

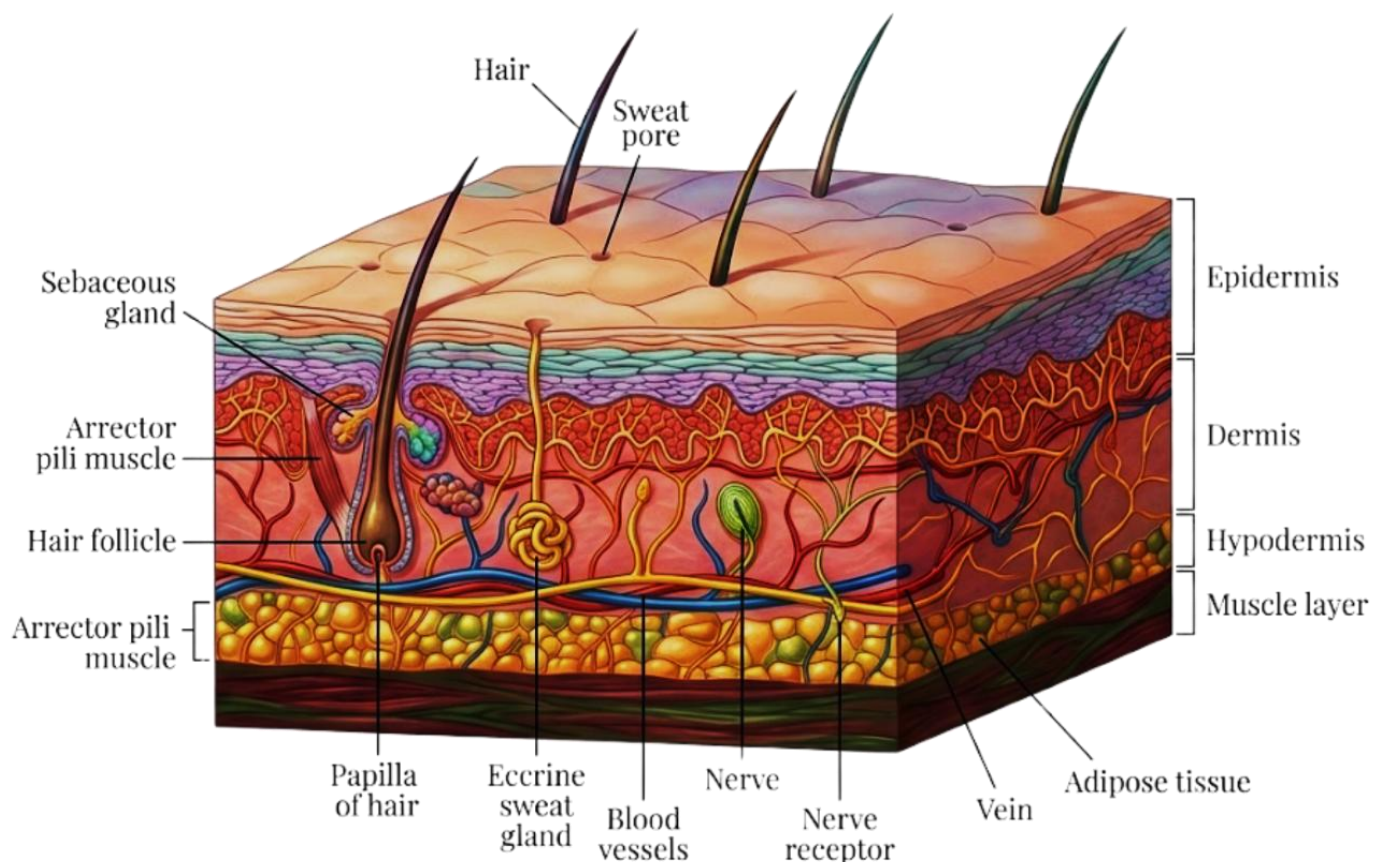
Sub-Micron Cosmeceuticals

Sub-Micron Cosmeceuticals: Biology (Skin, Hair, Nail, Eye Basics)

- Sub-micron cosmeceuticals involve very small particles (usually in nanometer to micrometer range) used in cosmetic formulations to improve penetration, effectiveness, and stability.
- To understand how this works, it is necessary to know the basic biology of target organs like skin, hair, nails, and eyes.

