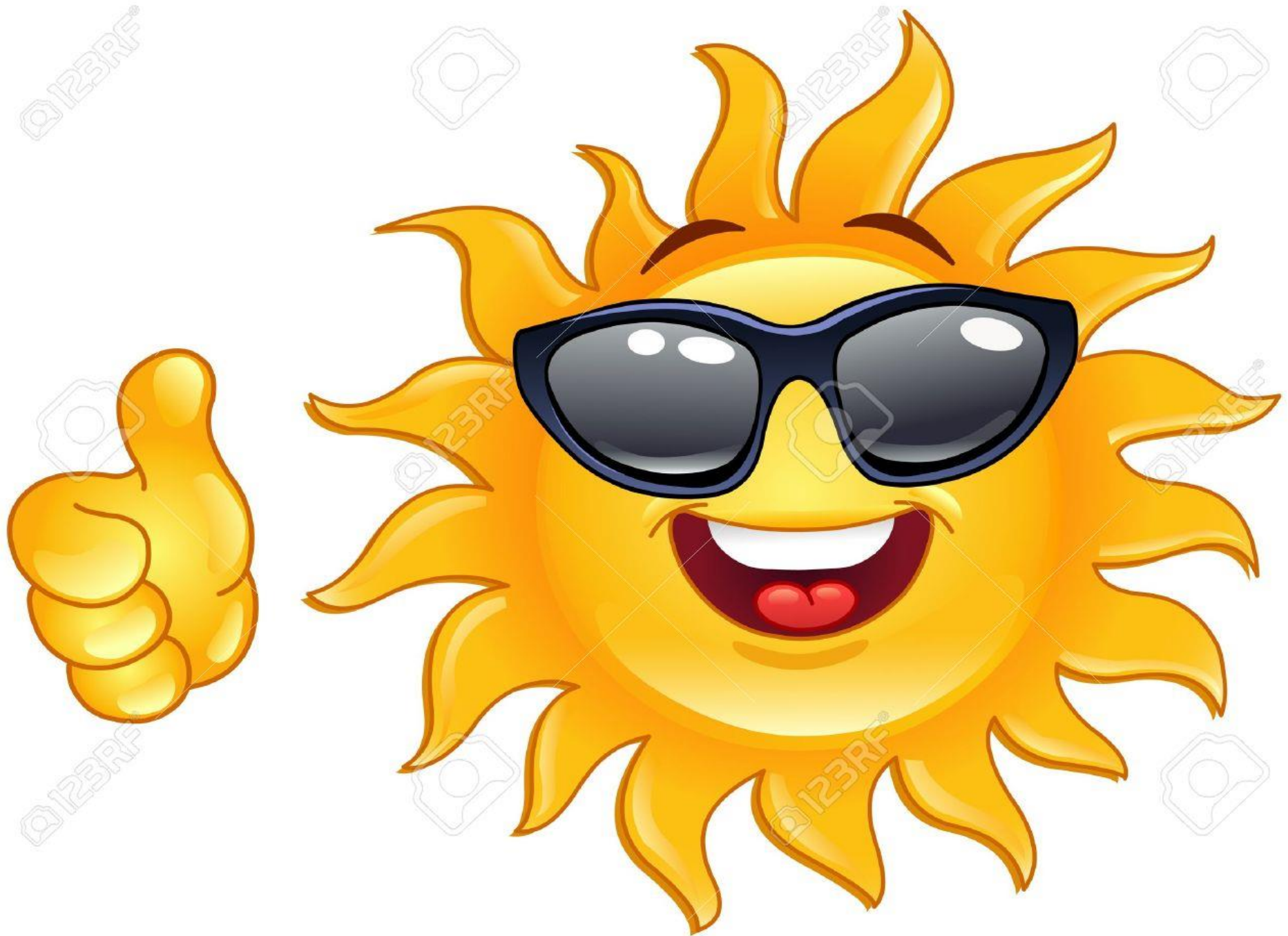


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ ط





Pigeon's chest

Bowed legs



Group of steroids that have hormones like functions.

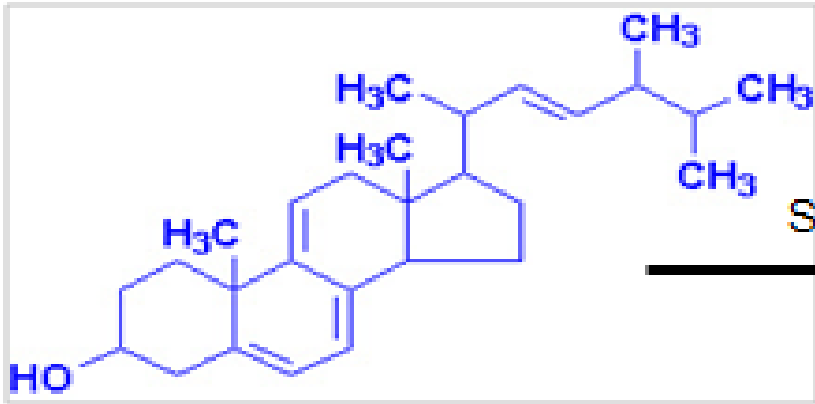
Objectives

- Types of vitamin D
- Formation of active form
- Sources & daily requirements of vitamin D
- Absorption and transport of vitamin D
- Biologically active forms of vitamin D
- Mechanism of action of vitamin D
- Regulation of vitamin D
- Functions of vitamin D
- Deficiency manifestation of vitamin D

FORMS OF VITAMIN D

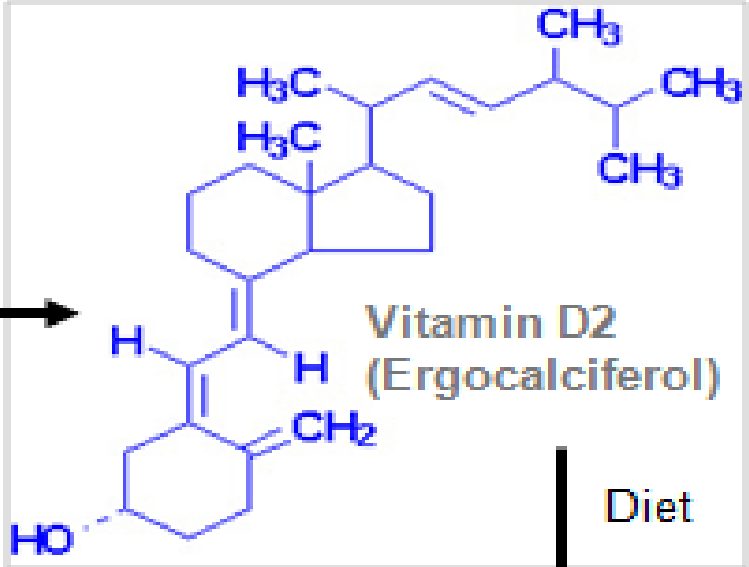
- Two major forms.
- Vitamin D2 (ergocalciferol) found in plants.
- Vitamin D3 (cholecalciferol) found in animals.
- The inactive natural precursors of vitamin D are the pro vitamins.
- Two of these are:
 - 1. Ergosterol ___ pro vitamin D2 found in plants.
 - 2. 7_ dehydro cholesterol ____ pro vitamin D3 found in skin.

- Transformation from inactive to active form is accomplished by ultraviolet rays.



