Ointments

- **Ointments** are semisolid preparations intended for external application to the skin or mucous membranes.
- Ointments may be medicated or not.
- Unmedicated ointments are used for the physical effects they provide as protectants, emollients, or lubricants.
- Ointment bases, may by used for their physical effects or as vehicles for medicated ointments.

CLASSIFICATION OF BASES

BASES

- **WATER SOLUBLE BASE**
- **EMULSION BASE**
- **ABSORPTION BASE**
- **OLEAGINOUS BASE**

Ointment bases:

- 1- Oleaginous or hydrocarbon base:
- 1- Anhydrous
- 2- Non-hydrophilic
- 3- Insoluble in water
- 4- Non-water removable
- Ex. Petrolatum, Fixed oils of vegetab
  of animal origin as lard and silicones

Ointment bases:

- 2- Absorption base:
- 1- Anhydrous
- 2- Hydrophilic
- 3- Insoluble in water
- 4- Non-water removable
- Ex. Anhydrous lanolin

Ointment bases:

- 3- Emulsion base
- A.(w/o):
- 1- Hydrous
- 2- Insoluble in water
- 3- Non-water removable
- Ex. Hydrous lanolin and cold cream

Ointment bases:

- B- Emulsion (o/w) water removable base:
- 1- Hydrous
- 2- Insoluble in water
- 3- Water removable
- Ex. Hydrophilic lanolin and vanishing cream

Ointment bases:

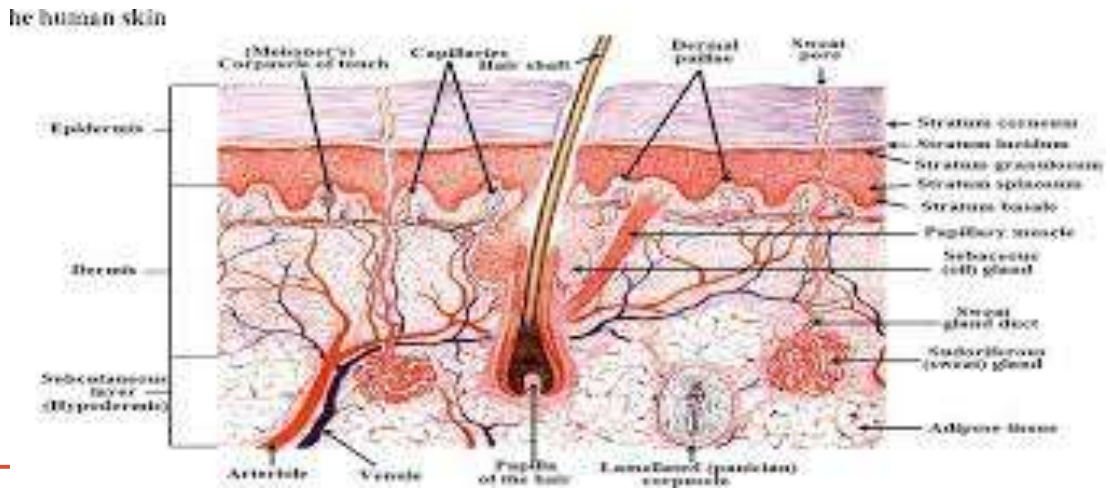
- 5- Water soluble base:
- 1- Anhydrous
- 2- Hydrophilic
- 3- Soluble in water
- 4- Water removable
- 5- Greaseless
- Ex. Polyethylene glycols (PEG) ointment

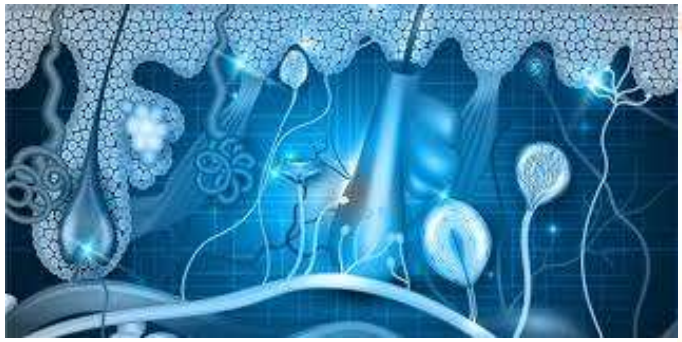
PREPARATION OF OINTMENTS

- Ointments are prepared by two general methods:
- (*a*) incorporation
- (*b*) fusion,

- Depending primarily on the nature of the ingredients.

