

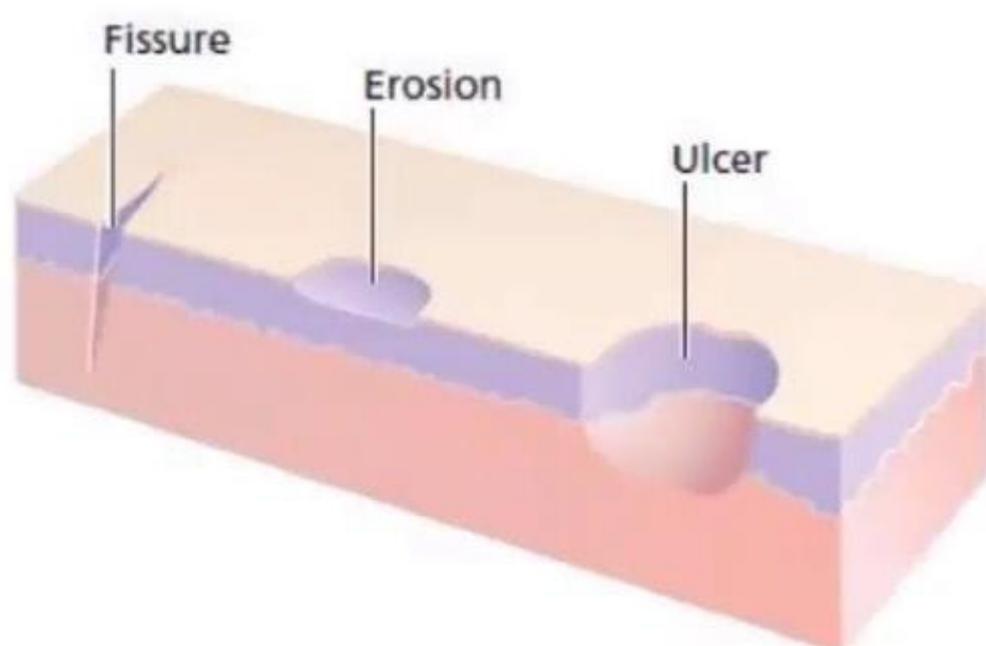
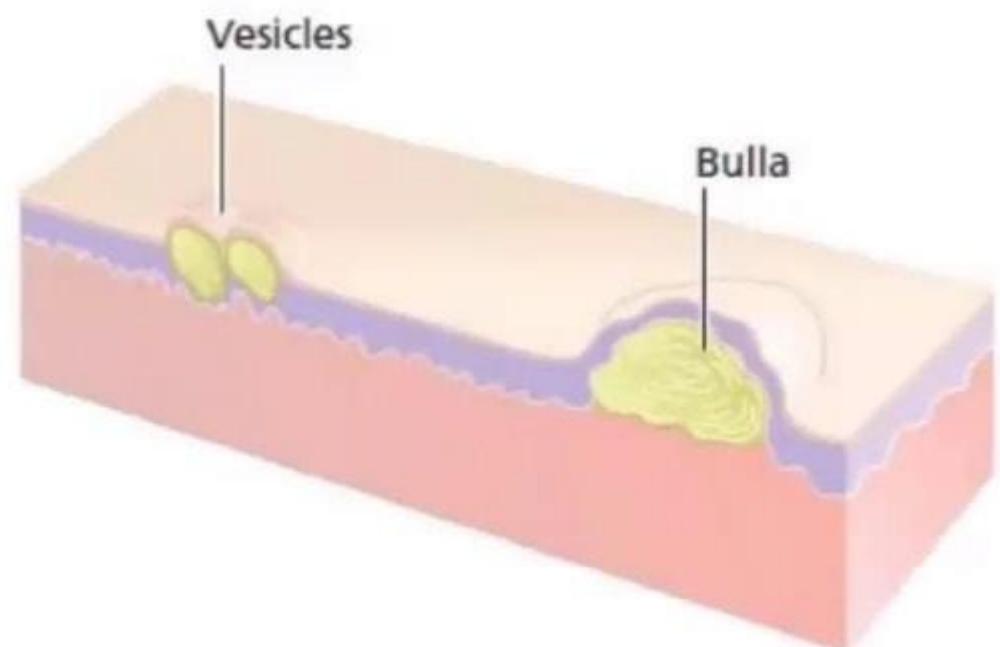
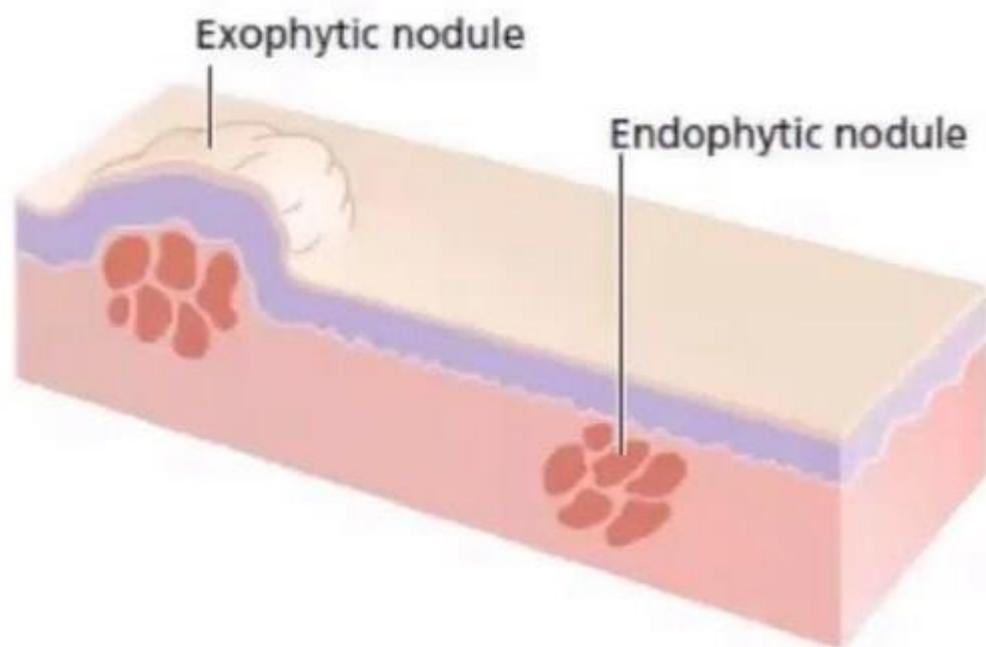
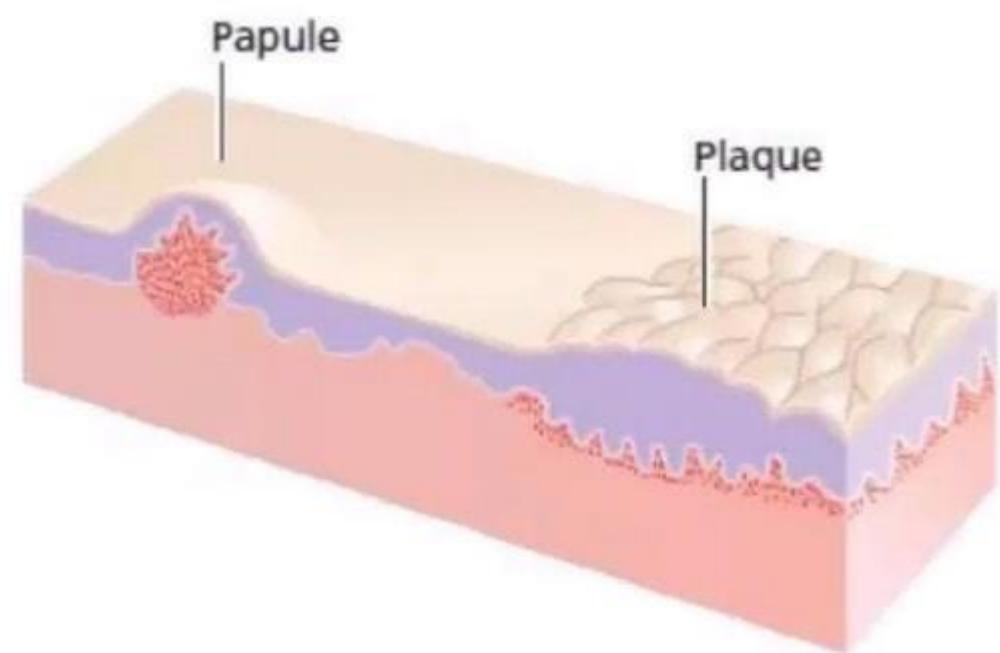
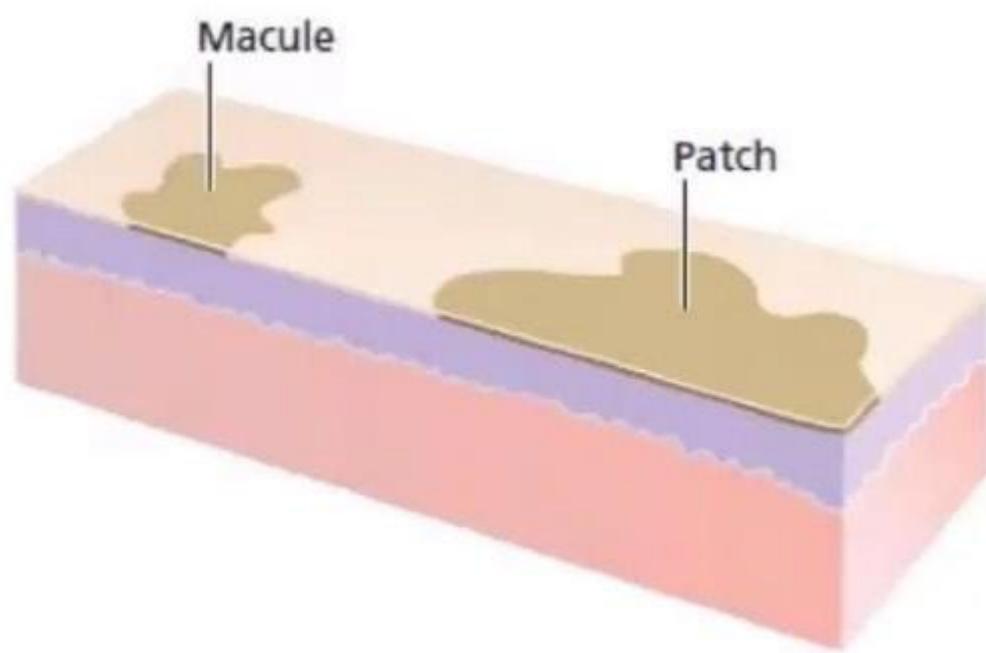
# INTRODUCTION TO CLINICAL DERMATOLOGY



