

Ass.Prof. Noura Bakr



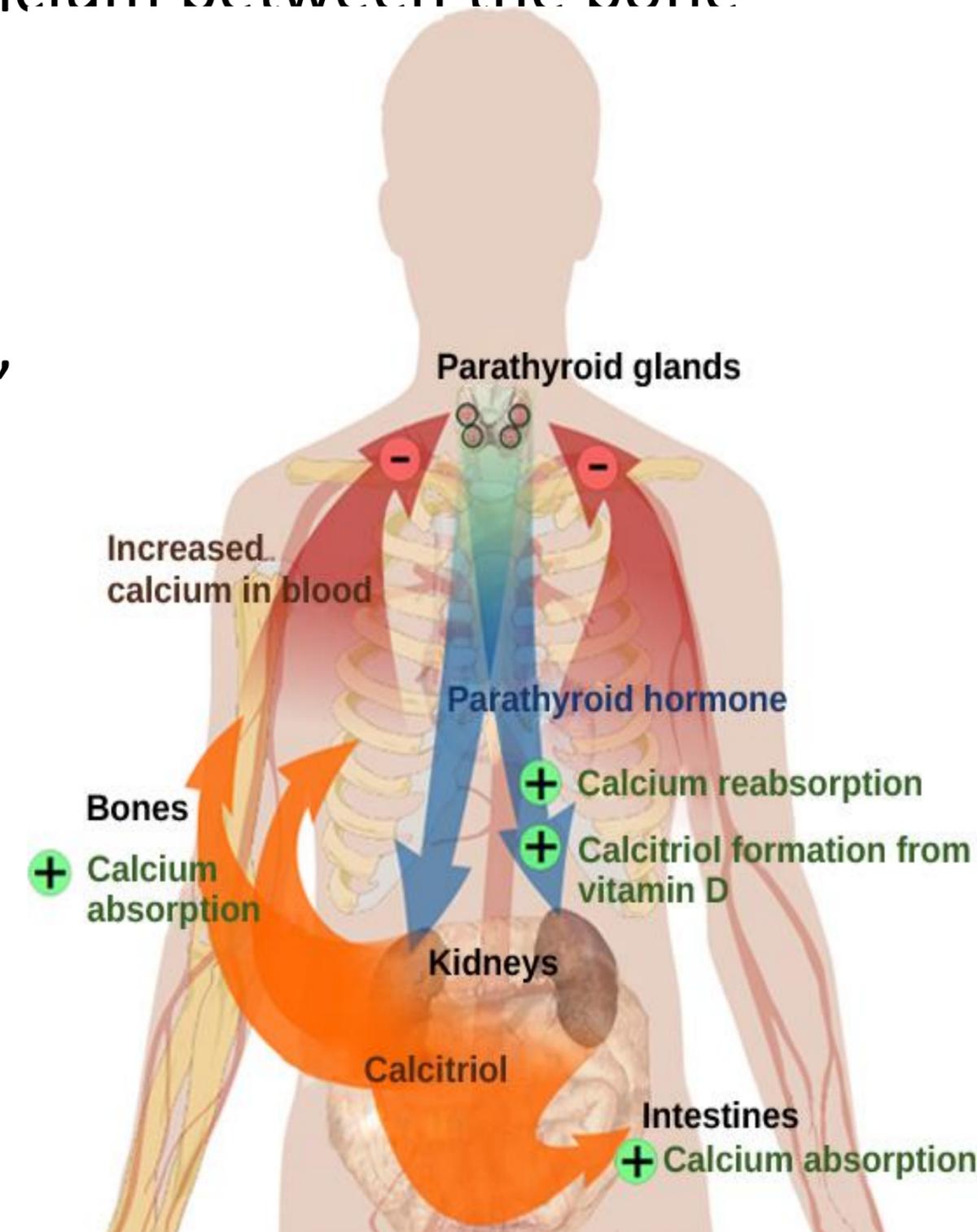
BONE & Calcium metabolism



Hormonal Regulation

➤ Three primary hormones regulate the exchange of calcium between the bone and the blood: PTH, Calcitonin, vitamin D (calcitriol)