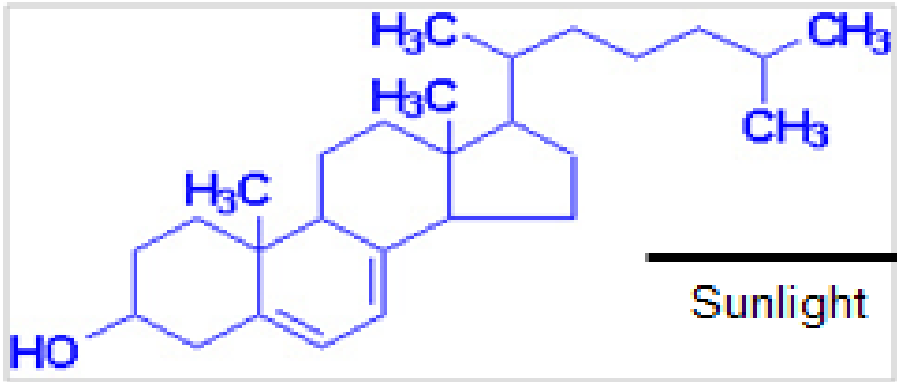
Ergosterol
(in plants)

Sunlight



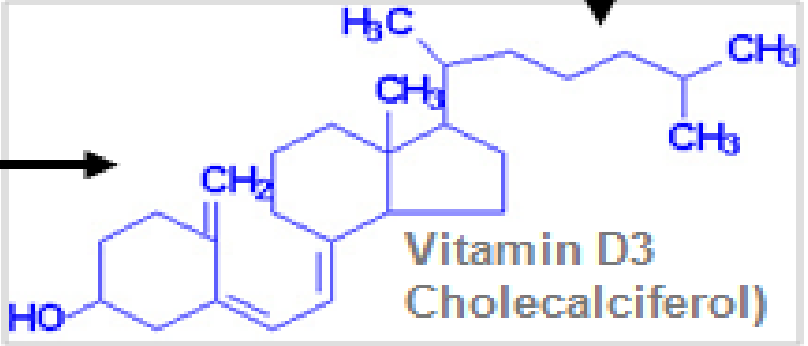
Vitamin D2
(Ergocalciferol)

Diet

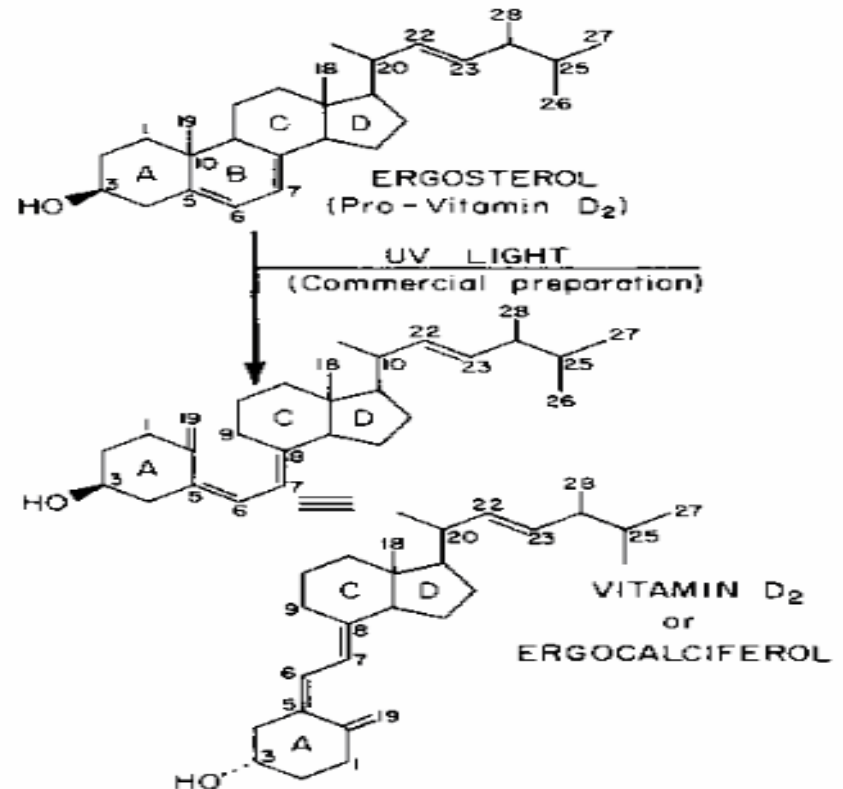
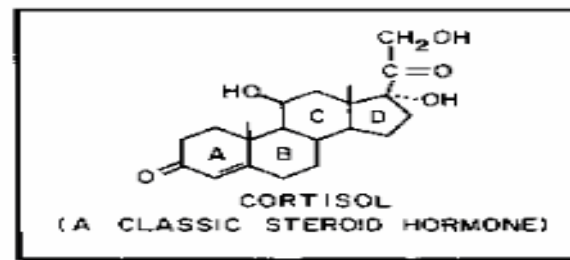
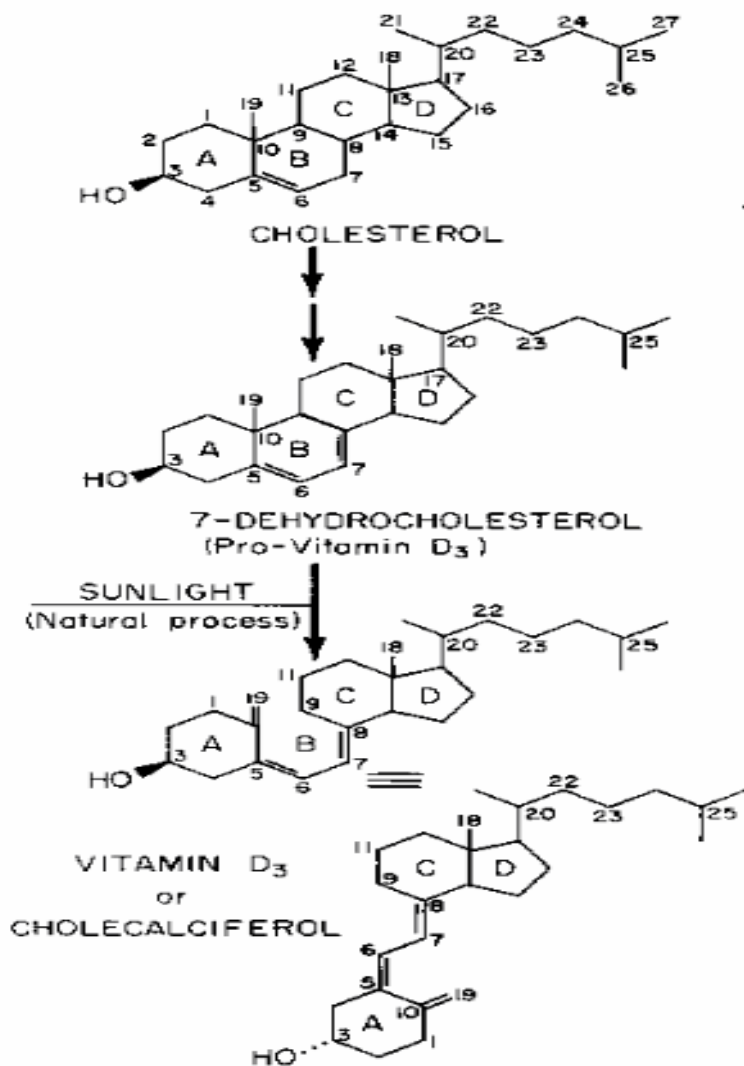


