

Mustansiriyah University

College of science

Biology Dept.

Zoology

4th class

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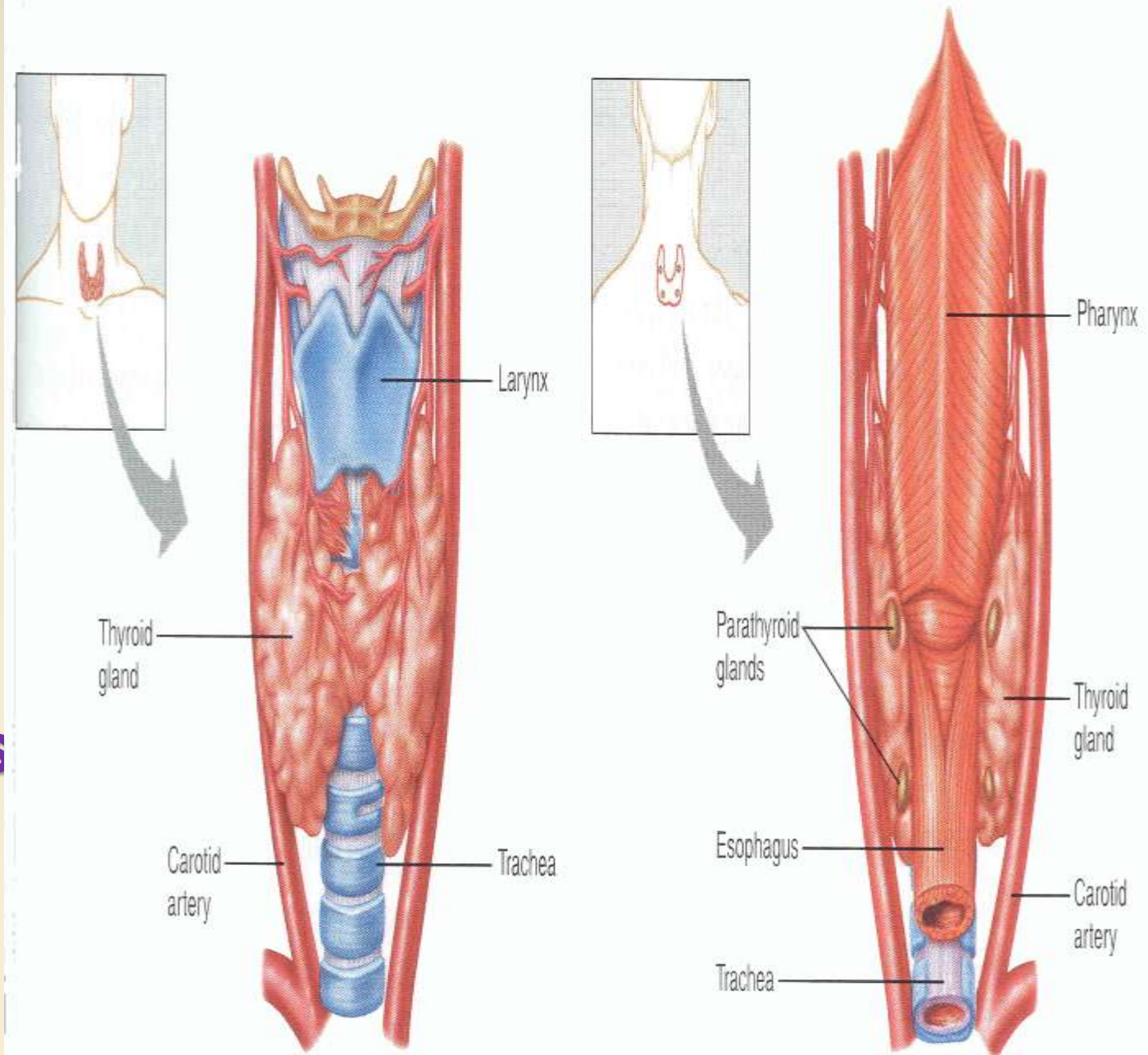
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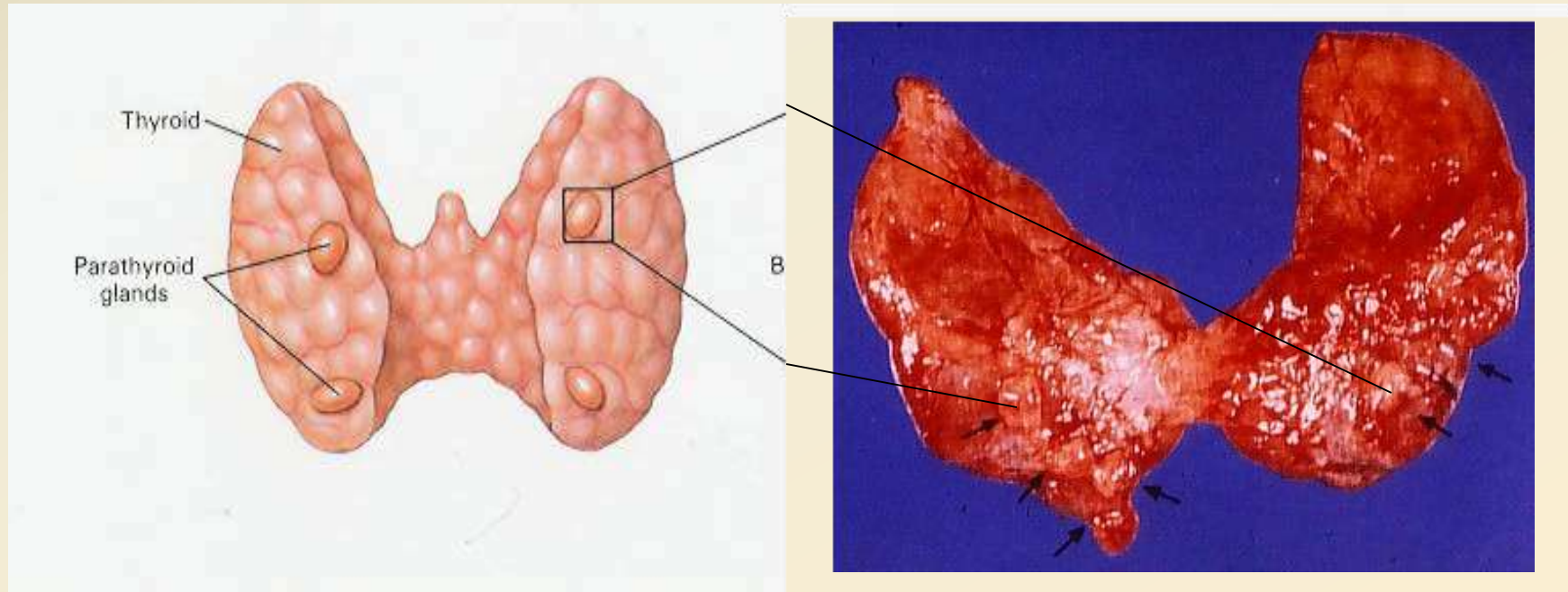
NAME :

