INTEGUMENTARY SYSTEM FUNCTIONS & STRUCTURES

WHAT ARE THE FUNCTIONS OF THE INTEGUMENTARY SYSTEM?

- PROTECTION
- SENSORY PERCEPTION
- BODY TEMPERATURE REGULATION
- STORAGE
- ABSORPTION
- EXCRETION
- PRODUCTION

PROTECTION

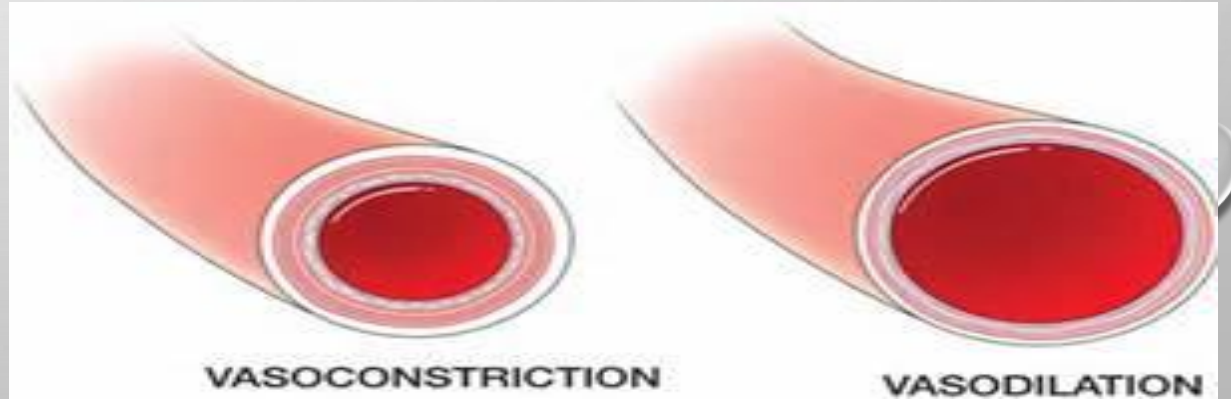
- BARRIER TO THE SUN'S UV RAYS & INVASION OF PATHOGENS
- HOLDS MOISTURE IN & PREVENTS DEEPER TISSUES FROM DRYING OUT

