

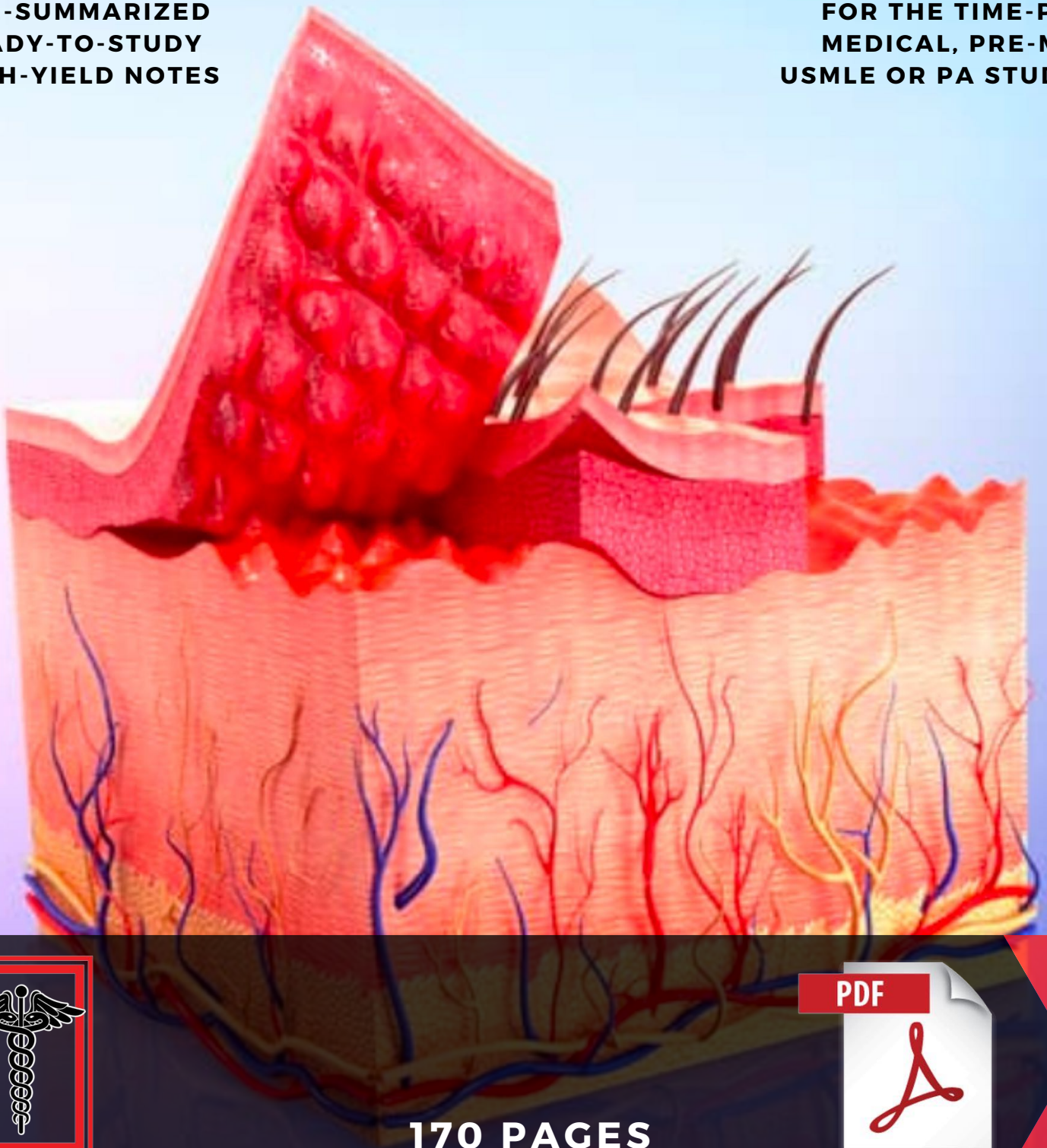
CLINICAL DERMATOLOGY

NOTES

FOURTH EDITION

**PRE-SUMMARIZED
READY-TO-STUDY
HIGH-YIELD NOTES**

**FOR THE TIME-POOR
MEDICAL, PRE-MED,
USMLE OR PA STUDENT**



PDF



170 PAGES

A Message From Our Team

Studying medicine or any health-related degree can be stressful; believe us, we know from experience! The human body is an incredibly complex organism, and finding a way to streamline your learning is crucial to succeeding in your exams and future profession. Our goal from the outset has been to create the greatest educational resource for the next generation of medical students, and to make them as affordable as possible.

In this fourth edition of our notes we have made a number of text corrections, formatting updates, and figure updates which we feel will enhance your study experience. We have also endeavoured to use only open-source images and/or provide attribution where possible.

If you are new to us, here are a few things to help get the most out of your notes:

- 1. Once saved, the notes are yours for life!** However, we strongly advise that you download and save the files immediately upon purchasing for permanent offline access.
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What's included: Ready-to-study anatomy, physiology and pathology notes of the integumentary system presented in succinct, intuitive and richly illustrated downloadable PDF documents. Once downloaded, you may choose to either print and bind them, or make annotations digitally on your iPad or tablet PC.

(**BLUE** = **CLICKABLE HYPERLINK**)

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- [**GENERAL PRINCIPALS OF DERMATOLOGY**](#)
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 - ACQUIRED NEVOMELANOCYTIC NEVI (COMMON MOLE)
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 - HAEMANGIOMAS
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 - STASIS DERMATITIS (VENOUS ECZEMA)
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 - ERYTHEMA MULTIFORME
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 - LICHEN PLANUS:
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 - NEUROFIBROMATOSIS 1
 - VITILIGO
- [**BACTERIAL INFECTIONS**](#)

- IMPETIGO (SCHOOL SORES)
- ERYSIPELAS
- CELLULITIS
- FOLLICULITIS
- FURUNCLES (BOILS) & CARBUNCLES
- FUNGAL INFECTIONS
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- PARASITIC INFECTIONS
 - SCABIES
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- VIRAL INFECTIONS
 - HERPES SIMPLEX
 - CHICKEN POX (VARICELLA ZOSTER)
 - HERPES ZOSTER (SHINGLES)
 - MOLLUSCUM CONTAGIOSUM
 - HPV WARTS (VERRUCA VULGARIS)
- PREMALIGNANT & MALIGNANT SKIN CONDITIONS
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 - BASAL CELL CARCINOMA
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 - KERATOACANTHOMA
 - MALIGNANT MELANOMA
- PEDIATRIC EXANTHEMS
 - MEASLES VIRUS
 - RUBELLA VIRUS ("GERMAN MEASLES)
 - HUMAN PARVOVIRUS B19 ("5TH DISEASE")
 - SCARLET FEVER
 - SCALDED SKIN SYNDROME (SSS)
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- PROCEDURAL DERMATOLOGY
- SKIN PATHOLOGY – UNDER A MICROSCOPE
- EXAMPLES OF EXAM QUESTIONS

OVERVIEW OF SKIN STRUCTURE & FUNCTION

OVERVIEW OF SKIN STRUCTURE & FUNCTION

Functions of Normal Skin:

- Mechanical barrier
- Chemical barrier
- Prevent Fluid Loss (Overlapping Cells & Intercellular Lipid → Minimises loss of Water)
- Defence against micro-organisms
- Immunological barrier
- Endocrine organ – (Produces Vitamin-D under UV)
 - Vitamin D → Maintains Calcium Homeostasis ($\uparrow \text{Ca}^+$ Absorption in Gut & \uparrow Renal Ca^+ Retention)
- Melanin → Protects against UV
- Thermoregulation – (Varying blood flow → Allows heat Conservation or Evaporative Cooling)
- Sensory organ

Basic Structure of Normal Skin:

- 3 Layers:

○ Epidermis (Top Cellular Layer):

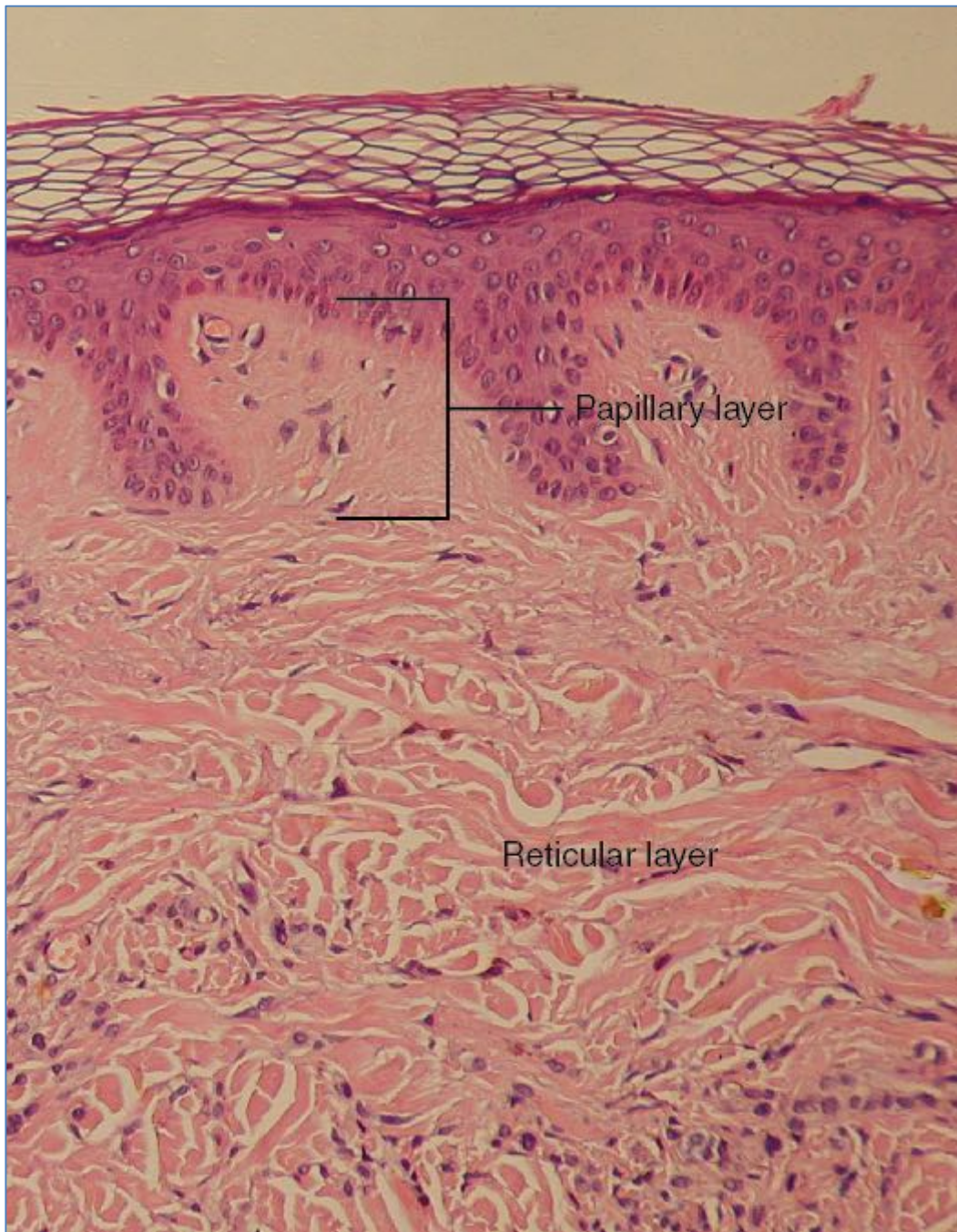
- Keratinocytes
- Melanocytes
- The 5 Layers of the Epidermis:
 - **1) Stratum Germinativum/Basale:**
 - Single layer of cuboidal/columnar cells
 - **2) Stratum Spinosum (Prickle Cell layer):**
 - Several layers of polyhedral cells
 - **3) Stratum Granulosum:**
 - 3-5 layers flattened cells
 - **4) Stratum Lucidum:**
 - (Present only on very thick layers of epidermis (Eg: Glabrous Skin [palms/feet]))
 - = The Lucid layer of Flattened Cells before Stratum Corneum
 - **5) Stratum Corneum:**
 - 5-50 layers of Flattened, Dead Cells (Squames)
 - Protective Barrier; Holds in Moisture
 - Cytoplasm is filled with **keratin & keratohyalin granules**

○ Dermis (Middle Fibrous Layer):

- Connective Tissue
- Blood Vessels
- Nerves (Sensory Receptors & Free Nerve Endings)
- Hair Follicles + Arrector Pili (the Smooth Muscle)
 - **Note: Skin without hair** – (Eg: Palms & Soles) = “**Glabrous Skin**”
 - **Note: Skin With Hair** – (Ie: Rest of the body) = “**Non-Glabrous Skin**”
- Glands (Sweat, Sebaceous)
- **Contains Some Cells:**
 - **Fibroblasts:** Synthesis and degradation of connective tissue
 - **Histiocytes/Macrophages:** Phagocytic cells
 - **Mast cells:** Secretory cells → Vasoactive Mediators (histamine) → Skin Allergies
 - **Lymphocytes:** Small number collect around blood vessels in normal skin
- **2 Layers:**
 - **(R) - Reticular Layer** (thick Collagen, lower layer) - much stronger
 - **(P) - Papillary layer** (fine Collagen, upper layer) – weaker