Parathyroid glands

1. Usually four – two on each side
2. Lie on the posterior surface of thyroid
3. May be embedded within thyroid gland
4. Regulate calcium/phosphate levels
5. Required for life

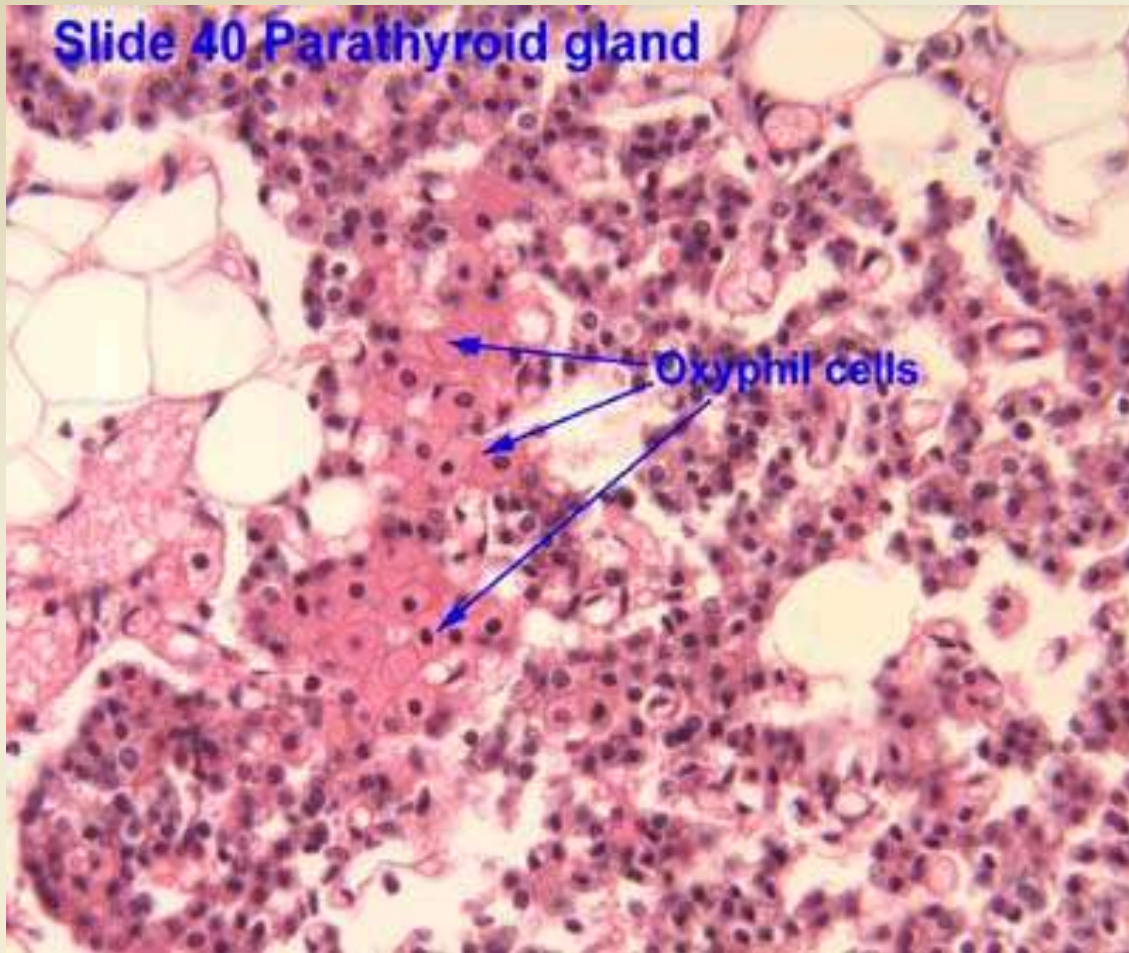


Parathyroid Glands (Post. view of thyroid)



Parathyroid Glands are located on the posterior aspect of the thyroid; sometimes the tissue is embedded within thyroid tissue.

Histology



- 50/50 parenchymal cells, stromal fat
- Chief cells – secrete PTH
- Waterclear cells
- Oxyphil cells