7-Dehydrocholesterol

Sunlight



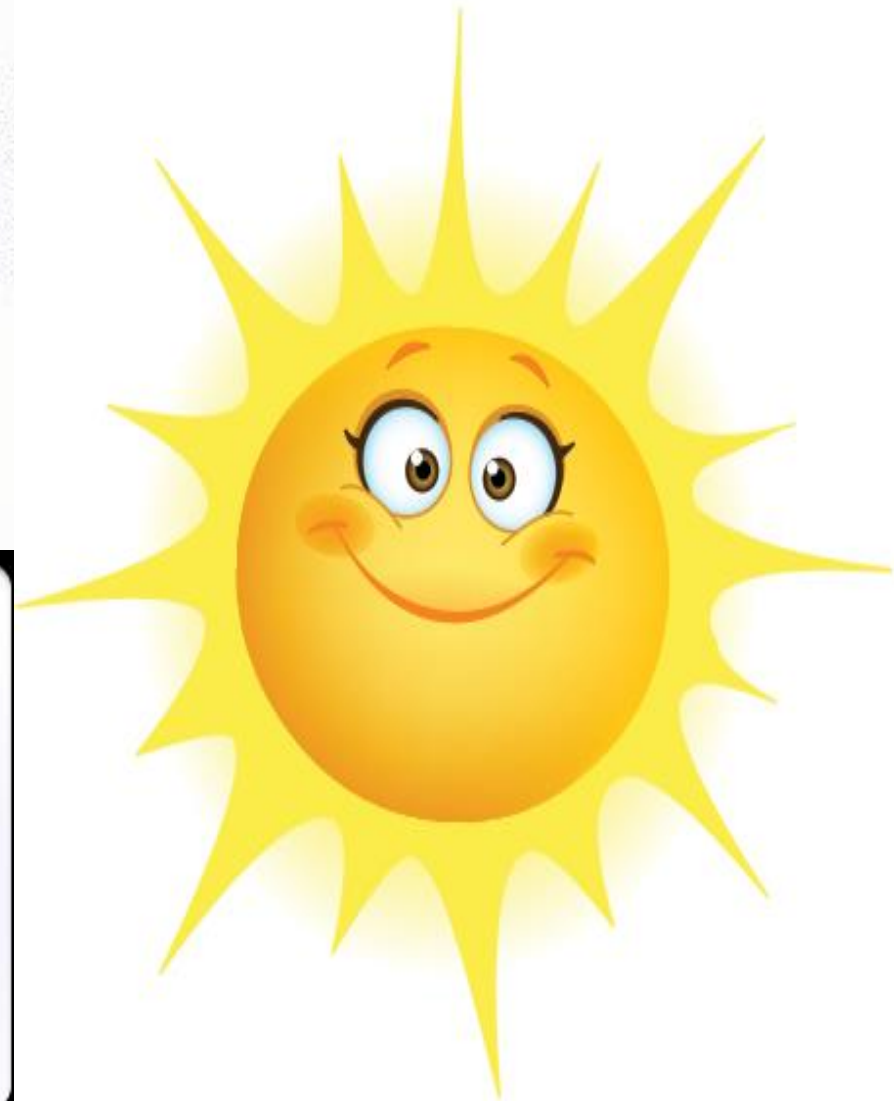
Vitamin D3
(Cholecalciferol)



- Photolytic cleavage of carbon to carbon bond between carbon 9 and 10

SOURCES AND DAILY REQUIREMENTS

- Sun ,Cod Fish liver oil is richest source, egg yolk, margarine, butter, cheese.
- Daily requirements:
- 200__400 IU /day.



natural sunlight



fortified milk



cheese



butter/margarine



cereal



fish

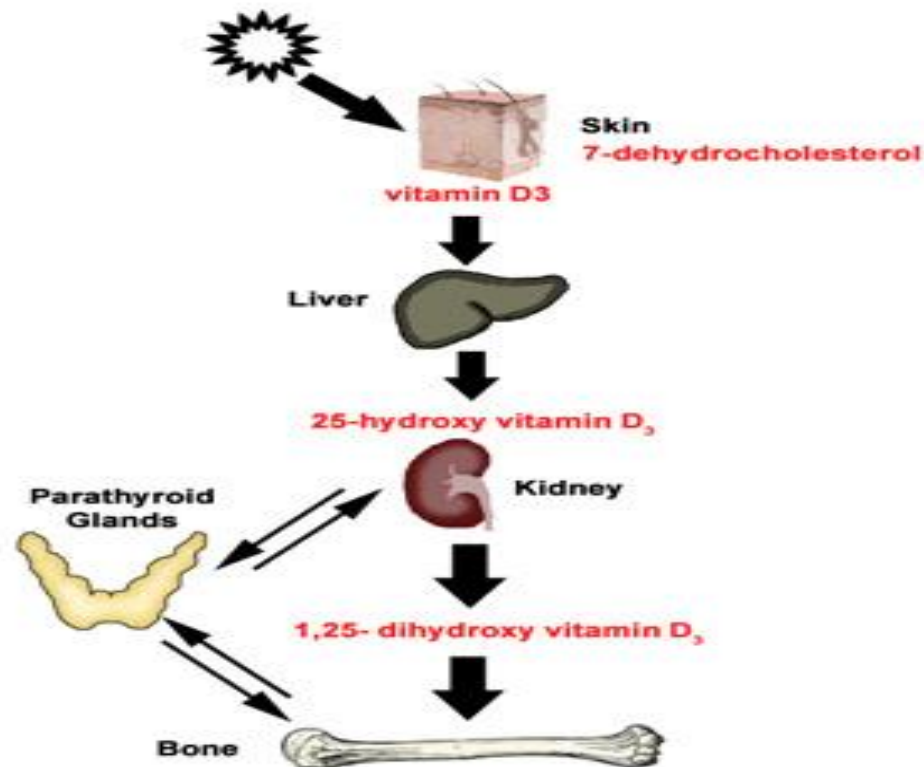
Absorption and transport

- **Absorbed** in small intestine
- Bile is essential for their absorption
- **Transported** in the blood bound to α_2 -globulin(vitamin D binding protein)
- **Stored** in liver.

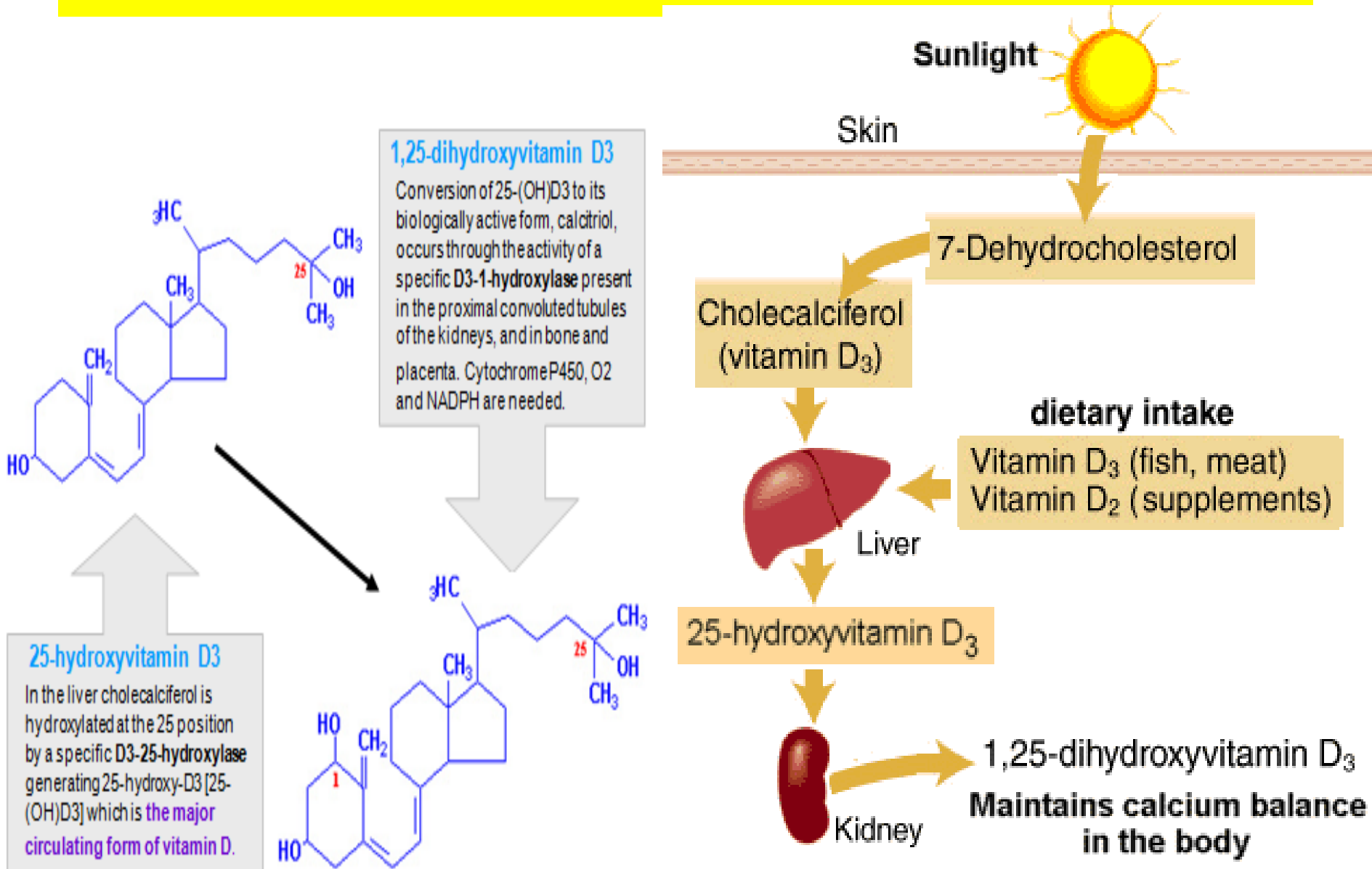
BIOLOGICALLY ACTIVE FORMS

Synthesized in liver and kidney

- 25- OH- D3 synthesized in liver(calcidiol).
- 1, 25- di- OH- D3 (calcitriol) synthesized in kidney.