SENSORY PERCEPTION

- NERVES IN SKIN HELP US RESPOND TO PAIN, PRESSURE, TEMPERATURE, & TOUCH

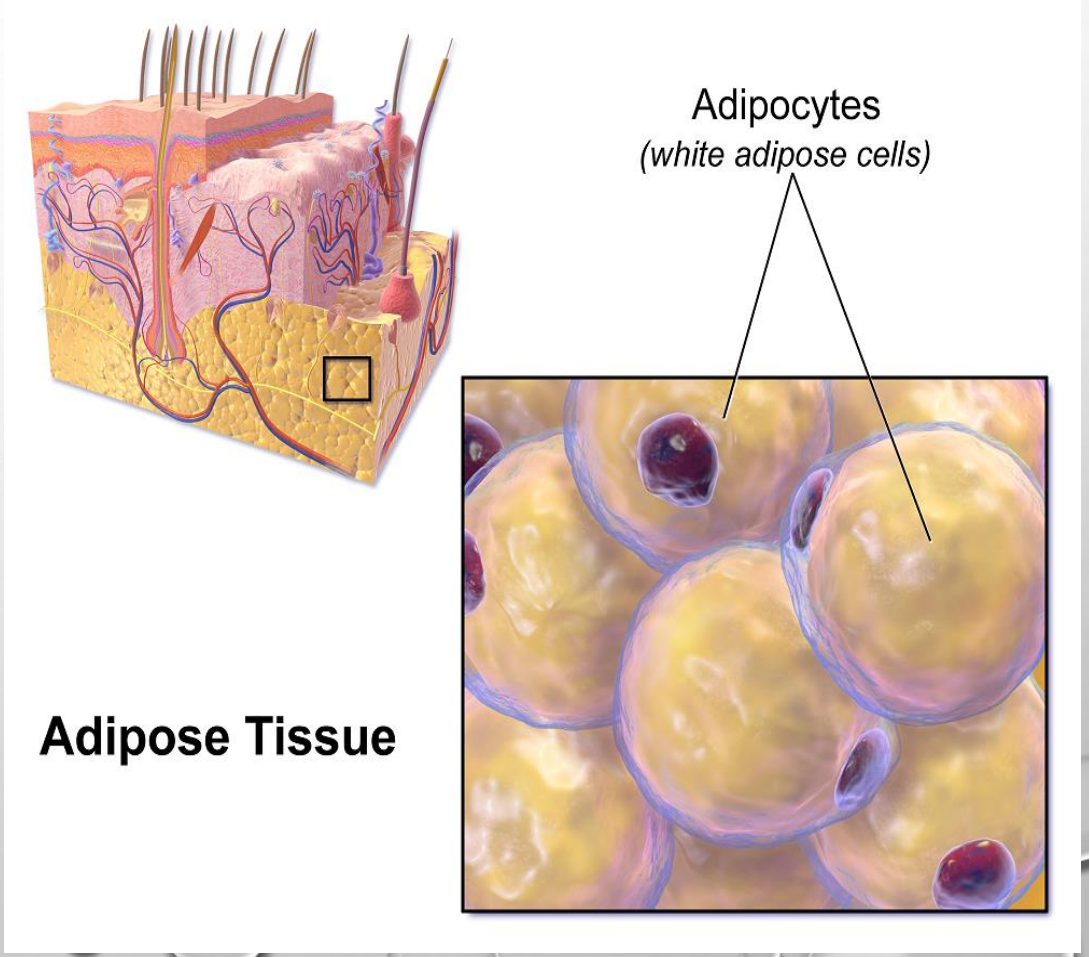
BODY TEMPERATURE REGULATION

- BLOOD VESSELS IN SKIN HELP BODY RETAIN OR LOSE HEAT
- WHEN THEY DILATE (GET LARGER), EXCESS HEAT FROM THE BLOOD CAN ESCAPE THROUGH THE SKIN
- WHEN THEY CONSTRICT (GET SMALLER), THE HEAT IS RETAINED IN THE BODY
- SUDORIFEROUS GLANDS ALSO HELP COOL THE BODY THROUGH EVAPORATION OF PERSPIRATION



STORAGE

- SKIN HAS TISSUES FOR TEMPORARY STORAGE OF FAT, GLUCOSE (SUGAR), WATER, VITAMINS, & SALTS.