Histology of the Thyroid Gland

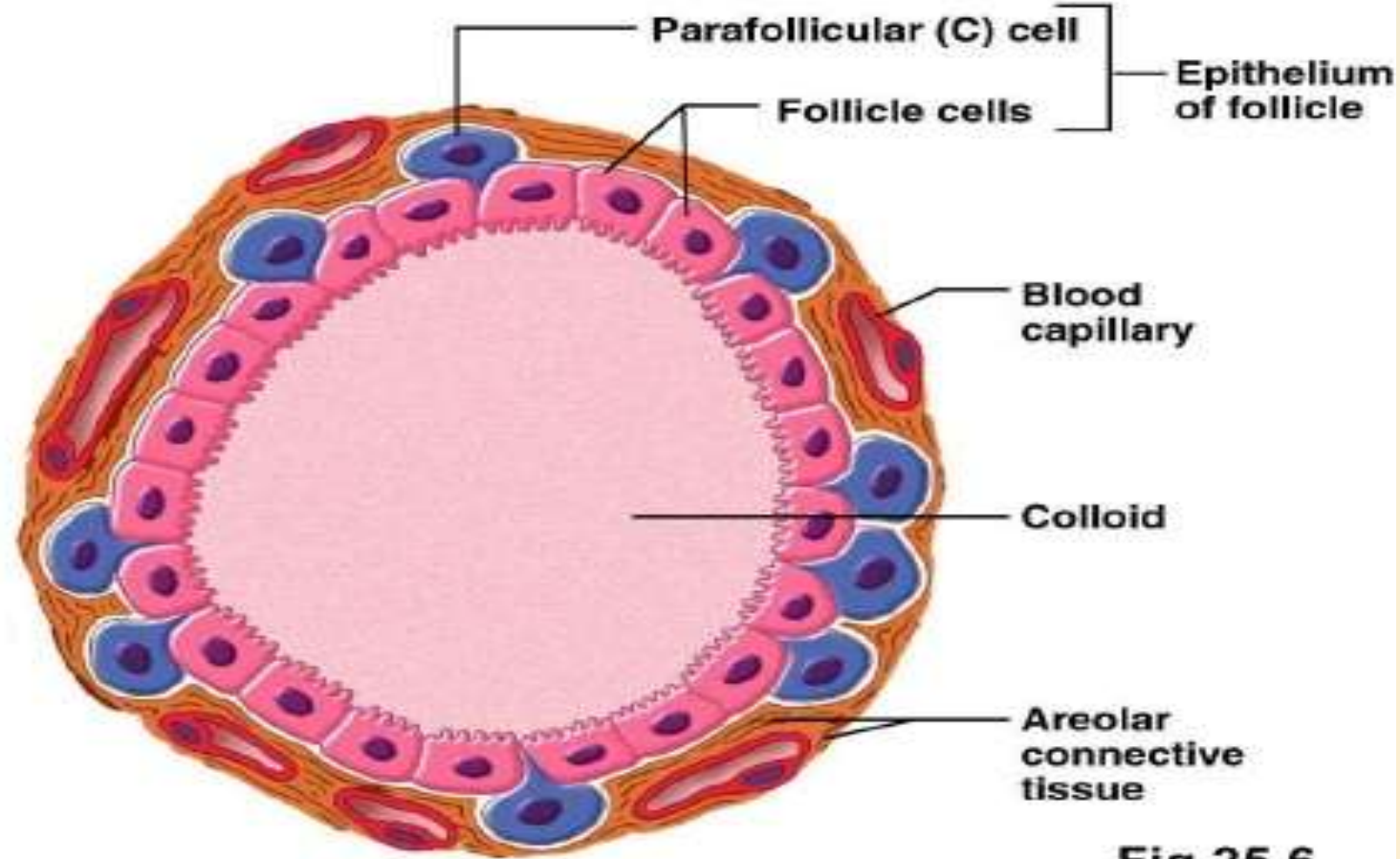