# Terminology of lesions

Table 3.2 Terminology of primary lesions.

	Small (<0.5 cm)	Large (>0.5 cm)
Elevated solid lesion	Papule	Nodule (>0.5 cm in both width and depth) Plaque (>2 cm in width but without substantial depth)
Flat area of altered colour or texture	Macule	Large macule (patch)
Fluid-filled blister	Vesicle	Bulla
Pus-filled lesion	Pustule	Abscess Furuncle
Extravasation of blood into skin	Petechia (pinhead size) Purpura (up to 2 mm in diameter)	Ecchymosis Haematoma
Accumulation of dermal oedema	Wheal (can be any size)	Angioedema



**Those are secondary lesions:**

**Fissure:** slit in skin

**Erosion:** loss of tissue (only epidermis) heal without scar formation

**Ulcer:** loss of tissue (epidermis and part of dermis) heal with scar formation

# Primary lesions

- **Erythema** is redness caused by vascular dilatation.
- A **papule** is a small solid elevation of skin, less than 0.5 cm in diameter.
- A **plaque** is an elevated area of skin greater than 2 cm in diameter but without substantial depth.
- A **macule** is a small flat area, less than 5 mm in diameter, of altered colour or texture.
- A **patch** is a large macule.
- A **vesicle** is a circumscribed elevation of skin, less than 0.5 cm in diameter, and containing fluid.
- A **bulla** is a circumscribed elevation of skin over 0.5 cm in diameter and containing fluid.
- A **pustule** is a visible accumulation of pus in the skin.
- An **abscess** is a localized collection of pus in a cavity, more than 1 cm in diameter. Abscesses are usually nodules, and the term 'purulent bulla' is sometimes used to describe a pus-filled blister that is situated on top of the skin rather than within it.

- A **wheal** is an elevated **white compressible evanescent** area produced by dermal oedema. It is often surrounded by a red axon-mediated flare. Although usually less than 2 cm in diameter, some wheals are huge.
- **Angioedema** is a diffuse swelling caused by oedema extending to the subcutaneous tissue.
- A **nodule** is a solid mass in the skin, usually greater than 0.5 cm in diameter, in both width and depth, which can be seen to be elevated (exophytic) or can be palpated (endophytic).
- A **tumour** is harder to define as the term is based more correctly on microscopic pathology than on clinical morphology. We keep it here as a convenient term to describe an enlargement of the tissues by normal or pathological material or cells that form a mass, usually more than 1 cm in diameter. Because the word ‘tumour’ can scare patients, tumours may courteously be called ‘large nodules’, especially if they are not malignant.
- A **papilloma** is a nipple-like projection from the skin.
- **Petechiae** are pinhead-sized **macules** of blood in the skin.

- The term **purpura** describes a larger **macule** or **papule** of blood in the skin. Such blood-filled lesions do not blanch if a glass lens is pushed against them (Diascopy, p. 39)
- An **ecchymosis** (**bruise**) is a larger extravasation of blood into the skin and deeper structures.
- A **haematoma** is a **swelling** from gross bleeding.
- A **burrow** is a linear or curvilinear papule, with some scaling, caused by a scabies mite.
- A **comedo** is a plug of **greasy keratin** wedged in a dilated pilosebaceous orifice. Open comedones are ‘blackheads’. The follicle opening of a closed comedo is nearly covered over by skin so that it looks like a pinhead-sized, ivory-coloured papule.
- **Telangiectasia** is the visible **dilatation** of small cutaneous blood vessels.
- **Poikiloderma** is a combination of **atrophy**, reticulate **hyperpigmentation** and **telangiectasia**.
- **Horn** is a **keratin projection** that is taller than it is broad.
- **Erthyroderma** is a **generalized redness** of skin that may be scaling (exfoliative erythroderma) or smooth.