- ADIPOSE (FATTY) TISSUES IN THE SUBCUTANEOUS FASCIA IS A SOURCE OF ENERGY



ABSORPTION

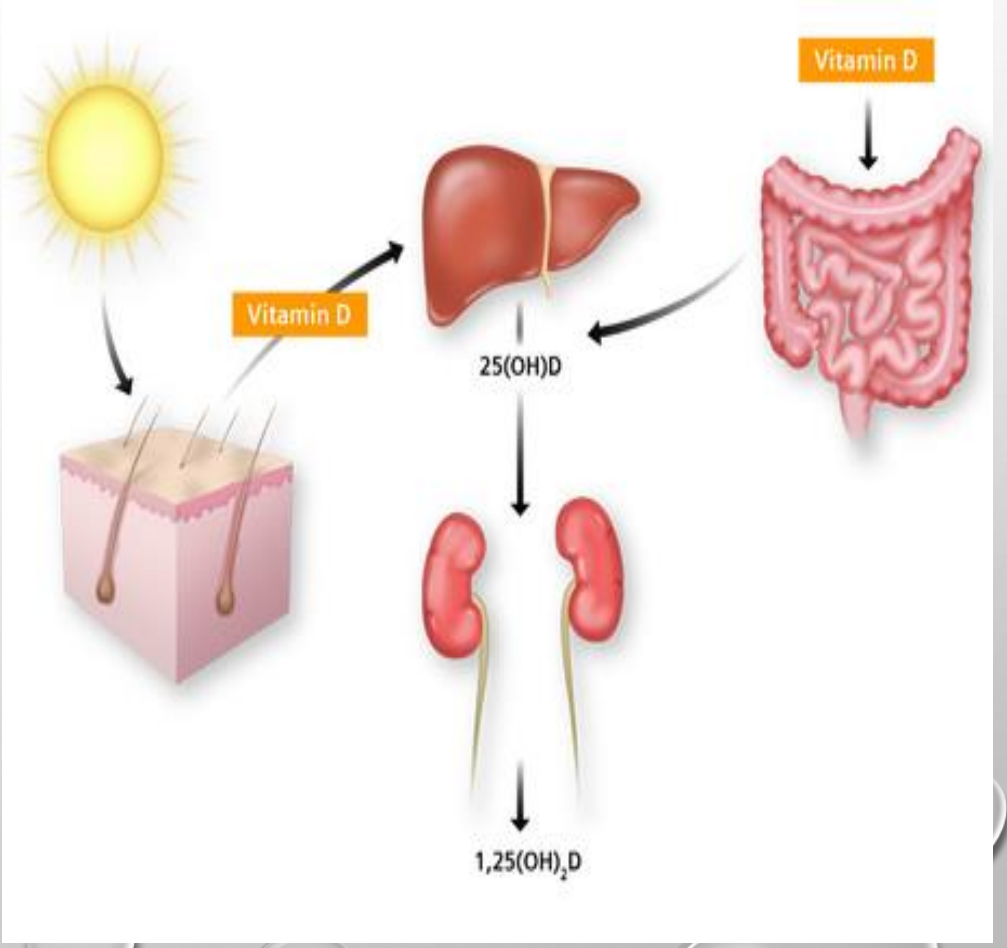
- CERTAIN SUBSTANCES CAN BE ABSORBED THROUGH THE SKIN
- EXAMPLES: TRANSDERMAL MEDICINES FOR MOTION SICKNESS, HEART DISEASE, & NICOTINE PATCHES

EXCRETION

- SKIN HELPS BODY ELIMINATE SALT, WASTE, & EXCESS WATER & HEAT THROUGH PERSPIRATION

PRODUCTION

- SKIN HELPS IN THE PRODUCTION OF VITAMIN D BY USING UV RAYS FROM THE SUN TO FORM AN INITIAL MOLECULE OF VITAMIN D THAT MATURES IN THE LIVER



WHAT ARE THE STRUCTURES OF THE INTEGUMENTARY SYSTEM?