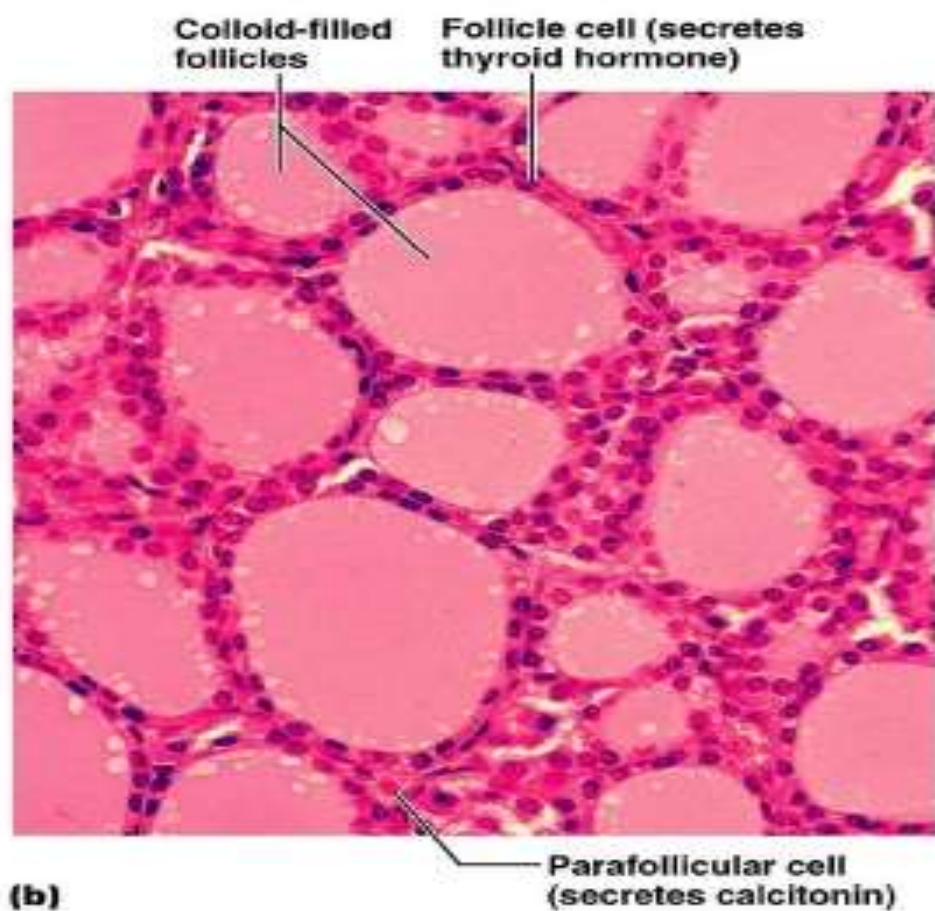
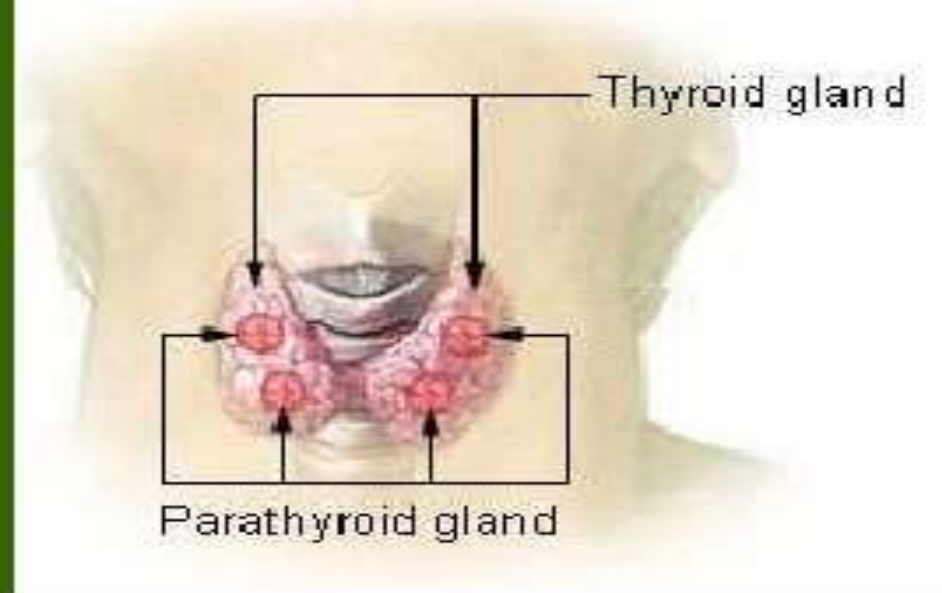