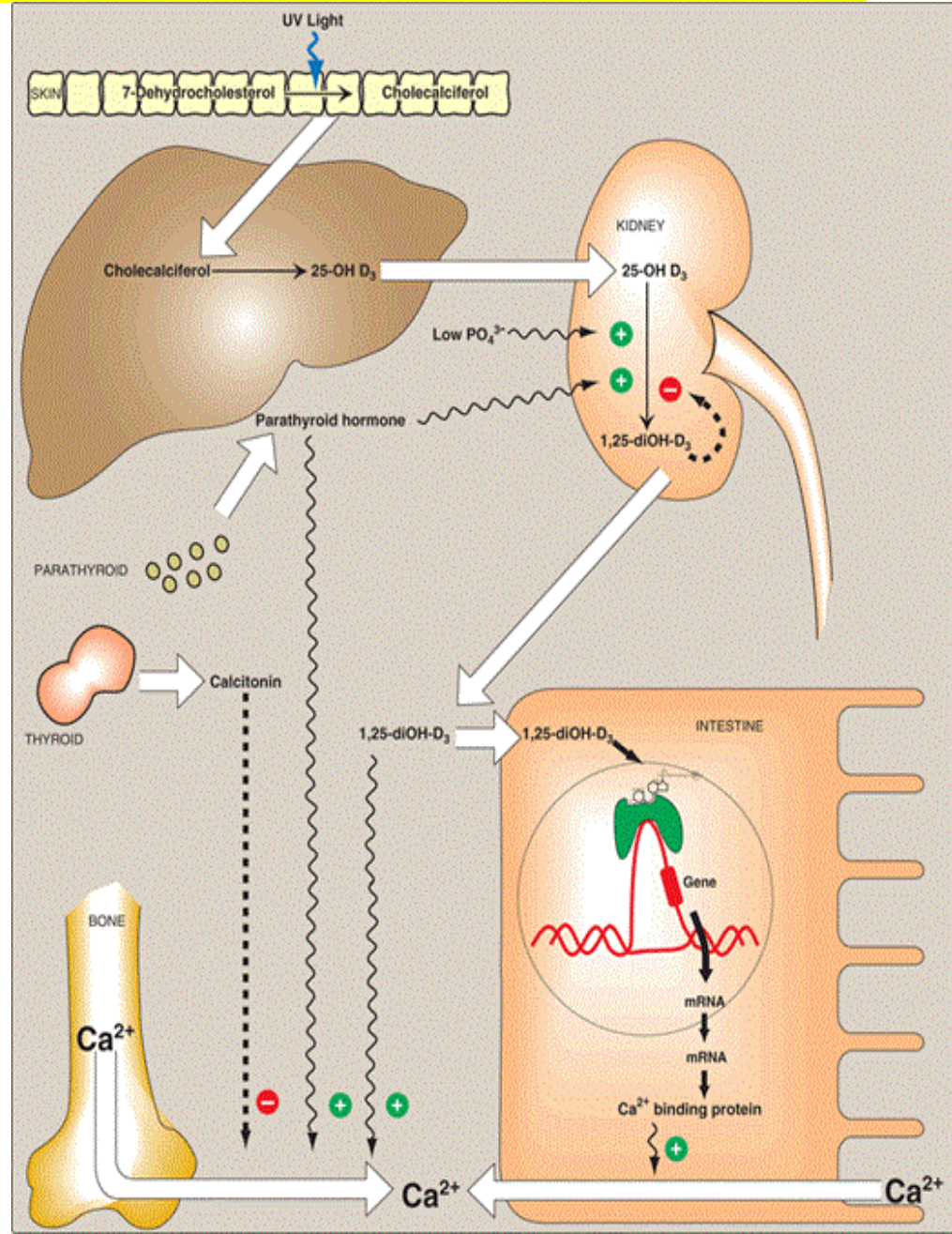


Activation of vitamin D



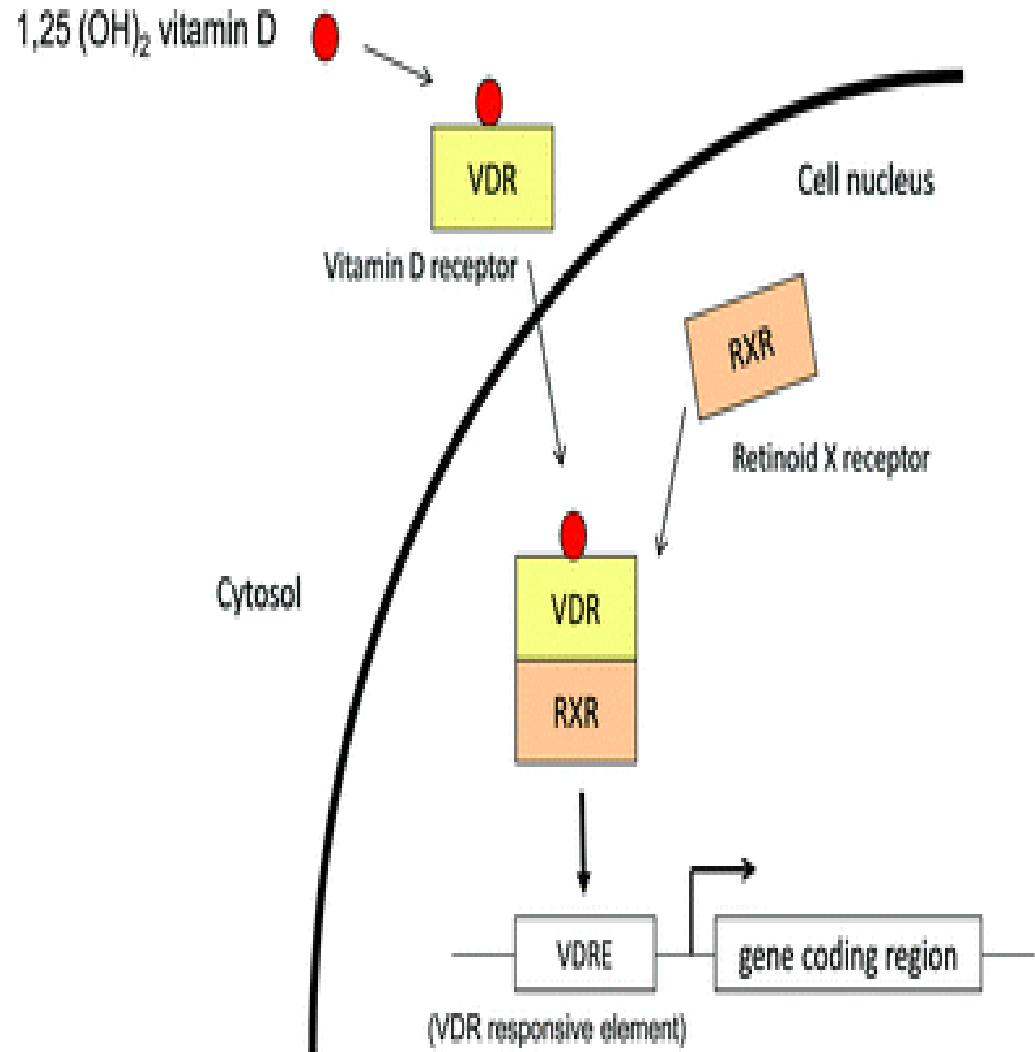
Regulation of vitamin D synthesis

- Feedback inhibition of 1α -hydroxylase
- Parathyroid hormone
- Serum phosphate level
- Serum calcium level
- Also stimulated by insulin, growth hormone, prolactin, estrogen and progesterone