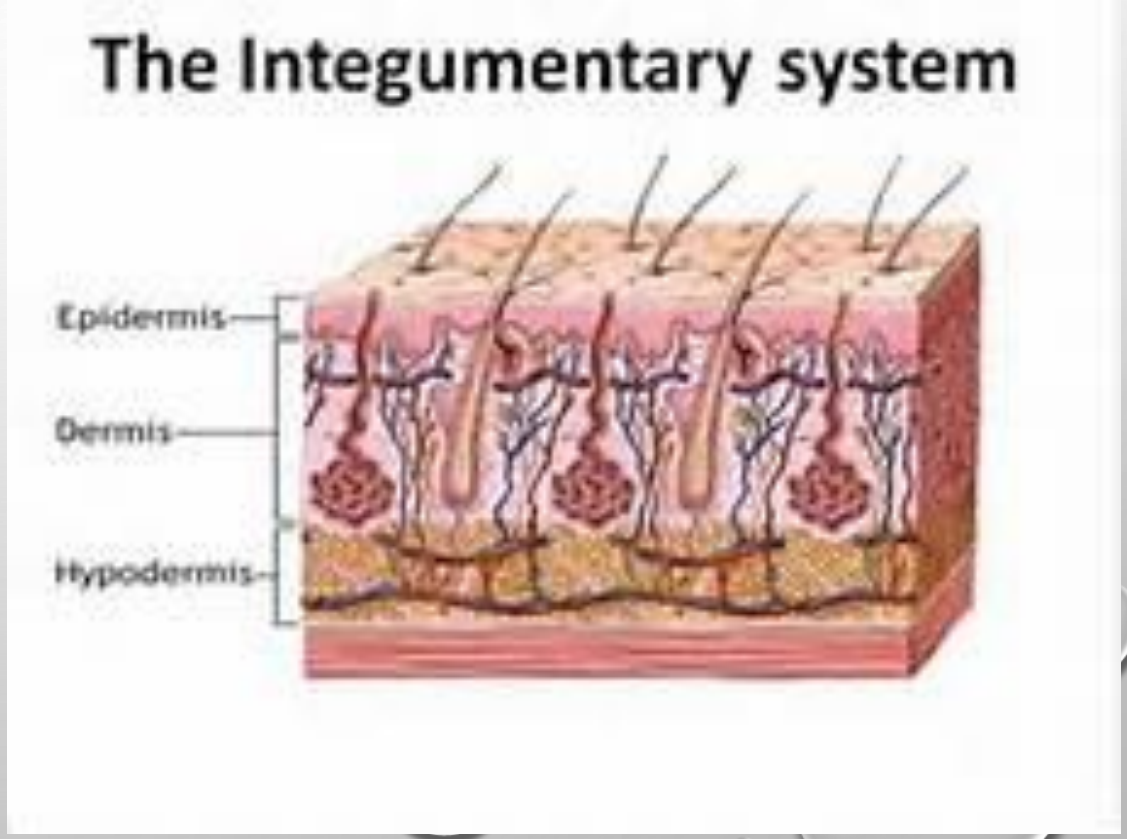
- SKIN
- HAIR
- NAILS
- GLANDS

SKIN

3 MAIN LAYERS OF TISSUE MAKE UP THE SKIN

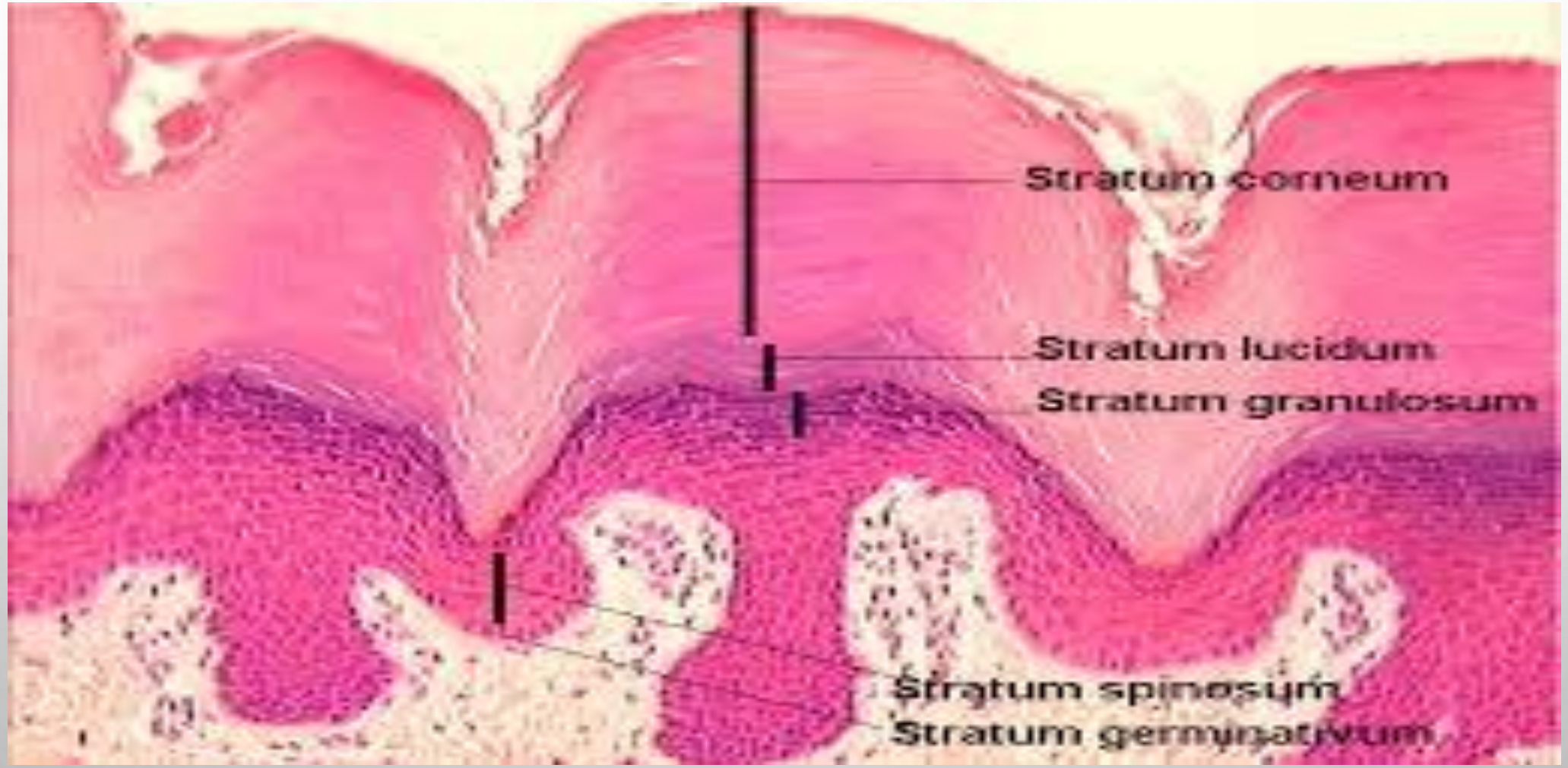
1. EPIDERMIS
2. DERMIS
3. SUBCUTANEOUS FASCIA

OR HYPODERMIS (SUBQ)



