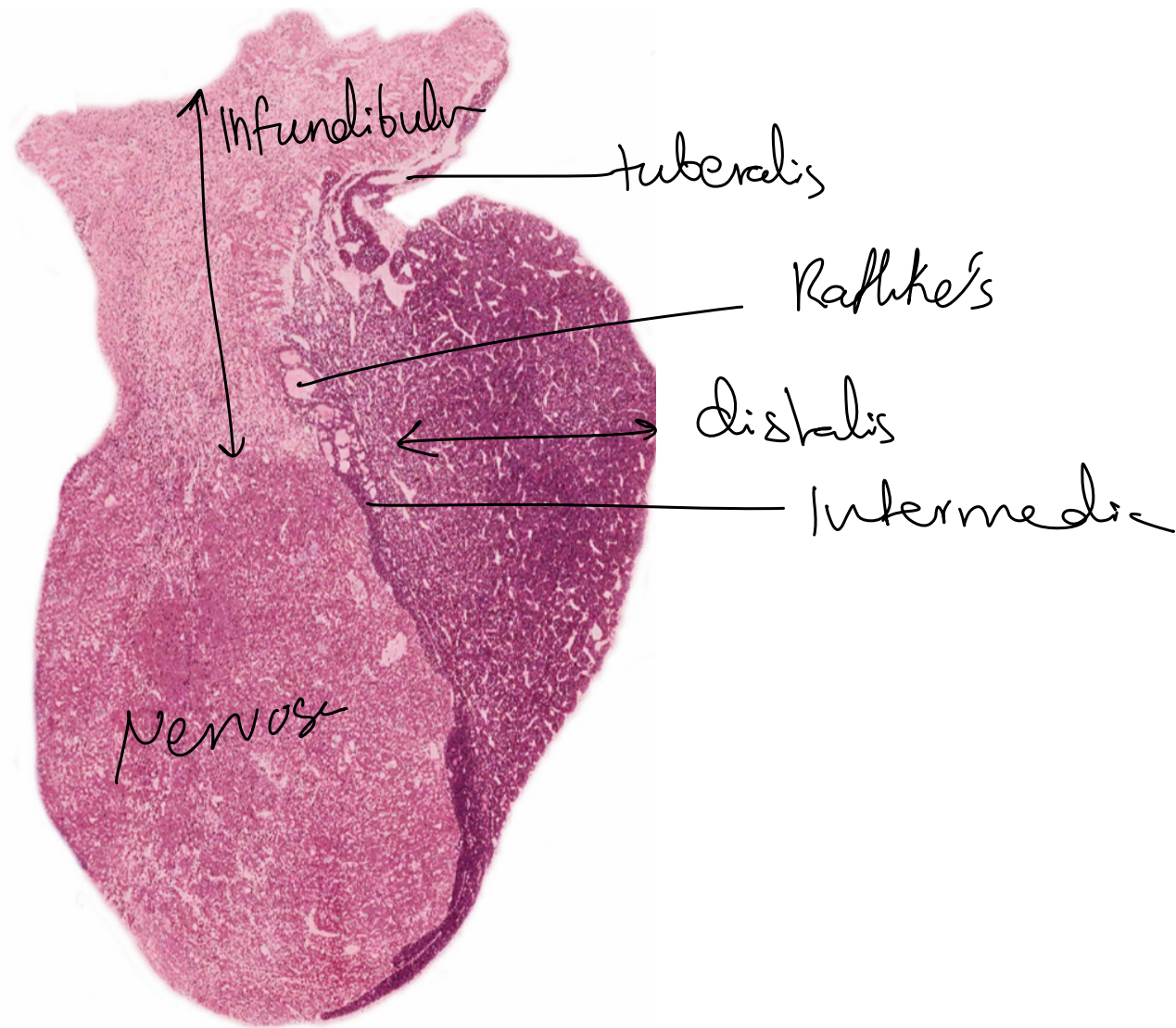
Remnant of Rathke's pouch





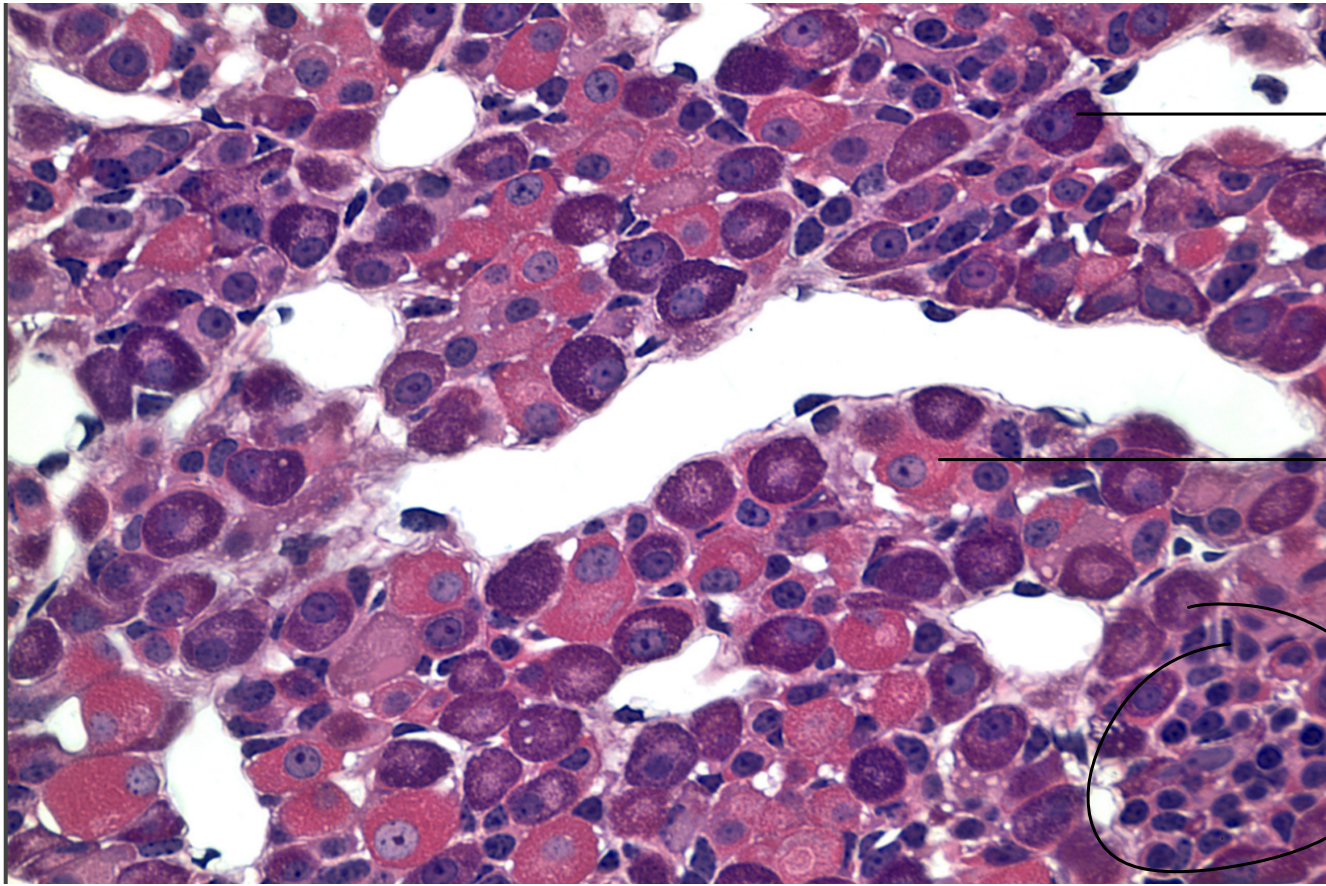
Remnant of
Rathke's pouch
with colloid

- Pars intermedia



Pituitary

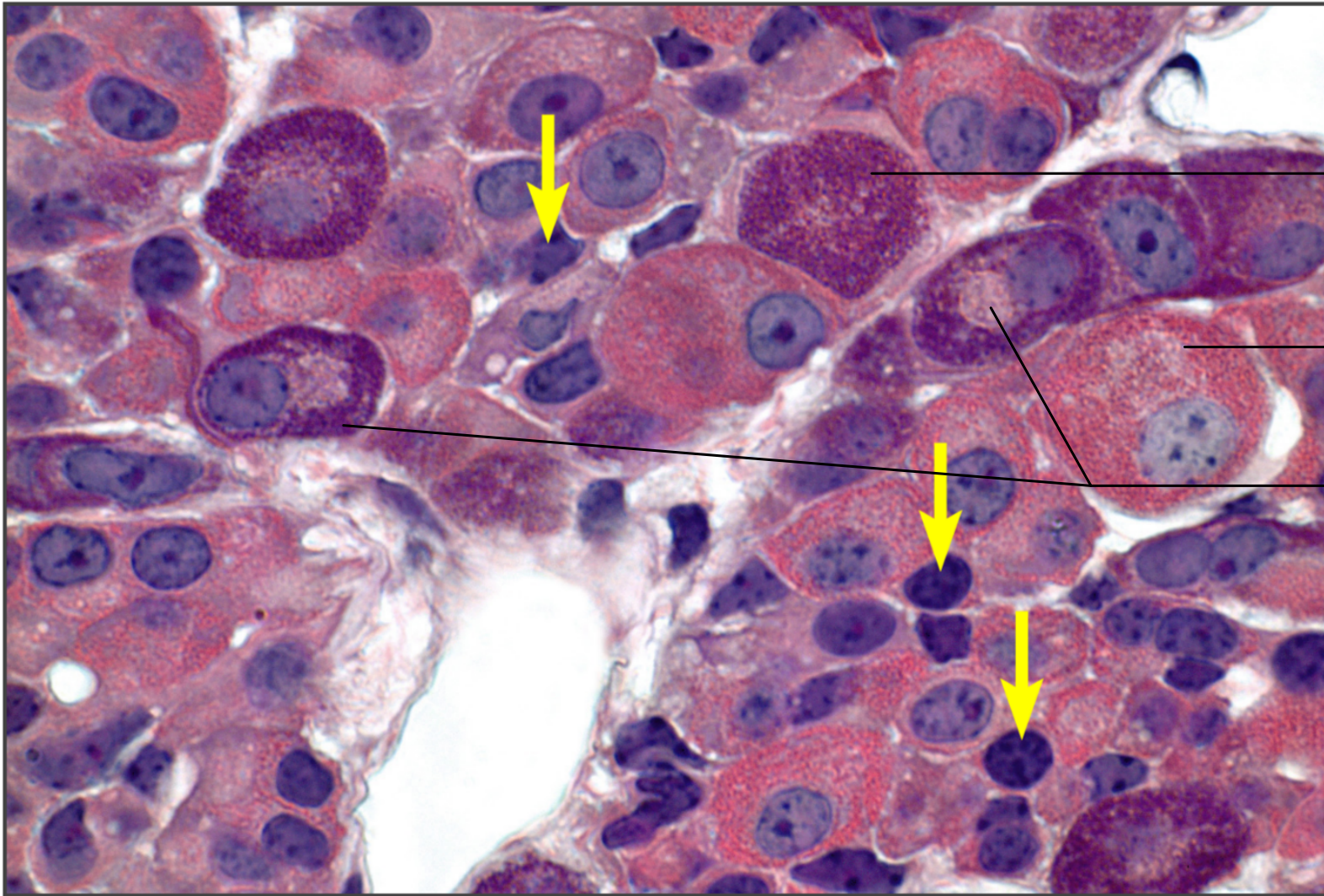
Ant pit - distalis