○ Hypodermis (Fat Layer):

- Adipose Tissue
- **Functions:**
 - Insulates the body
 - Stores Energy



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LAYER 1: THE EPIDERMIS:

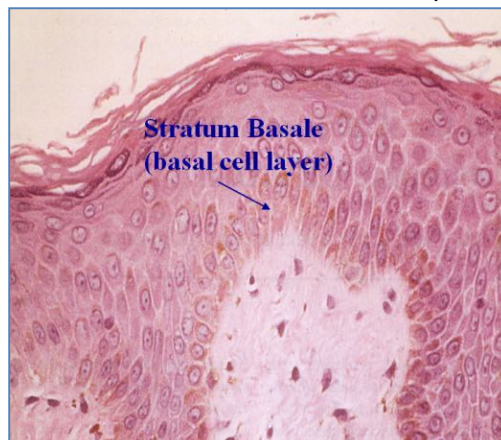
- Structure of the Epidermis:

- Most Superficial Layer of Stratified Squamous Keratinised Epithelium
- Avascular
- Almost Entirely Cellular:
 - 95% of Epidermal Cells are *Keratinocytes* (Produce Keratin)
 - Other Cells include: *Melanocytes*, *Merkel Cells* & *Langerhans Cells*
 - Continually regenerating (Rate is just sufficient to replace cells lost from the surface)
- Protective barrier
- Approximately 0.1 to 1mm thick

- The 5 Layers of the Epidermis:

○ **1) Stratum Germinativum/Basale:**

- Single layer of cuboidal/columnar cells
- **Basal Cells** take 14 days to differentiate → Keratinocytes
- Keratinocytes take 14 days to be shed off
- Strongly adherent to the Basement Membrane by **Hemidesmosomes**



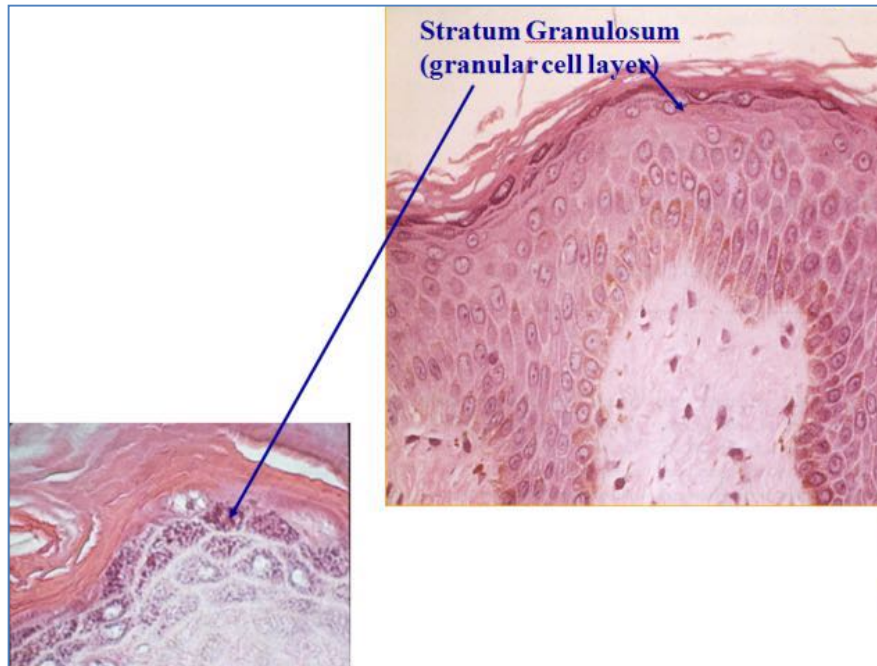
○ **2) Stratum Spinosum (Prickle Cell layer):**

- Several layers of polyhedral cells
- Keratin-Tonofibrils Insert into interconnecting desmosomes from adjacent cells
- **Keratinocytes** Contain '**Lamellar (lipid containing) bodies**':
 - Are Secreted into the Extracellular spaces (Sticks Cells Together)
 - → Forms a water-barrier
 - → Also acts to cement keratinized squames together in Stratum Corneum
- **Langerhans Cells:**
 - Like Macrophages
 - Have Antigen Presenting Capacity



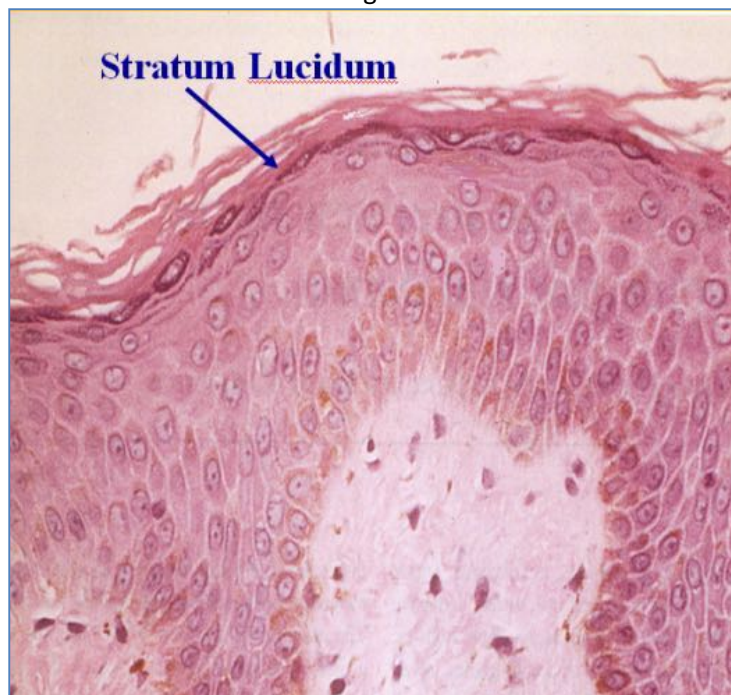
○ **3) Stratum Granulosum:**

- 3-5 layers flattened cells
- Loss of nuclei
- **Keratinocytes:**
 - **Keratohyalin granules** (Composed of *Profilaggrin*, *Keratin Filaments*, & *Loricrin*)
 - Keratohyalin = Protein involved in Keratinisation
 - Note: Eczema is probably due to a mutation in Profilaggrin
 - **Lamellar Body secretions:**
 - Lamellar Body Contents Discharged into Intracellular Spaces
 - (Lipids, Enzymes)
 - – Acts like the “*Mortar*” between the cellular “*Bricks*”



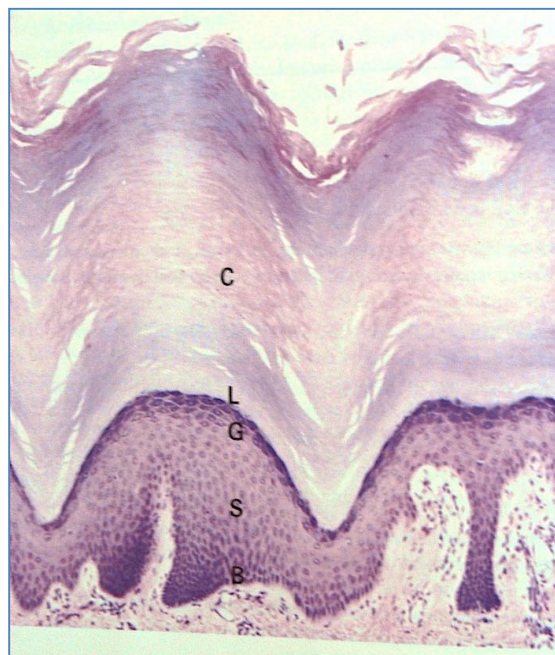
○ **4) Stratum Lucidum:**

- (Present only on very thick layers of epidermis (Eg: Glabrous Skin [palms/feet]))
- = The Lucid layer of Flattened Cells before Stratum Corneum
 - Cells have No nuclei or organelles



○ **5) Stratum Corneum:**

- 5-50 layers of Flattened, Dead Cells (Squames)
 - Devoid of Nuclei & Organelles
- Protective Barrier; Holds in Moisture
- Cytoplasm is filled with **keratin & keratohyalin granules**
- Cells are stuck together by contents of **Lamellar Bodies**
- Thicker on Glabrous Skin (Palms and soles)