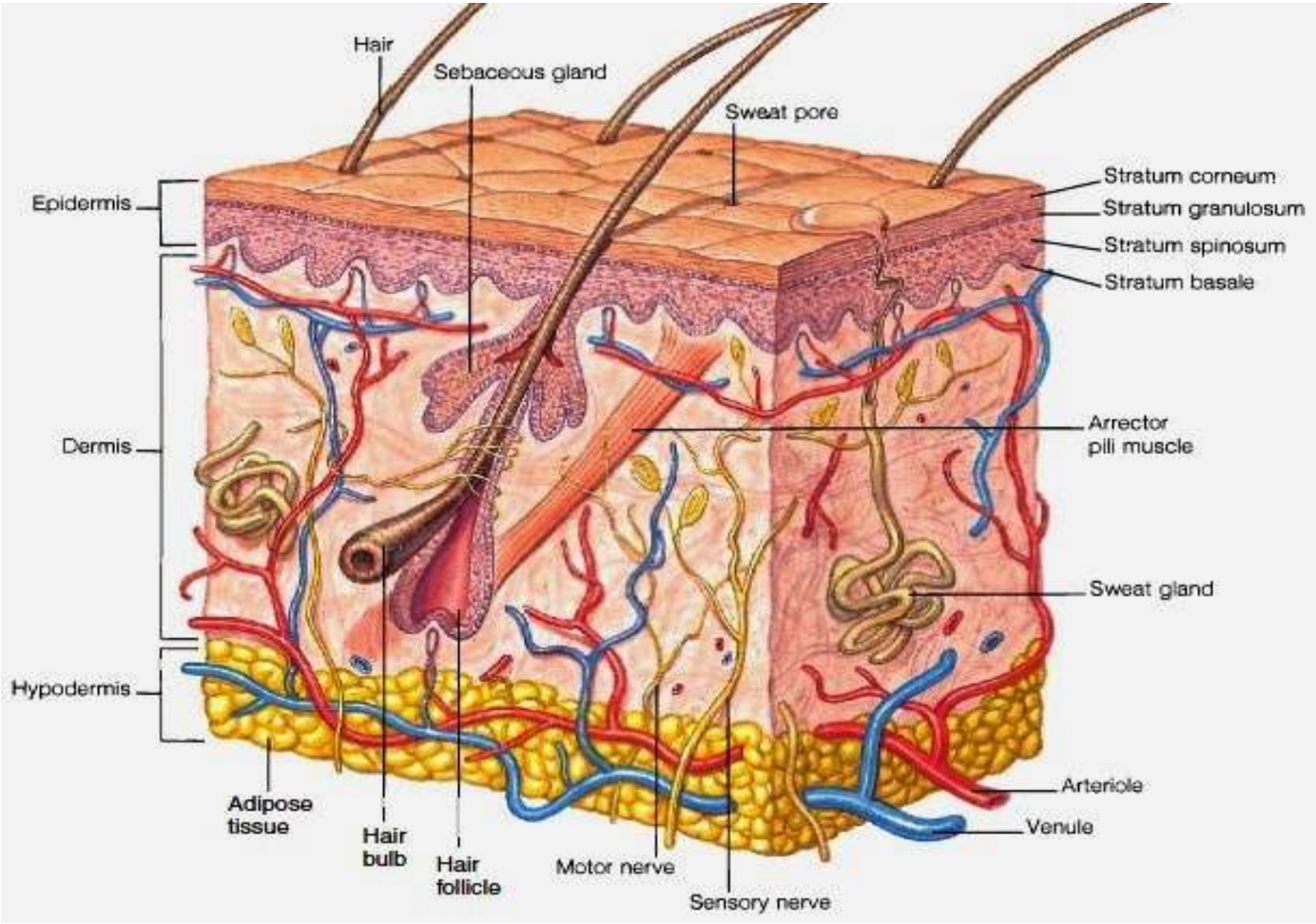
Transdermal drug delivery system





❑ Defination

- Topiccally adminsterd drug delivery systems that deliver drugs throug the skin for systemic effects



Drug transport through the skin

How molecules penetrate inert (artificial) membranes and then move on to target site of skin transport.

- **Diffusion process**

In passive diffusion matter moves from one region of a system to another, following random molecular motions

- **FIST FICK´S I LAW**

$$J = -D\frac{dc}{dx}$$

J rate of transfer per unit are of surface (flux)
C concentration of diffusing substances
X space coordinate measured normal to section
D diffusion coefficient
Negative sign indicate that the flux is in direction of decreasing concentration (down of concentration gradient).

➢ SECOND FICK´S I LAW

An equation for mass transport that emphasizes the change in concentration with time at a definite location rather than the mass diffusing across a unit area of barrier in unit time is known as Fick's second law

$$\frac{\partial c}{\partial t} = D\frac{\partial^2 c}{\partial x^2}$$

Its represents diffusion only in x direction

- **Many expermental design employ a membrane sperating two compartment The solution in the receptor compartment is constantly removed and replaced with fresh solvent to keep the concentration at low level . This is know as " SINK CONDITION**

Advantages of precutaneous route over oral route

1- eliminates variables which influence GIT absorption of drugs(PH changes,food and fluid intake,intestinal movement)

2- eliminate the first pass metabolism

3-More improved and convenient patient compliance.

4-Rapid termination in case of toxicity is possible.

5-Self medication is possible.

6- Controlled delivery resulting in more reliable and predictable blood levels.

DISADVANTAGES OF TDDS

- 1- low skin permeability to drugs
- 2-Drugs that require high blood levels cannot be administered
- 3-Skin irritation or dermatitis due to excipients and enhancers of drug delivery system used for increasing percutaneous absorption is another major limitation.
- 4-Adhesive may not adhere well to all types of skin
- 5-Stratum corneum is hydrophobic (limiting drug penetration)