Baso

Acido

Chromo
phobes

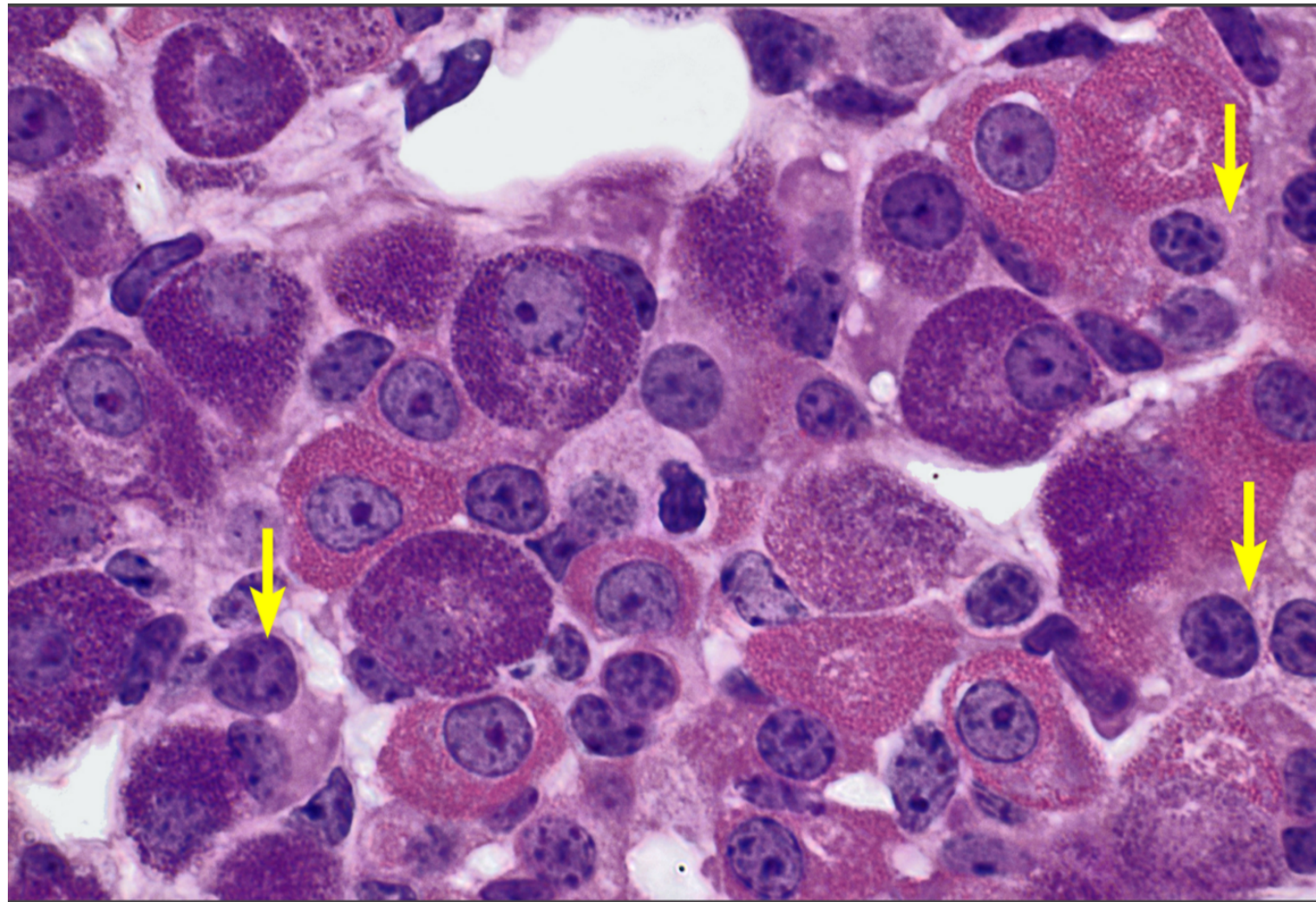


Base

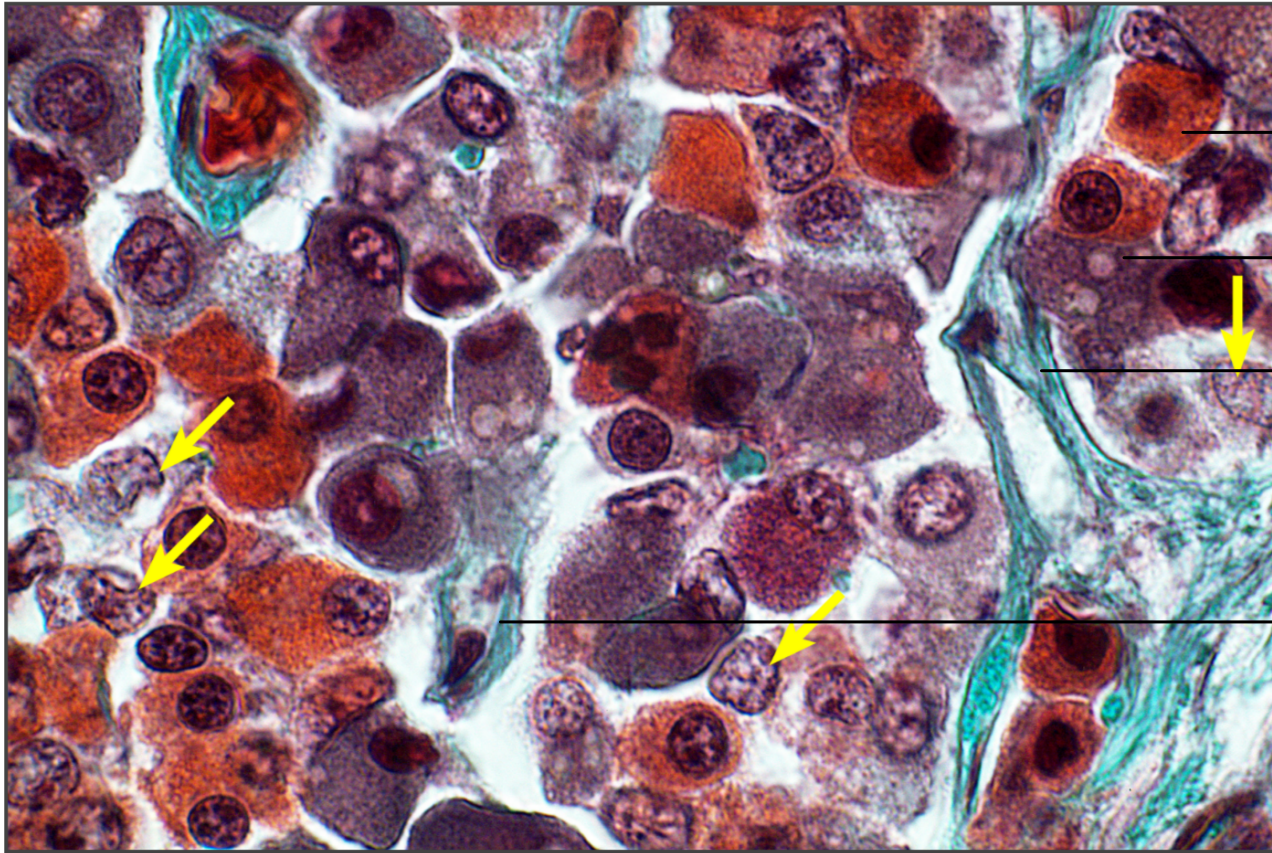
Acido

Golgi

Chromophobes



Chromophobes



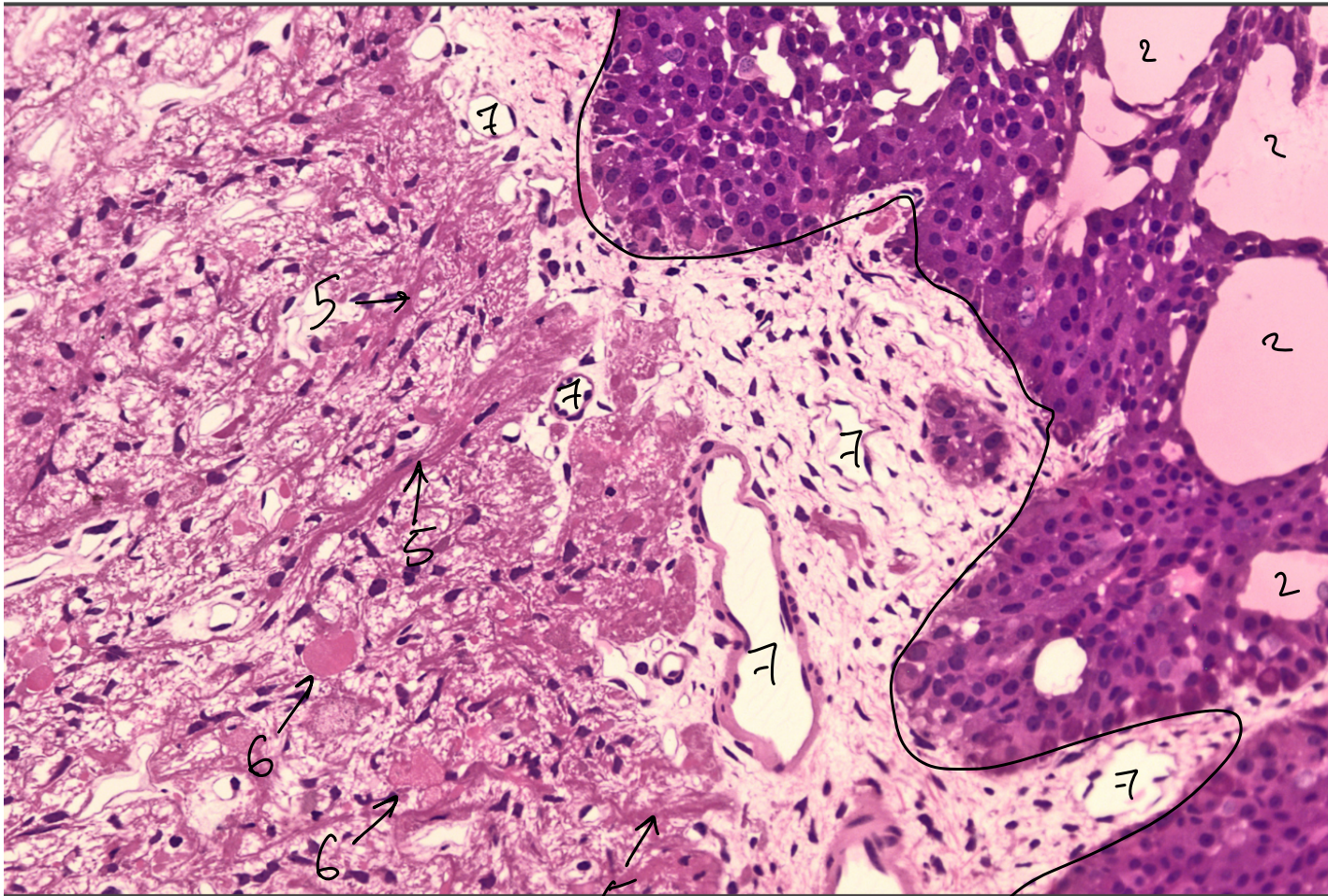
Acido

Baso

Reticular

