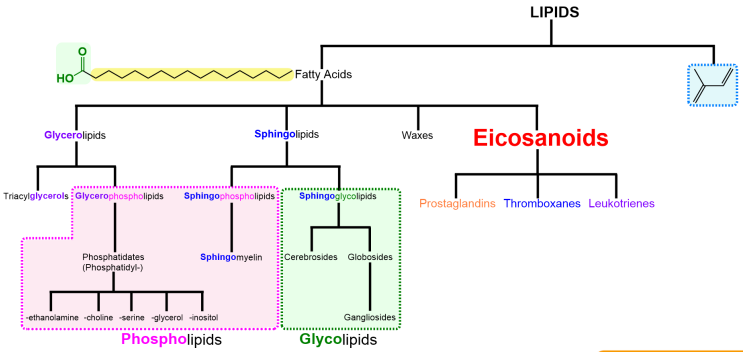
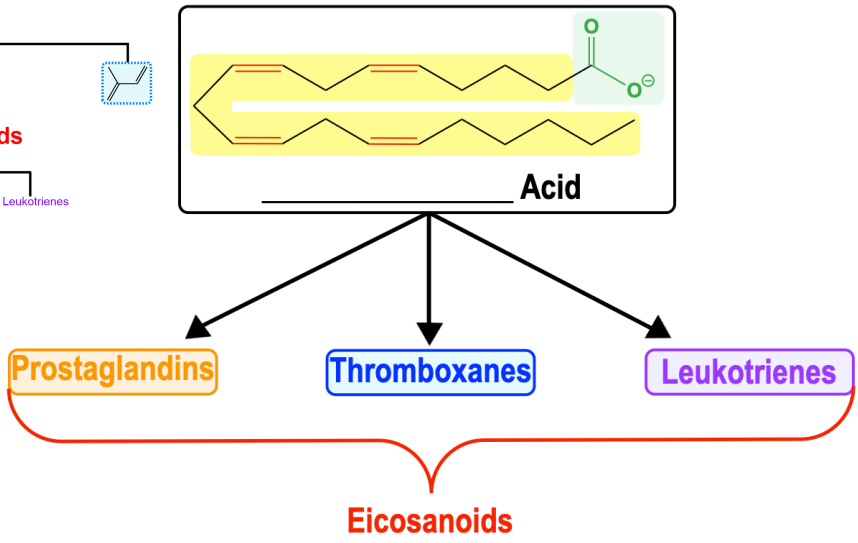
CONCEPT: EICOSANOIDS

- _____: lipids derived from C_{20} polyunsaturated fatty acids, like *arachidonic acid* (20:4 $\Delta^{5,8,11,14}$).
  - □ Name derived from Greek word "*eikosi*" = _____.
- _____ classes of *eicosanoids*: 1) *Prostaglandins*. 2) *Thromboxanes*. & 3) *Leukotrienes*.



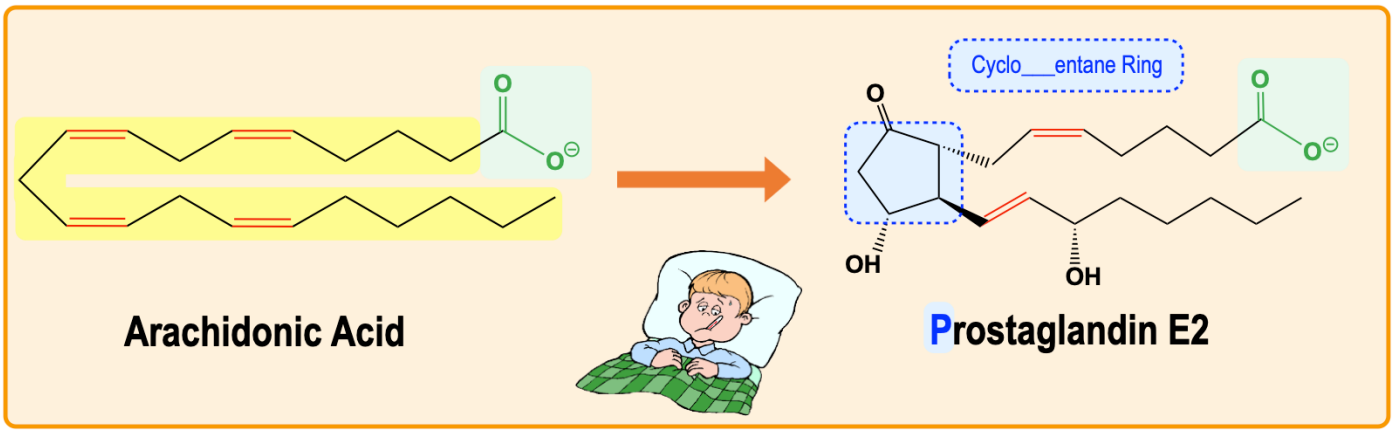


Eicosanoid Functions

- Eicosanoids: wide _____ of functions, but usually act as *special types of hormones*.
- _____: *signaling* molecules released by a cell/gland that can *travel* & affect *distant* cells in other areas.
  - □ Eicosanoids function as _____ *hormones* (act only on *nearby* cells in the *vicinity* of its synthesis).
  - □ Act at _____ concentrations & tend to *decompose* within a few seconds/minutes, *limiting their travel*.

1) Prostaglandins

- _____ (PG): contain a _____-*carbon* ring (cyclo*pent*ane).
  - □ *Many* functions include regulating pain/fever/inflammation, affecting blood flow & smooth muscle contractions.