# Secondary lesions

(These evolve from primary lesions)

- A **scale** is a **flake** arising from the horny layer. Scales may be seen on the surface of many primary lesions (e.g. macules, patches, nodules, plaques).
- A **keratosis** is a **horn-like thickening** of the stratum corneum.
- A **crust** may look like a scale, but is composed of **dried blood** or tissue **fluid**.
- An **ulcer** is an area of skin from which the **whole of the epidermis** and at least the upper **part of the dermis** has been lost. Ulcers may extend into subcutaneous fat, and heal with scarring.
- An **erosion** is an area of skin denuded by a complete or partial loss of **only the epidermis**. Erosions heal without scarring.
- An **excoriation** is an **ulcer** or **erosion** produced by **scratching**.
- A **fissure** is a slit in the skin.

- A **sinus** is a cavity or **channel** that permits the escape of pus or fluid.
- A **scar** is a result of healing, where normal structures are permanently replaced by fibrous tissue.
- **Atrophy** is a thinning of skin caused by diminution of the epidermis, dermis or subcutaneous fat. When the epidermis is atrophic it may crinkle like cigarette paper, appear thin and translucent, and lose normal surface markings. Blood vessels may be easy to see in both epidermal and dermal atrophy.
- **Lichenification** is an area of **thickened skin** with increased **markings**.
- A **stria** (stretch mark) is a **streak-like linear atrophic** pink, purple or white lesion of the skin caused by changes in the connective tissue.
- **Pigmentation**, either more or less than surrounding skin, can develop after lesions heal.

# Skin. Basic structure 1

- Largest organ in the body.  
Wt 4kg. SA 1.7m
- Consists of 2 layers:
  - **Epidermis**: 4 cell layers
    1. Basal layer
    2. Prickle layer
    3. Granular layer
    4. Horny layer
  - **Dermis**:
    1. Papillary dermis; adjacent to the epidermis.
    2. Reticular dermis;
      - Connective tissue fibers
      - Ground Substance (GAG)
      - Appendages( glands...)
      - Neurovascular and lymphatics.

# Epidermis

- The epidermis is formed from many layers of closely
- packed cells, the most superficial of which are flattened and filled with keratins; it is therefore a stratified squamous epithelium.

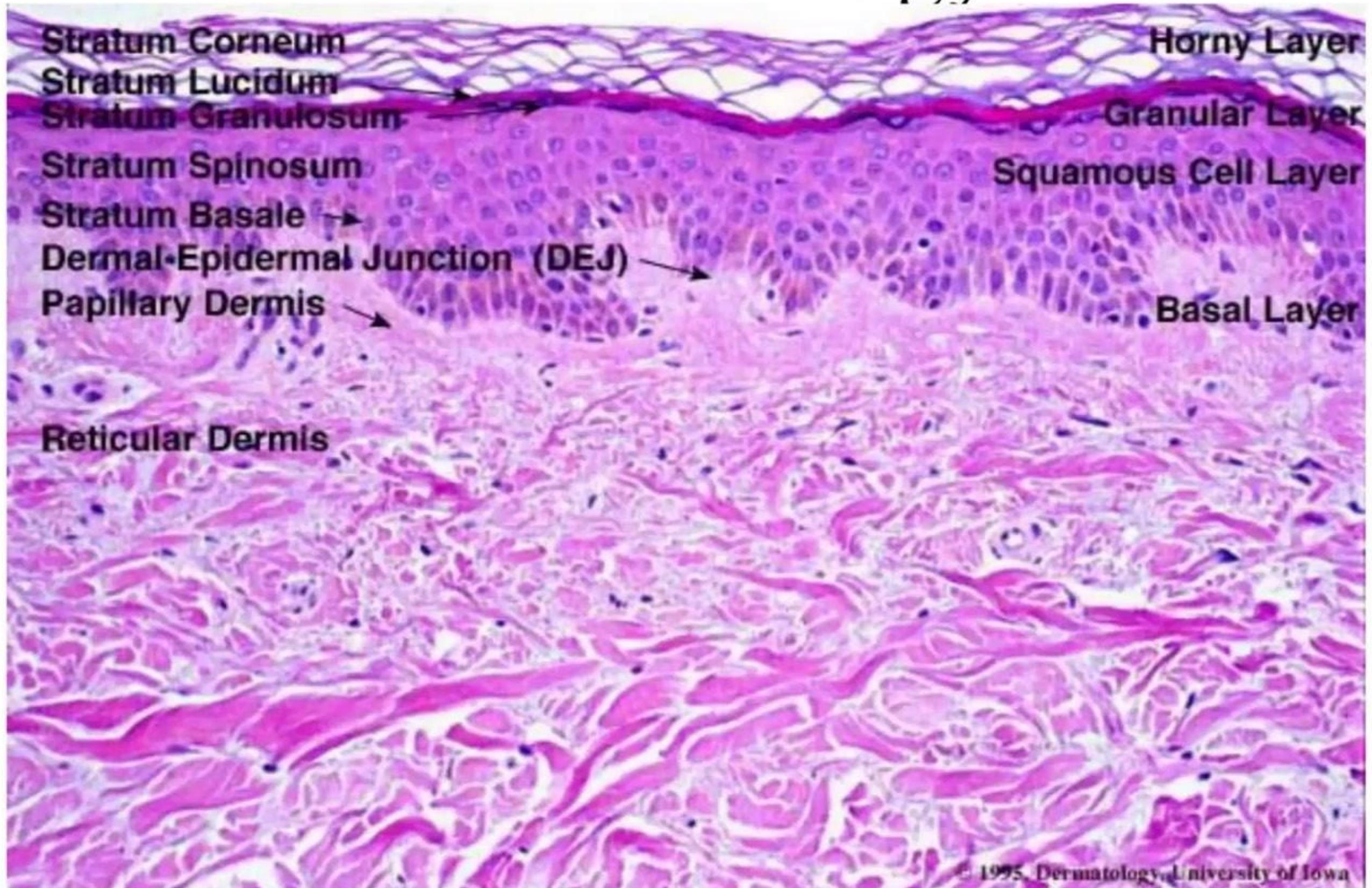
It adheres to the dermis partly by the interlocking of its downward projections (epidermal ridges or pegs) with upward projections of the dermis (dermal papillae)