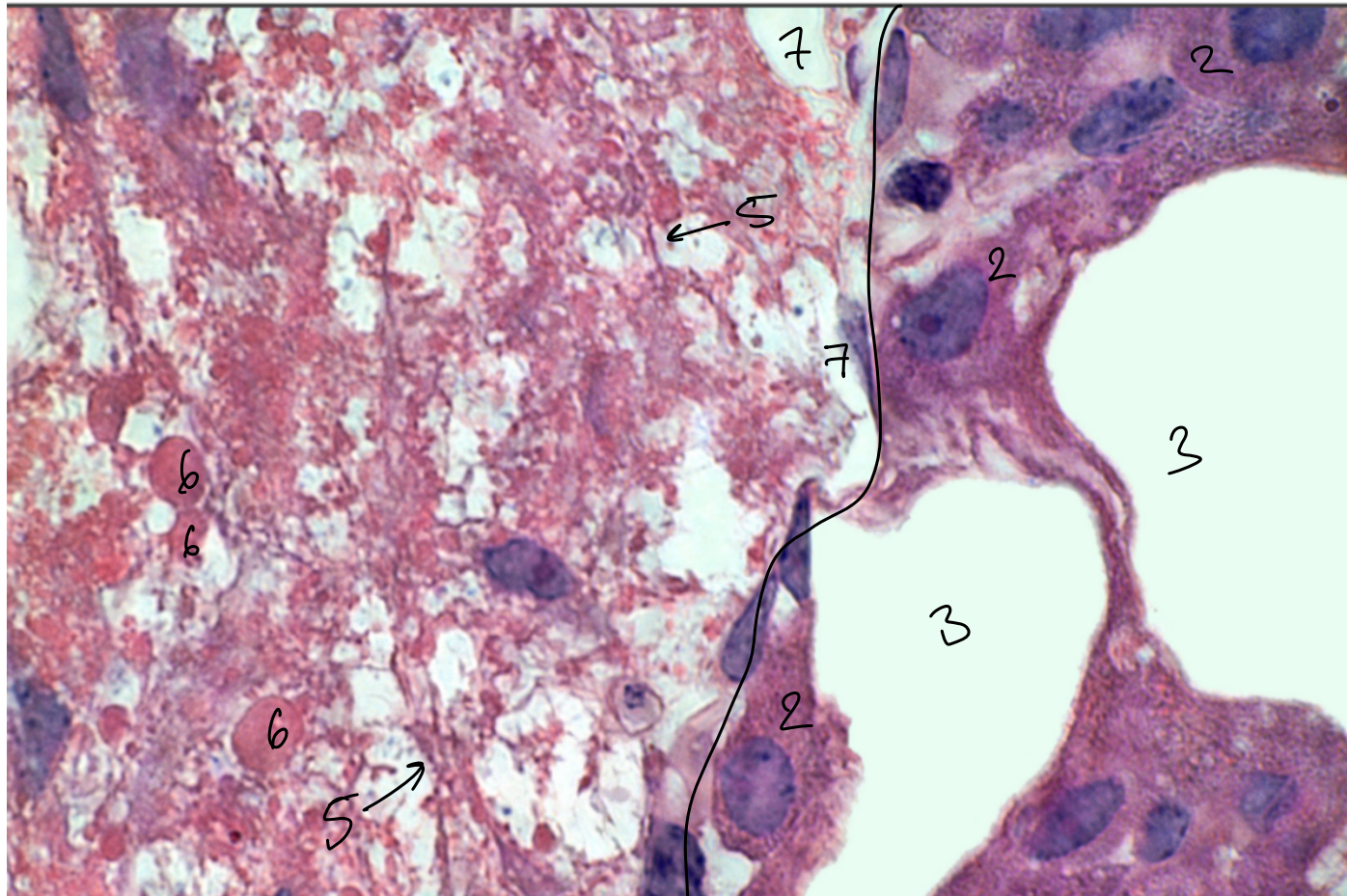
Capillaries

Chromophobes

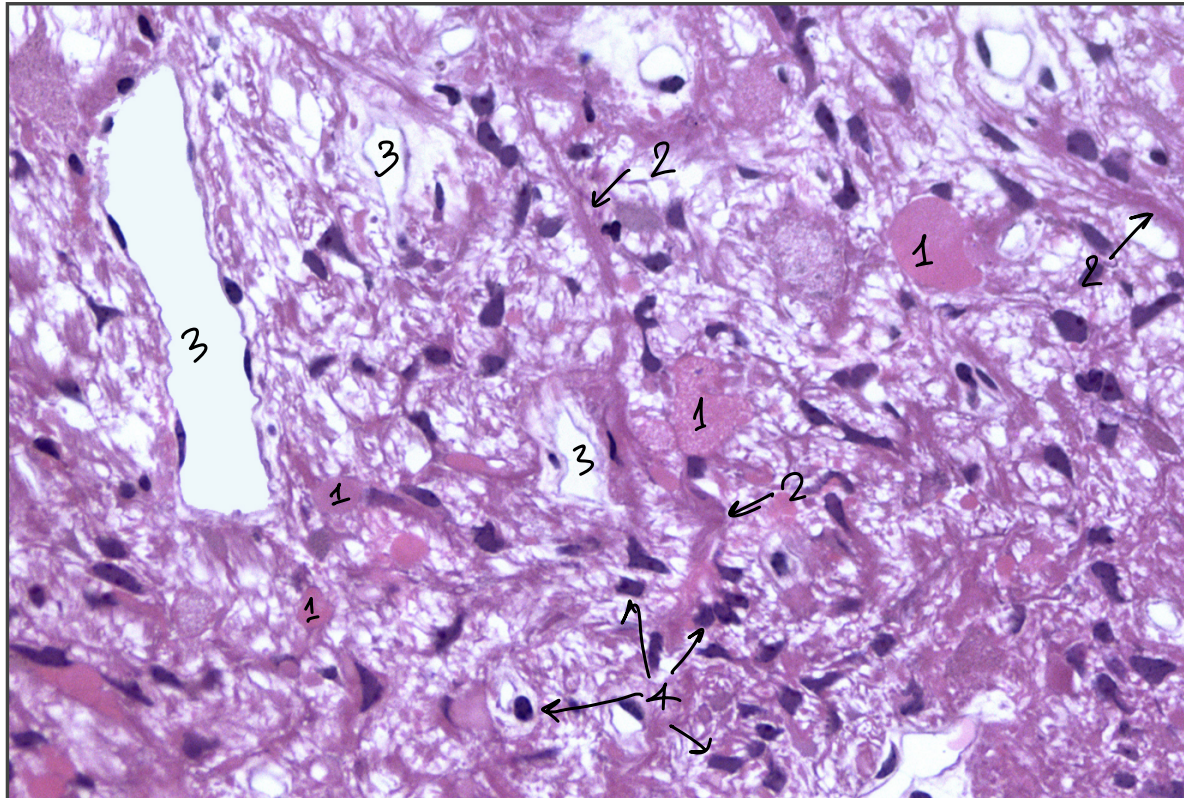


①	Main Slide
②	Cystic remnants of Rathke's pouch
③	Pars intermedia
④	Pars nervosa
⑤	- Axon bundles
⑥	- Herring bodies
⑦	Blood vessels