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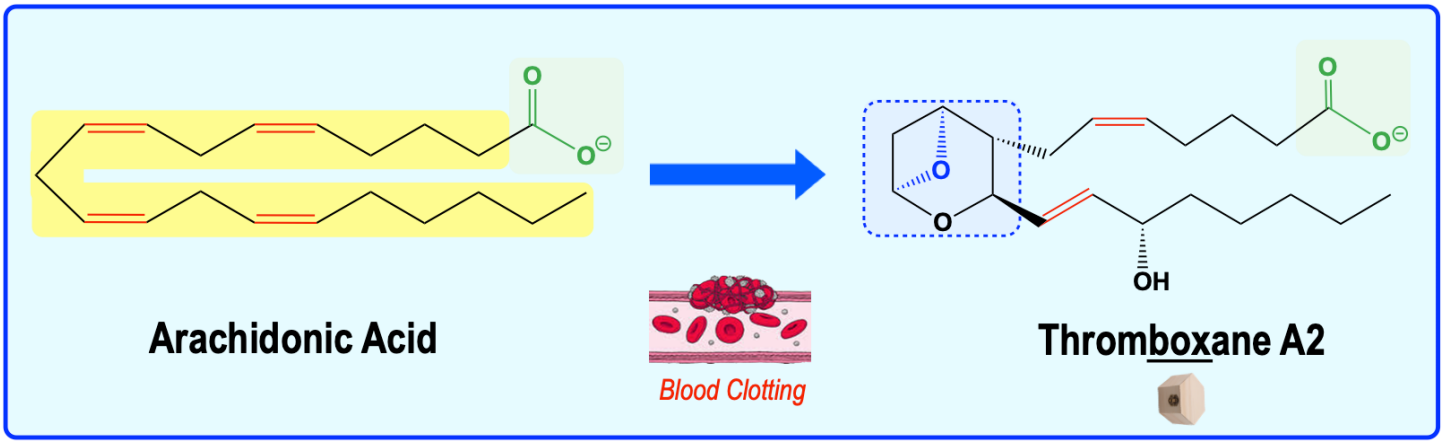
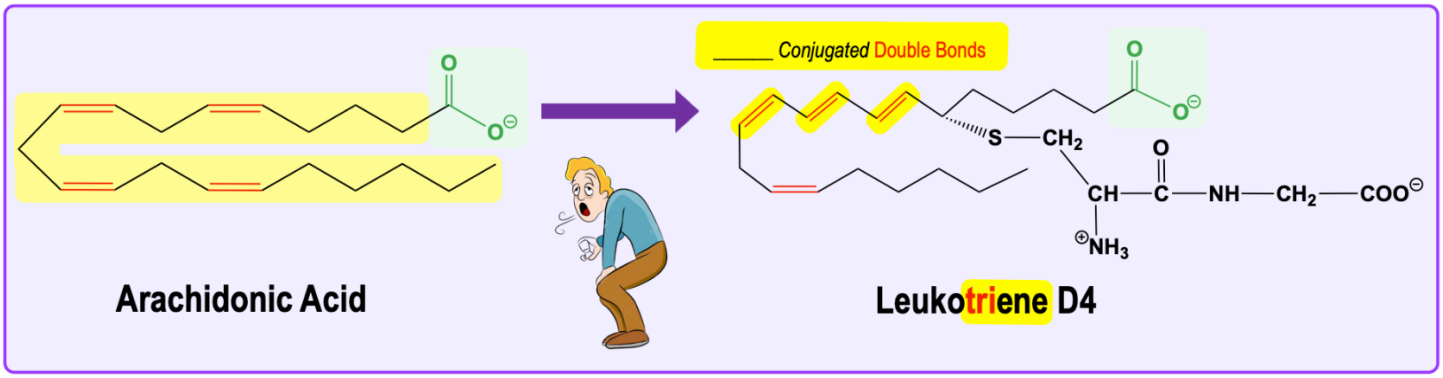
2) Thromboxanes

- _____: have a _____-membered ring with an *ether*.
  - □ Produced by platelets (or *thrombocytes*) & act in *formation of blood* _____ & *reducing blood flow to the clot*.



3) Leukotrienes

- *Leuko*_____: have _____ conjugated *double bonds*.
  - □ Predominantly expressed by _____ (*white blood cells*).
  - □ Function as powerful *biosignals* (ex. Leukotriene D4 induces strong smooth muscle contraction of _____).
    - □ Allergic reactions can trigger leukotriene synthesis, leading to an _____ *attack*.



PRACTICE: Which of the following fatty acids is the precursor to the eicosanoids?

a) Arachadonic Acid.
b) Palmitic Acid.
c) Steric Acid.
d) Oleic Acid.
e) Carboxylic acid.

CONCEPT: EICOSANOIDS

PRACTICE: Which of the following is true regarding eicosanoids?

a) All eicosanoids contain three conjugated double bonds.
b) All eicosanoids contain arachidonic acid and sphingosine.
c) Prostaglandins and leukotrienes both contain a ring structure.
d) Thromboxanes, prostaglandins & leukotrienes all contain a carboxyl group.

PRACTICE: Which of the following is true about thromboxane?

a) Raises body temperature leading to intense fever.
b) Promotes platelet aggregation and blood clotting.
c) Promotes inflammatory responses & regulates excretion of salt & water.
d) It is an isoprene-based lipid.
e) It is a glycerophospholipid.

PRACTICE: Prostaglandins are local regulators whose chemical structure is derived from:

a) Oligosaccharides.
b) Fatty Acids.
c) Steroids.
d) Amino Acids.
e) Isoprenoids.

PRACTICE: Non-steroidal anti-inflammatory drugs (NSAIDS), like aspirin & ibuprofen, lower body temperatures by blocking production of which eicosanoid?

a) Biological waxes.
b) Prostaglandins.
c) Sphingolipids.
d) Vitamin D.
e) Cholesterol & other isoprenoids.