# Epidermis

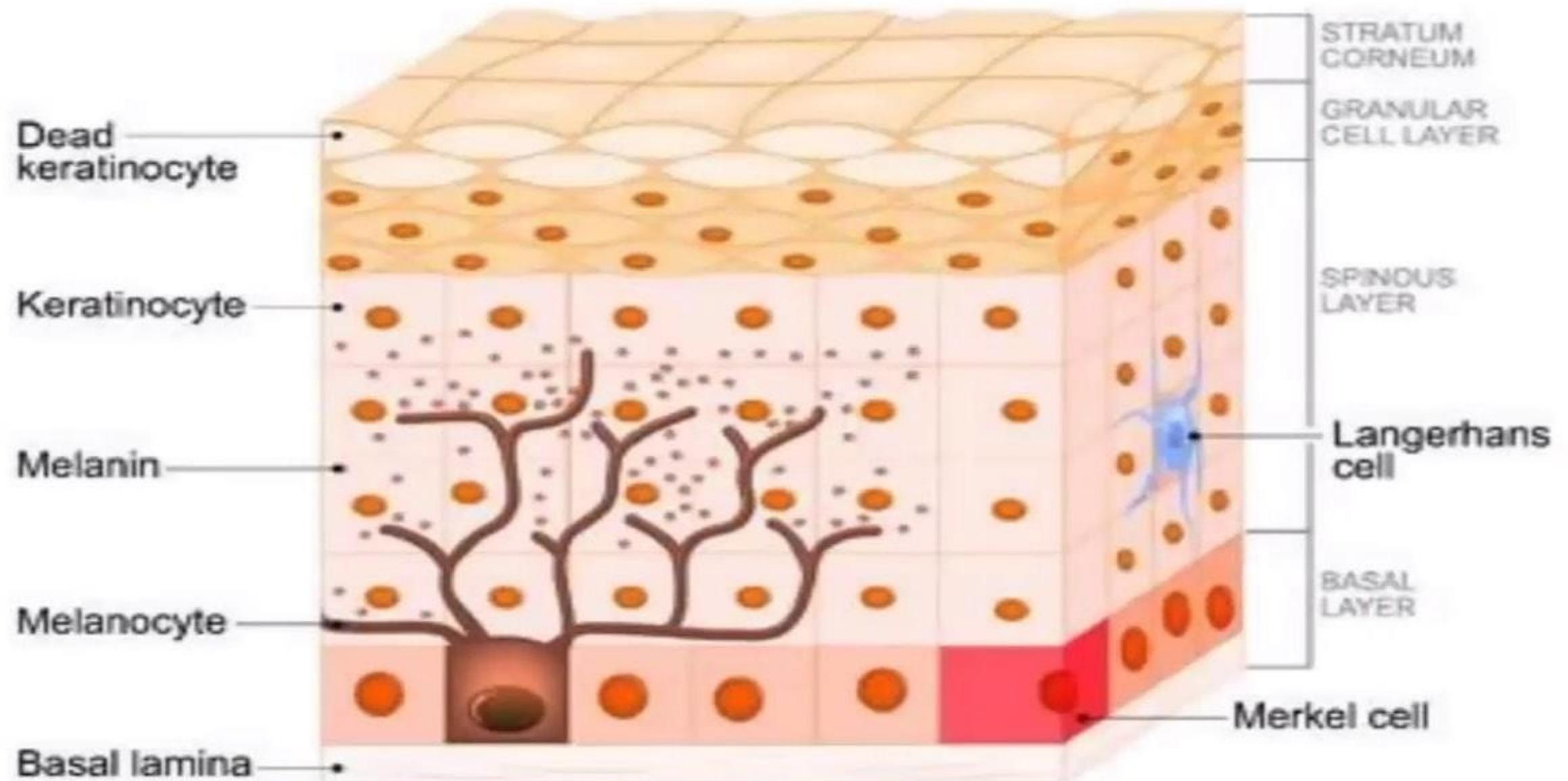
- Stratified sq. cell( Keratinocytes).
- **Keratinocytes**: 85- 95% of Epidermal cells.
- **Desmosomes**:
  - The major adhesion structure between KC.
  - If damaged will lead to **Acantholysis** (separation of keratinocytes) → **Immunobullous dis.** **داء الفقاعات**.
- **Melanocytes** :melanogenesis,
- **Langerhans' cells**: Bone marrow, APC and immune surveillance, Dendretic.
- **Merkel cells**: basal layer, transducers for fine touch, non-Dendretic.

- **Melanocytes :**
- Melanocytes are the only cells that can synthesize melanin.
- They migrate from the neural crest into the basal layer of the ectoderm where, in human embryos, they are seen as early as the eighth week of gestation.
- They are also found in hair bulbs, the retina and pia
- arachnoid.
- Each dendritic melanocyte associates with
- a number of keratinocytes, forming an ‘epidermal
- melanin unit’ The dendritic processes of
- melanocytes wind between the epidermal cells and end
- as discs in contact with them. Their cytoplasm contains discrete organelles, the melanosomes, containing varying amounts of the pigment melanin .

# Skin histology



# EPIDERMIS



# Dermis

- The dermis lies between the epidermis and the subcutaneous fat.
- It supports the epidermis structurally and nutritionally. Its thickness varies, being greatest in the palms and soles and least in the eyelids and penis.
- In old age, the dermis thins and loses its elasticity.

# Dermis

- Components: Ground Substance, Fibres, Cells and other structures.
- Makes about 15-20% of human body wt
- thickness: 1mm eyelids, 5mm back
- Interdigitates with Epi via dermal papilla

# Functions of some resident dermal cells.

- **Fibroblast**
- Synthesis of collagen, reticulin, elastin, fibronectin, glycosaminoglycans, collagenase
  
- **Mononuclear phagocyte Mobile:**
- phagocytose and destroy bacteria ,Secrete cytokines
  
- **lymphocytes :** Immunosurveillance
  
- **Langerhans cell and dermal dendritic cell**
- In transit between local lymph node and epidermis ,Antigen presentation
  
- **Mast cell**
- Stimulated by antigens, complement components, and other substances to release
- many inflammatory mediators including histamine, heparin, prostaglandins,
- leukotrienes, tryptase and chemotactic factors for eosinophils and neutrophils

# Functions of skin

- **Protection** : Chemicals, particles, UV radiation  
Antigens haptens Microbes
- Preservation of a balanced **internal environment**
- Prevention of **loss of water**, electrolytes and macromolecules
- **Shock absorption** strong, yet elastic and compliant covering.
- **Sensation**
- **Calorie** reserve
- **Vitamin D** synthesis
- **Temperature** regulation
- **Lubrication** and waterproofing
- **Psychosexual** display

# Functions of skin

- The horny layer of the skin is able both to prevent the loss of fluid and electrolytes, and to stop the penetration of harmful substances
- It is a dry mechanical barrier from which contaminating organisms and chemicals are continually being removed by washing and desquamation. Only when these breach the horny layer do the cellular components, come into play. The skin is involved in so many Immunological reactions, seen regularly in the clinic (e.g. urticaria, allergic contact dermatitis, psoriasis, vasculitis) .

# Approach to patients with Dermatological disease

- History
- Examination
- Dermatological investigations
- Other investigations

# Derm. History

- Chief complaint +Duration:
  - **Rash**: multiple red things with/out scale
  - **Lesion**: one or few things ,
  - **Others**: as appropriate ( e.g hair loss, blisters, color change...)

# Derm HX

- Analysis of the complaint:
  - **Onset** : site where it started and how
  - **Progression**: increasing/decreasing/same and which sites
  - **Symptoms**: itch/pain...
  - **Modifying factors**:
  - **Recent illness**: viral/fevers..
  - **Atopy**: asthma+eczema+hay fever (personal or 1<sup>st</sup> degree relative)
  - **Drugs** used

# History

- **Review** of systems: brief for relevant systems
- **Past medical** history
- **Drug** history and **allergies**.
- **Family** medical history and history of skin diseases.
- **Social** history( animal contact, smoking..)
- **Sexual** history

# Examination

## T.SAD

- **Type/s** of lesions
- **Shape** of lesions
- **Arrangement**
- **Distribution**

# Examination

**Type/s** of lesions:

- **Primary** lesions
  - **Petechiae**: **pin point** bleeding(platelet problem)
  - **Ecchymosis**: **large** bleeding
  - **Hematoma**: large bleeding leading to **swelling** of skin.
- **Secondary** (modified..scratched, traumatised...) lesions
  - **Scale**: flake of horny layer (represents **hyperproliferation** of epidermis)
  - **Crust**: **dried fluid** / blood (represent damage to skin)
  - **Lichenification**: thickened skin with increased markings (represents **repeated rubbing**)
  - **Erosion**:
    - Loss of epidermis only.
    - Heals without scarring.
  - **Ulcer**:
    - Loss of epidermis and at least part of dermis.
    - Heals with scar formation.