Mechanism of action of vit D

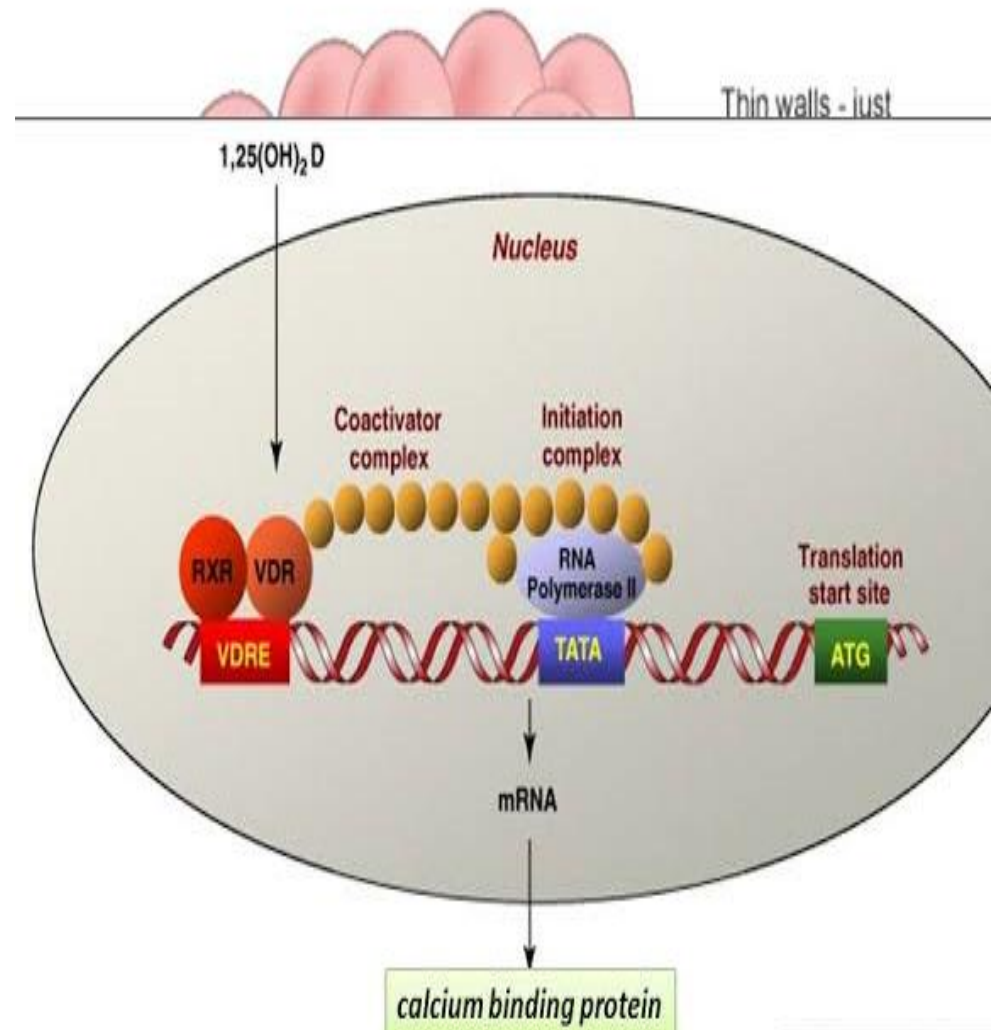
- Calcitriol acts in a similar way as steroid hormones by binding to specific receptors(VDR).



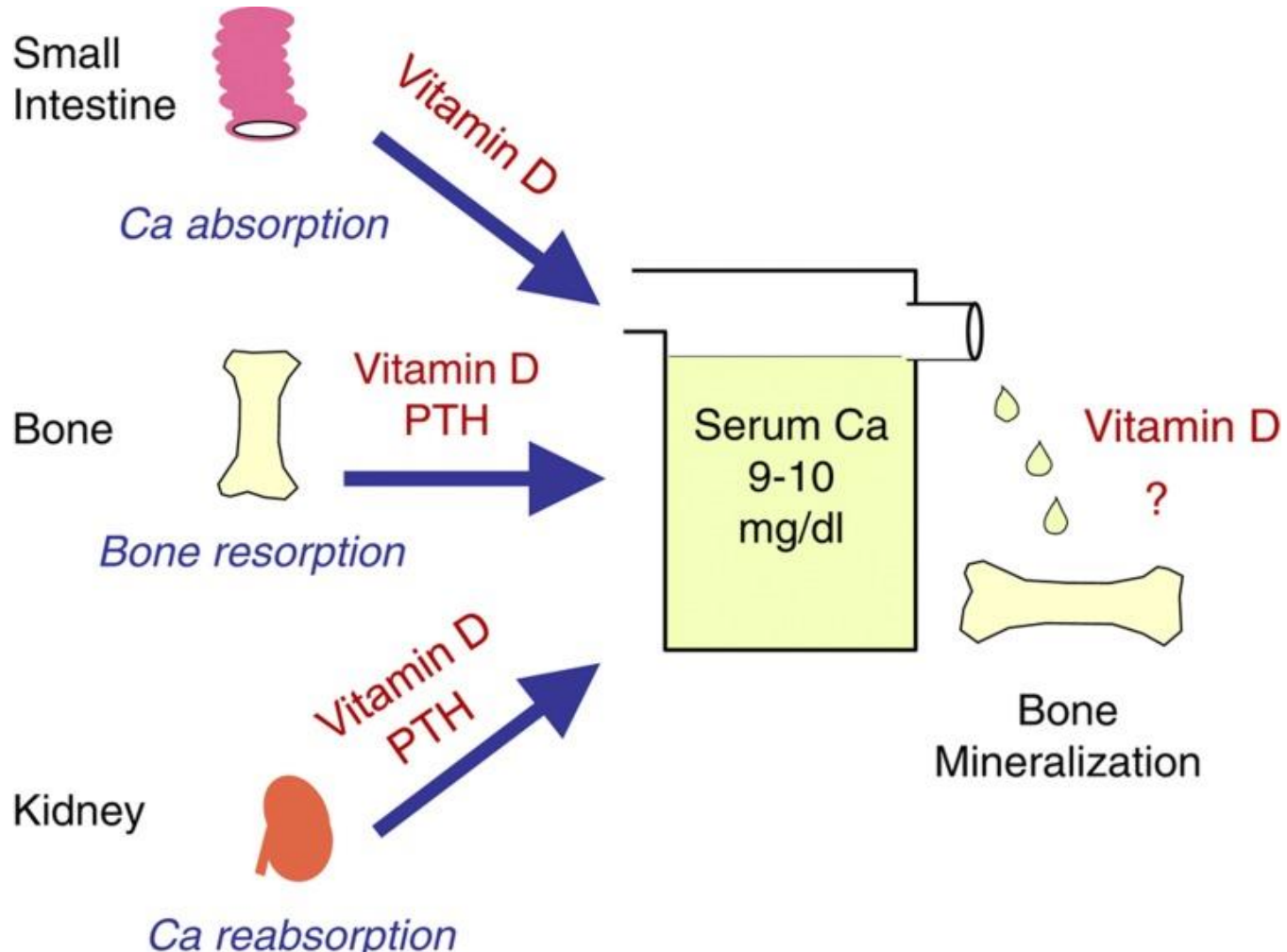
Mechanism of action of vit D

Like steroid hormone they has

- Sterol nucleus
- Both biologically active forms are subjected to feedback inhibition.
- Has target organs like hormones.