Skin Biology

Skin is the largest organ and the main target for most cosmeceuticals.



Layers of Skin

**Epidermis
(Outer Layer)**

Dermis

**Hypodermis
(Subcutaneous
Layer)**

1. Epidermis (Outer Layer)

- Contains **stratum corneum** (dead cells)
- Main barrier to drug/cosmetic penetration
- Controls water loss

2. Dermis

- **Contains:**
 - Collagen (gives strength)
 - Elastin (gives elasticity)
- Blood vessels and nerves present

3. Hypodermis (Subcutaneous Layer)

- Contains fat
- Provides insulation and cushioning

Functions of Skin

- Protection against environment
- Regulation of temperature
- Sensory perception
- Prevents water loss

Important Skin Components

- **Melanocytes** → produce melanin (skin color)
- **Sebaceous glands** → produce oil (sebum)
- **Sweat glands** → regulate temperature

Relevance to Cosmeceuticals

- Sub-micron particles help penetrate **stratum corneum**
- **Deliver active ingredients like:**
 - Vitamins
 - Antioxidants
 - Anti-aging agents

Hair Biology

Hair originates from hair follicles in **dermis**.

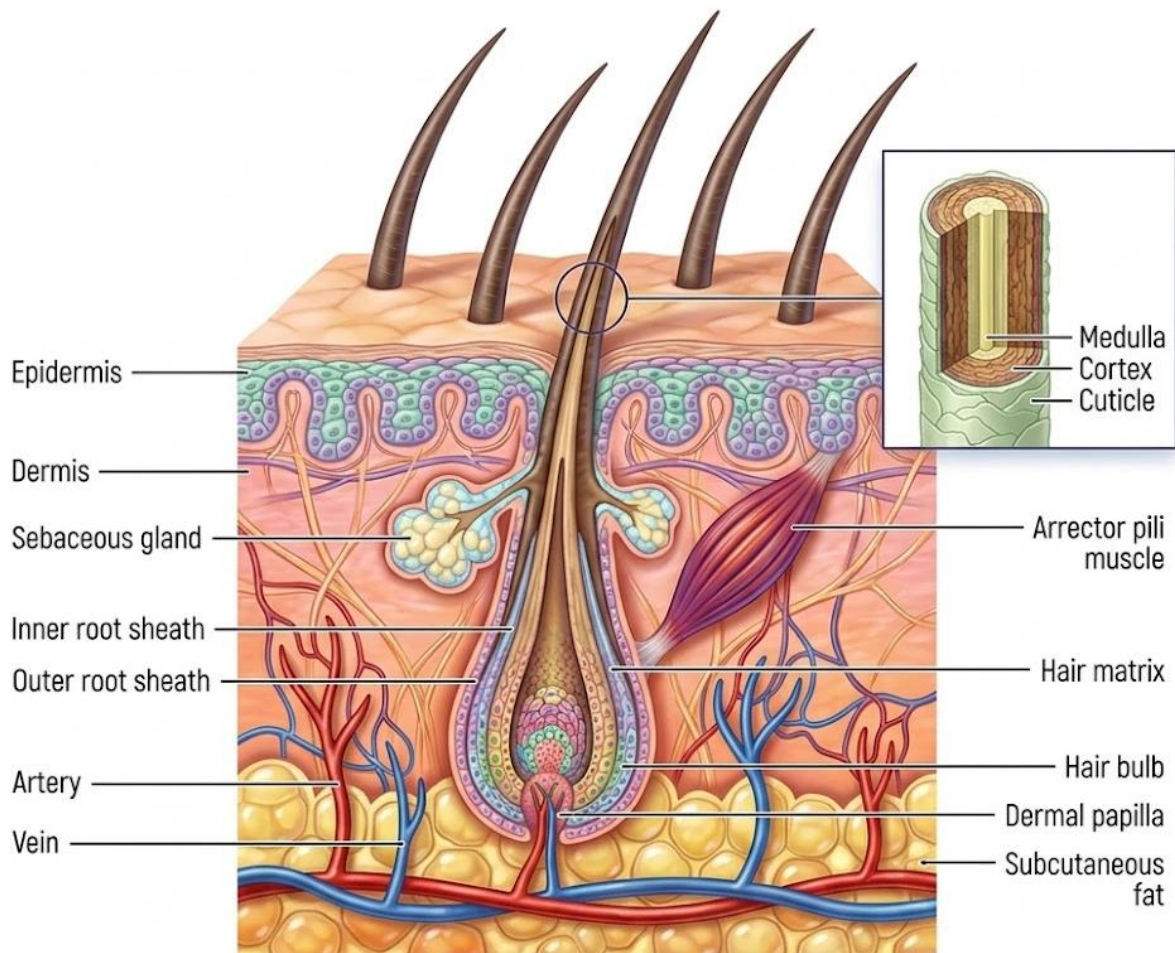
Structure of Hair

- **Hair shaft** (visible part)
- **Hair root** (inside skin)

Layers of Hair

- Cuticle (outer protective layer)
- Cortex (main structure)

- Medulla (inner core)



Hair Growth Cycle

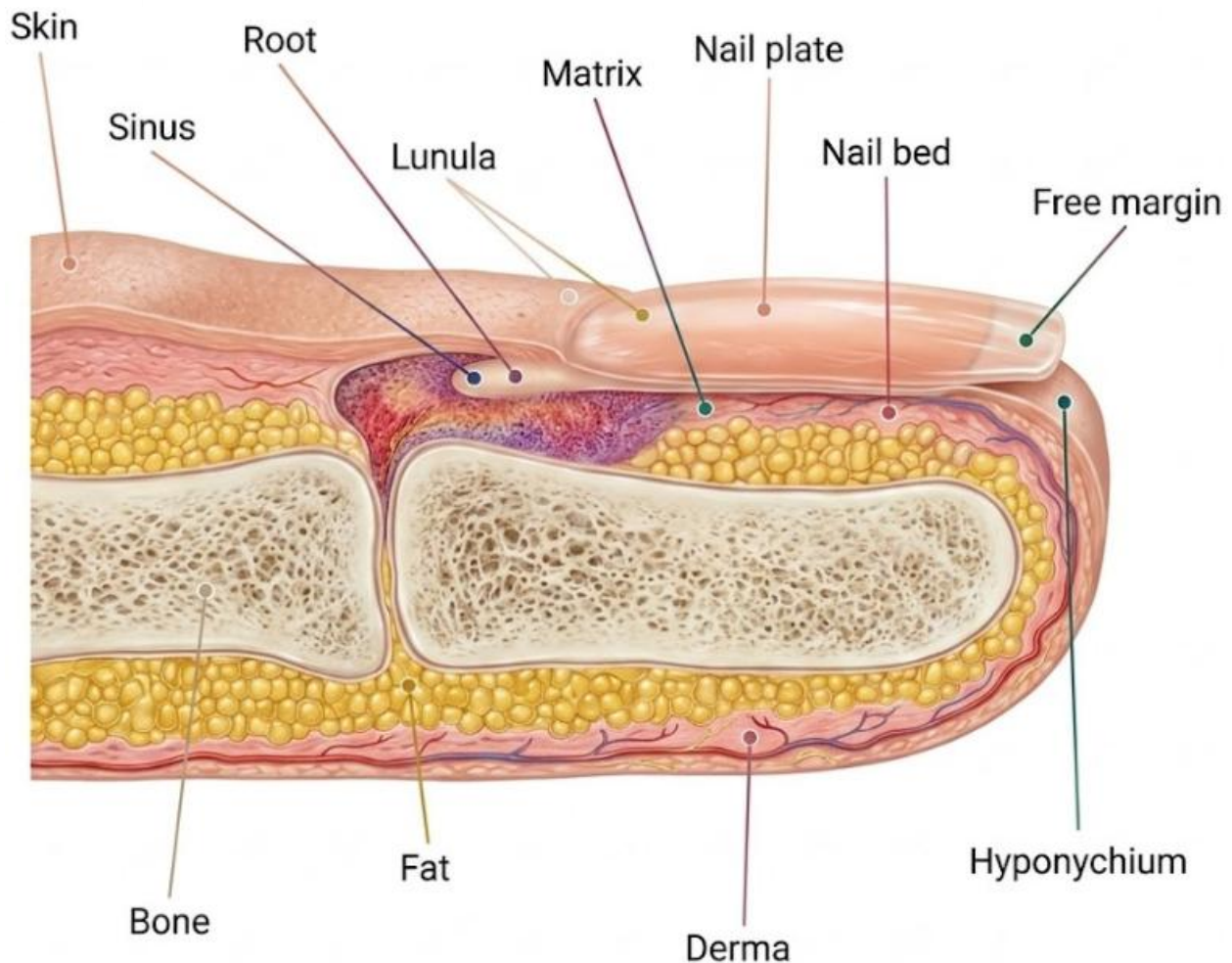
- **Anagen** (growth phase)
- **Catagen** (transition phase)
- **Telogen** (resting phase)

Relevance

- **Cosmeceuticals target:**
 - Hair growth
 - Dandruff control
 - Hair strengthening

Nail Biology

Nails are made of **keratin protein**.