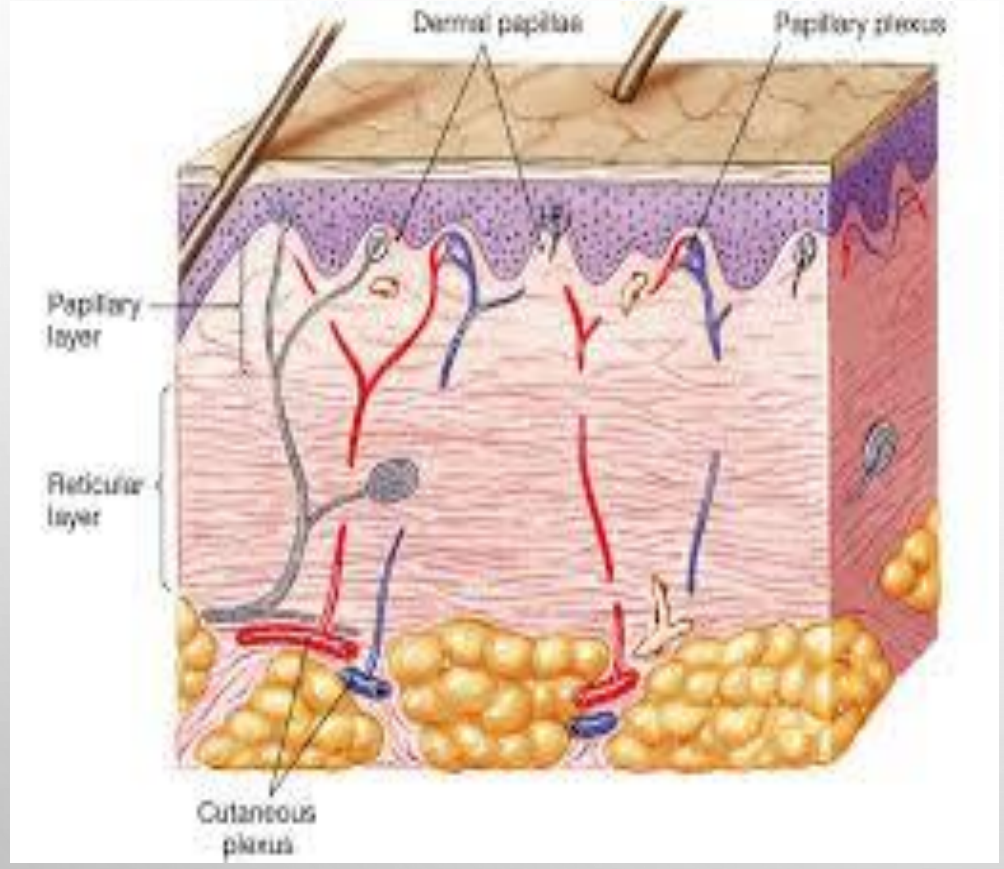
EPIDERMIS

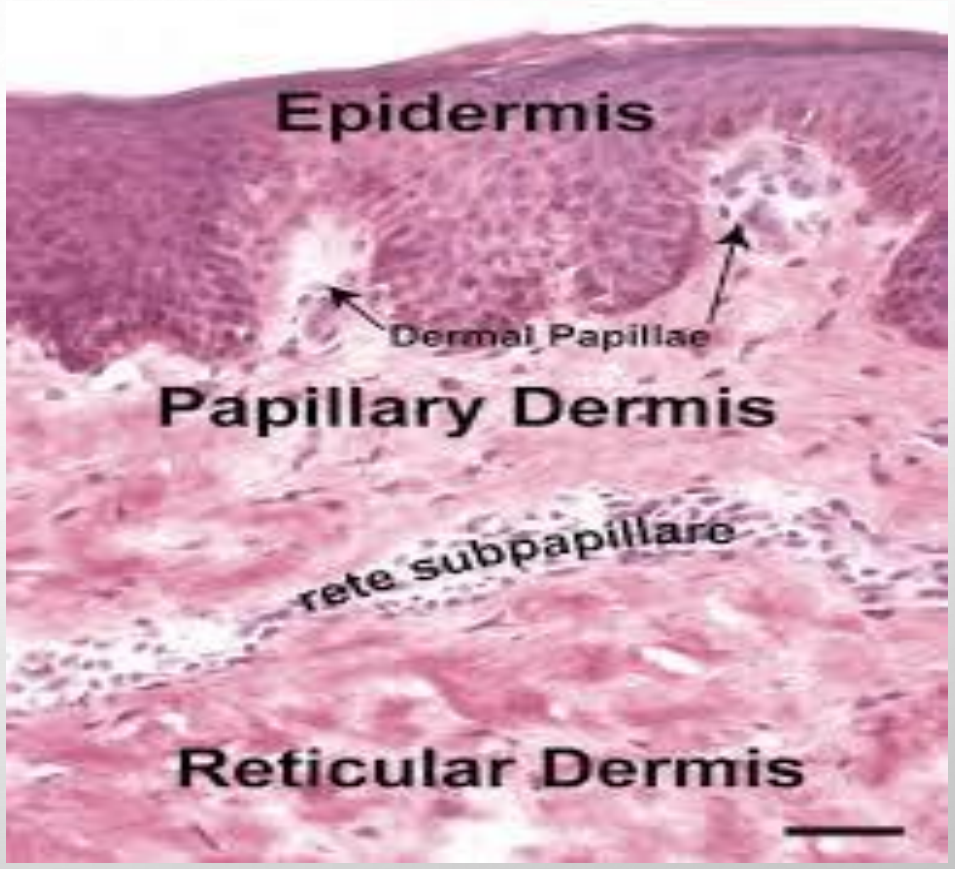
- OUTERMOST LAYER OF SKIN
- MADE OF 5 SMALLER LAYERS, CONTAINS NO BLOOD VESSELS OR NERVE CELLS.
- THE 2 MAIN LAYERS:
- 1. **STRATUM CORNEUM** - OUTERMOST LAYER
- 2. **STRATUM GERMINATIVUM** – INNERMOST LAYER
- CELLS FROM THE S. CORNEUM ARE CONSTANTLY SHED AND REPLACED BY NEW CELLS FROM THE S. GERMINATIVUM


Stratum corneum
Stratum lucidum
Stratum granulosum
Stratum spinosum
Stratum germinativum