	Main Slide
1	Pars intermedia
2	- Basophils of the pars intermedia
3	Cystic remnants of Rathke's pouch
4	Pars nervosa
5	- Axons
6	- Herring bodies
7	Capillaries



Pars nervosa

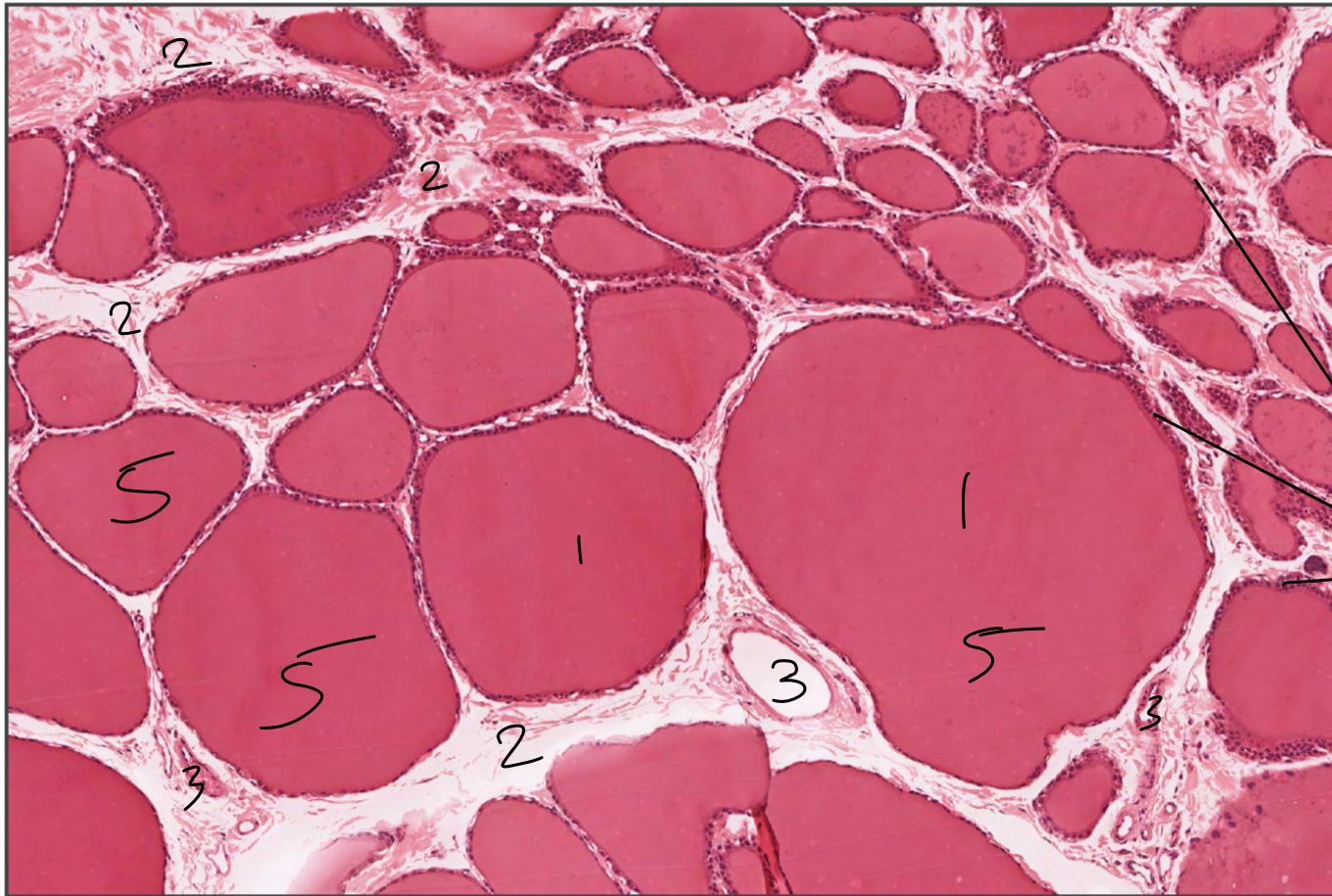
- 1 Herring bodies
- 2 Unmyelinated axons

Main Slide

- 3 Capillaries
- 4 Pituicytes >

Thyroid

Hide



1	- Thyroglobulin
2	Stroma >
3	Blood vessels
4	- Follicular cells
5	Thyroid follicles >

Thyroid gland



- 1 - Thyroglobulin
- 2 Follicles >
- 3 - Follicle (principal) cells >
- Parafollicular (clear) cells >
- Main Slide

Parafollicular (clear) cells >

Parafollicular cells are also referred to as clear cells as the staining of their cytoplasm contrasts with that of the more basophilic-staining cytoplasm of the follicle cells. Parafollicular cells' secretion of calcitonin is both regulated and controlled by blood calcium levels. Parafollicular cells are found in the follicular epithelium as well as in small clusters in the connective tissue between follicles.



- Follicle (principal) cells >

The activity of follicle cells, also referred to as principal cells, is controlled by thyroid stimulating hormone (TSH) secreted by thyrotropes in the adenohypophysis. Active follicle cells have a columnar shape (yellow arrows); inactive cells are squamous (white arrows); intermediate- activity cells are cuboidal (black arrows). Follicle cell activity varies, even within the same follicle.

- Thyroglobulin

Follicles >

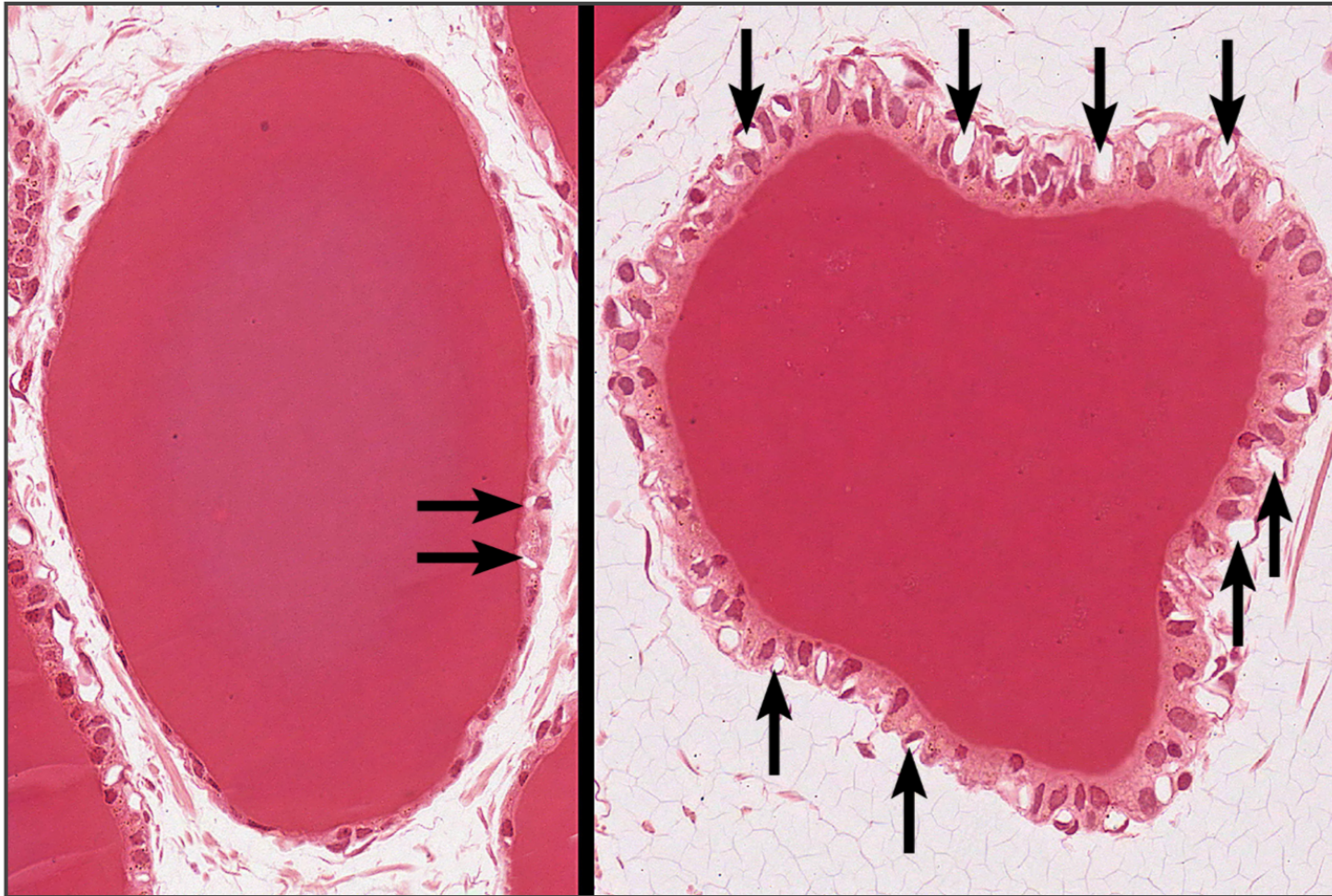
- Follicle (principal) cells >

Parafollicular (clear) cells >

Main Slide

Inactive

Active



Capillaries >

Numerous capillaries are present in the wall of the follicle to receive the T3 and T4 hormones released by the follicle cells. Additionally, these vessels transport thyroid stimulating hormone released by thyrotropes in the pituitary to regulate follicle cell activity.