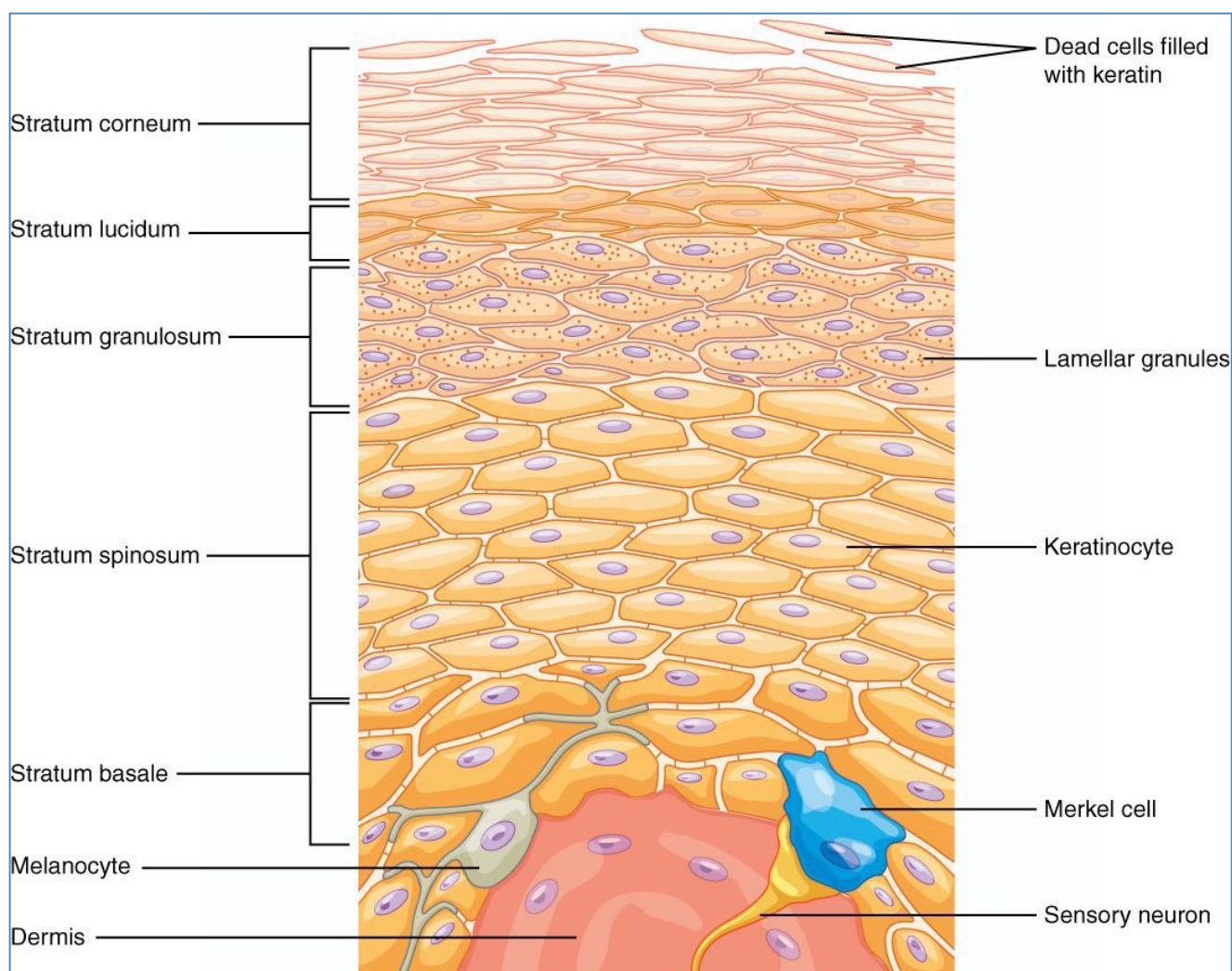


C = Corneum; L = Lucideum; G = Granulosum; S = Spinosum; B = Basale

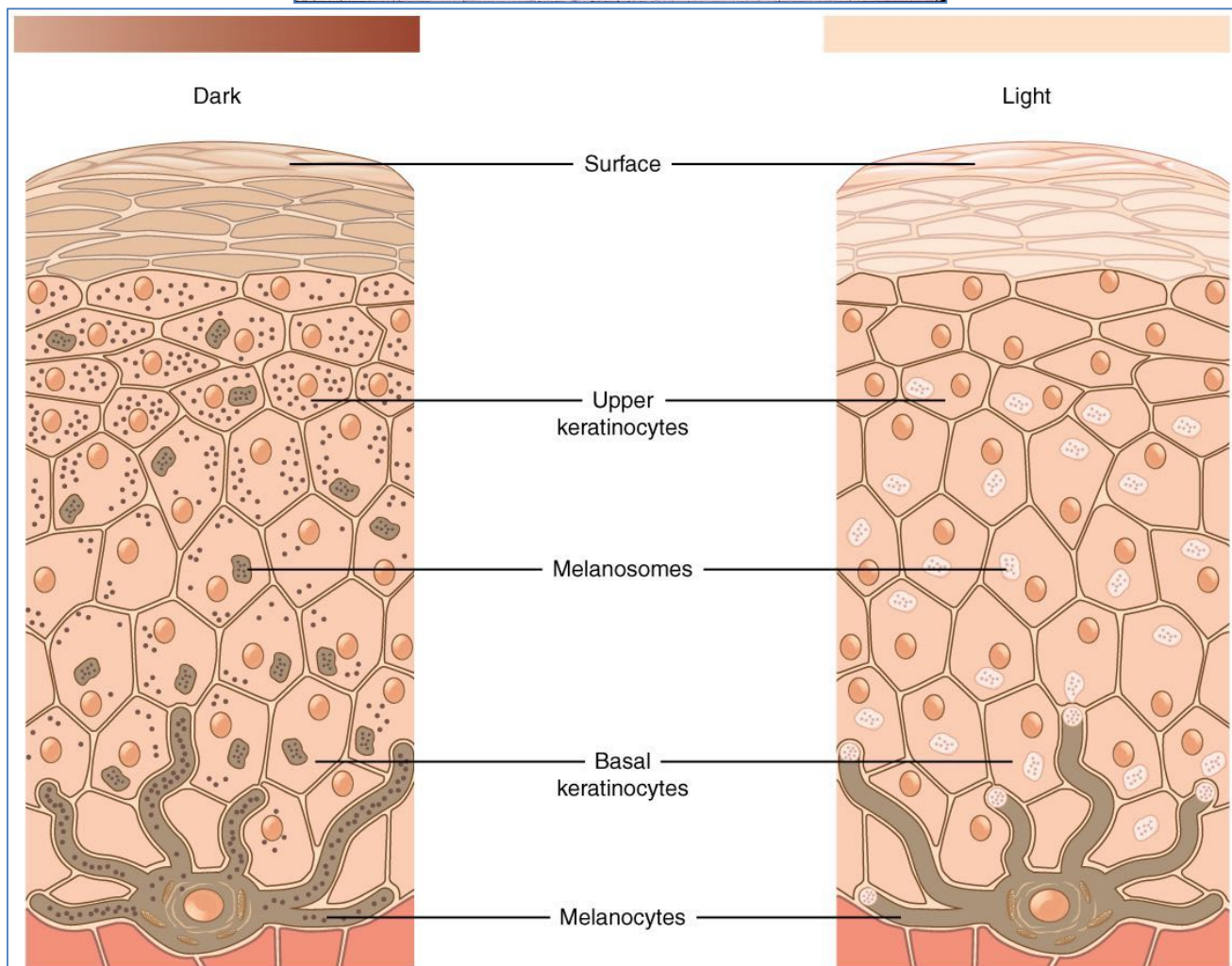
- **Cellular Component of the Epidermis:**

○ **Keratinocytes – (In all Layers):**

- Form the *Keratinized Stratified Squamous Epithelium*
- Contain **Keratin** (Protein) Intermediate Filaments in the Cytoplasm
- **Keratin:**
 - **Two types of epithelial keratins:**
 - Type I (acidic)
 - Type II (basic)
 - (Note: Each are produced in Equal Amounts)
 - **Keratin Proteins Polymerise as Heterodimers:**
 - Type 1 + type 2 → Polymers
 - **Keratin Polymers aggregate → Keratin Filaments**
 - **Keratin Filaments aggregate → Tonofilaments**
- **“Keratinisation” – Keratinocytes Differentiate as they Migrate Upwards:**
 - Formation of Keratin proteins in Cytoplasm
 - →Aggregation of the Keratin Filaments into **‘Tonofilaments’** (Like a rope)
 - (*Tonofilaments* →Anchor Desmosomes to the Cytoskeleton)
- **Join to Adjacent Cells via:**
 - **Desmosomes:**
 - Intercellular attachments between keratinocytes
 - **Hemidesmosomes:**
 - Attachment of the Basal Keratinocytes (Epidermis) to the Basement Membrane (Dermis)
 - Very Tight Connection



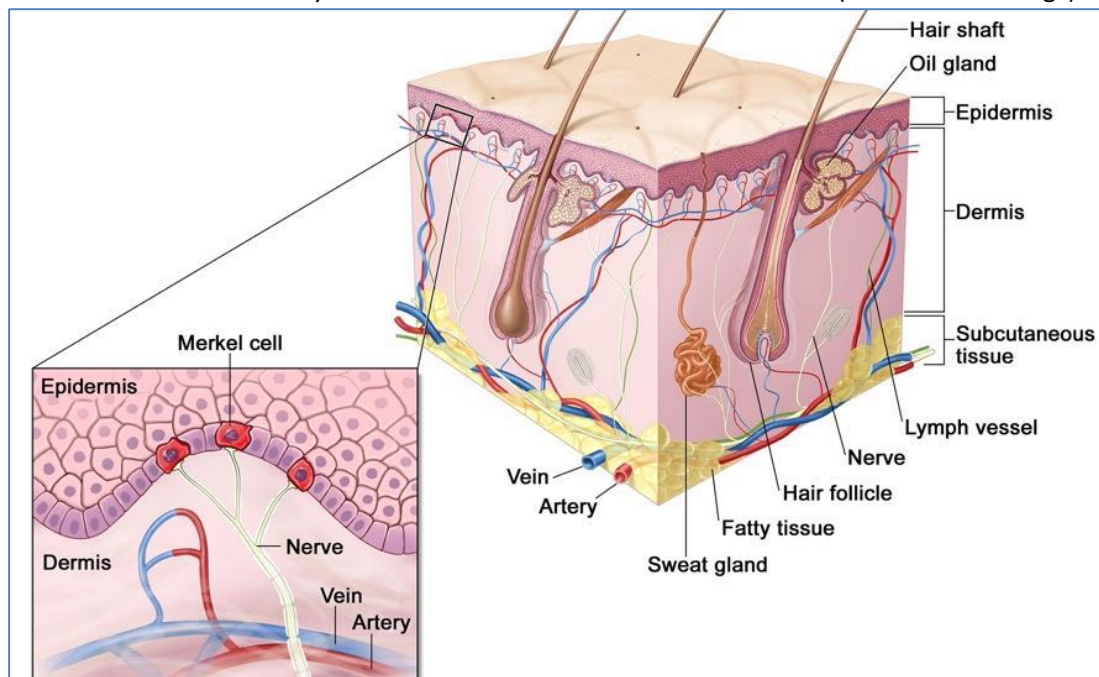
- **Melanocytes – (In Stratum Basale):**
 - **Pigment Cells – Synthesise Melanin Pigment**
 - Melanin contained in *Melanosomes*
 - Transferred to keratinocytes via Dendritic Processes
 - Melanin Absorbs UV radiation
 - **Located in Stratum Basale, Dermis and Hair Follicles**
 - **Note: Differences in Racial Pigmentation:**
 - Due to ↑Melanocyte Activity (NOT Melanocyte *Number*)



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○ **Merkel Cells – (In Stratum Basale):**

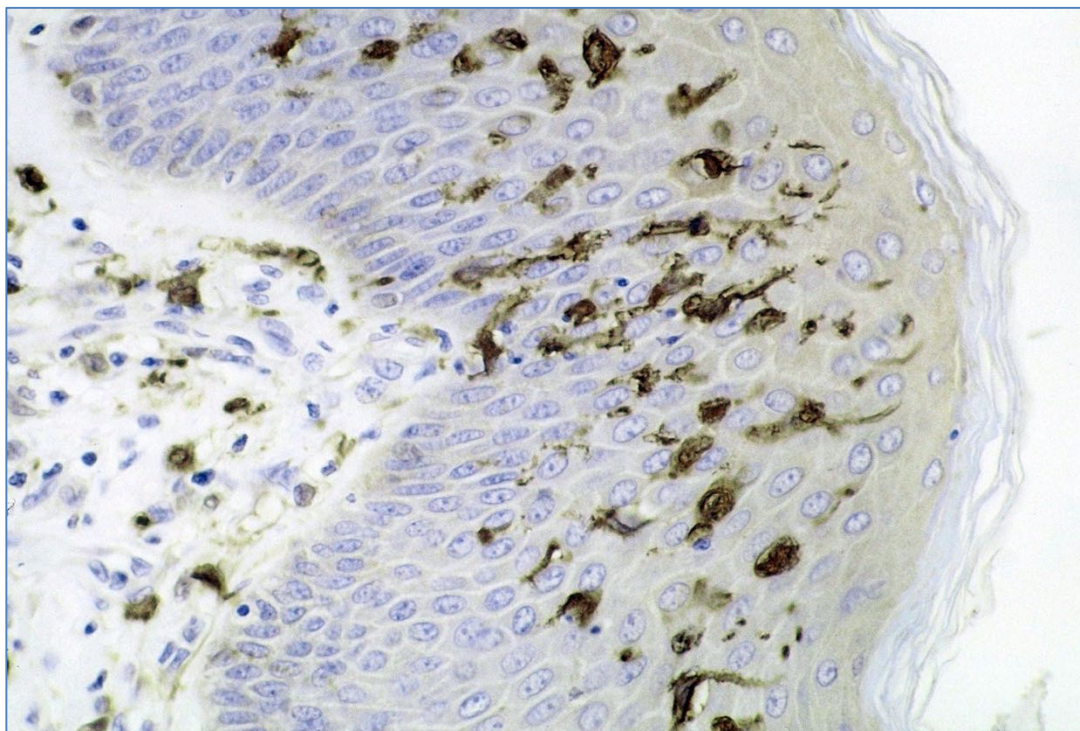
- Nerve Ending Associated
- Contain small, dense Granules of Catecholamines
- **Located in Stratum Basale**
- - Probably Neuro-Endocrine Function
 - Sensory mechanoreceptors
 - Closely associated with Nerve Terminal Filaments (free nerve endings)



Source: <https://www.dana-farber.org/merkel-cell-carcinoma/>

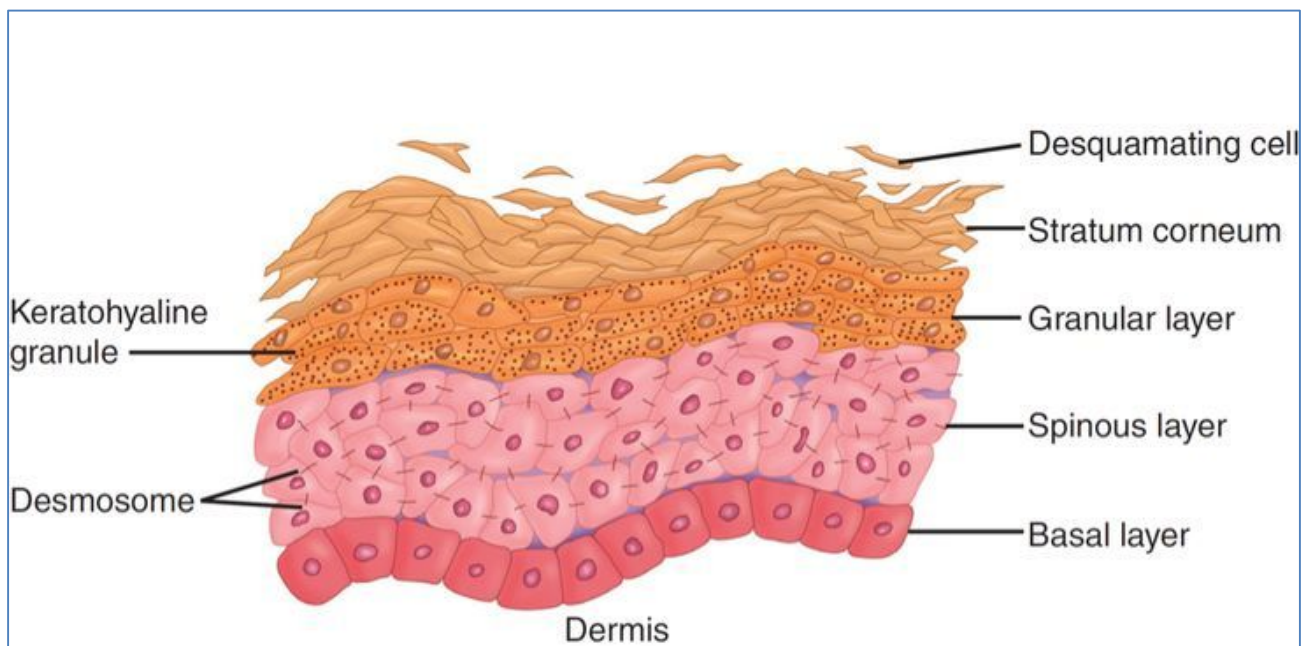
○ **Langerhans Cells – (In Stratum Spinosum):**