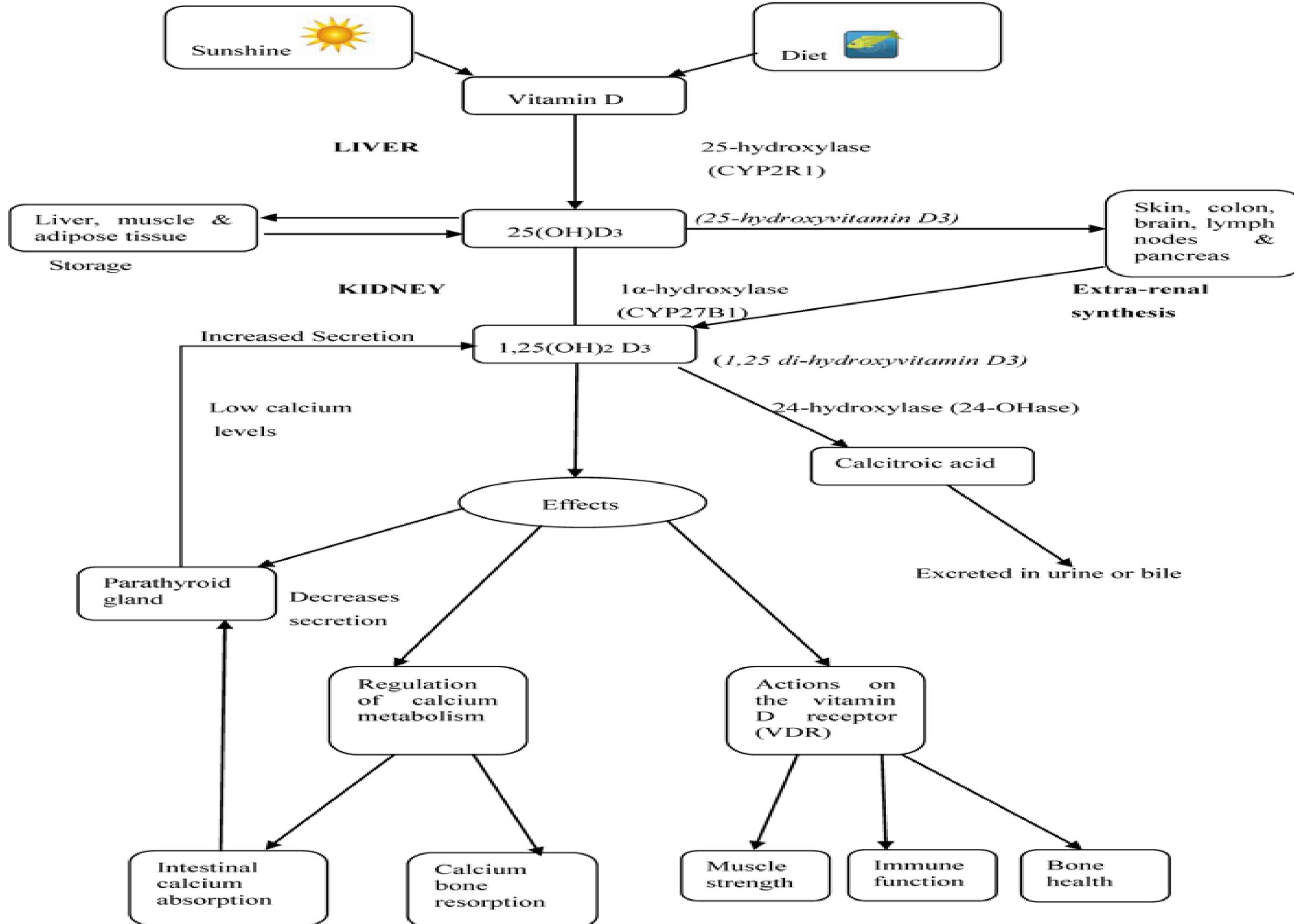
➤ Organs regulate calcium metabolism: bone, PT gland, kidney and intestine



Vitamin D

- is a hormone essential for calcium absorption and bone mineralization
- prolonged and severe vitamin D deficiency leads to rickets in children and osteomalacia in adults ("imperfect calcification" **bone demineralization** associated with defect in muscle function and inflammation)
- Vitamin D deficiency leads to **decreased calcium absorption** and ultimately the **release of calcium from the bones** in order to **maintain circulating calcium** concentrations.