- Inactive follicle cells

Active follicle

Capillaries >

Inactive follicle

Main Slide

Thyroglobulin >

- Active follicle cells

Squamous

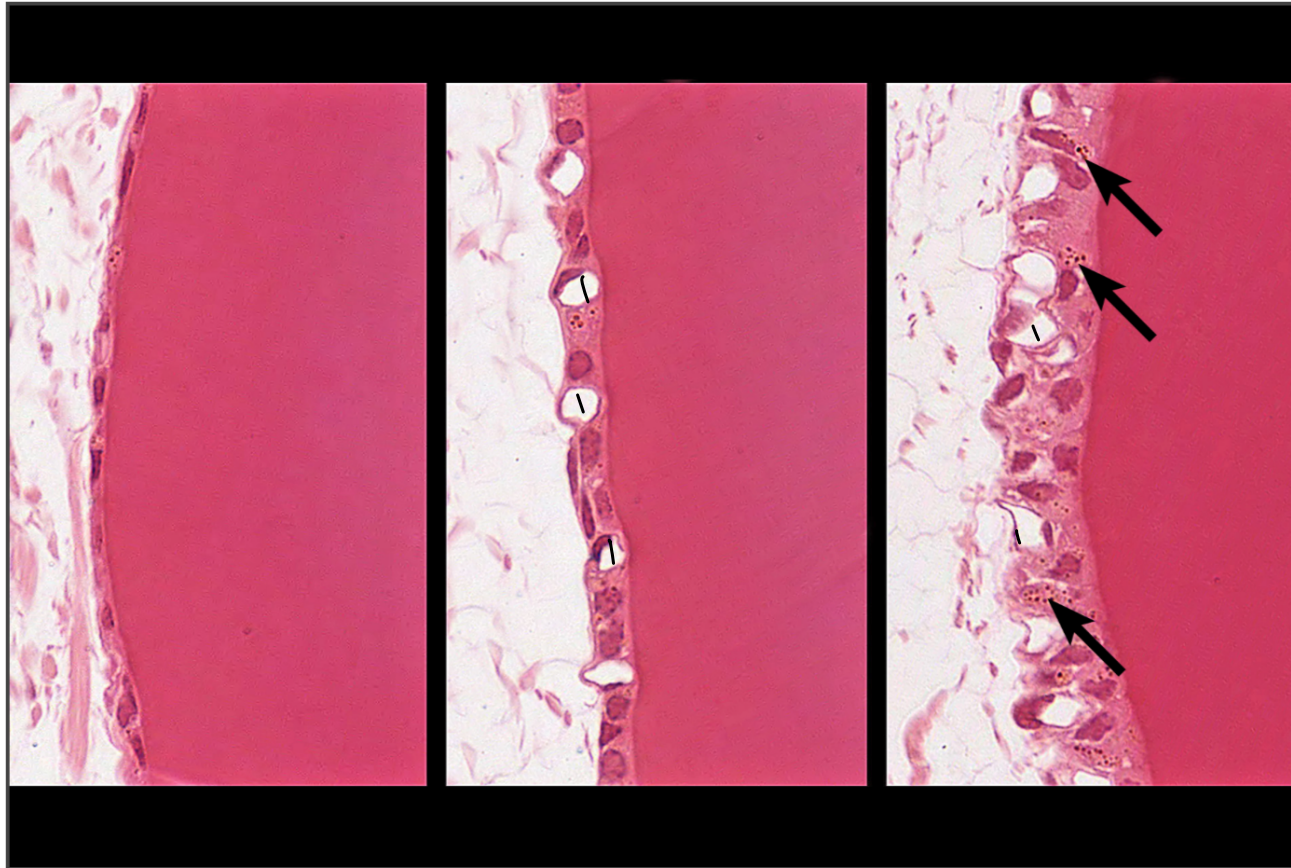
Inactive

~~cuboidal~~

Intermediate

columnar

↑ Activity



Granules

The increased height of the follicle cells results from a greater abundance of synthetic and protein-processing organelles. Also present are granules, which are involved either in the transport and release of thyroglobulin into the lumen or resorption and processing of thyroglobulin to release T3 and T4 into the surrounding capillaries

Inactive follicle cells

Main Slide

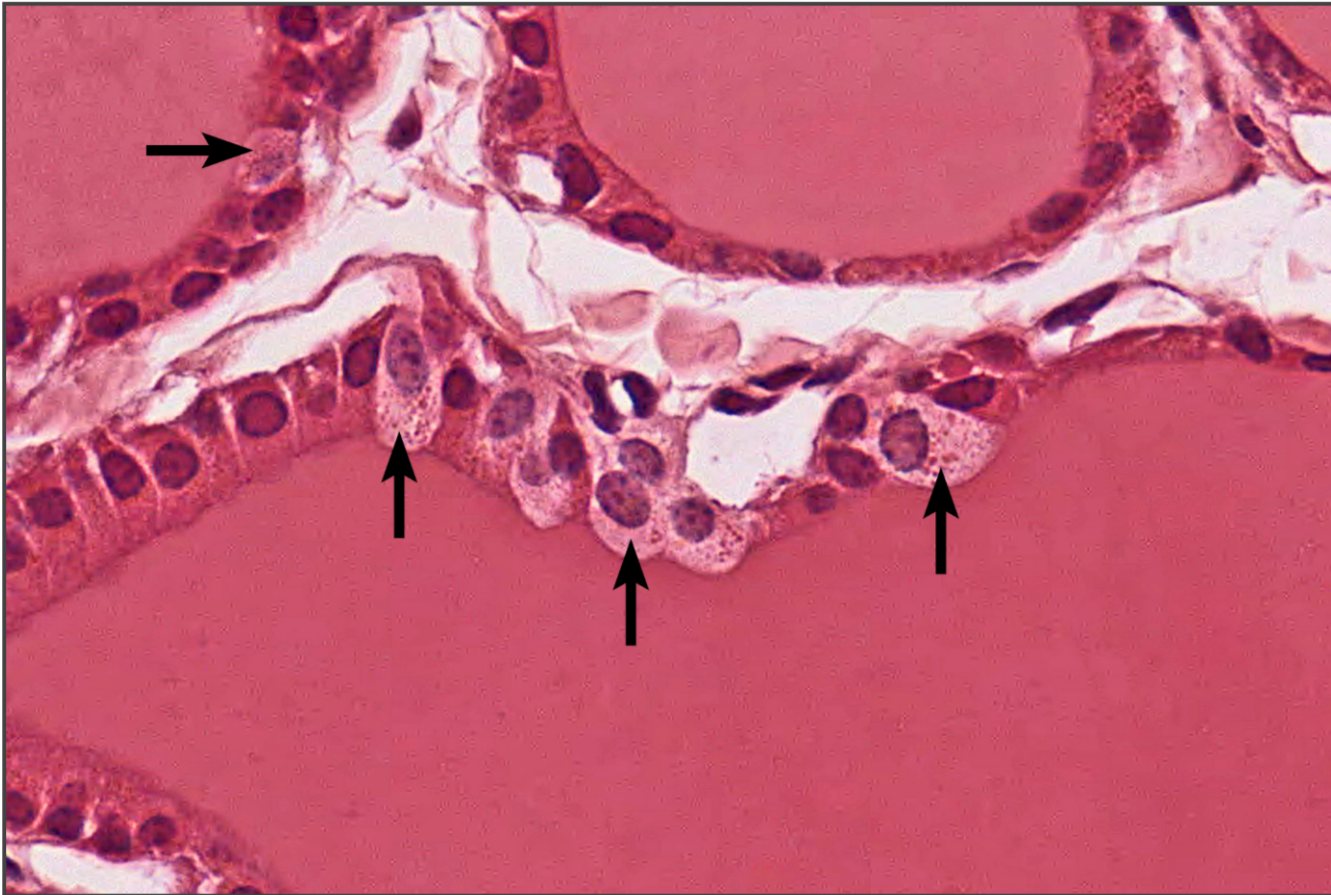
Intermediate activity follicle cells

Active follicle cells >

Thyroglobulin

\ Capillaries >

Granules



Parafollicular cells

Parafollicular cells or C cells are located both in the interfollicular connective tissue and within the basal lamina of the follicular epithelium (seen here). These cells are separated from the thyroglobulin by processes from adjacent follicle cells extending over the parafollicular cells. Parafollicular cells have a pale cytoplasm with secretory granules containing calcitonin. Calcitonin secretion lowers, and is regulated by, blood calcium.