Parts of Nail

- Nail plate (visible part)
- Nail bed
- Nail matrix (growth area)

Relevance

- **Nail products aim to:**
 - Strengthen nails
 - Treat fungal infections
 - Improve appearance

Challenges

- Hard keratin makes drug penetration difficult

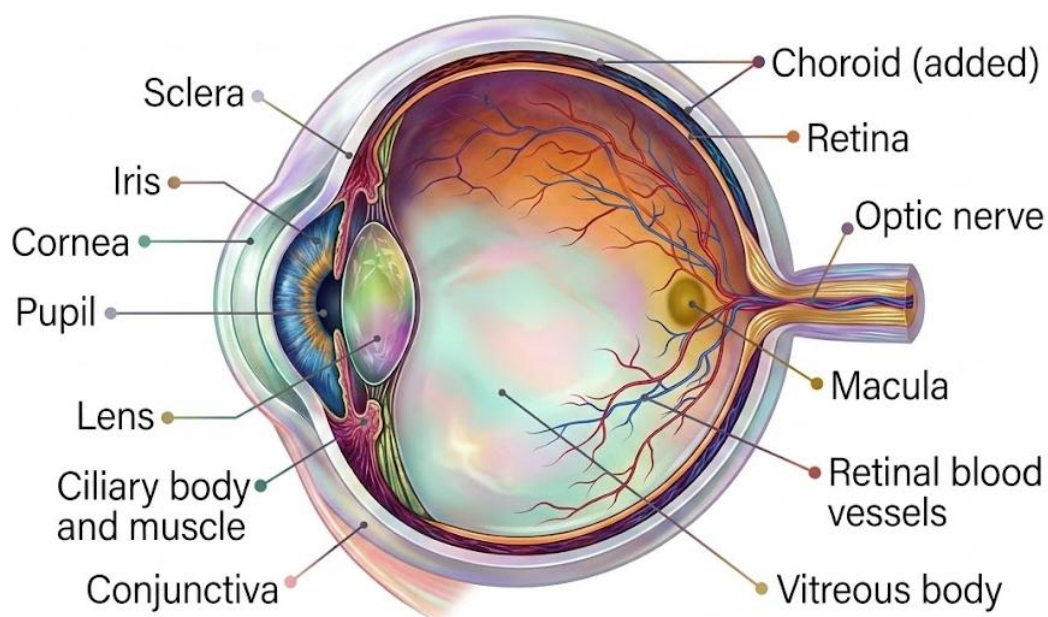
Eye Biology

Eye is highly sensitive and requires **special formulations**.

Important Parts

- Cornea (outer layer)
- Conjunctiva

- Tear film



Relevance

- **Cosmetics include:**

- Eye drops
- Mascara
- Eyeliners

- **Must be:**

- Non-irritant
- Sterile (in some cases)

Challenges

- Tear fluid washes away drugs
- Limited absorption

Formulation Science of Submicron Cosmeceuticals

- Formulation science involves the design, preparation, and stabilization of cosmetic products using submicron carriers to enhance performance and delivery.

Key Objectives

- Enhance skin penetration
- Improve stability of active ingredients
- Provide controlled and sustained release
- Ensure safety and aesthetic appeal



FREE PREVIEW

[Click here to visit our website](#)

PHARMACY PREMIUM NOTES

Complete subject
and semesters are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHopeNotes

Instagram

@firsthope.official

[Click here to follow >](#)

YouTube channel

FirstHope-Pharmacy / Live streams

[Click here to watch >](#)

WhatsApp channel

Follow FirstHope on WhatsApp

[Click here to join >](#)

FirstHope website

firsthopenotes.com

[Click here to visit >](#)

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.