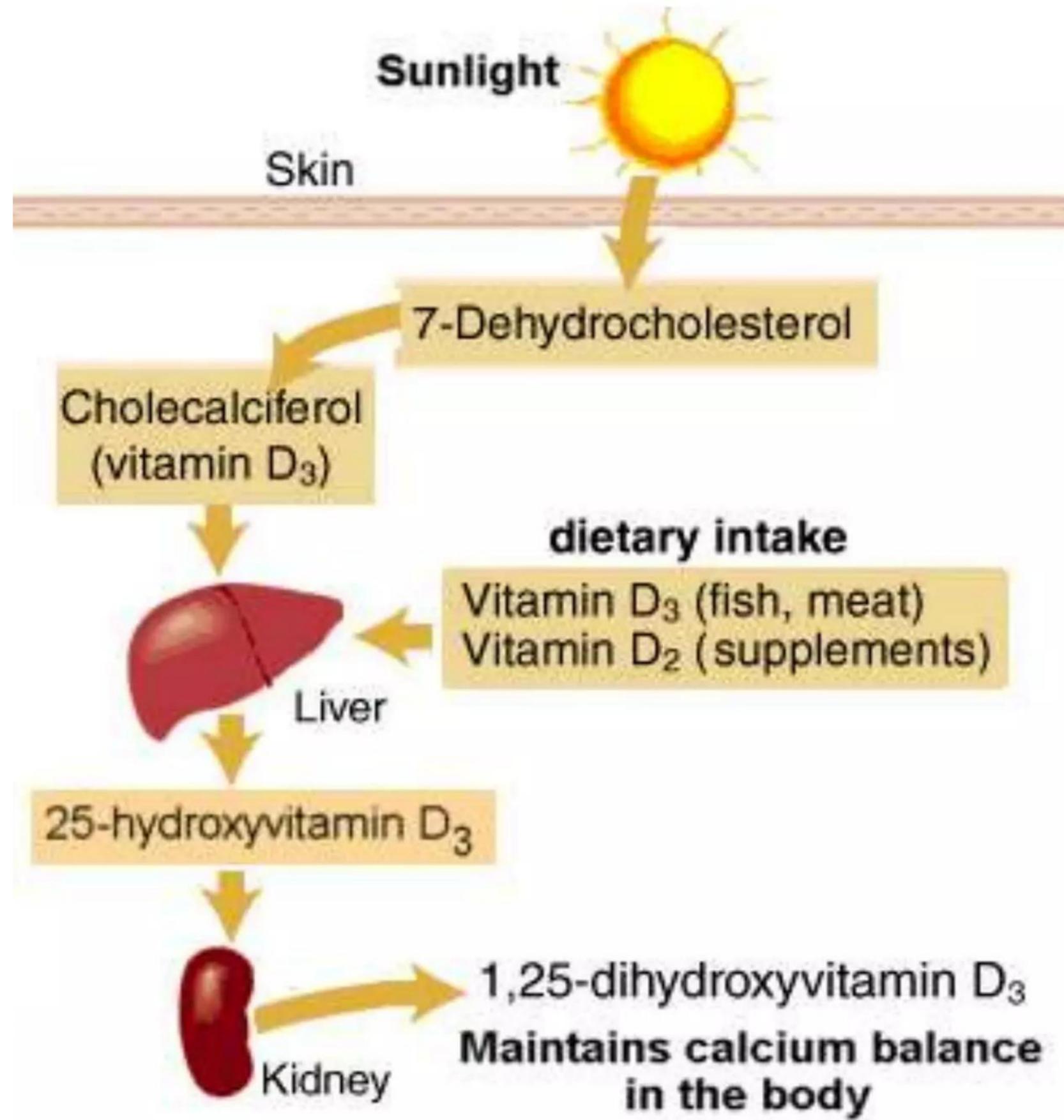


Vitamin D undergoes several transformations in the body before it becomes active:

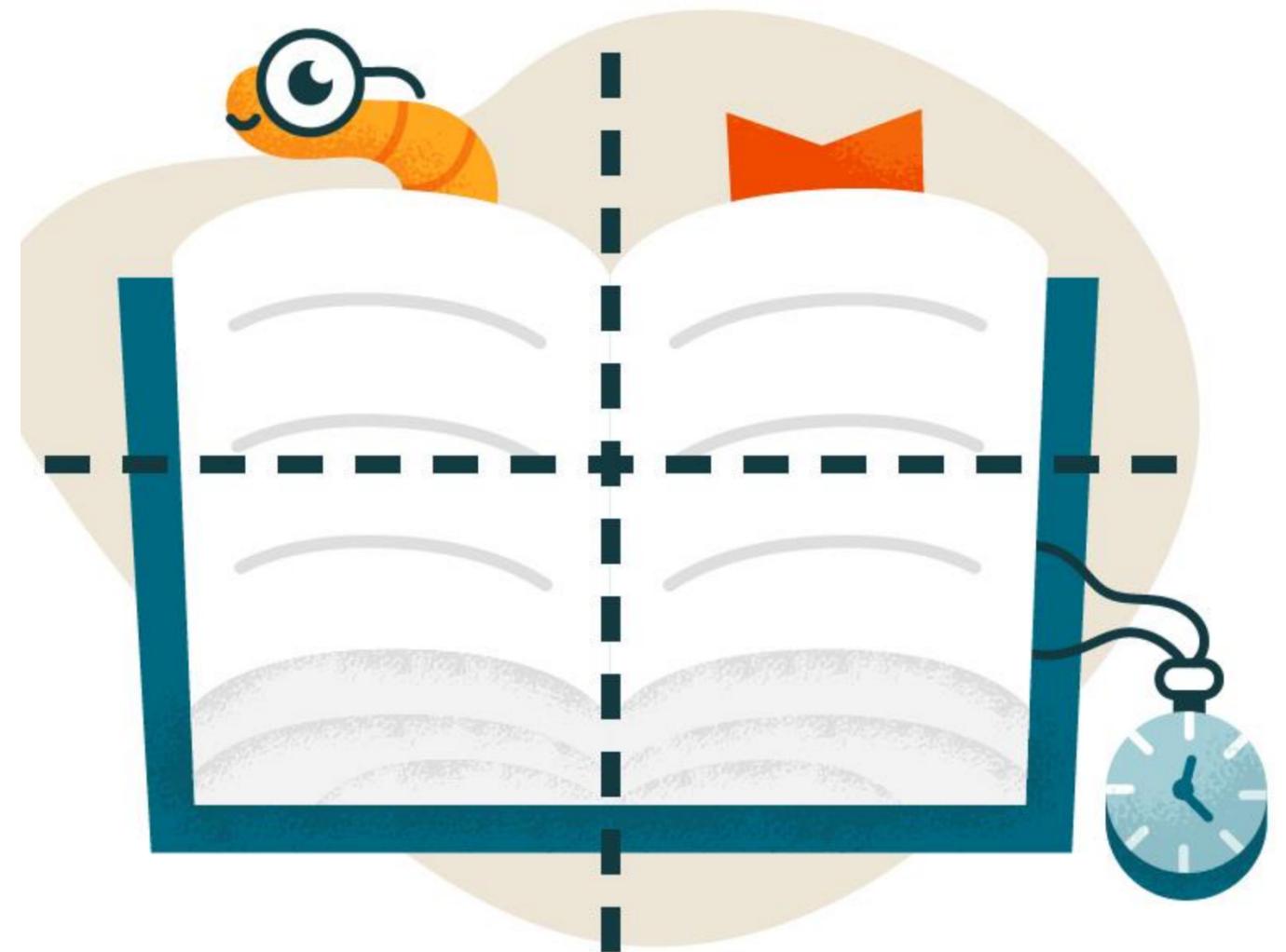
Synthesis/Intake: Vitamin D (cholecalciferol/D3 from sunlight/animal sources, or ergocalciferol/D2 from plants/supplements) is synthesized in the skin or obtained through diet.

Liver Conversion: In the liver, it's converted to 25-hydroxyvitamin D (calcidiol), the major circulating and storage form that is typically measured in lab tests.