- Antigen Presenting Cells of the Immune System
- Have long Dendritic Processes that radiate through the Epidermis
- **Located in the Stratum Spinosum**
- Migrate through Epidermis and Dermis to Lymph Nodes
- - Immune Function



Public domain; Available from: https://commons.wikimedia.org/wiki/File:Dendritic_cells.jpg

- **Epidermopoiesis (Epidermal Renewal) & Desquamation (Shedding of Skin):**
 - **(Note: Rate of Epidermopoiesis must = Rate of Desquamation)**
 - **Stimulated by Growth Factors:**
 - Epidermal Growth Factor (EGF)
 - Transforming Growth Factor α (TGF α)
 - Fibroblast Growth Factor (FGF)
 - **Inhibited by Cytokines:**
 - Interferon Gamma (IFN γ)
 - Tumour Necrosis Factor (TNF)
 - **Epidermopoiesis (Epidermal Renewal):**
 - Epidermis continually renews itself
 - - by Basal (Columnar) Cell Division
 - Turnover rate \approx 6 Weeks
 - **Basal Cells Become \rightarrow Keratinocytes (Epidermal Cells):**
 - Via Keratinization = Synthesis of Keratin Protein
 - Transit time to the stratum corneum is approx 14 days
 - **Desquamation (Shedding of the Skin):**
 - Occurs when desmosomes are degraded (Mediated by Cholesterol Sulphatase)
 - Or by Wear & Tear
 - Desquamation requires another 14 days

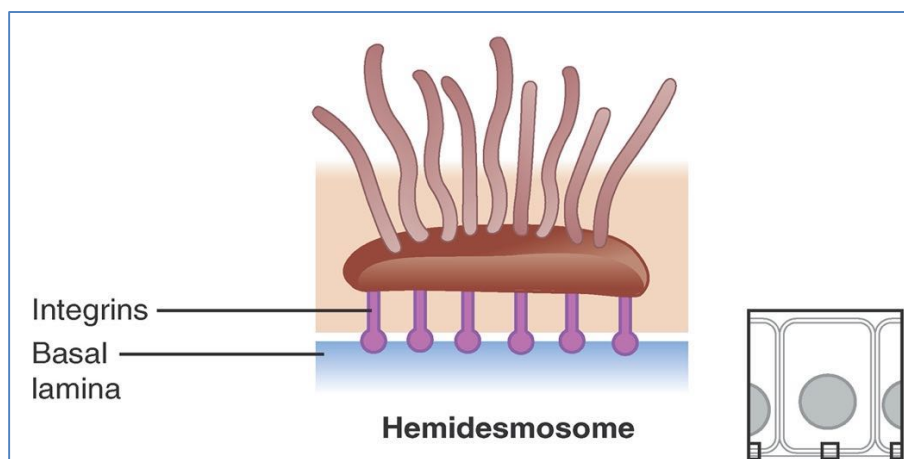


Baumann, L. S., & Baumann, L. (2009). Cosmetic dermatology. McGraw-Hill Professional Publishing.

DERMAL-EPIDERMAL JUNCTION:

- Dermal-Epidermal Junction (Stratum Basale: Basement Membrane):

- Where the Stratum Basale of the Epidermis attaches to the Basement Membrane
- **Stratum Basale:**
 - **Basal Cells** (Basal Keratinocytes)
 - **Hemidesmosomes** on Basal Cells attach the Epidermis to the Basement Membrane
 - **Melanocytes** are Interspersed amongst the Basal Cells
 - Large Dendritic Cells
 - Responsible for Melanin Pigment Production
 - **Merkel Cells:**
 - - Probably Neuro-Endocrine Function
 - Contain small, dense Granules of Catecholamines
- **Basement Membrane:**
 - **Lamina Lucida** - anchoring transmembrane filaments of the Hemidesmosomes
 - **Lamina Densa** - (Lattice structure of type IV Collagen)
- **Hemidesmosomes:**
 - Important in maintaining adhesion between Dermis & Epidermis
 - Associated with Keratin Filaments & Keratin Tonofibrils
- **Epidermis & Dermis join in a ripple-like fashion for extra strength (in addition to desmosomes):**
 - **Rete Ridges** (Epidermis)
 - **Dermal Papilla** (Dermis)

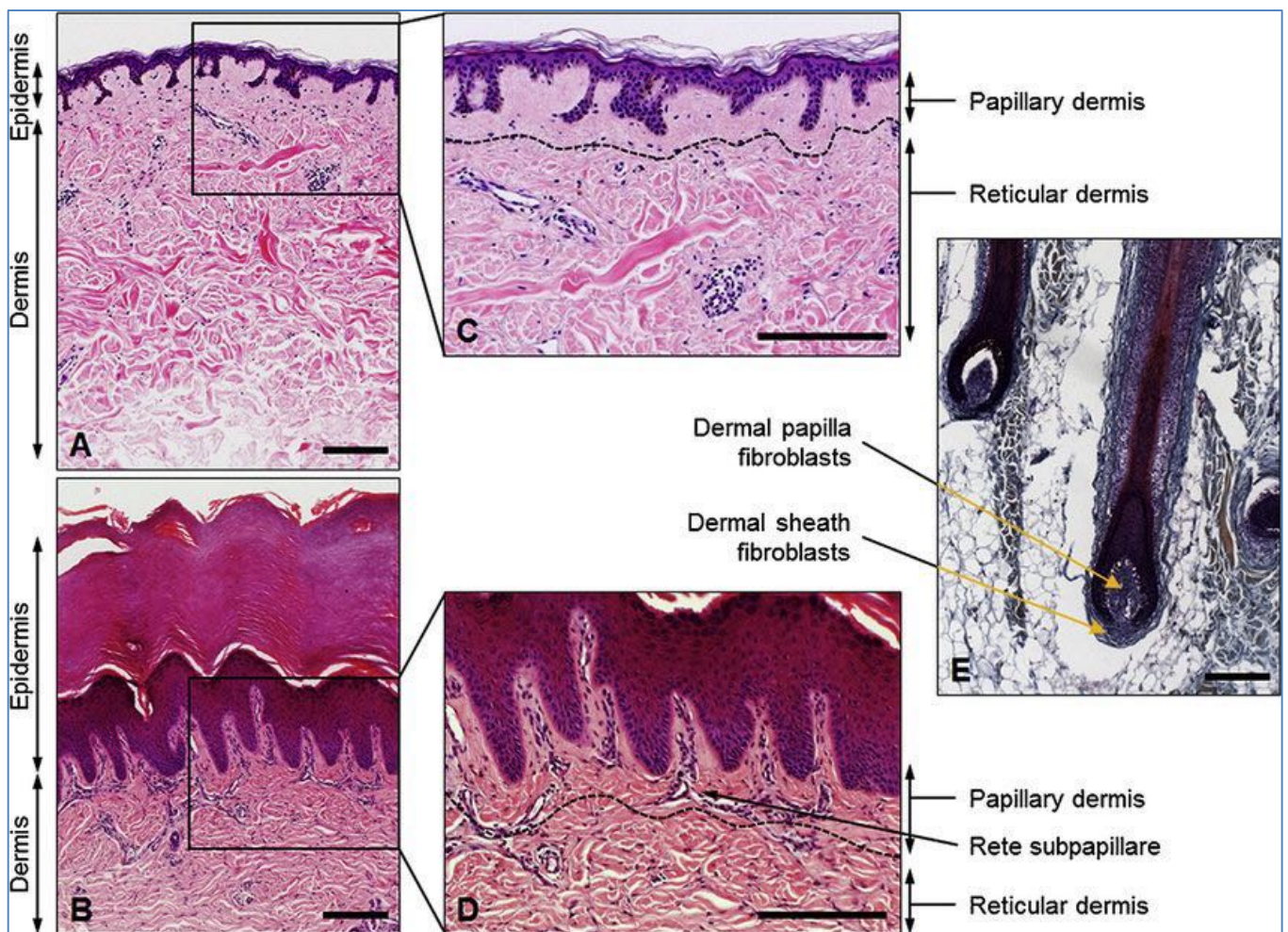


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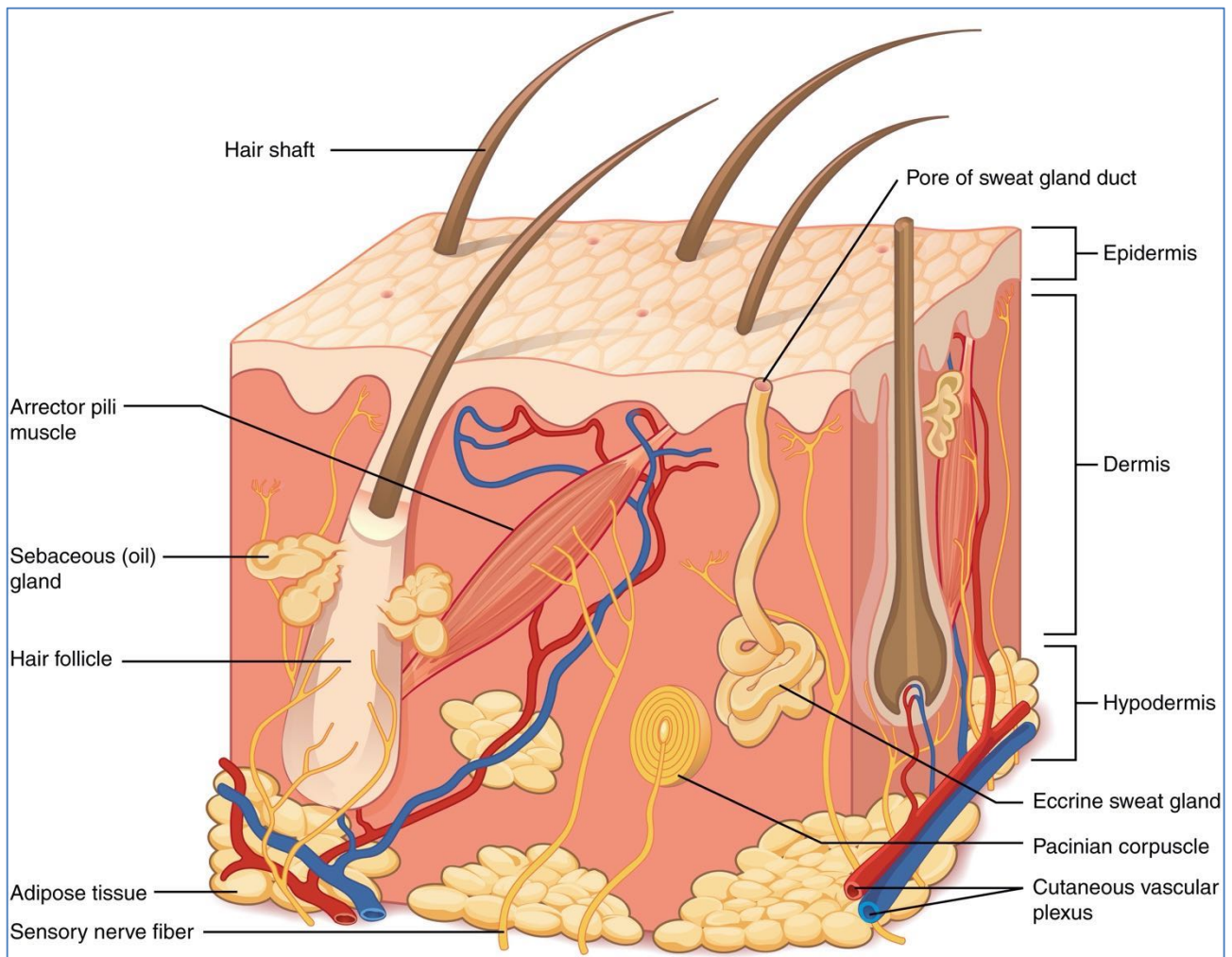
LAYER 2: THE DERMIS:

- Structure of the Dermis:

- **Mostly Extracellular Matrix:**
 - Extracellular Collagen
 - Elastin
- **Contains Some Cells:**
 - **Fibroblasts:** Synthesis and degradation of connective tissue
 - **Histiocytes/Macrophages:** Phagocytic cells
 - **Mast cells:** Secretory cells → Vasoactive Mediators (histamine) → Skin Allergies
 - **Lymphocytes:** Small number collect around blood vessels in normal skin
- **Also contains Neurovascular & Other Auxiliary Skin Structures:**
 - Blood Vessels
 - Nerves
 - Sweat Glands
 - Hair Follicles (And Arrector Pili – The Smooth Muscle of the Hair Follicle)
- **2 Layers:**
 - **(R) - Reticular Layer** (thick Collagen, lower layer) - much stronger
 - **(P) - Papillary layer** (fine Collagen, upper layer) - weaker