# Ulcer



# Physical exam /Types of lesions :

## primary lesions

- Macule/patch: alteration of **color** or texture
- Macule < 0.5 cm / patch > 0.5 cm.
- Papule/plaque: **raised** areas **without depth**
- Papule < 0.5 cm / plaque > 0.5 cm.
- Nodule: solid mass in the skin with significant **depth**
- Vesicle/bullae/blister: **fluid** filled spaces
- Weal: elevated, white, compressible and evanescent.
  - 1<sup>0</sup> lesion in **urticaria**
- Pustule/abscess: **pus** accumulation (damage+Neut)
- Comedon: **greasy plug** of keratin in pilosebaceous orifice
  - 1<sup>0</sup> lesion in acne **vulgaris**

# Macules and patches

**Vitiligo** which is due to an immune attack to the melanin pigment in the skin.



# Papules and plaques



- Common viral wart ثالول
- Solid elevated mass.

# Bullae



Acantholysis which leads to escape of fluid from dermis resulting in fluid filled vesicle.

# Weal



**Reactive erythema** presenting as red colored patches

- **Shape** of lesion/s:

- **Colour**

- **Red:** more RBC.s(Hb) either intravascular(dilated vessels) or extravascular (hemorrhage)
    - **Brown/black:** melanin
    - Exogenous.....

- **Surface**

- **Scaly:** papulosquamous disorders
    - **Non scaly:** erythemas (purpuras vs reactive erythemas/diascopy)

- **Margin:**

- **Well defined:** psoriasis
    - **Ill defined:** Eczema

Scaly well-defined margins.



# examination

- **Arrangement:**
  - **Linear:** epidermal naevi, kobnerised...
  - **Grouped:** Herpes...
  - **Annular:** granuloma annulare..
  - Other patterns.
- **Distribution:**
  - **Unilateral:** infection, contact...
  - **Bilateral:** inflammatory
  - **Localised:** single, acral, photoexposed..
  - **Generalised.**

# Linear epidermal naveus



# Grouping



Herpes simplex -1 infection

annular



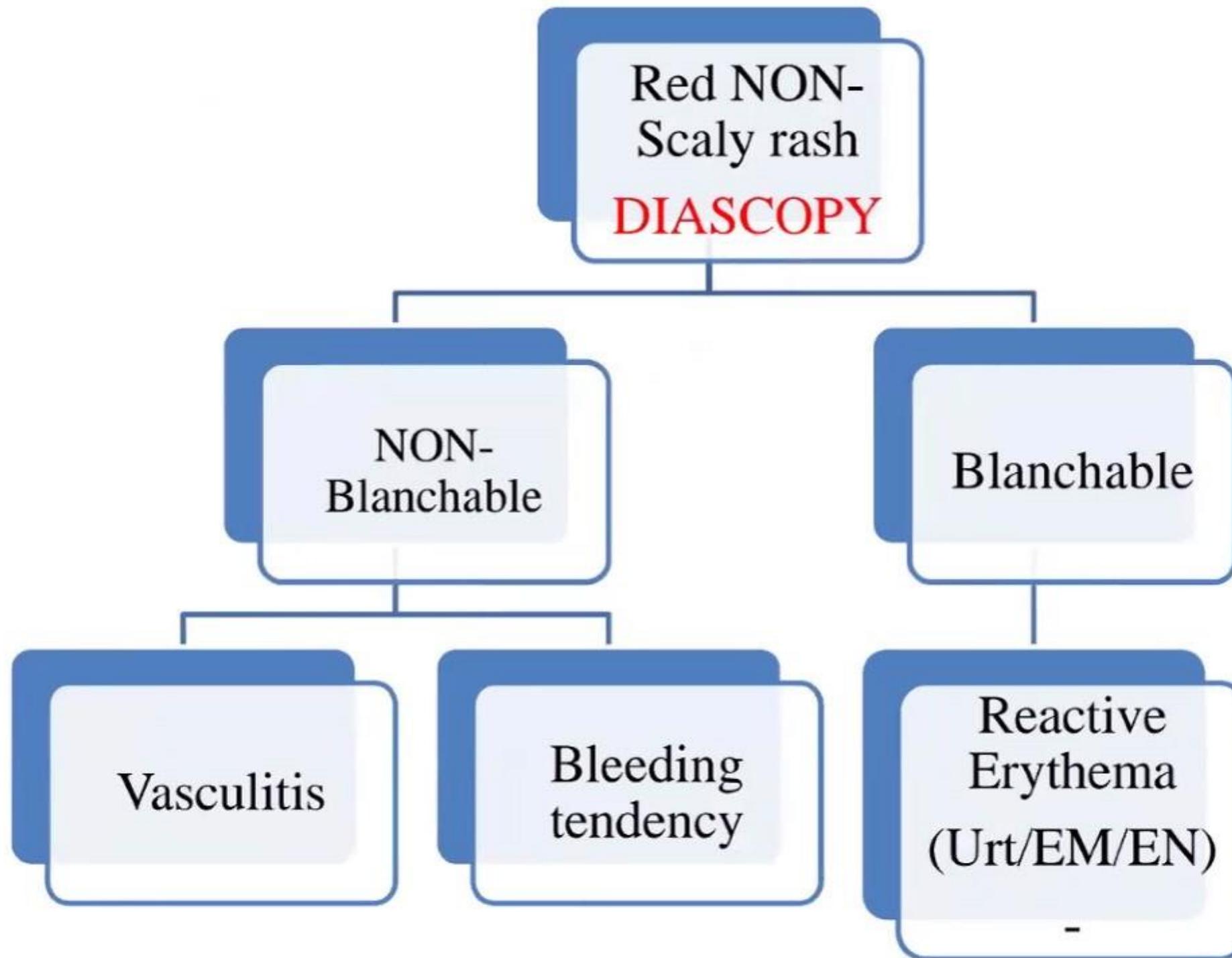
# Groups of disorders

- Non-scaly macule/patch: **pigmentary** disorder or resolving papulosq
- Scaly papules/plaques: **papulosquamous** condition
- Non scaly papules/plaques: **reactive erythema**
- Bullae/vesicles: **bullous dis....**

# Red NON-Scaly rash

- Red is **BLOOD**. This is either
  - Intra vascular: dilated vessel due to usually release of inflammatory mediators (histamine..)  
**DIASCOPY.....BLANCHABLE**
  - DDX: Reactive Erythema: EM/EN/URT
  - Extra vascular: Hemorrhage
    - Vessel wall injury: vasculitis
    - Bleeding tendency or due to trauma...**DIASCOPY.....NON-BLANCHABLE**

# Red NON-Scaly Algorithm



# Urticaria weals



- Red, non-scaly
- **Wheal**
- **TIME** limit (24 hrs not more)
- **Distribution:** generalized
- **Special feature:**  
**angioedema**



# EM



- Red, non –scaly
- Individual **papules/plaques..**
- Last for **1-2 w**
- **Distribution** is **ACROFACIAL**
- **Special feature: Target lesion**

# EN



- Red, non-scaly
- Individual **NODULES**
- Last for **3-6 weeks**
- **Distribution:** favorite site is shins
- **Special feature:** when they start healing 1-2 weeks they leave **Bruises**