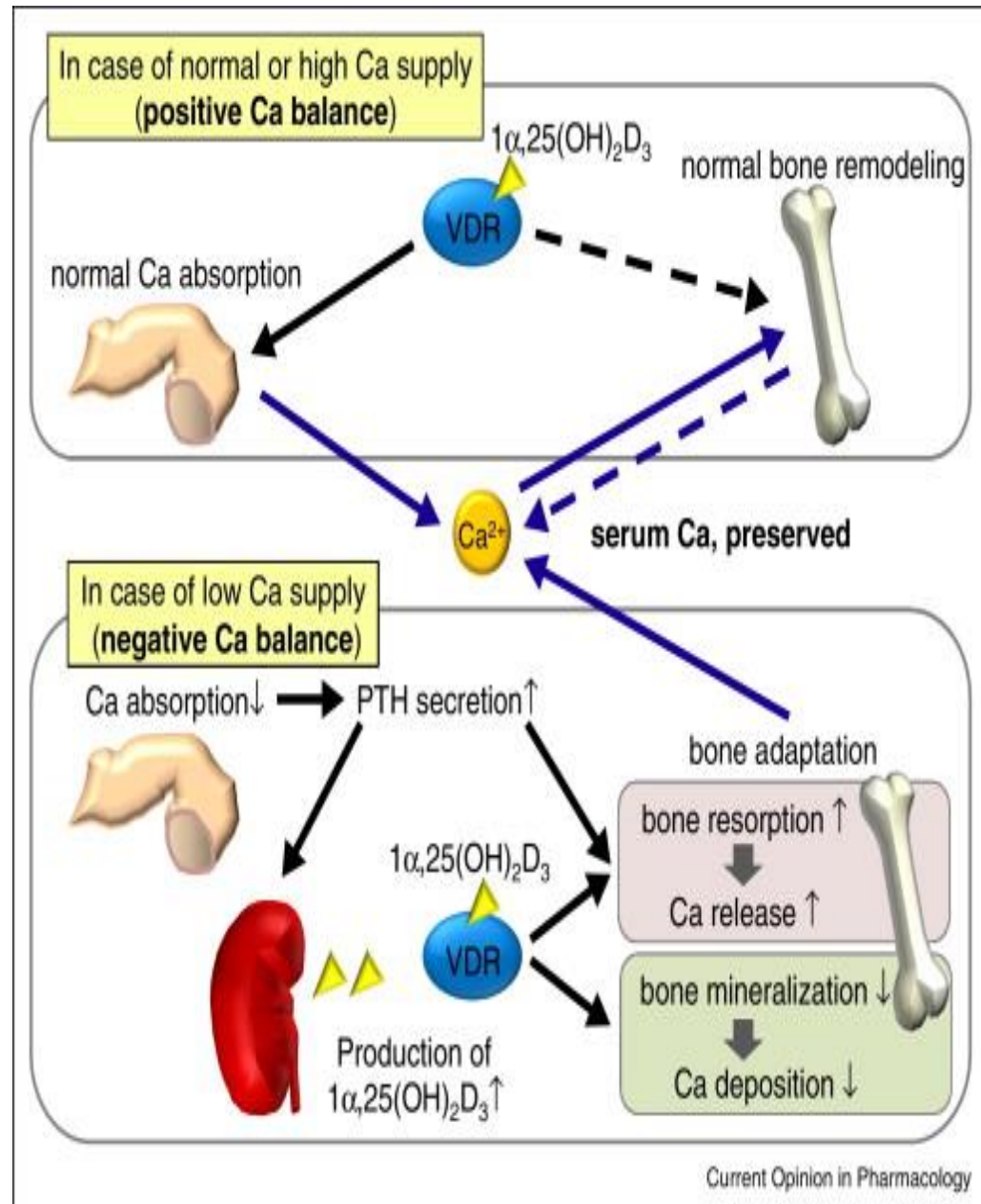


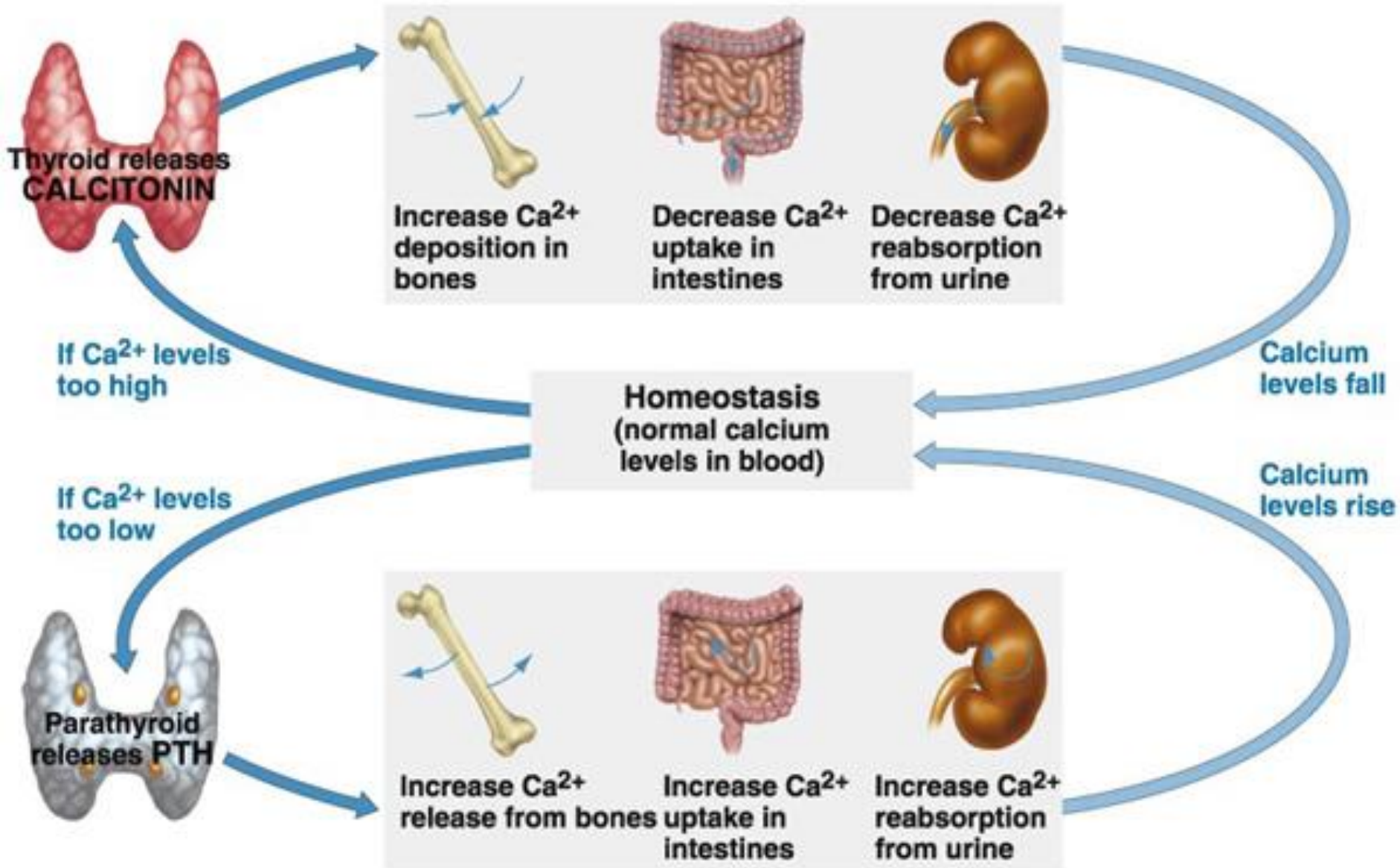
- Maintains calcium level along with Parathormone and Calcitonin.