Fig 25.6

- Follicle cells continuously synthesize thyroglobulin and secrete it into the follicle lumen for iodination and storage
- TSH (pituitary gland) signals the follicle cells to release TH

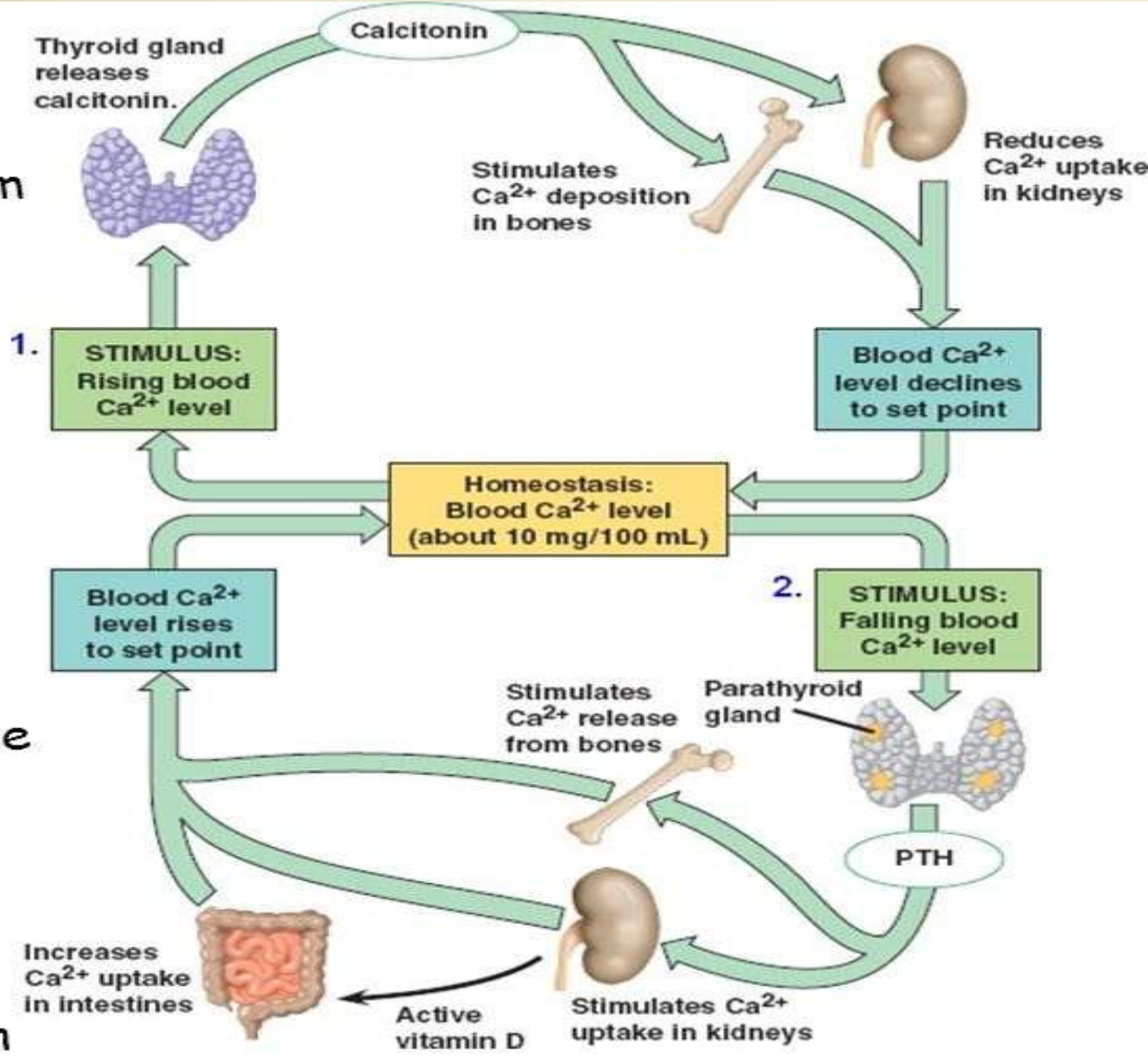
Parathyroid Hormone

- Released by the cells of the parathyroid gland in response to low blood $[Ca^{2+}]$. Causes blood $[Ca^{2+}]$ to increase.
- PTH will bind to osteoblasts and this will cause 2 things to occur:
 - The osteoblasts will decrease their activity and they will release a chemical known as *osteoclast-stimulating factor*.
 - Osteoclast-stimulating factor will increase osteoclast activity.
- PTH increases calcitriol synthesis which increases Ca^{2+} absorption in the small intestine.
- PTH decreases urinary Ca^{2+} excretion and increases urinary phosphate excretion.



Feedback Loop

- Negative feedback in calcium homeostasis. A rise in blood Ca^{2+} causes release of calcitonin from the thyroid gland, promoting Ca^{2+} deposition in bone and reducing reabsorption in kidneys.
- A drop in blood Ca^{2+} causes the parathyroid gland to produce parathyroid hormone (PTH), stimulating the release of Ca^{2+} from bone.
- PTH also promotes reabsorption of Ca^{2+} in kidneys and uptake of Ca^{2+} in intestines.





Hyperparathyroidism

- Presence of tumours (adenomas) in the one or more parathyroid glands
- Parathyroid glands regulate the metabolism of calcium via action of parathyroid hormone (PTH)
- ↑ Secretion of PTH leads to hypercalcaemia, loss of calcium from bone, hypercalciuria and renal calculi
- Most cases have no symptoms