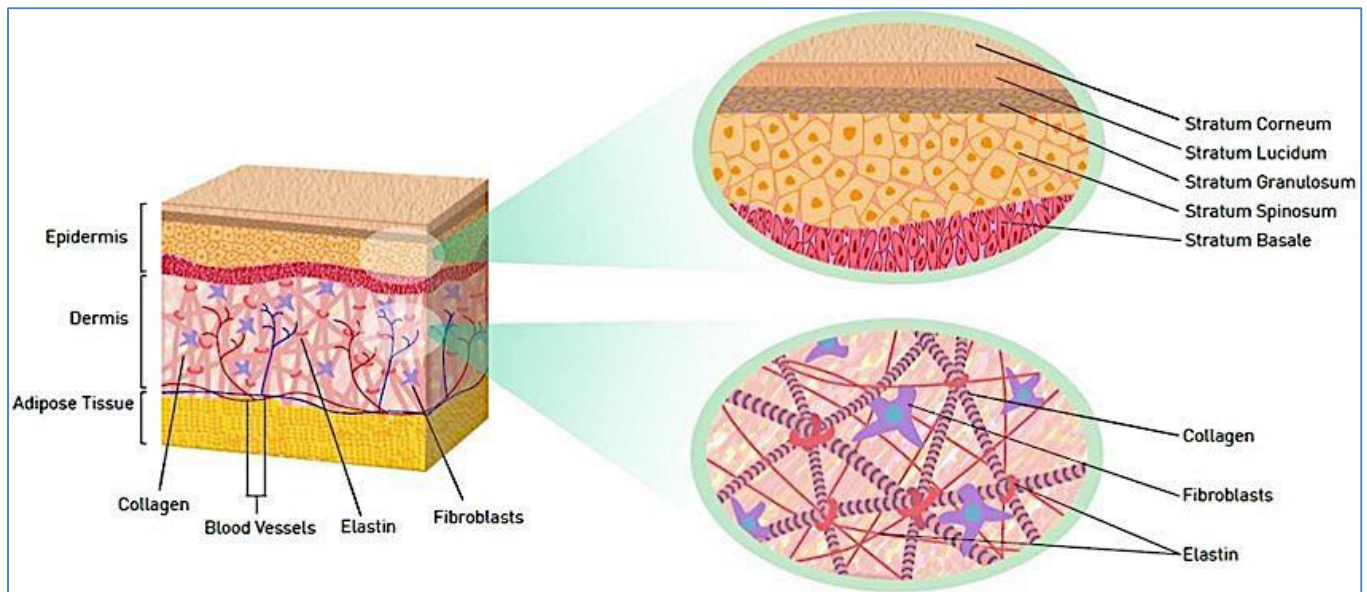
Available from: https://www.researchgate.net/figure/Adult-human-skin-consists-of-epidermis-and-dermis-The-epidermis-is-thrown-into-folds_fig2_281588115



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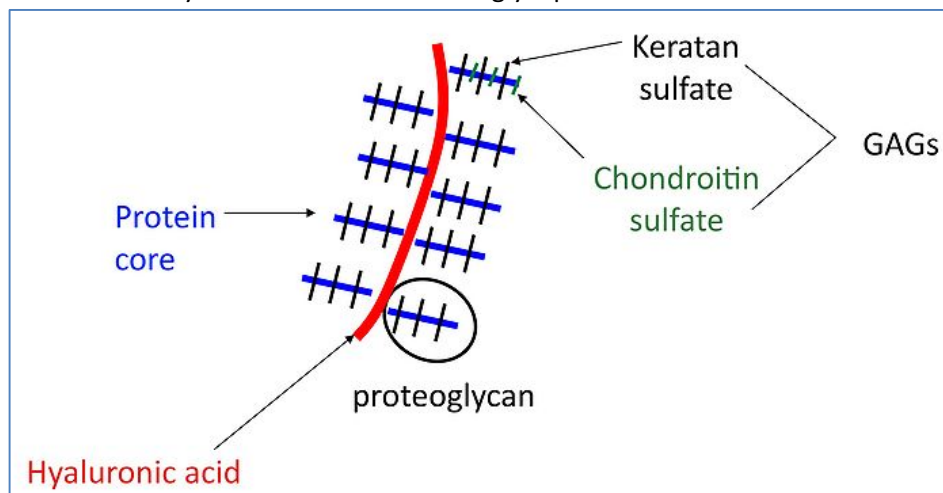
- **Connective Tissue of the Dermis:**

- **#1 Collagen** = Very tough, fibrous protein – *High Tensile Strength*
 - The Predominant Protein of the Dermis (As opposed to Keratin of the Epidermis)
- **Elastin** = Provides Elasticity to Skin – *Deformity with Memory*



Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/fig6_276696375

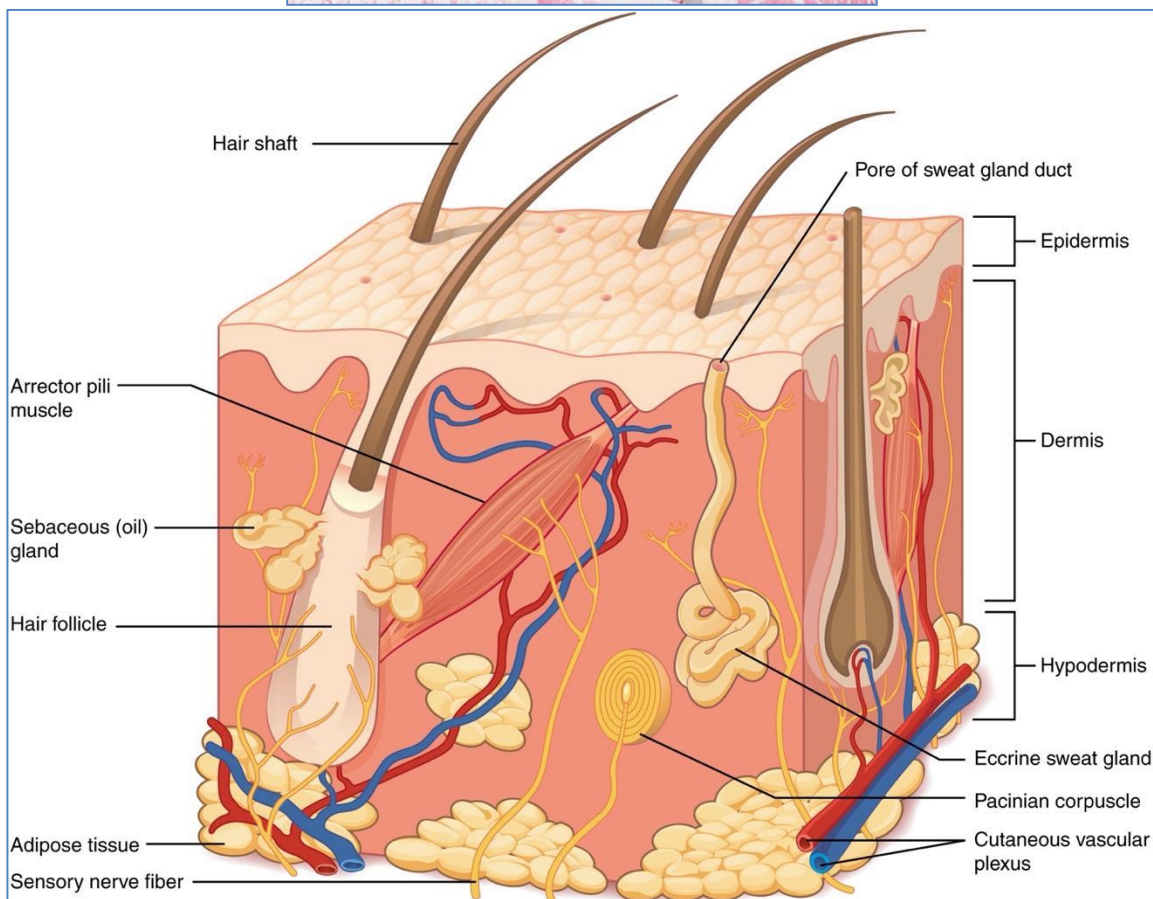
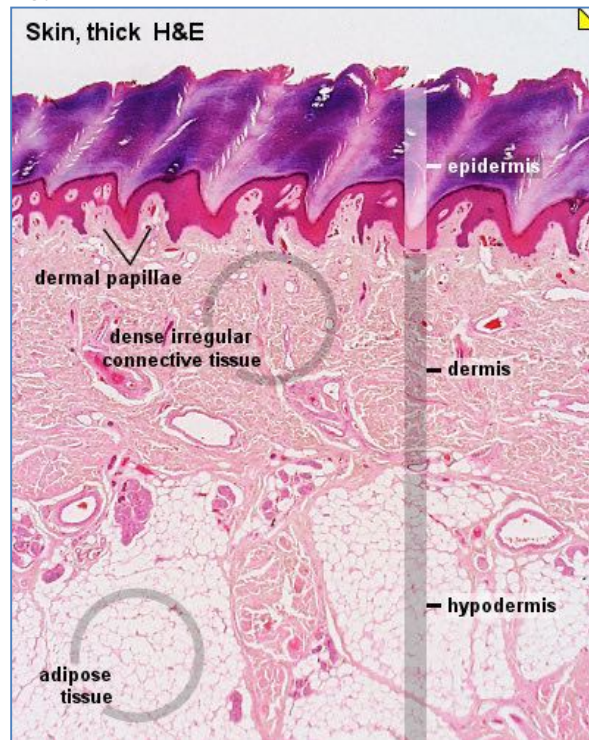
- **Glycosaminoglycans (GAGs)** = Absorb water – *Provide Viscosity*
 - Hyaluronan backbone with glycoprotein branches



LAYER 3: THE HYPODERMIS:

- Structure of The Hypodermis:

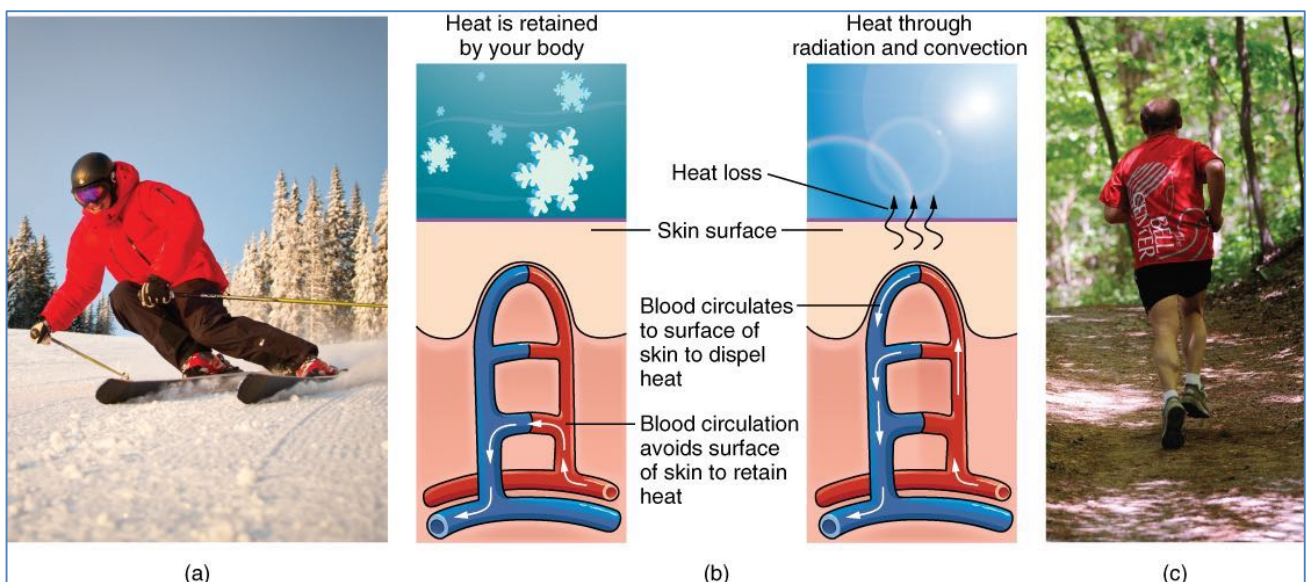
- **Composition:**
 - Mostly Fat (Adipose Cells)-(Thickest in Abdomen)
 - Blood Vessels
 - Nerves
- **Functions:**
 - Insulates the body
 - Stores Energy



AUXILIARY COMPONENTS OF SKIN:

- Vasculature:

- Abundant network of dermal vessels
- Functions:
 - **Nutrition of Skin Tissue:**
 - **Regulation of Body Temperature:**
 - Conducts heat from Interior to Exterior → Heat loss to Environment
 - Vasodilation/constriction Important in Thermoregulation
 - **Blood Reservoir:**
 - Under conditions of circulatory stress (Eg: Exercise/Haemorrhage/Shock), Sympathetic Stimulation → Vasoconstriction → ↑Circulating Blood Volume
- Cutaneous Circulatory Apparatus – 2 Types of Vessels:
 - **1) Nutritive Vessels:**
 - Arteries
 - Capillaries
 - Veins
 - (Organized into a horizontal **Subdermal Plexus**):
 - Ascending arterioles extend towards the epidermis
 - **Subpapillary Plexus** (In the Papillary Dermis)
 - **Capillaries** loop into the dermal papilla
 - **2) Vascular Structures for Heat Regulation:**
 - **Extensive Subcutaneous Venous Plexi:**
 - Can hold Large quantities of blood
 - **Arteriovenous Anastomoses:**
 - Only present in areas of Maximal Cooling (Hands, Feet, Lips, Nose & Ears)
 - **Note: BOTH Innervated by Sympathetic Adrenergic Vasoconstrictor Fibers:**
 - **Sympathetic NS** → Vasoconstriction → Minimal Heat Loss
 - (No Stimulation → Vasodilation → Maximal Heat Loss)