# Vasculitis

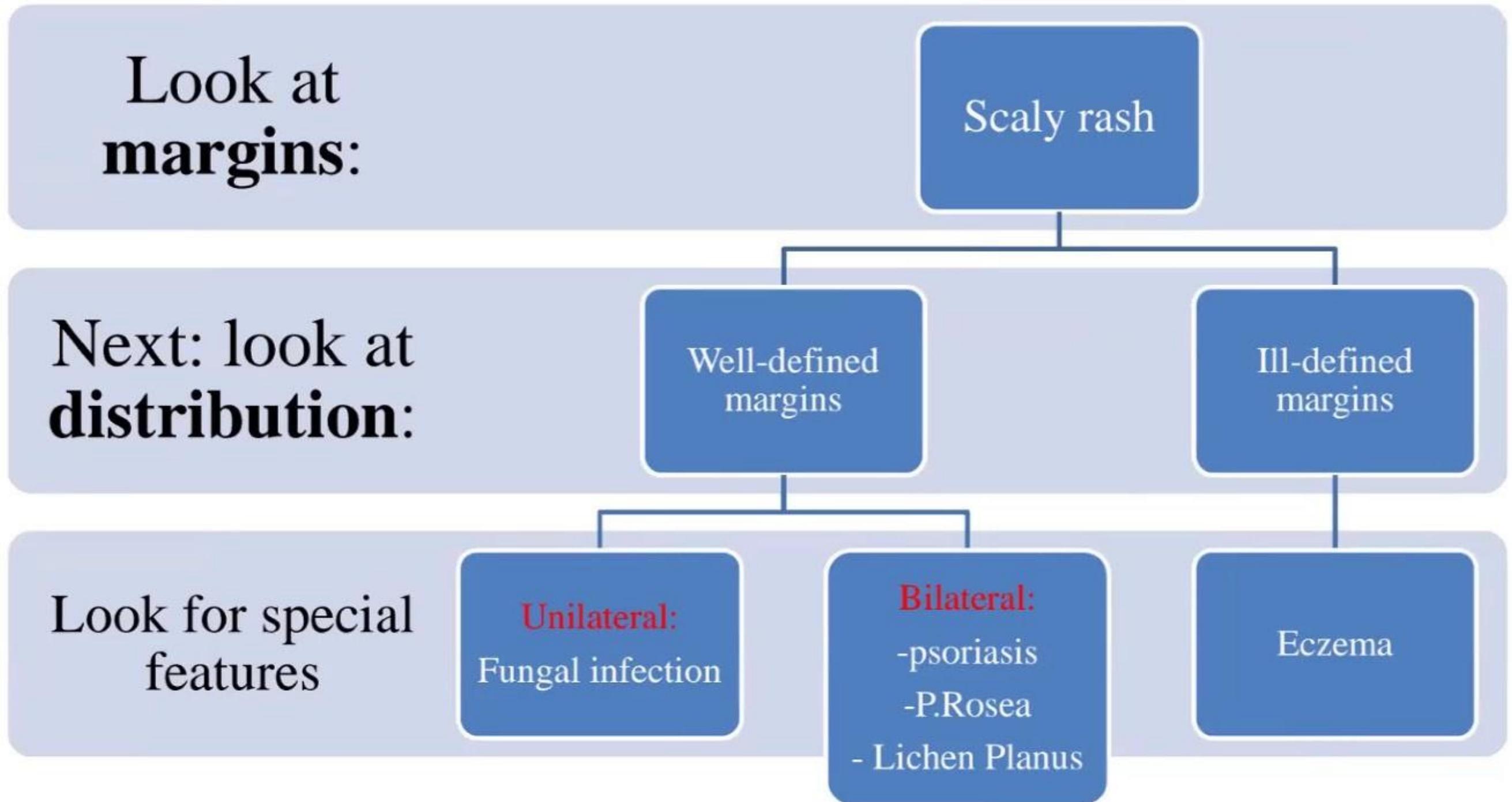


- Red, non-scaly, non-blanchable
- Polymorphic primary lesions
- Last for **few weeks**
- Very **painful & itchy**
- **Distribution:** mainly **legs** but can be generalized

# Patients with **Red scaly** rashes (papulosquamous)

- Scale is flake (piece) from horny layer.
- Usually indicates **hyper-proliferation** of epidermis
- The group includes many conditions but commonest are:
  - Fungal infections
  - Eczema
  - Psoriasis
  - Pityriasis Rosea
  - Lichen Planus

# Patients with Red scaly rashes (papulosquamous)



# Eczema



- Red, scaly
- Ill-defined
- bilateral & symmetrical

# Psoriasis



- Red, scaly
- Well-defined

# Lichen Planus

## Special feature



- Violaceous color
- White streaks

# P. Rosea

## Special feature



Collarette scale



Fir-tree distribution

# T.Corp

- Scraping is a must for single/unilateral scaly patches/plaques



# Dermatological investigation tools

- **Wood's light:** fungal infections, pigmentary problems.
- **KOH.**
- **Tzanc smear** (cytological exam)
- **Diascopy**
- **Patch test**
- **Skin biopsy** and **immunofluorescence.**
- Depending on individual cases:
  - FBC, LFT, KFT, CXR.....

# Wood's light

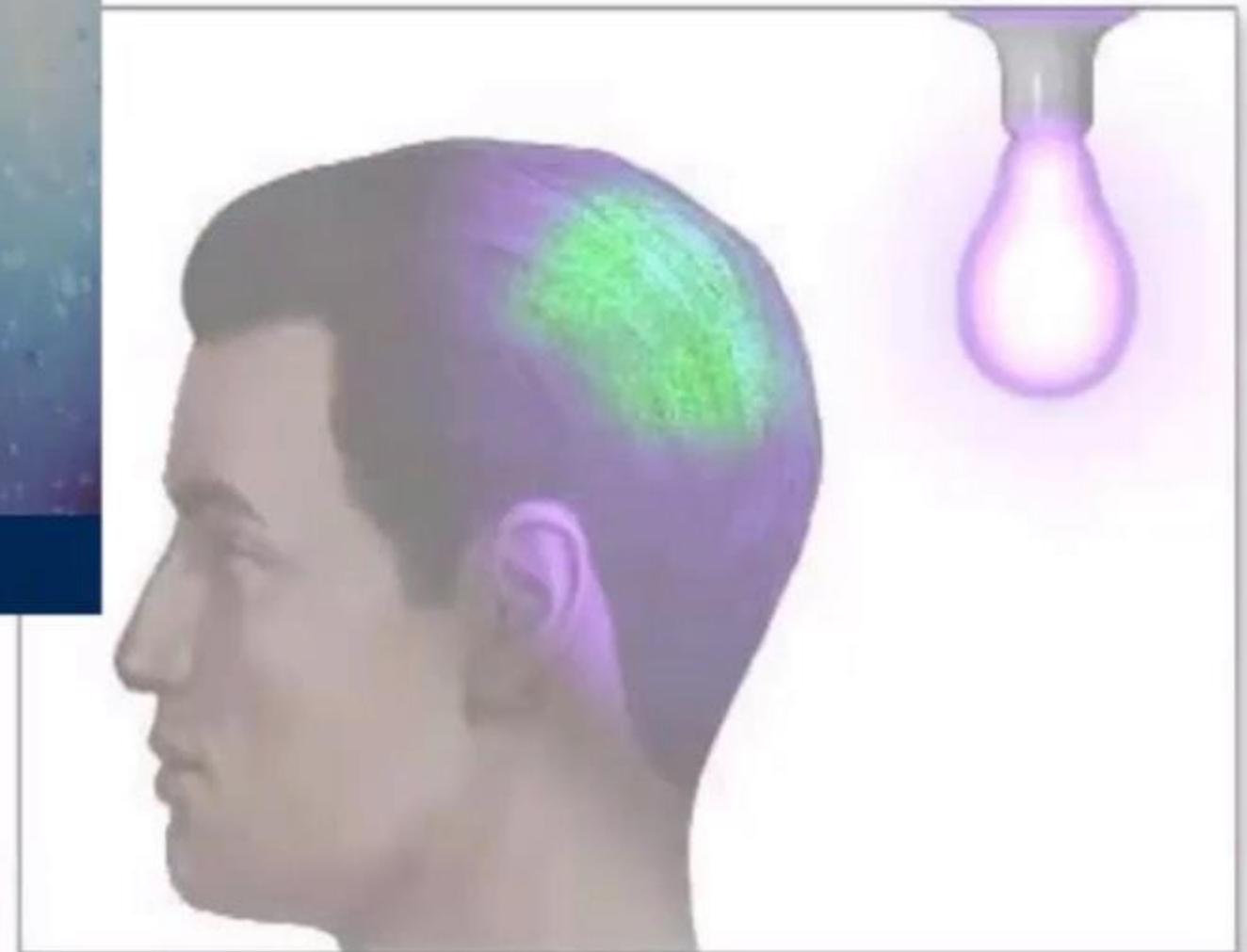
- Source of UVA (365 nm)
  - Diagnosis of some **infections**:
    - **Tinea capitis**: green flu on hair shaft
    - **P. Versicolor**: golden yellow
    - **Pitryosporum**: orange
    - **Pseudomonas**: blue
  - **Pigmentary** disorders: (diagnosis )
    - **Hypopigmentation** (pale) vs **Depigmentation** (chalky white)
    - **Hyperpigmentation**: ( prognosis )
      - **Good** enhancement (**epidermal**/good prognosis)
      - **Poor** enhancement (**dermal** pigment/poor prognosis)