DERMIS

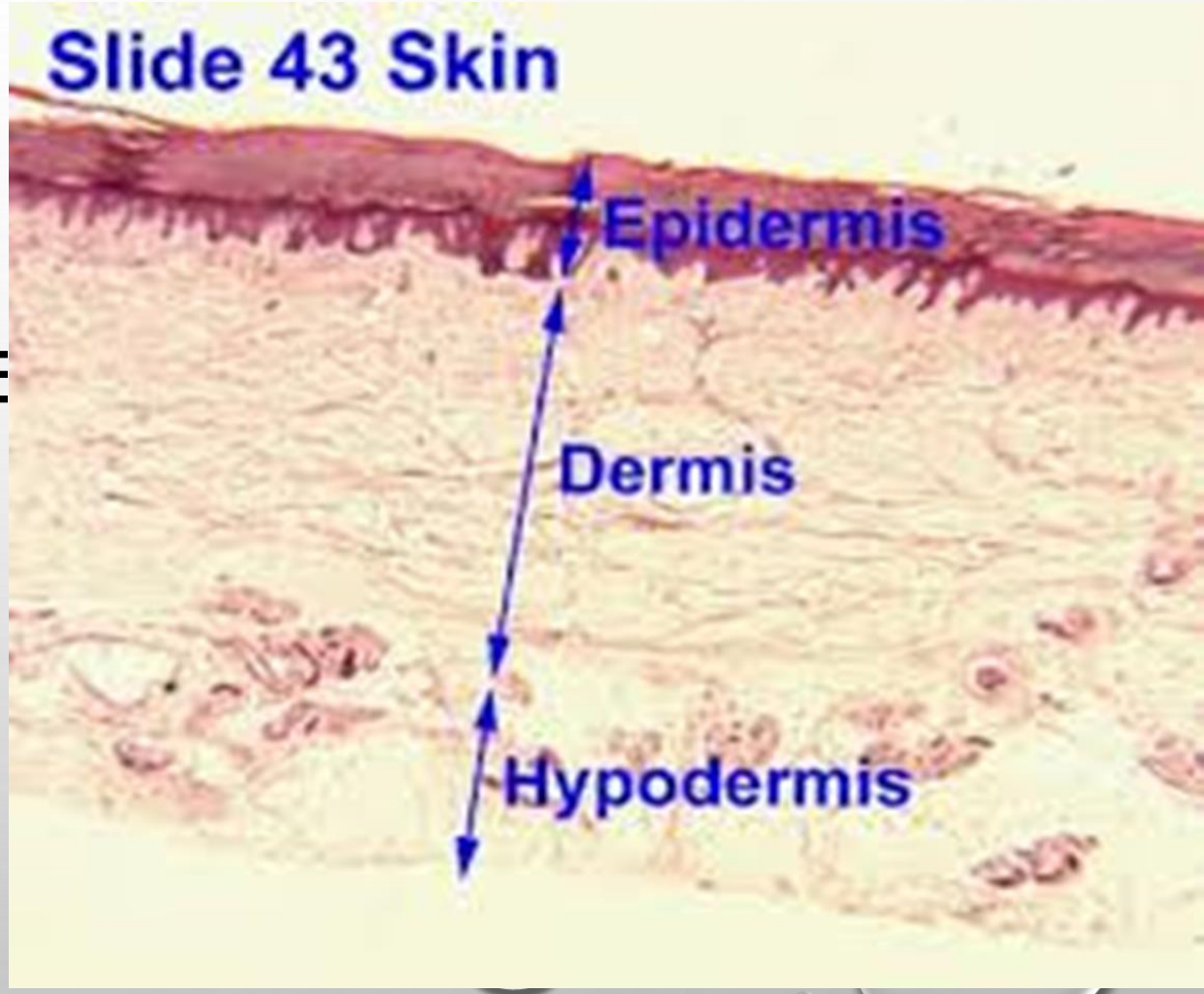
- ALSO CALLED CORIUM OR “TRUE SKIN”
- MADE OF ELASTIC CONNECTIVE TISSUE
- IT CONTAINS: BLOOD VESSELS, LYMPH VESSELS, NERVES, INVOLUNTARY MUSCLE, GLANDS, AND HAIR FOLLICLES.
- TOP OF THE DERMIS IS COVERED WITH PAPILLAE (RIDGES) WHICH FIT INTO THE EPIDERMIS. THESE RIDGES FORM LINES (STRIATIONS) ON THE SKIN. WHAT DO WE CALL THESE STRIATIONS?
- FINGERPRINTS AND FOOTPRINTS


Dermal papillae
Papillary plexus
Papillary layer
Reticular layer
Cutaneous plexus


Epidermis
Dermal Papillae
Papillary Dermis
rete subpapillare
Reticular Dermis

SUBCUTANEOUS FASCIA- HYPODERMIS

- INNERMOST LAYER OF SKIN
- MADE OF ELASTIC AND FIBROUS CONNECTIVE TISSUE AND ADIPOSE TISSUE
- IT CONNECTS THE SKIN TO UNDERLYING MUSCLES