- Secretory granules

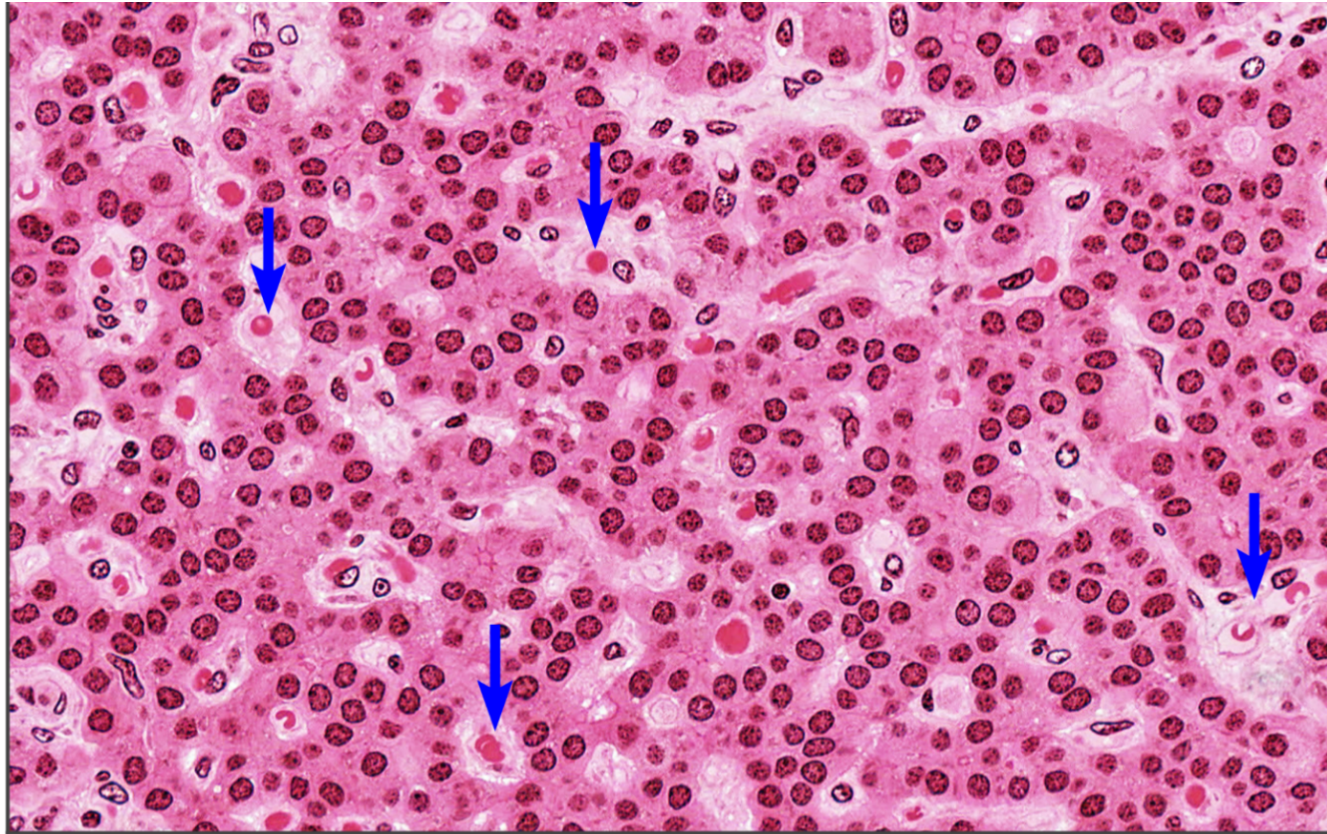
Parafollicular cells

Main Slide

Capillary

Active follicle cells

* Parathyroid



Capillaries

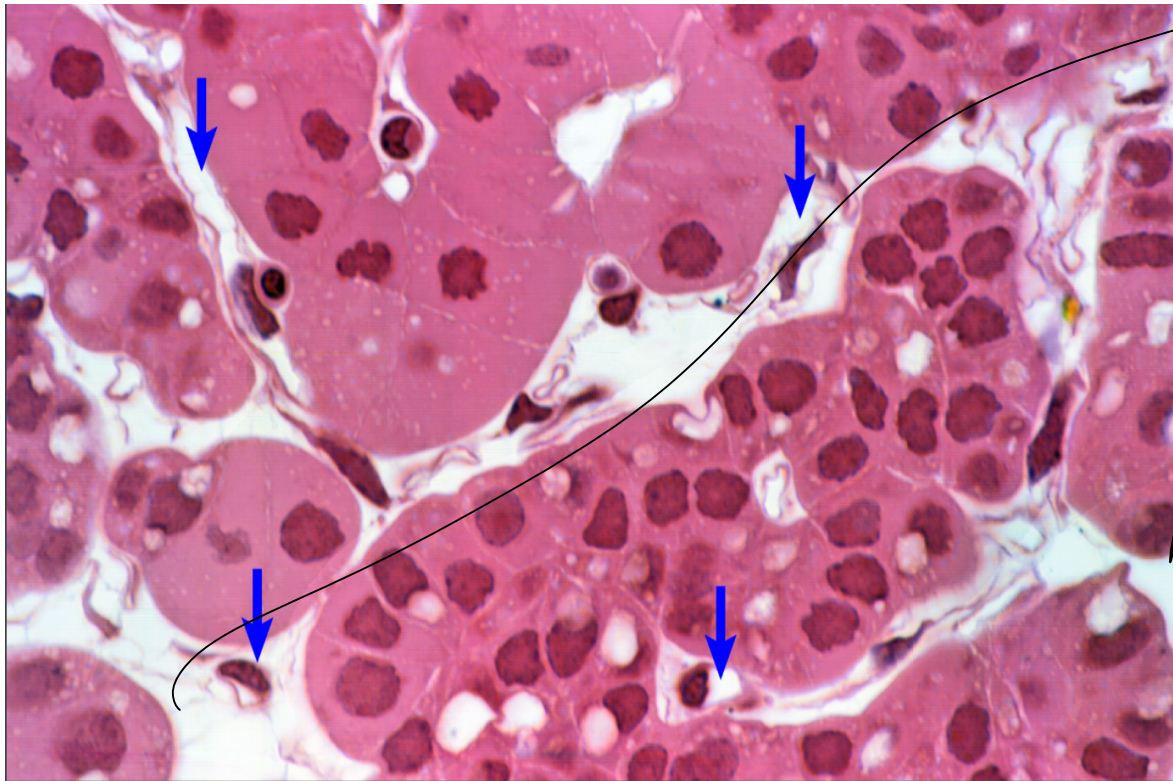
Chief or principal cells secrete parathyroid hormone, which raises the blood calcium level, in part, by indirectly stimulating osteoclasts to mobilize calcium. Parathyroid hormone release is suppressed by a high blood calcium level.