# Tinea Vesicolor – Woods Light



tinea capitus: green flu



Pityriasis versicolor: golden yellow

Infectious organisms glowing under Wood's lamp illumination

# Potassium hydroxide preparations for fungal infections

- If a fungal infection is suspected, scales or plucked hairs can be dissolved in an aqueous solution of 20% potassium hydroxide (KOH) containing 40% dimethyl sulphoxide (DMSO).
- The scale from the edge of a scaling lesion is vigorously scraped on to a glass slide with a scalpel blade or the edge of a second glass slide.
- Other samples can include nail clippings, the roofs of blisters, hair pluckings, and the contents of pustules when a candidal infection is suspected.
- A drop or two of the KOH solution is run under the cover slip . After 5–10 min the mount is examined under a microscope with the condenser lens lowered to increase contrast. Nail clippings take longer to clear up to a couple of hours.

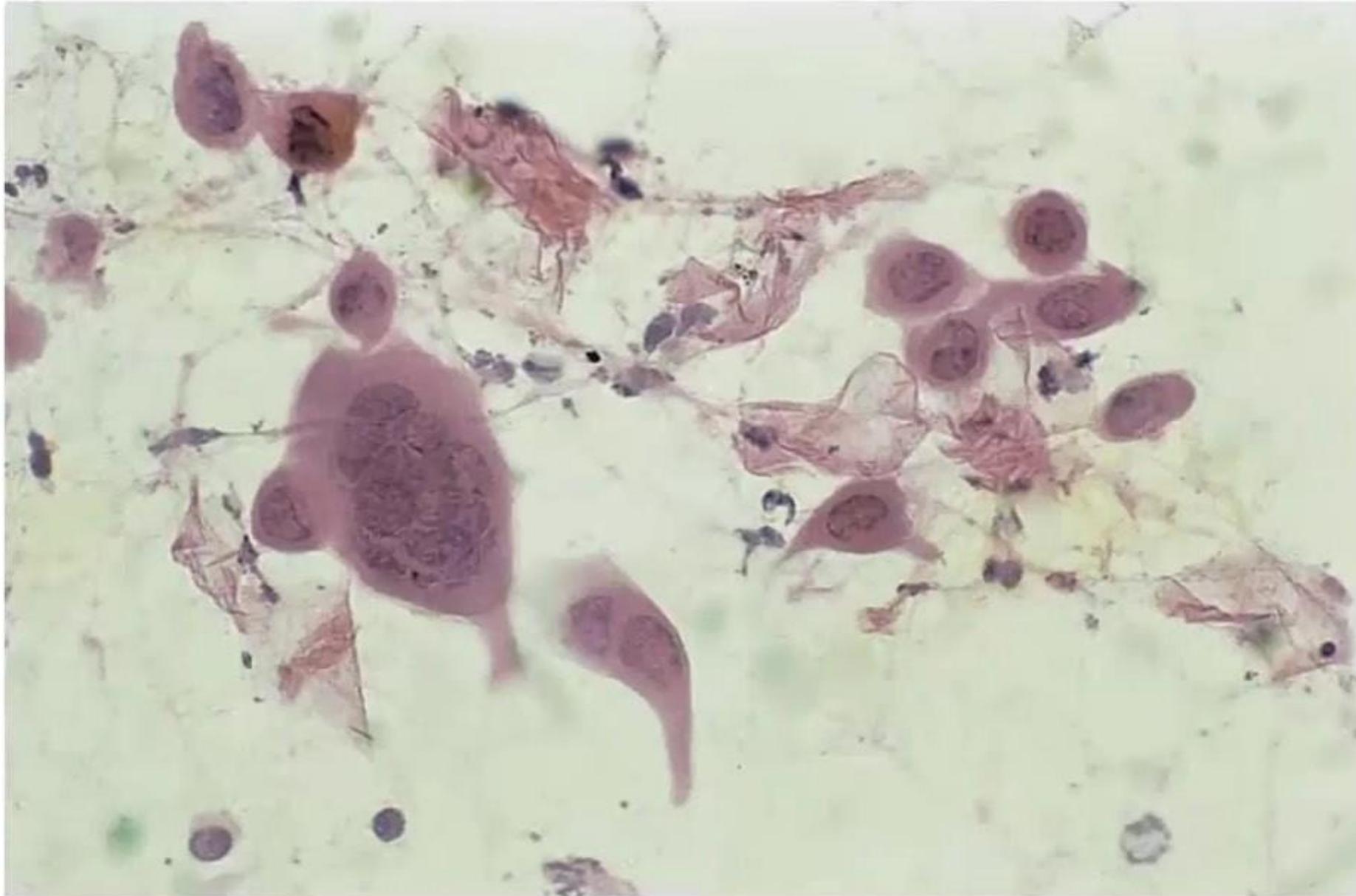
# KOH – fungal hyphae



# Tzanc smear

- Cytology can aid diagnosis of viral infections such as herpes simplex and zoster, and of bullous diseases such as pemphigus.
- A blister roof is removed and the cells from the base of the blister are scraped off with a surgical blade. These cells are smeared on to a microscope slide, air-dried and fixed with methanol.
- They are then stained with Giemsa, toluidine blue or Wright's stain.
- Acantholytic cells are seen in pemphigus and multinucleate giant cells are diagnostic of herpes simplex or varicella zoster infections

# Tzanc smear



- Multinucleated giant cells (HSV)

# Diascopy

- **Diascopy** is a test for blanchability performed by applying pressure with a finger or glass slide and observing color changes.
- It is used to determine whether a lesion is vascular (inflammatory or congenital), nonvascular (nevus), or hemorrhagic (petechia or purpura). Hemorrhagic lesions and nonvascular lesions do not blanch("negative diascopy"); inflammatory lesions do("positive diascopy").