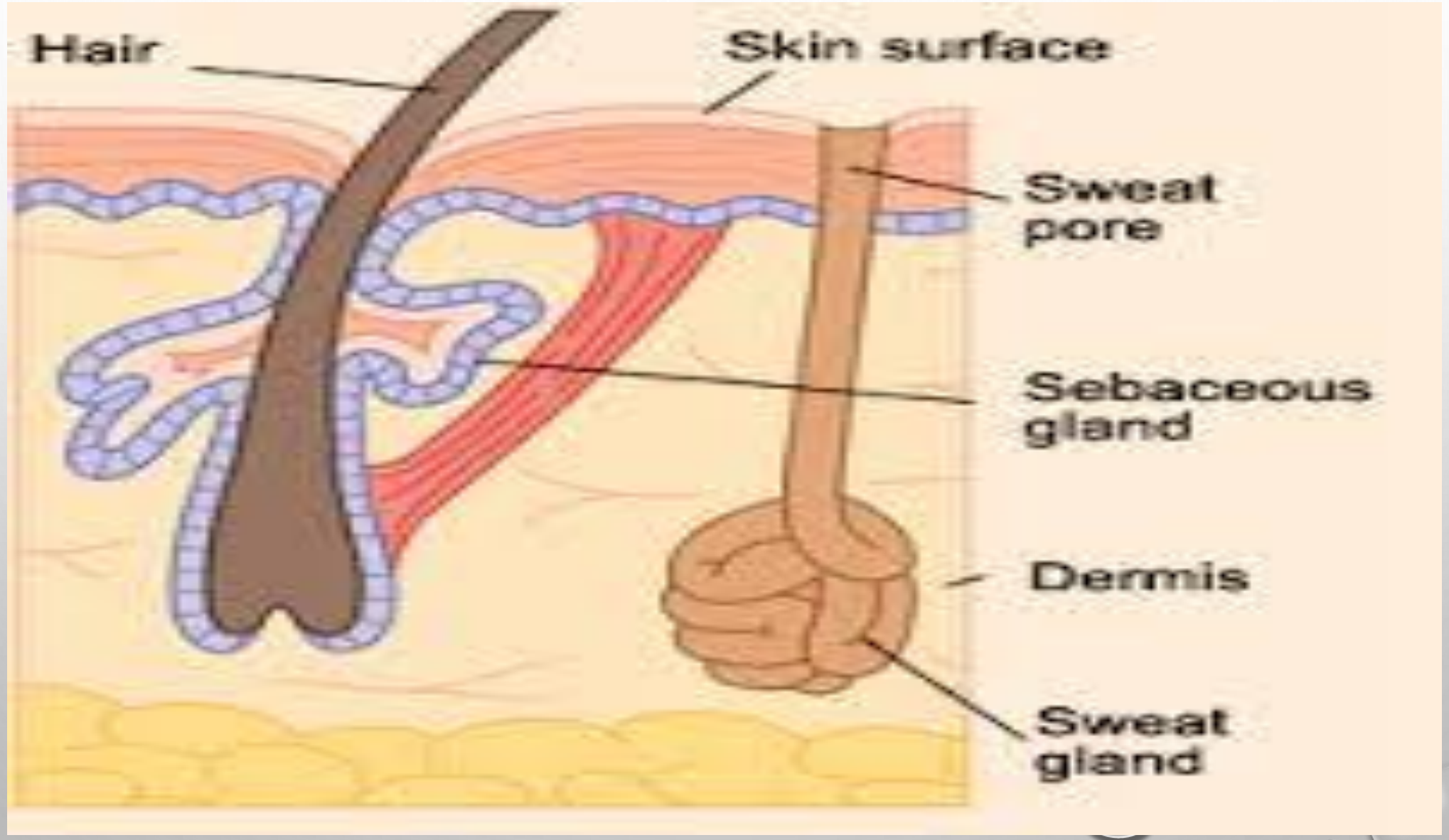


GLANDS

- 2 MAIN TYPES OF GLANDS
- 1. ***SUDORIFEROUS*** – SWEAT GLANDS; COILED TUBES THAT COME THROUGH THE DERMIS AND OPEN ON THE SURFACE OF SKIN AT PORES.
- SWEAT (PERSPIRATION) CONTAINS WATER, SALTS, AND BODY WASTES.
- IT IS ODORLESS UNTIL IT MIXES WITH BACTERIA ON THE SKIN = BODY ODOR
- PERSPIRATION REMOVES EXCESS WATER FROM THE BODY AND COOLS THE BODY AS THE SWEAT EVAPORATES INTO THE AIR