Principal cells >

Main Slide

Capillaries

Oxyphils have
much ↑ cytoplasm

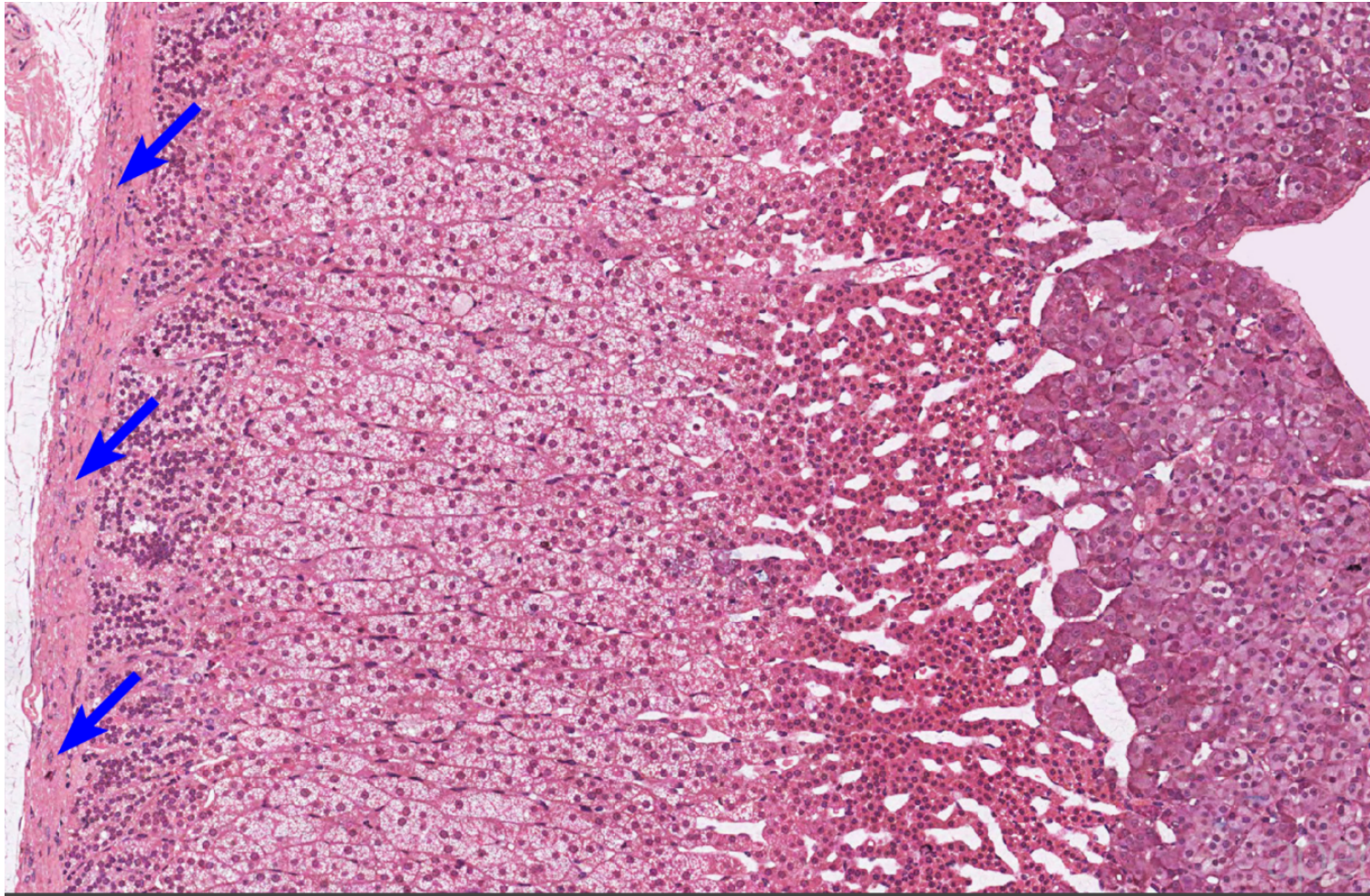


	Capillaries
1	Oxyphil cells
	Main Slide
2	Principal cells

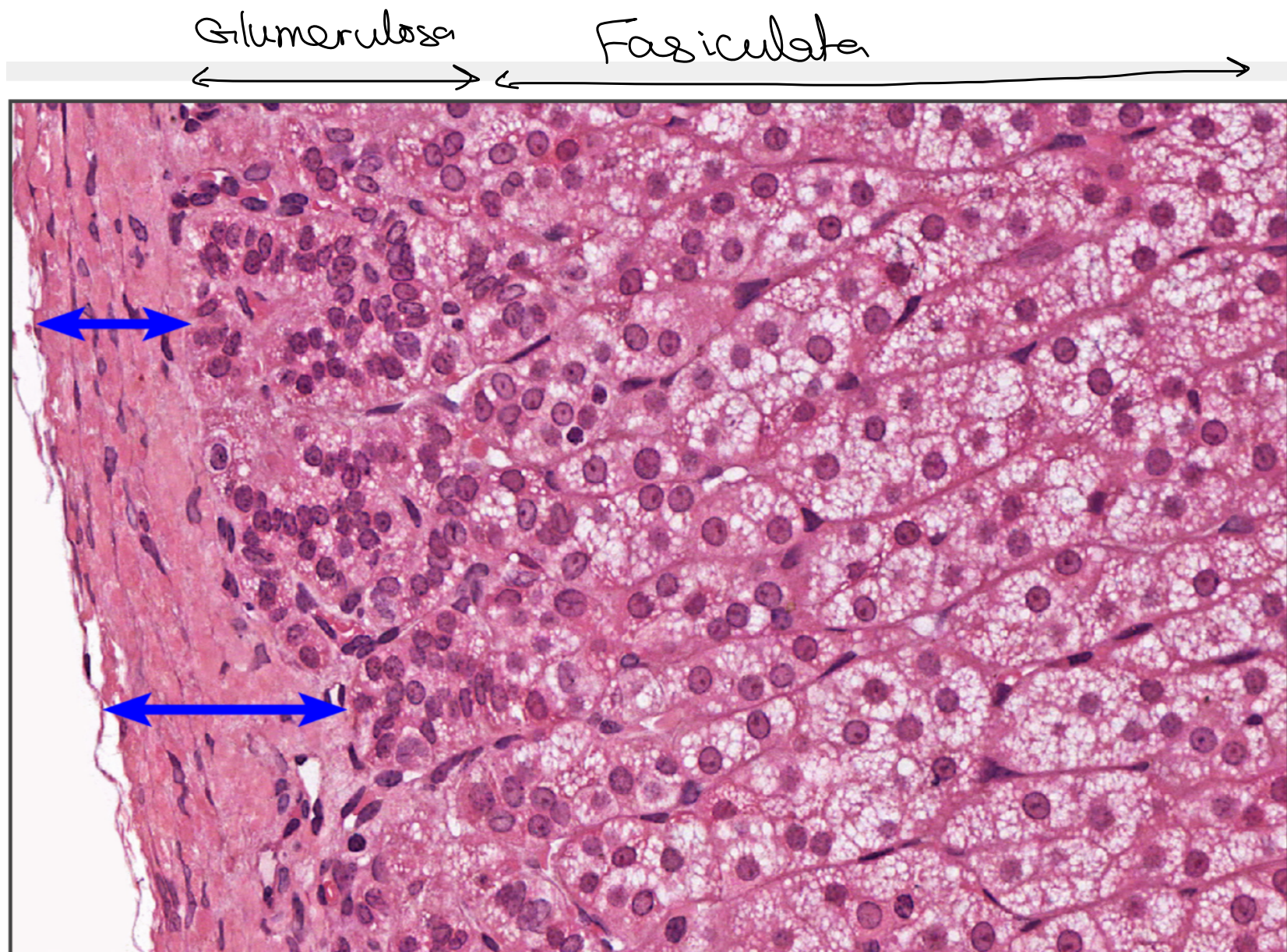
Capillaries

Chief, or principal, cells are small, polygonal cells with centrally located nuclei. Oxyphil cells can be clearly distinguished from the principal cells by their larger size and abundant, eosinophilic cytoplasm. Note the large number of capillaries between the rows of chief and oxyphil cells. 1000x

* Adrenal gland

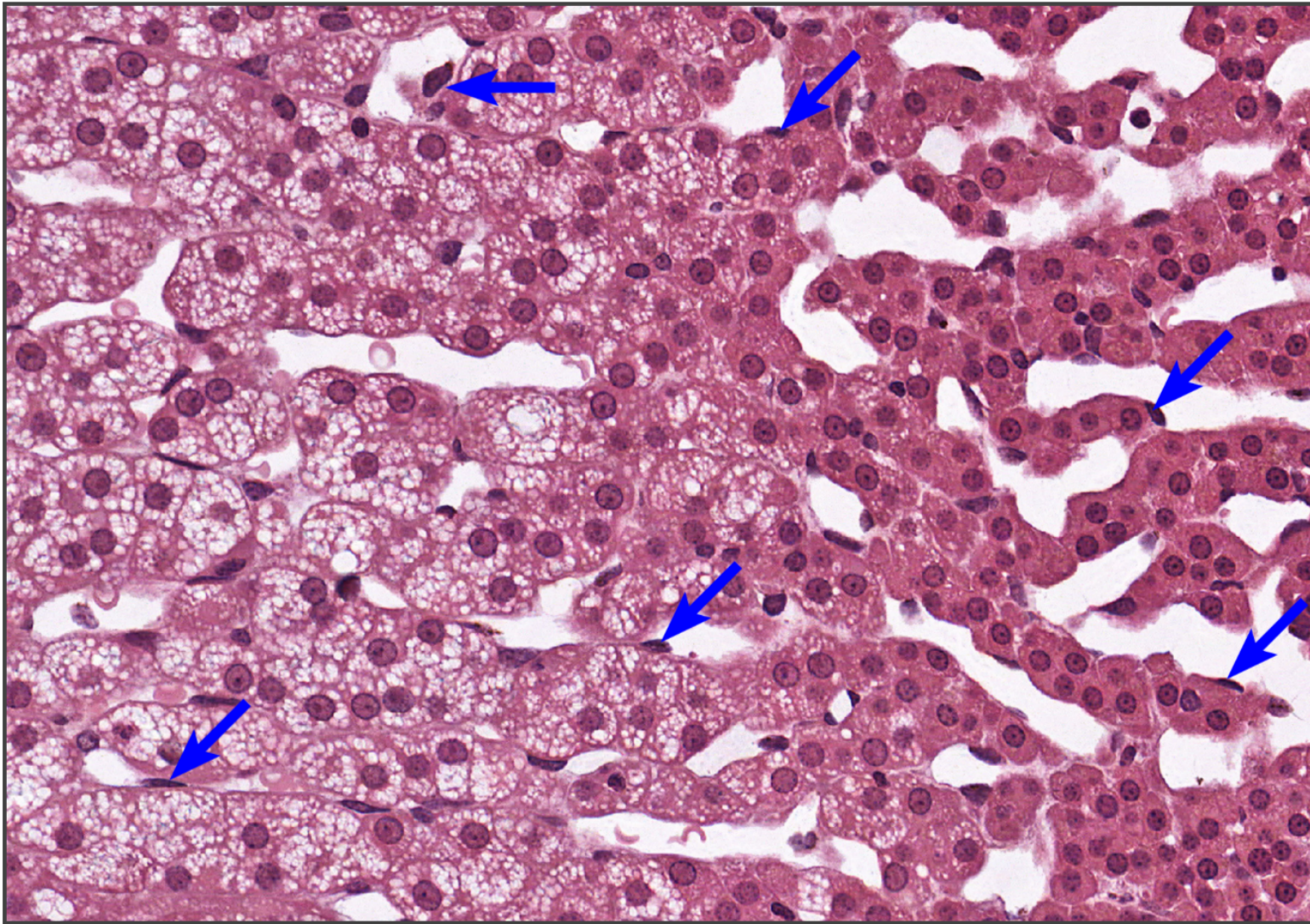


Capsule

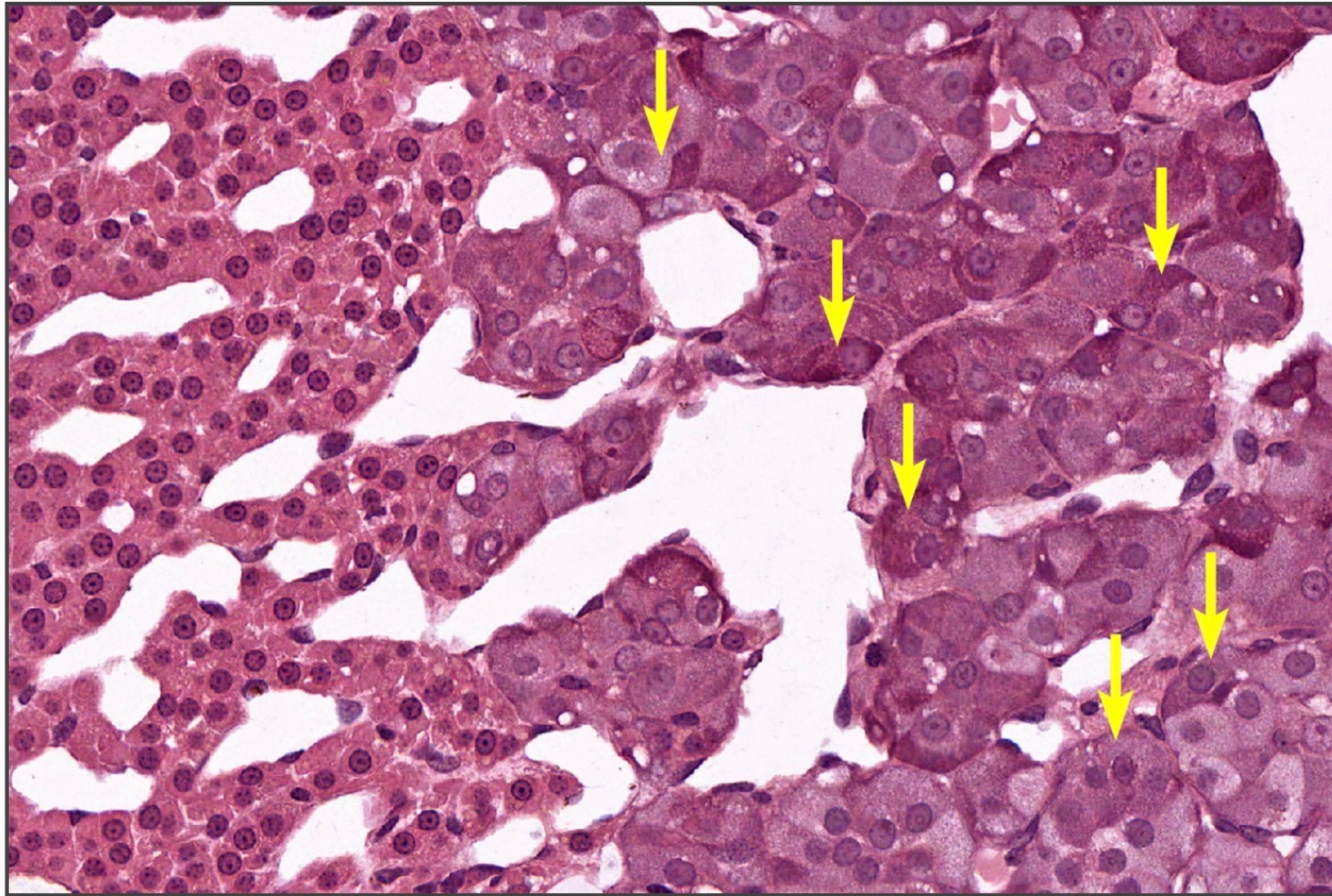


Capsule

Zona glomerulosa is located just beneath the dense, irregular connective tissue capsule and contains round clusters of cells. Zona fasciculata, the middle layer, possesses typical steroid-secreting cells with a vacuolated cytoplasm produced by extraction of lipid during tissue processing. These droplets contain cholesterol and other lipids for steroid hormone synthesis. 400x