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- **Cutaneous Sensory System:**

○ **Sensory Apparatus of the Skin:**

- Most afferent nerve fibres terminate the Face & Extremities (Few on back)

○ **Sensory receptors:**

- Receptors of touch, pain, temperature, itch and mechanical stimuli
- Nerve fibers enter the dermis from the underlying adipose tissue

▪ **1) Unencapsulated:**

• **Free Nerve Endings:**

- In Superficial Dermis & Epidermis
- Receptors for Pain, Touch, Pressure, & Temperature

○ **Including Nociceptors:**

▪ **A-Delta Fibres:**

- Fast, Sharp, Pricking Pain
- Thick, Myelinated → Fast Conduction

▪ **C-Fibres:**

- Slow, Dull, Aching, Burning Pain
- Thin, Unmyelinated → Slow Conduction

• **Merkel Cell Discs (Merkel Touch Spots):**

- Found in the Stratum Basale of the Epidermis
- Receptors for Light Touch

• **Hair-Follicle Receptors:**

- In & Surrounding Hair Follicles
- Mechanoreceptors

▪ **2) Encapsulated (Lamellated Capsule):**

• **Meissner Corpuscles:**

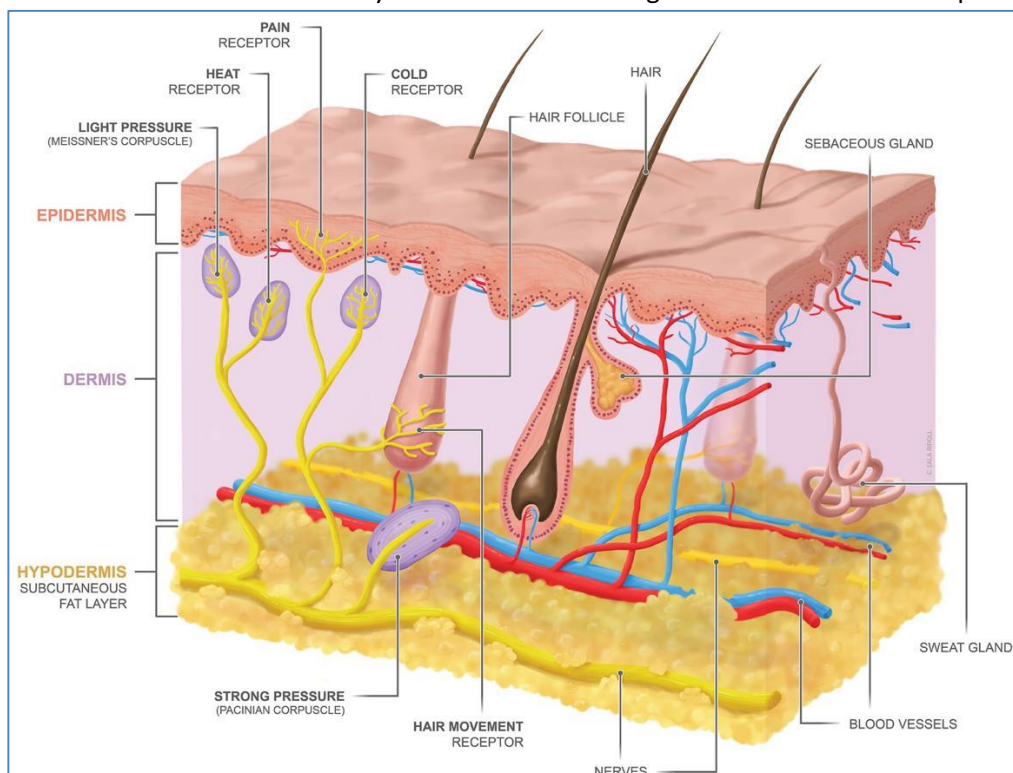
- In Dermal Papillae
- Fine Touch receptors

• **Pacinian Corpuscle:**

- In Deep Dermis & Hypodermis
- Deep Pressure Sensors

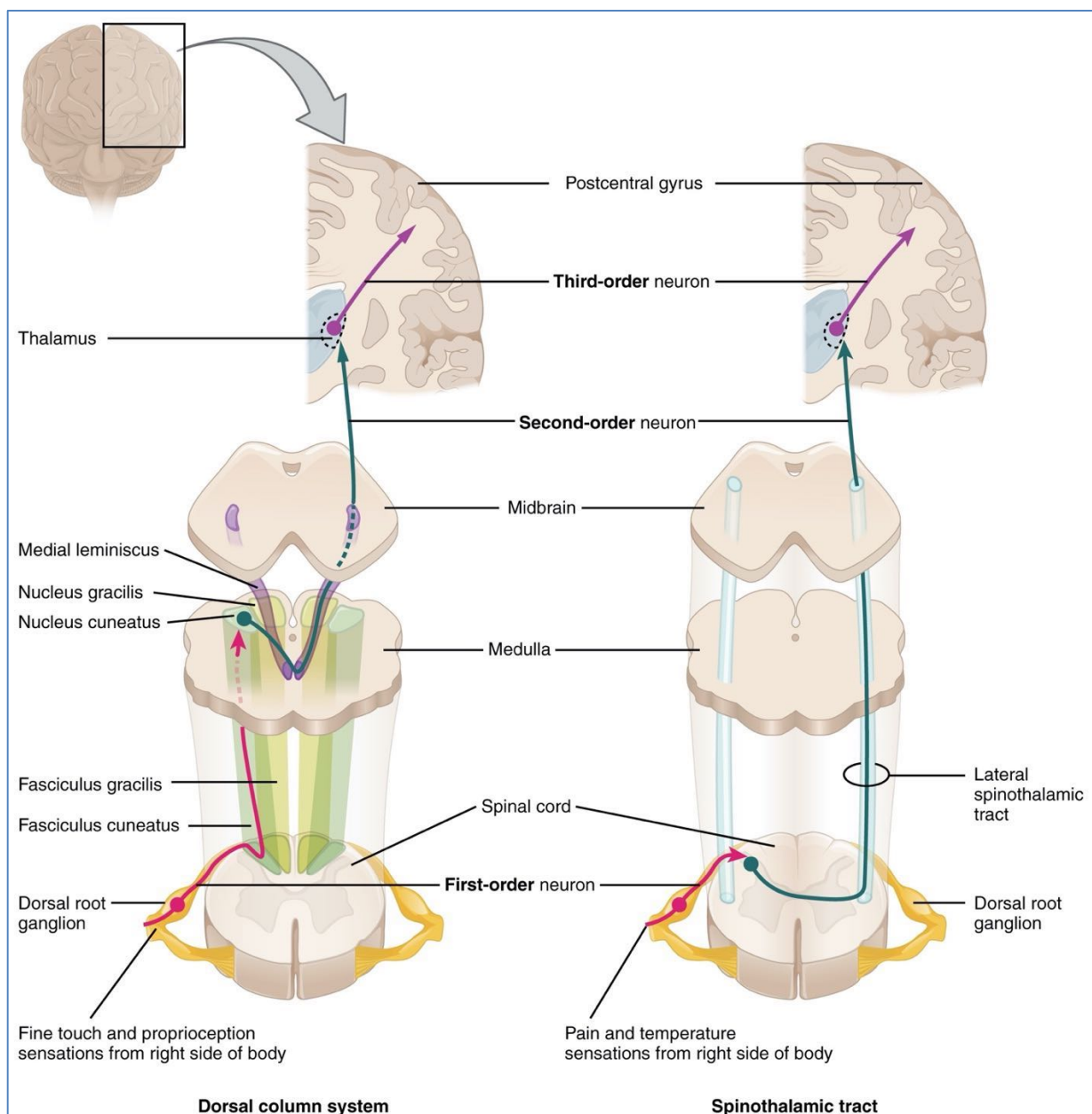
• **Ruffini Endings:**

- In Deep Dermis & Hypodermis
- Directly Associated with Collagen Fibrils → Stretch Receptors



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<https://www.flickr.com/photos/dundeetilt/29923768703>

- **Physiology of Sensory Receptors:**
 - **Concept of Adaption:**
 - **Adaption:** Under a maintained stimulus of constant strength, the frequency of action potentials declines over time
 - **Slowly-Adapting Receptors (Eg: Nociceptors):**
 - Continue to Transmit Impulses to the brain as long as the Stimulus is Applied
 - **Rapidly-Adapting Receptors (Eg: Pacinian Corpuscles):**
 - Receptors Rapidly Adapt & are stimulated only when the Stimulus Strength has Changed
- **Connection to the CNS:**
 - **First Order Neuron:**
 - Sensory Neuron Nucleus is in the **Dorsal Root Ganglion**
 - Its axon extends from periphery to Dorsal Horn of the Dorsal Root Ganglion
 - **Second Order Neuron:**
 - Neuronal Nucleus is in the Substantia Gelatinosa
 - Its axon Decussates, Then it Ascends in the **Spinothalamic Tracts** → Thalamus
 - **Third Order Neuron (Thalamus):**
 - Neuronal Nucleus is in the Thalamus
 - Its axon passes through the Internal Capsule (behind Pyramidal Fibres) → Sensory Cortex