Kidney Activation: In the kidneys, PTH stimulates the conversion of calcidiol to the biologically active form, 1,25-dihydroxyvitamin D (calcitriol)



Case study

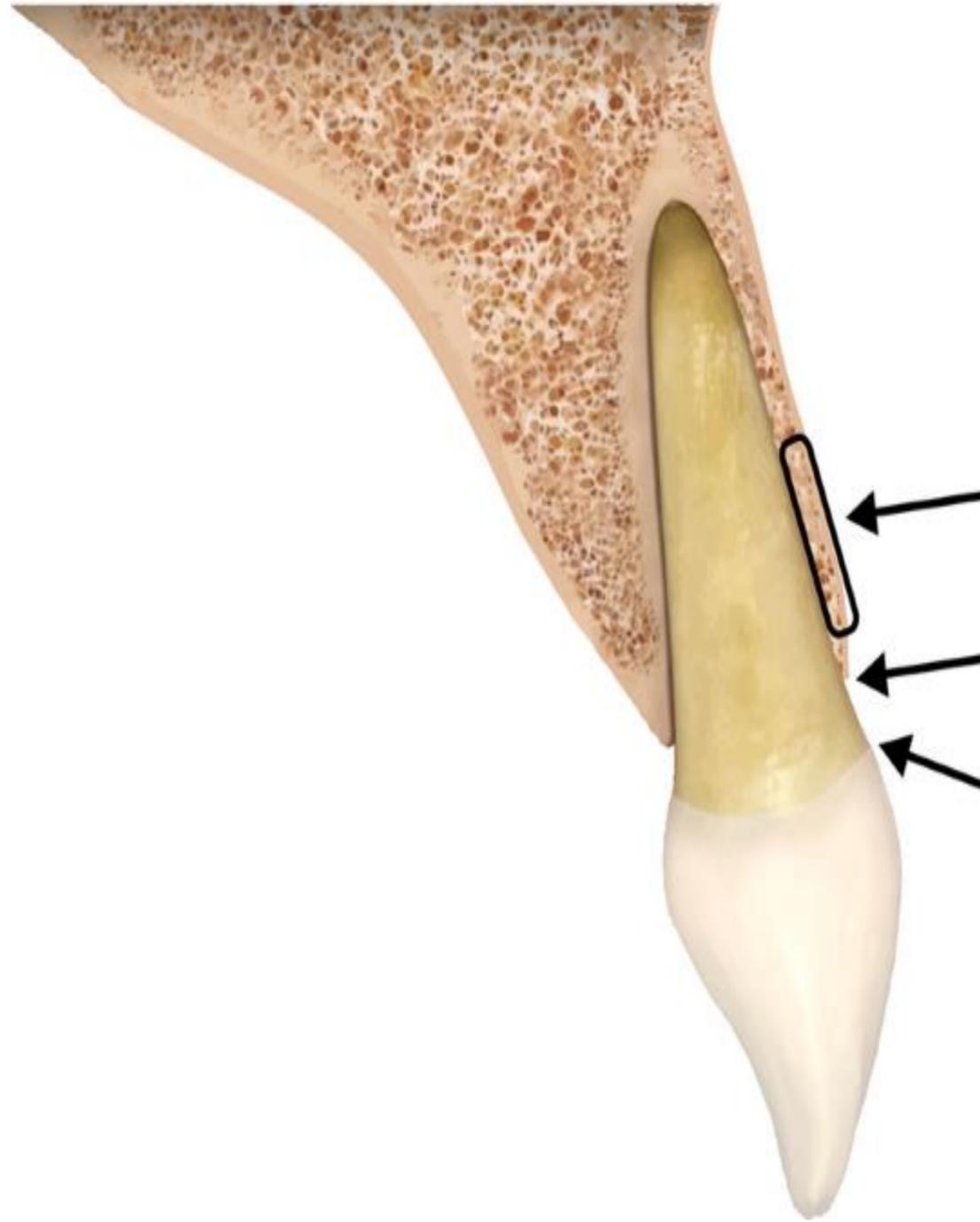




(a)



(b)



For knowledge





Ass.Prof. Noura Bakr

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