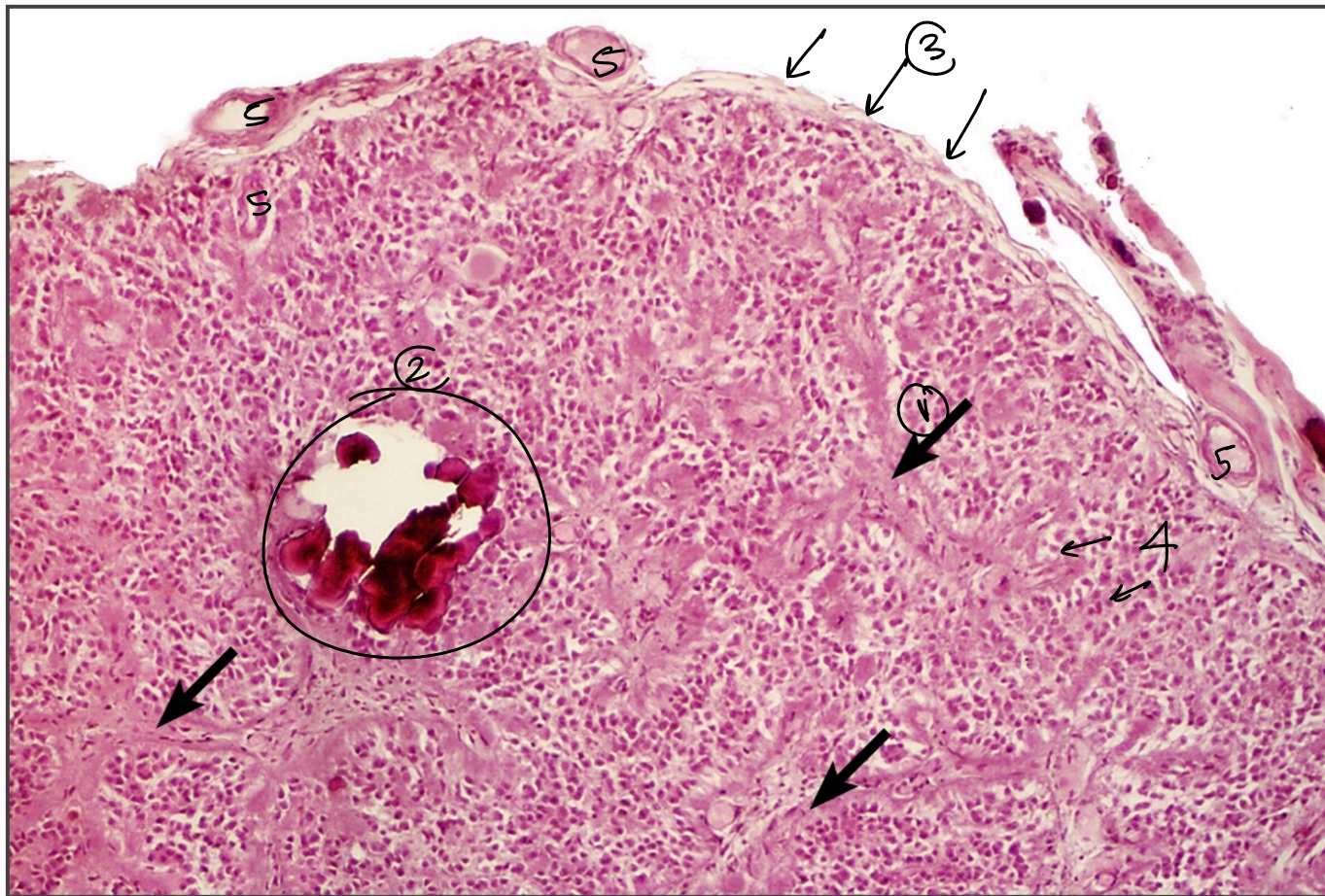
- Endothelial cells



- Chromaffin cells

The interface between zona reticularis and adrenal medulla shows the medulla composed of chromaffin cells, modified sympathetic neurons. Some blood percolates through the cortical zones before entering the medulla. By this circulatory pattern, glucocorticoids influence norepinephrine synthesis in the chromaffin cells. 400x

→ Pineal gland: Neuroectoderm (roof of 3rd ventricle - diencephalon)



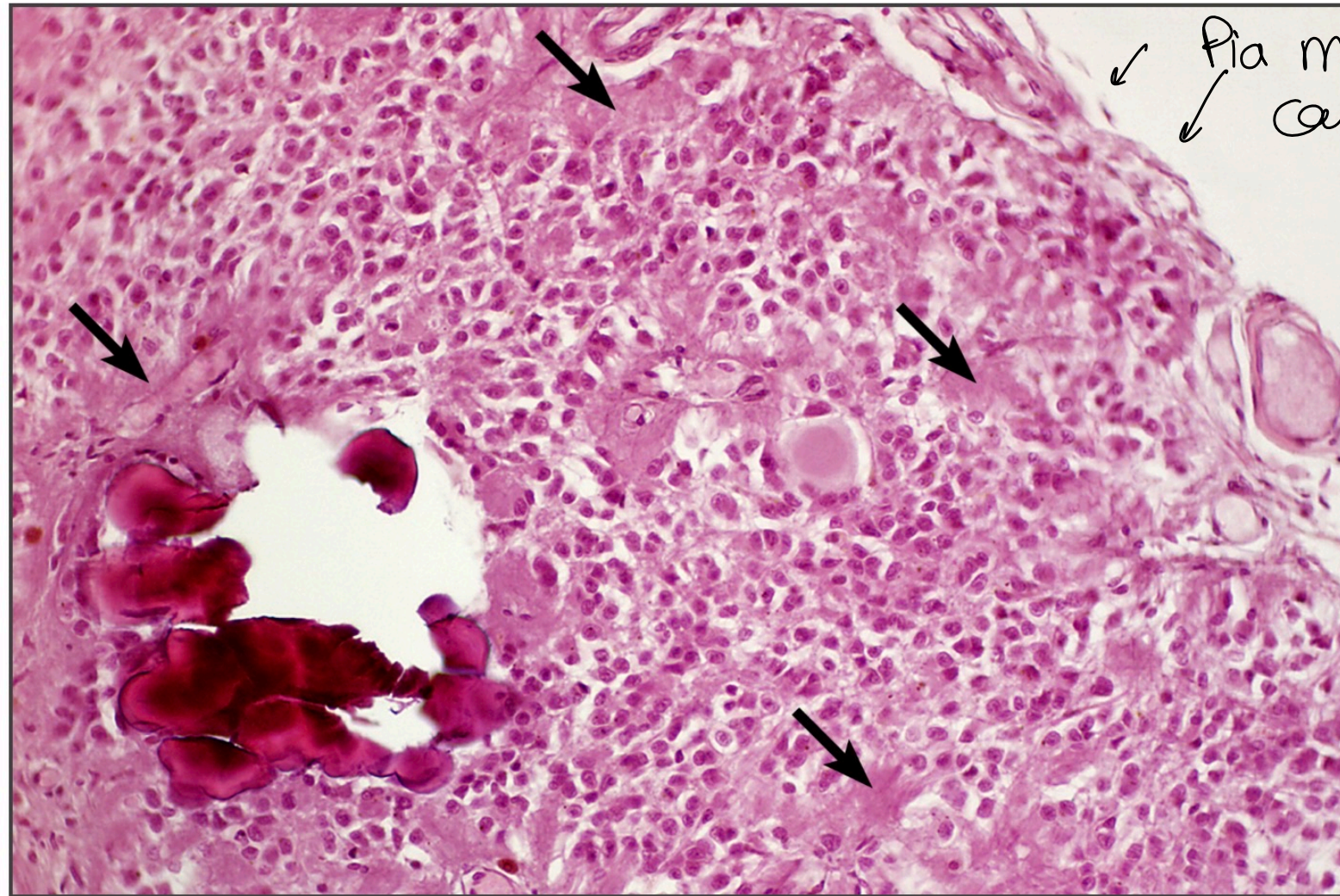
①	Connective tissue septa
	Main Slide
②	Corpus arenaceum >
③	Capsule
④	Pinealocytes >
⑤	Blood vessels

The major cells
(modified neurone)

↓
melatonin

Connective tissue septa

The conical-shaped pineal gland, or epiphysis cerebri, is attached by the pineal stalk to the roof of the diencephalon of the brain, from which it develops. The gland is surrounded by a capsule of pia mater and arachnoid elements; connective tissue septa penetrate the gland, subdividing it into indistinct lobules. The pineal secretes melatonin, which regulates circadian rhythms. 100x.



Pia matter
capsule

Connective tissue septa