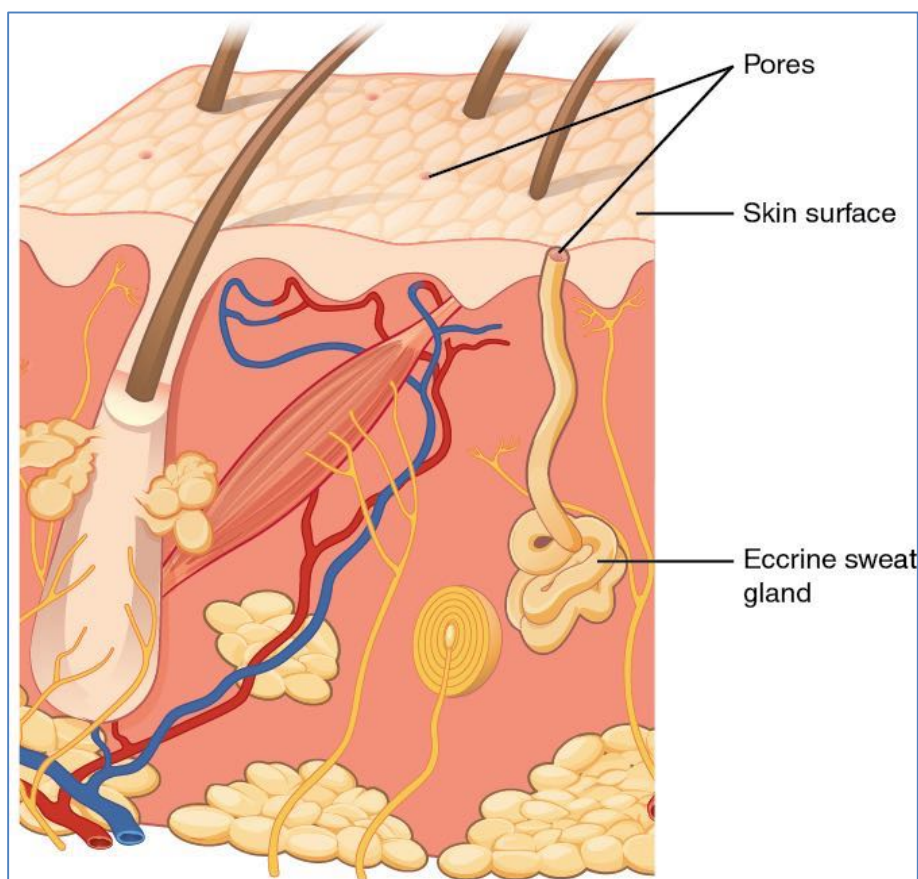
- **Glands:**

○ **Sebaceous (Sebum) Glands:**

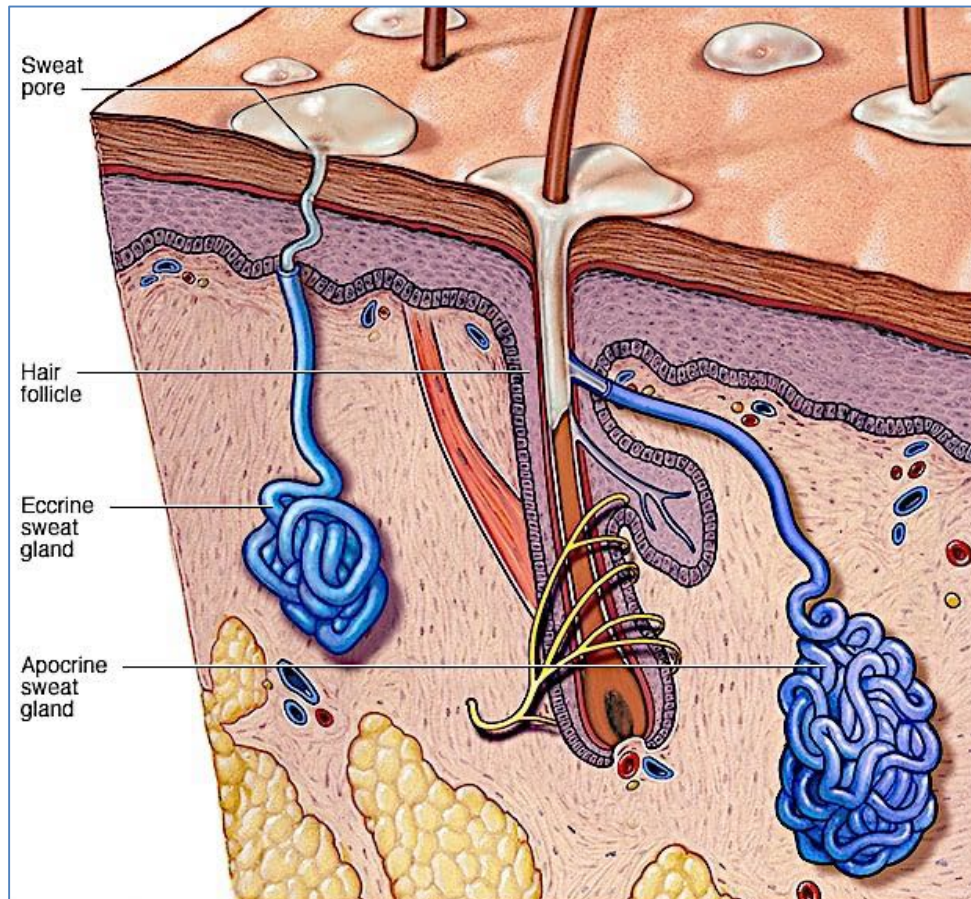
- **Associated with hair follicles (The Pilosebaceous Unit)**
 - (∴ Not found on Palms/Soles)(Most found on Face & Scalp)
- **Holocrine Secretion:**
 - (Ie: Secretion via complete destruction of cells)
 - **Produce oily sebum:**
 - Triglycerides
 - Fatty Acids
 - Wax Esters
 - Cholesterol
 - (Also Antibacterial/Antifungal Action)
- **Stimulated by Androgens:**
 - Stimulated by Androgens (Inhibited by Estrogens)
 - Very Active at puberty

○ **Eccrine (Sweat) Glands:**

- On most of the body (Scarce on the back)
- **Simple, Coiled Tubular Glands:**
 - Secretory Coil (deep in Dermis) – Secrete the Water & Electrolytes
 - Sweat Duct – Reabsorb Na^+ Ions from the sweat
- **Clear watery secretion**
 - Person can perspire several liters per hour
 - **Process:**
 - 1) Secretion of Electrolyte-Rich Fluid
 - 2) Reabsorption of excess Na^+ by the Duct
- **Stimulated by High Temperature and Stress**
 - Emotional Sweating doesn't occur during sleep
 - Thermal sweating does occur during sleep
 - Innervated by Sympathetic Nerves



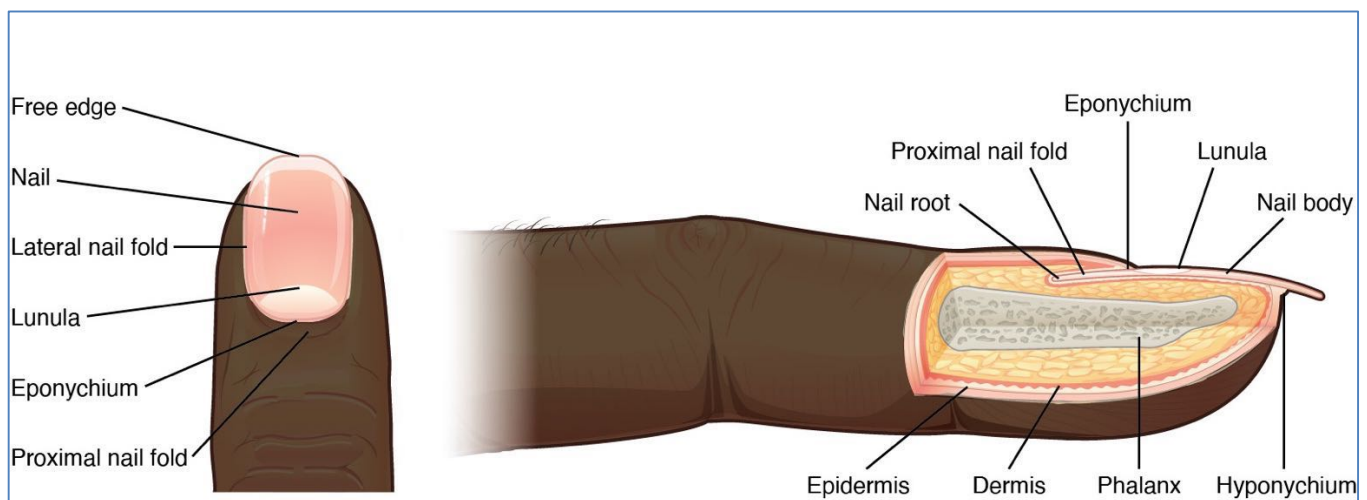
- **Apocrine (Pheromone) Glands:**
 - Associated with hair follicles
 - **Large complex gland:**
 - Located in Dermis
 - Duct Opens into Hair Follicle
 - **Viscous, Milky Secretion – (protein and cellular debris):**
 - **Produces pheromones**
 - Bacterial action is required for odor production
 - Thought to have or had a role as a sexual attractant in humans
 - Respond to emotive stimuli
 - **Stimulated by Androgens:**
 - Most Active at puberty



Source: Mayoclinic.org

- **Nails ("Ungals"):**

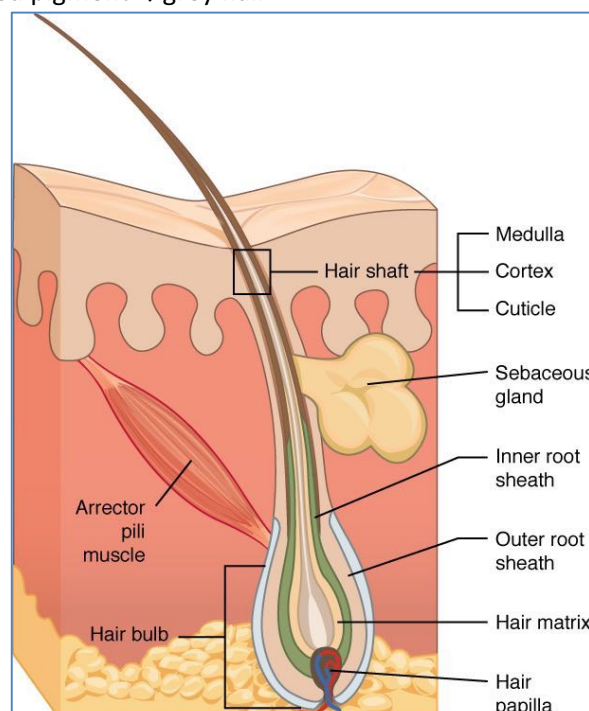
- **Composition:**
 - Plate of hardened and densely packed **keratin (Protein)**
- **Functions:**
 - Protect distal phalanges of fingers and toes
 - Aid in picking up objects
 - Efficient natural weapon
- **Structural Landmarks:**
 - **Nail Plate:**
 - Fully keratinized structure
 - Firmly attached to the nail bed
 - **Nail Bed:** Skin underneath the nail
 - **Lunula:** Proximal whitish half-moon-shaped area on Nail Plate
 - **Cuticle:** The dorsal part of the proximal nail fold
 - **Nail Matrix:** Nail growth occurs From Here - by proliferation and differentiation of the nail matrix
 - **Paronychium:** The Skin around the Nail
 - **Hyponychium:** The area where the nail plate detaches from the digit
 - **Proximal Nail Fold:** The fold at the Proximal Edge of the nail (Covers $\approx 1/4$ of the nail)
 - **Lateral Nail Folds:** The folds of skin at the Lateral Edges of the Nail



CNX OpenStax, CC BY 4.0 <<https://creativecommons.org/licenses/by/4.0/>>, via Wikimedia Commons

- **Hair/The 'Pilosebaceous Unit':**

- **The Pilosebaceous Unit:**
 - Hair Shaft
 - + Sebaceous/apocrine ducts empty into hair follicles
- **Arrector Pili Muscle:**
 - Smooth Muscle
 - Supplied by Adrenergic Nerves
 - → Erection of the Hair during Cold/Emotional Stress (Goose-Bumps)
- **2 Types of Hair:**
 - **Vellus:**
 - Fine, Short & Almost invisible
 - (All over the body)
 - **Terminal:**
 - Thick, coloured & Visible
 - (Scalp, beard, axilla, genital area)
- **Hair Follicles Respond to Androgen:**
 - Pre-pubertal children don't have *Terminal Hair* in Axilla/Genital Area/Facial Hair
 - During Puberty, hair grows in these areas
 - With age, androgen stimulation decreases → *Terminal Hair* on scalp reverts from *Terminal* to *Vellus* hair (Hair follicles aren't lost, but change to *Vellus* hair)
- **Hair follicles undergo cycles of Growth, Resting and Shedding:**
 - **Anagen (growing):**
 - Lasts 3 Years
 - Keratinocytes in the follicular bulb proliferate to form the hair shaft
 - **Catagen (Resting):**
 - Lasts 2 Weeks
 - The keratinocytes and melanocytes undergo programmed cell death
 - **Telogen (Shedding):**
 - Last 3 Months
 - Hair but does not grow
 - May Remain Anchored, or Be Shed
 - Following telogen a new growth cycle will begin (ie: anagen)
- **Hair Pigmentation:**
 - Colour of hair is determined by the melanocytes – actively pigmented only in Anagen
 - Absence of pigment → white hair
 - Diminished pigment → grey hair

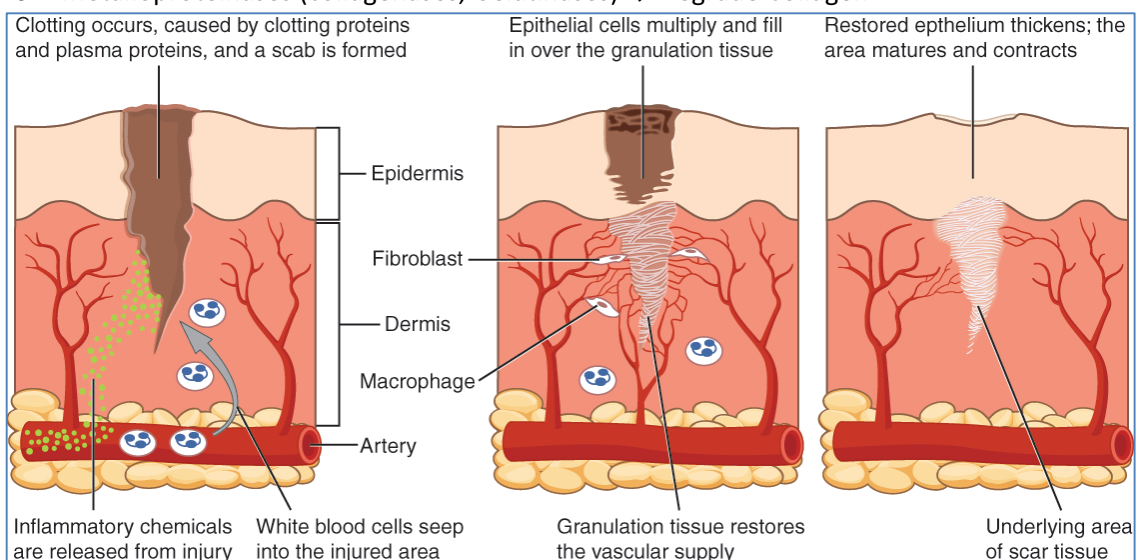


Causes of Skin Injury:

- **Physical Agents:**
 - Mechanical trauma
 - Thermal Burns
 - Cold
 - Electrical
 - Radiation (Eg: In Radiotherapy)
- **Hypoxia:**
 - Ischaemia (Eg: In Peripheral Vascular Disease)
- **Chemicals:**
 - Acid/Alkali
 - Phosphorus
- **Infectious:**
 - Bacteria
 - Viruses
- **Autoimmune:**
 - Scleroderma
 - Lupus Erythematosus
- **Genetic:**
 - Histiocytosis X