# Diascopy



# Prick test

- Prick testing detects immediate (type I ) hypersensitivity
- patients should not have taken systemic antihistamines for at least 48 h before the test.
- Commercially prepared diluted antigens and a control are placed as single drops on marked areas of the forearm. The skin is gently pricked through the drops using separate sterile fine needles. The prick should not cause bleeding. The drops are then removed with a tissue wipe.
- After 10 min the sites are inspected and the diameter of any wheal measured and recorded. A result is considered positive if the test antigen causes a wheal of 4 mm or greater and the control elicits negligible reaction.

# Prick test (type-1)



Skin prick or scratch test kit



# Patch tests

- Standard dilutions of the common antigens in appropriate bases are available commercially
- The test materials are applied to the back under aluminium discs or patches; the occlusion encourage penetration of the allergen. The patches are left in place for 48 h and then, after careful marking, are removed.
- The sites are inspected 10 min later, again at 96 h and sometimes even later if doubtful reactions require further assessment.
- The test detects type IV delayed hyper-sensitivity reactions .

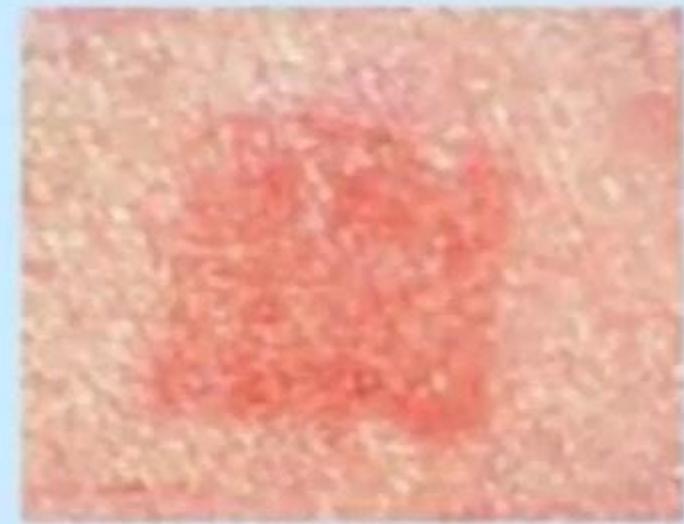
- The readings are scored according to the reaction seen :
  - NT Not tested.
  - 0 No reaction.
  - ± Doubtful reaction (minimal erythema).
  - + Weak reaction (erythematous and maybe papular).
  - ++ Strong reaction (erythematous and oedematous or vesicular )
  - +++ Extreme reaction (erythematous and bullous).
  - IR Irritant reaction (variable, but often sharply circumscribed, with a glazed appearance and increased skin markings).
- A positive patch test does not prove that the allergen in question has caused the current episode of contact dermatitis; the results must be interpreted in the light of the history and possible previous exposure to the allergen.



**Extreme positive**  
Coalescing  
vesicles;  
bulla



**Strong positive**  
Erythema;  
papules;  
infiltration;  
discrete vesicles



**Weak positive**  
Erythema;  
infiltration;  
discrete papules



**Doubtful**  
Faint or homo-  
genous erythema;  
no infiltration



**Irritant**  
Discrete, patchy  
or homogenous  
erythema; no infiltration

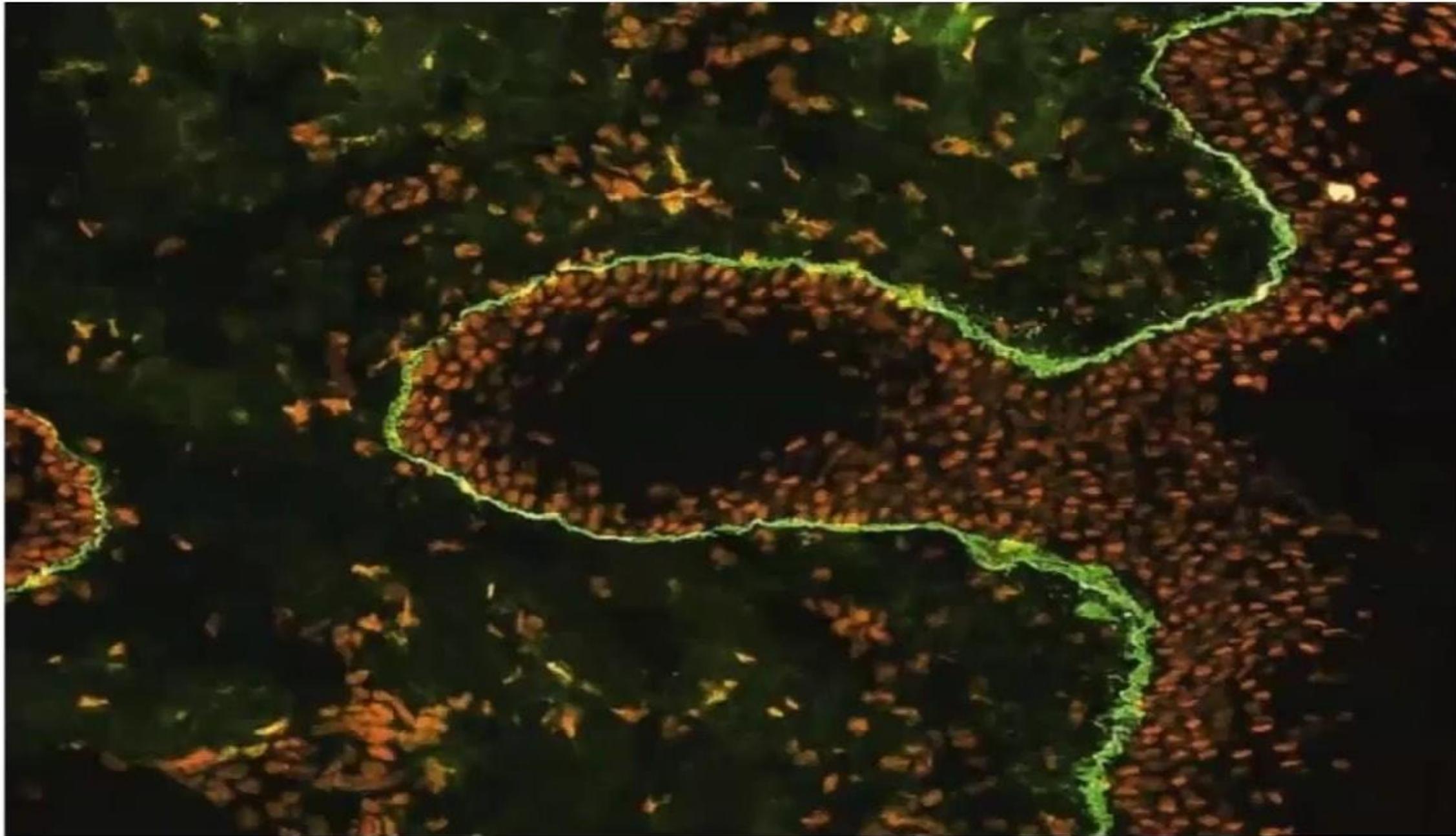
# **Dermoscopy**

- **Dermoscopy** or dermatoscopy refers to the examination of the skin using skin surface microscopy .
- Derm(at)oscopy is mainly used to evaluate pigmented skin lesions (melanoma)

# Dermoscopy



# Immu fluo.





Thank  
you!!