Functions of vitamin D

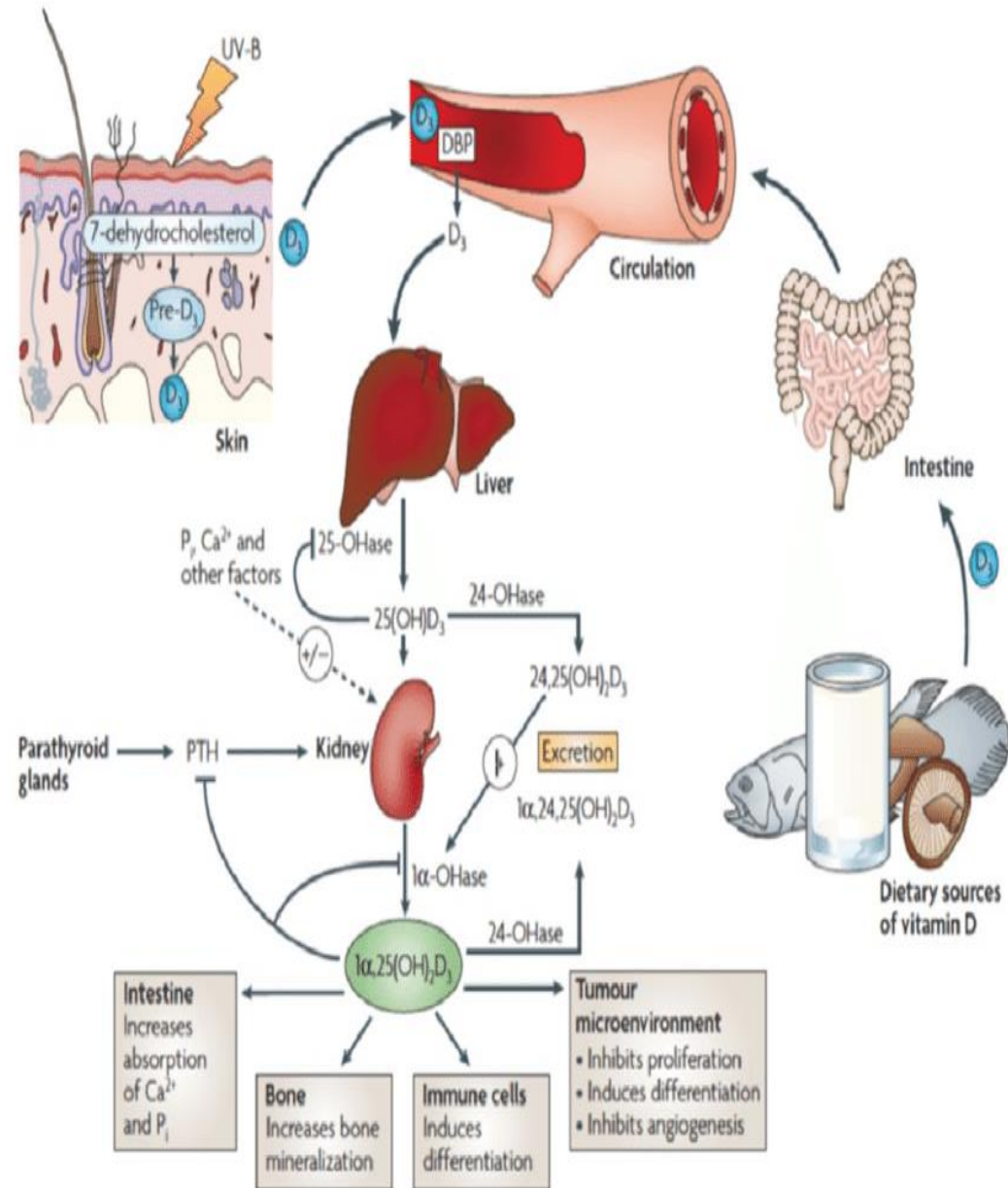
- Regulates calcium and phosphorous level in blood by promoting their absorption from kidney, intestine and bone.
- It regulates parathyroid hormone secretion.



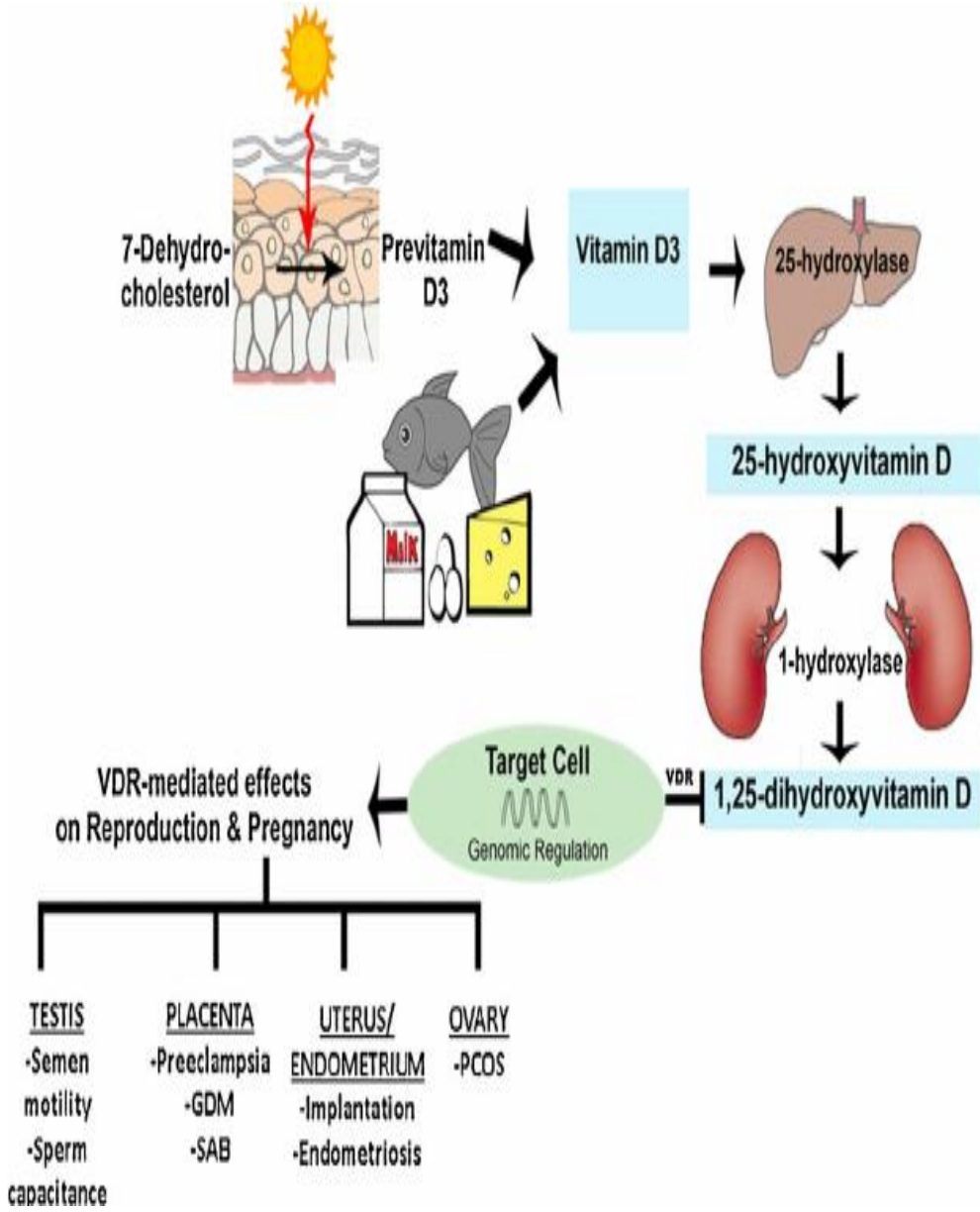


Functions of vitamin D

- Affects immune system by promoting immunosuppression, phagocytosis and anti tumor activity.
- **Vitamin D** can help to reduce the risk of respiratory infections, including **colds** and **flu**



- It promotes bone formation and mineralization and is essential for intact and strong skeleton.
- Necessary for normal reproduction and normal fetal growth during pregnancy.



Causes of Deficiency

- Insufficient exposure to sunlight
- Strict vegetarians or diet lacking vitamin
- Chronic alcoholics
- Liver and kidney diseases
- Fat malabsorption
- Pregnancy and lactation

DEFICIENCY

- **Nutritional:**
- Rickets in children and osteomalacia in adults.
- **Renal osteodystrophy**
- (renal defects).
- Symptoms
- Bowing of legs, knocked knee, pigeon chest
- Large head with protruding forehead.