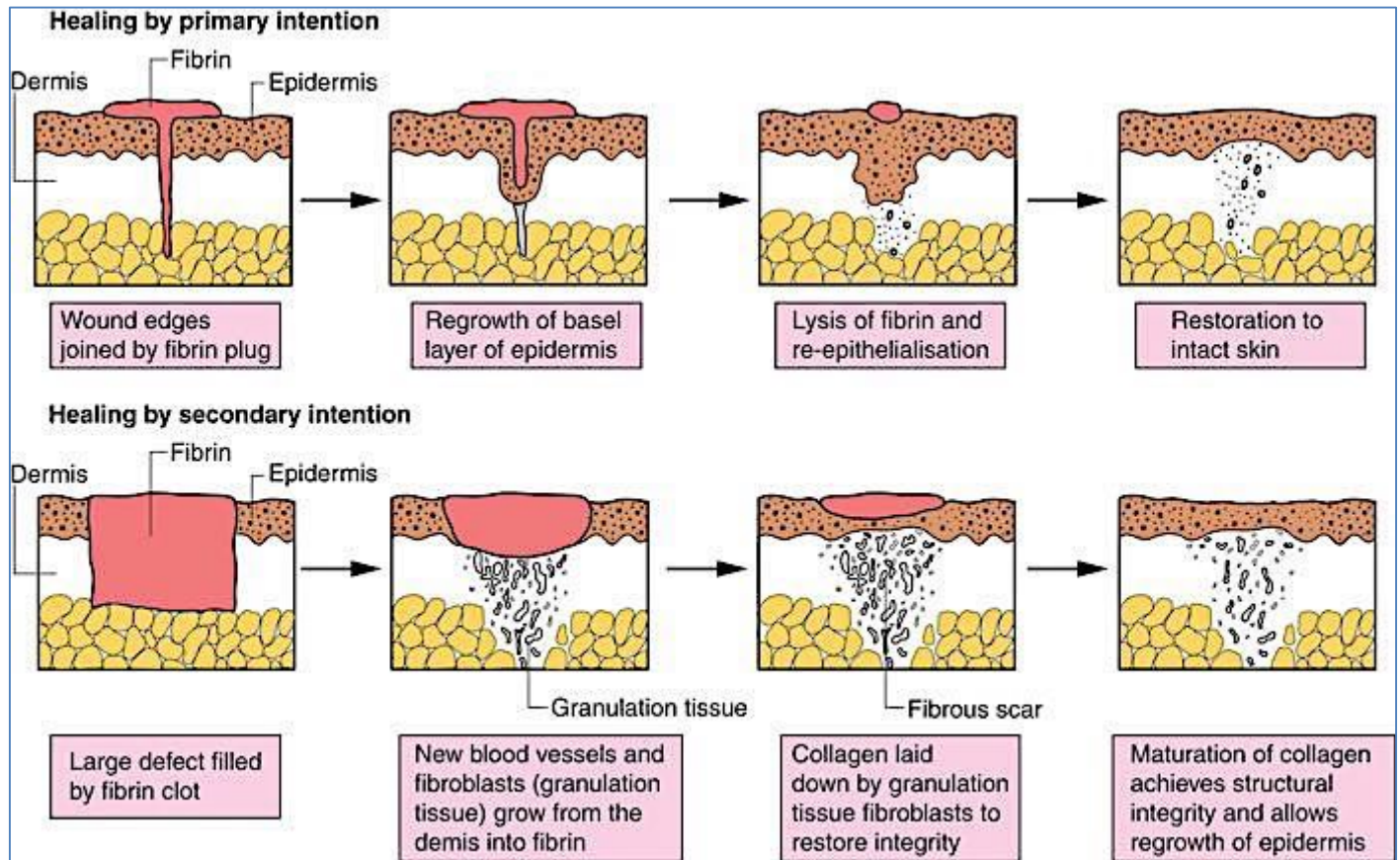
Mechanisms of Healing:

- **Acute Inflammation:**
 - Vasodilation
 - Increased Permeability → Stasis
 - Leukocyte Margination/Migration
 - Phagocytosis of Damaged/Dead Tissue/Organisms + Enzyme Release
- **Granulation Tissue:**
 - **3-5 Days After Injury**
 - **Occurs only in Deeper Cuts/Injuries (Not Superficial Injuries)**
 - **Angiogenesis** – (Migration + Proliferation of Endothelial Cells)
 - Driven by FGF (Fibroblast Growth Factor) + VEGF (Vasculo-Endothelial Growth Factor)
 - **Fibrosis** - Fibroblast Migration + Proliferation
 - Driven by PDGF (Platelet-Derived Growth Factor) + TGFB (Transforming Growth Factor-B)
- **Collagen Synthesis:**
 - A Triple Helix Protein
 - Synthesis is Vitamin C Dependent
 - As time goes by, the Collagen Scar gets Stronger:
 - At 1wk, the scar is weak
 - Strengths peaks @ 3mths
 - Metalloproteinases (collagenases, Gelatinases) → Degrade Collagen



Healing By Primary Intention Vs Secondary Intention:

- **Primary Intention:**
 - o Wound edges are CLOSE together
 - o Tends to be Quick
 - o Cells of the Basal Layer of the Epidermis lines the Surface of the Wound (within 1-2 Days)
- **Secondary Intention:**
 - o Wide, open wound (Edges are FAR apart)
 - o Takes a lot Longer
 - o Granulation Tissue Fills the Wound → Epithelialisation from Wound Margins







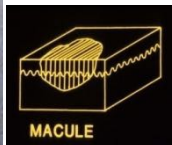
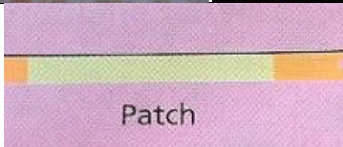


Unattributable


GENERAL PRINCIPALS OF DERMATOLOGY








Key words + Definitions:





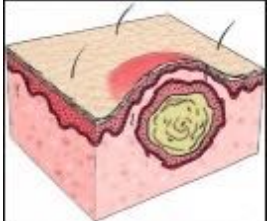

- **Primary Lesion:**
 - The initial lesion that characterizes a condition
- **Secondary Lesion:**
 - Over time, the primary lesion may continue to develop or be modified by regression/trauma, producing a “secondary lesion”

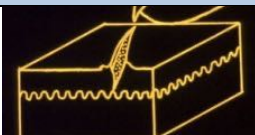








Morphology Terminology – Primary Lesions:

<u>Lesion Name:</u>	<u>Lesion Description:</u>	<u>Picture:</u>
Erythema	Redness due to vascular dilation (Eg: Cellulitis)	
Erythroderma	Red rash covering >90% of the Body	
Telangiectasia	Permanently dilated dermal blood vessels to the point of being visible; Blanches under pressure	
Macule	A macule is a small, flat is of altered colour, without elevation or depression (nonpalpable). (Eg: Lentigo Simplex, Eg: Freckles)	 
Patch	A patch is a large Macule	
Petechiae	Tiny macules of blood in the skin; Small, non-blanching Extravasated RBC's	
Purpura (May Be Palpable)	<p>A Large Macule or Patch of blood in the skin. Doesn't blanch under pressure. (Eg: A Hickey)</p> <p>Larger area of RBC extravasation</p> <p>(The hallmark of vasculitis – severe inflammation of the blood vessels; If it is this bad in the skin, it's probably this bad elsewhere in the body)</p>	








Ecchymosis/ Haematoma	A Larger subcutaneous bleed. The resultant swelling = a 'Haematoma'	
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Micropapule	A Very Small raised lesion 1-2mm in diameter.	
Papule	A small raised lesion (less than 0.5cm)	
Plaque	Flat-topped, raised area of the skin. (Usually dermal thickening.) A large Papule more than 2cm in width but NO depth. (Eg: Psoriasis)	
Papilloma	A nipple-like mass projecting from the skin	
Burrow	A linear Papule caused by a burrowing organism. Eg: Scabies	
Nodule	A raised, solid lesion greater than 0.5cm in width AND depth. (Eg: Keloid Scar)	
Tumour	A mass of enlarged tissues of more than 1cm diameter	

Vesicle	A clear, fluid-containing elevation of less than 5mm in diameter. (Eg: Chickenpox) (Typically appear clear, but can fill with pus to become a <i>Pustule</i>)	
Bulla	A large Vesicle more than 0.5cm in diameter	
Pustule	A small Pus-filled vesicle of less than 5mm in diameter	
Impetiginized (Impetigo):	Covered in Crust, Pustules, & Often Weeping	
Cyst	A cavity containing liquid, semisolid, or solid material	
Abscess	A Pus-containing cavity of more than 1cm in diameter. (Note: a cyst can become infected and fill with pus, becoming an abscess)	

Excoriation	A Scratch - May be Epidermal or may extend down into the Dermis <ul style="list-style-type: none"> - Often linear - Often Covered with Crust 	 EXCORIATION
Fissure	A deep crack - extends down to the dermis & blood vessels	 FISSURE
Erosion	A superficial <u>incomplete</u> loss of the epidermis. Eg: Superficial Burn	 EROSION
Ulcer	An area of <u>complete</u> loss of the epidermis and often portions of the dermis and even subcutaneous fat.	 ULCERATION
Wheal	A wheal is an elevated, white, compressible area produced by dermal oedema. It typically disappears within 24 to 48 hours	
Angioedema	Oedema which extends to the subcutaneous tissue	
Comedone (Blackhead)	A plug of keratin or sebum blocking a sebaceous orifice	
Alopecia (Hair Loss)	Can be: <ul style="list-style-type: none"> - Scarring (Permanent loss of hair follicles) - Or Non-Scarring (follicles are still alive and well) 	
Eschar (Necrosis)	Patch of Dead Skin (necrosis) – A Thick Crust over an Ulcer or Erosion: <ul style="list-style-type: none"> – Typically black; Full-thickness skin loss (Dead skin = something bad – RED FLAG) (Implies something vascular → Ischaemic Necrosis) 	

Morphology Terminology – Secondary Lesions:

<u>Lesion Name:</u>	<u>Lesion Description:</u>	<u>Picture:</u>
Scale	Dry, laminated masses of keratin that represent thickened stratum corneum. Eg: Psoriasis	
Keratosis	Thickening of the skin. Eg: Solar Keratosis	
Hyperkeratosis	Large area of Thickened skin → Thick Scale.	
Verrucous	Very Hyperkeratotic – Similar to a Wart	
Lichenification	Palpable epidermal thickening of the skin usually due to friction. Eg: Lichen Simplex	
Crust	Dried serum, pus, or blood usually mixed with epithelial and sometimes bacterial debris	
Atrophy	Thinning of the skin (epidermal, dermal, or subcutaneous)	

Erosion	A superficial <u>incomplete</u> loss of the epidermis. Eg: Superficial Burn	
Ulcer	An area of <u>complete</u> loss of the epidermis and often portions of the dermis and even subcutaneous fat. Eg: SCC	
Excoriation	A superficial loss of epidermis from scratching or picking, therefore often linear and often covered by crust	
Scar	A pale, firm raised or depressed lesion resulting from skin injury. Eg: Keloid Scar	
Stria (Stretch Marks)	Streak-like, linear, pink/purple/white marks due to changes in Connective Tissue	
Pigmentation	An Increase or Decrease in skin pigmentation. Eg: Birthmark	

Other Descriptors:

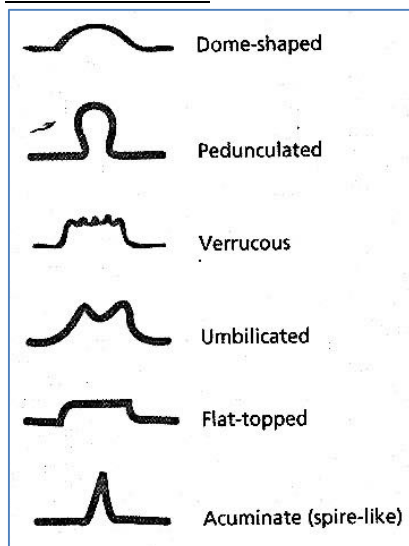
- Colour:

- **Erythema** = Red
- **Violaceous** = Purple
- **Slate** = Gray
- **Hyperpigmented** = Darker than surrounding skin
- **Hypopigmented** = Lighter than surrounding skin
- **Bronze** = Red-Brown
- **Dusky** = Purple-Grey
- **Variegated** = Many different Colours

- Relating to Edge of Rash:

- **Definition:**
 - Eg: Well Defined
 - Eg: Ill/Poorly Defined
- **Geometric Shape:**
 - **Nummular** = Round
 - **Annular** = Ring-like
 - **Circinate** = Circular
 - **Arcuate** = Curved
 - **Discoid** = Disc-like
 - **Gyrate/Serpiginous** = Wave-like
 - **Polycyclic** = Edge is like a number of overlapping circles

- Surface Contour:



- Relating to Symptoms:

- **Weeping** = Oozing clear fluid from the skin surface
- **Crusted** = Covered in scabs
- **Pruritis** = Itchy
- **Dysaesthesia** = Tingling, Burning, Numbness

- Symmetry:

- Eg: Dermatitis is typically symmetrical
- Eg: An infective lesion (Eg: Abscess) is likely to be Unilateral

- Is it in Typical Distribution:

- Eg: Seborrheic Dermatitis (Dandruff) typically occurs on the scalp, forehead, eyebrows & chest
- Eg: Atopic Dermatitis typically in the cubital & popliteal fossae

- Localised or Universal:

- **Universal** – Eg: Chicken Pox
- **Localised** – Eg: Herpes Zoster (Shingles) localised to a dermatome

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