

DERIVATIVES OF LIPIDS

1. **EICOSANOIDS:** Eicosanoids are the Paracrine hormones derived from 20 carbon poly-unsaturated fatty acid called Arachidonic acid. There are three classes of Eicosanoids viz. Prostaglandins, thromboxanes and leukotrienes.

- a. **PROSTAGLANDINS (PG):**

The prostaglandins contain a five carbon ring structure derived from a fatty acid called arachidonic acid. There two groups of prostaglandins viz. PGE (*ether* soluble) and PGF (*fosfat*). The term *fosfat* is Swedish that means phosphate. Each group has been subtyped based on their functions such as PGE₁, PGE₂, PGF₁, PGF₂ and so on. They are involved regulating wide array of functions such as causing inflammation, pain, menstruation, parturition, fever and others are involved in wake-sleep cycle and responsiveness of certain tissues to hormones such as epinephrine and glucagon.

- b. **THROMBOXANES:**

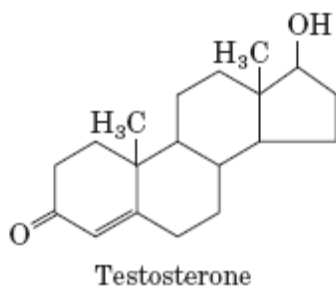
These are six membered ring structure containing an ether. They are derived from a fatty acid called arachidonic acid. They are produced by platelets and aid in blood coagulation.

- c. **LEUKOTRIENES:**

First discovered in leucocytes. They are involved in smooth muscle contraction. They are powerful biological signals. The overproduction of leukotrienes can cause asthmatic attack.

2. **STEROID HORMONES:**

Steroid hormones are oxidized derivatives of sterols. They have steroid nucleus but do not have the hydrocarbon chain attached to ring D thus making them more polar than cholesterol.



The steroid hormones move through the blood and enter the cell and then nucleus and bind to specific steroid hormone receptor and initiate the gene expression.

3. **VITAMIN D:**

It is also called cholecalciferol is derived from a sterol called 7-Dehydrocholesterol. When the 7-Dehydrocholesterol is exposed to UV rays, it gets converted to cholecalciferol (Vitamin D₃). It is converted to 1,25 Dihydroxy-cholecalciferol (1,25 Dihydroxy-Vitamin D₃) in liver and kidney, which is the active form of the vitamin D.

4. **VITAMIN A:**

Also called Retinol derived from retinoic acid. It regulates the development of epithelial tissues including skin.

5. VITAMIN E:

Also called tocopherols. These lipids have substituted aromatic ring and a long isoprenoid side chain and are non-polar. They mainly act as free radical scavengers.

6. VITAMIN K:

These lipids also have substituted aromatic ring and a long isoprenoid side chain and are non-polar. They aid in blood clotting.