Chapter 12: Structure and Functions of Skin

Skin: Overview

The skin is the largest organ of the human body, serving as a protective barrier and playing a role in temperature regulation, sensation, and excretion. It consists of two main layers: the epidermis and the dermis.

Structure of the Skin

1. **Epidermis**: The outer layer that provides a waterproof barrier and creates skin tone. It contains:
    - **Keratinocytes**: Produce keratin for protection.
    - **Melanocytes**: Produce melanin, giving skin its color.
    - **Langerhans Cells**: Involved in immune response.
    - **Merkel Cells**: Responsible for touch sensation.
2. **Dermis**: Below the epidermis, containing connective tissue, hair follicles, and glands. It includes:
    - **Sweat Glands**: Regulate body temperature through sweat production.
    - **Sebaceous Glands**: Secrete sebum to keep skin lubricated.
    - **Hair Follicles**: Anchor hair to the skin.
    - **Nerve Endings**: Detect sensations like pain, temperature, and touch.
    - **Blood Vessels**: Aid in temperature regulation.
3. **Hypodermis (Subcutaneous Layer)**: Made up of fat and connective tissue, providing insulation and cushioning.

Special Derivatives of the Skin

- **Sweat Glands**: Produce sweat for cooling and waste removal.
- **Sebaceous Glands**: Secrete oil to moisturize the skin.
- **Hair**: Protects against UV rays and provides insulation.
- **Nails**: Protect the tips of fingers and toes.
- **Mammary Glands**: Produce milk in females.

Heat Regulation

- **Vasodilation**: Blood vessels widen to release heat through the skin.
- **Vasoconstriction**: Blood vessels narrow to retain heat, reducing blood flow to the skin surface.

Conclusion

The skin protects the body from external damage, regulates temperature, and enables sensory perception. Its specialized structures and functions make it vital for maintaining overall health.