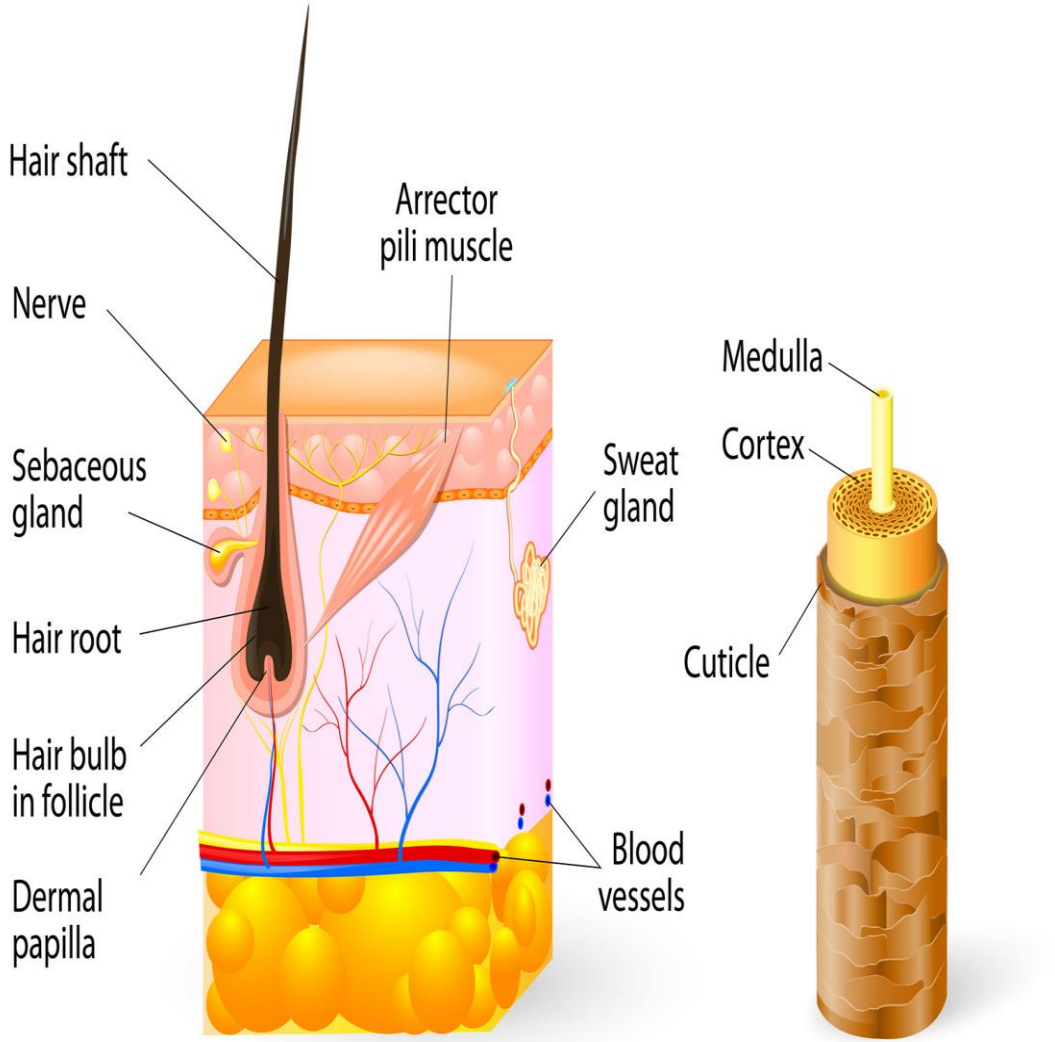
GLANDS

- 2. ***SEBACEOUS*** – OIL GLANDS; OPEN ONTO HAIR FOLLICLES.
- PRODUCE SEBUM – OIL THAT KEEPS SKIN AND HAIR FROM BECOMING DRY AND BRITTLE
- SEBUM IS SLIGHTLY ACIDIC AND ACTS AS AN ANTIBACTERIAL AND ANTIFUNGAL TO HELP PREVENT INFECTIONS.
- WHEN AN OIL GLAND BECOMES PLUGGED, THE ACCUMULATION OF DIRT AND OIL RESULTS IN A BLACKHEAD OR PIMPLE


Hair
Skin surface
Sweat pore
Sebaceous gland
Dermis
Sweat gland

HAIR

- HAIR PROTECTS THE BODY AND COVERS ALL SURFACES EXCEPT FOR THE PALMS AND SOLES
- 3 PARTS OF A HAIR
- 1. ROOT
- 2. FOLLICLE-HOLLOW TUBE WHERE THE ROOT GROWS
- 3. SHAFT-ONLY VISIBLE PART OF THE HAIR



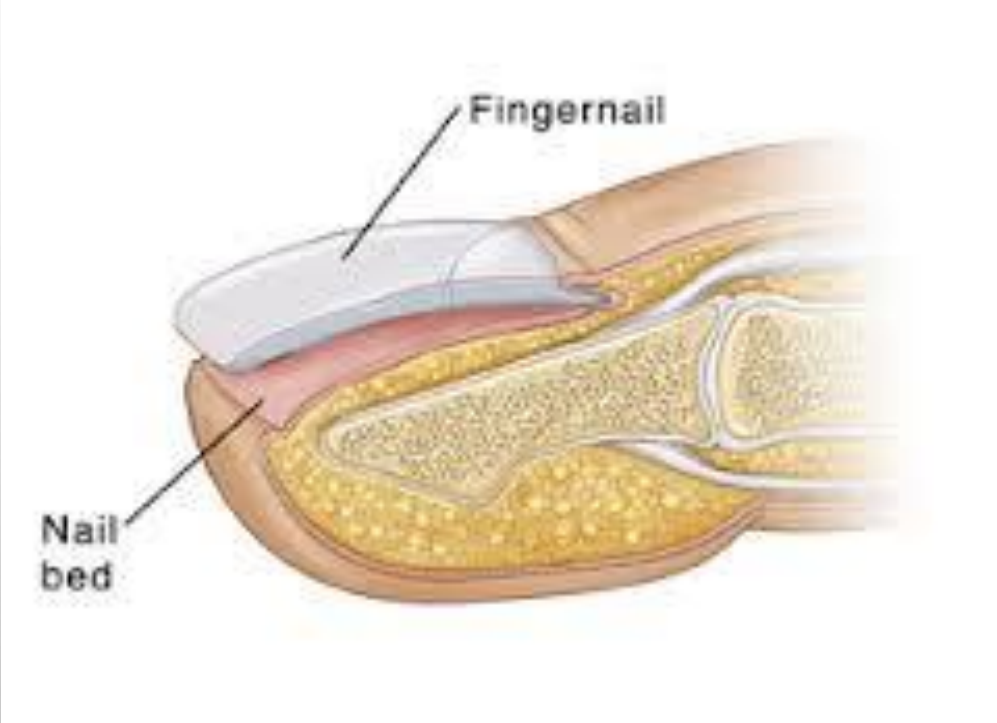
FOLLICLE SHAPE DETERMINES
HAIR TEXTURE
STRAIGHT
WAVY
CURLY
SPIRAL
COILED
FOLLICLE SIZE DETERMINES
HAIR THICKNESS
THICK
THIN
THICK
THIN

HAIR

- ALOPECIA- (BALDNESS) PERMANENT HAIR LOSS ON THE SCALP. DUE TO GENETICS, CAN HAPPEN IN MALES AND FEMALES

NAILS

- PROTECT THE FINGERS AND TOES FROM INJURY
- MADE OF DEAD, KERATINIZED EPIDERMAL EPITHELIAL CELLS
- CELLS ARE PACKED CLOSELY TOGETHER TO FORM A THICK, DENSE SURFACE
- FORMED IN NAIL BEDS
- IF LOST, NAILS WILL REGROW IF THE NAIL BED ISN'T DAMAGED


Fingernail
Nail bed

©Dermnet.com