Bowed legs –
Characteristic
of rickets

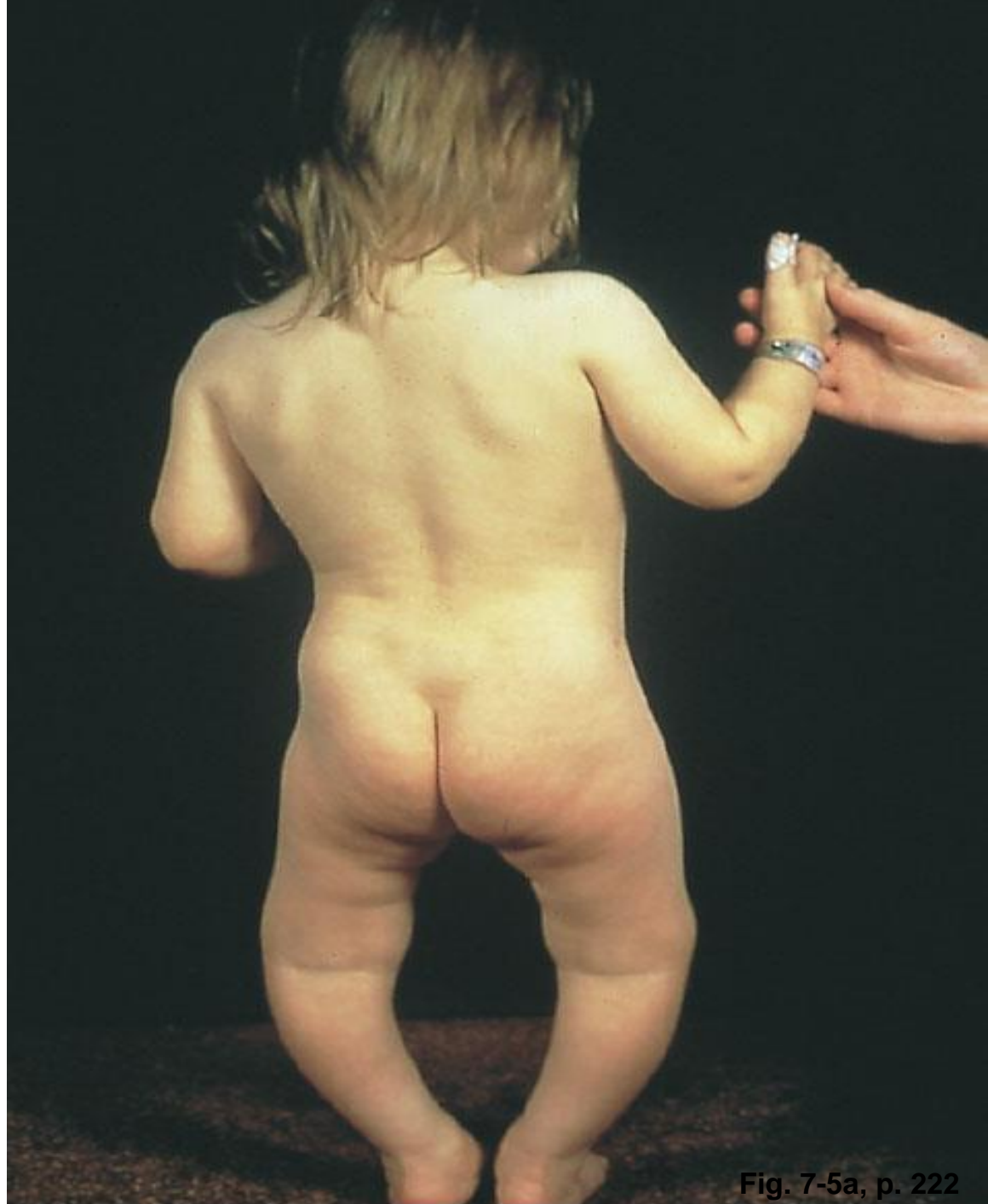
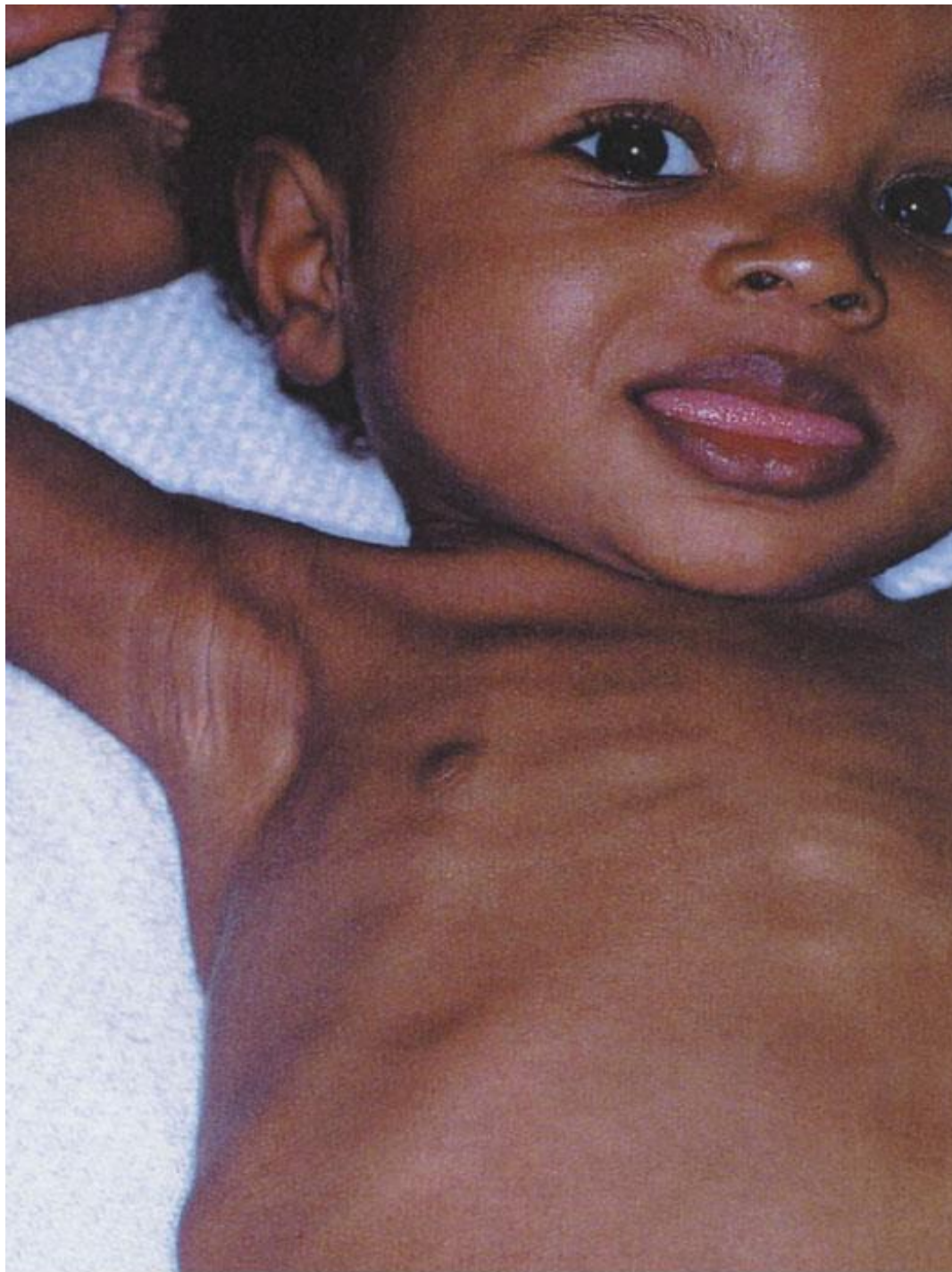


Fig. 7-5a, p. 222

Beaded ribs –
Characteristic
of rickets



RICKETS

- Type 1
- Inherited autosomal recessive trait (1-25-hydroxylase deficiency).
- Type 11
- Single amino acid change in one of the zinc fingers of the DNA binding sites for receptors, making them non functional.

TREATMENT

SUNSHINE
IS THE BEST
MEDICINE



Clinical uses

- Vitamin D receptors are located in various tissues,so it,
- Reduce the risk of heart attack. Alleviate hypertension.
- Reduce the risk of type-1 Diabetes, by stimulating release of insulin& also expression of insulin receptors.
- Reduce the growth rate of cancer cells.

HYPERVITAMINOSIS D

- Well tolerated
- Toxicity is due to induced hypercalcaemia.
- Immediate effects, anorexia, thirst, lassitude, constipation and poly uria.
- Delay defect_ urinary lithiasis, metastatic calcification.

Recommended books

- Chatterjea
- lippencott,s
- Harper



Thank You