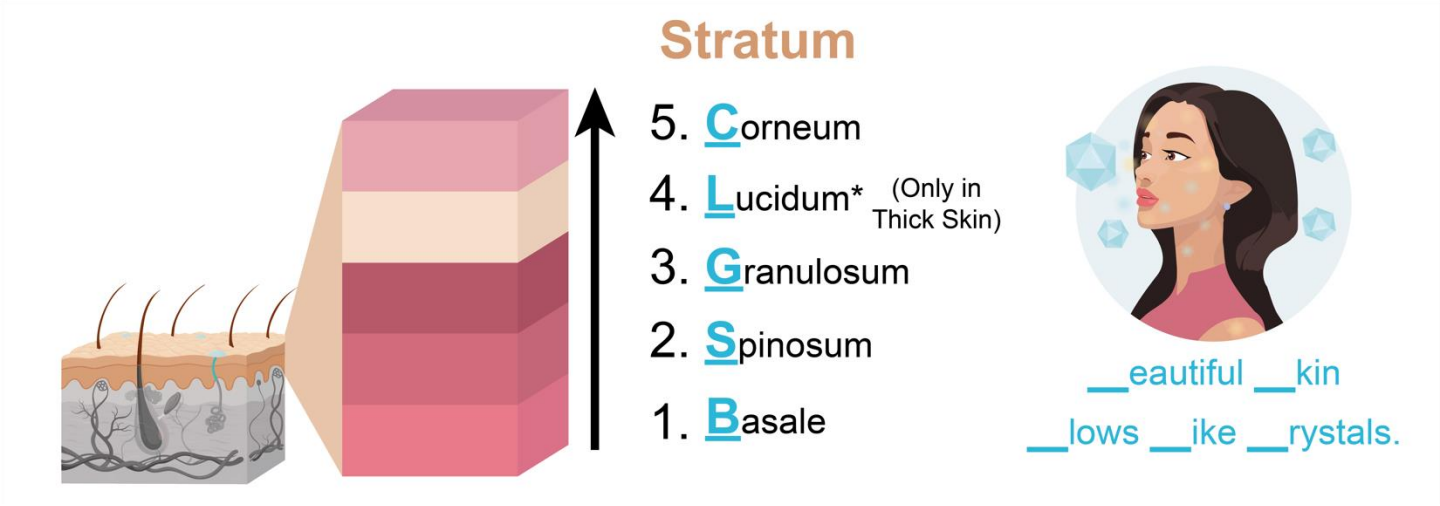
TOPIC: THE EPIDERMIS: LAYERS

- The epidermis is composed of _____ distinct layers of cells.



Thin vs. Thick Skin

- Although skin all over the body is similar in structure, local variations led to _____ majorly recognized skin types:

Thin Skin	Thick Skin
Does ***NOT*** contain stratum lucidum.	Contains stratum lucidum.
Makes up most of skin.	Located on _____ of hands & soles of feet.
Contains _____ follicles & oil glands.	Does ***NOT*** contain hair follicles or oil glands.
Fewer sweat glands.	_____ sweat glands.

EXAMPLE: Imagine you're a pathogen trying to enter a human body via the skin on a person's sole of the feet. Which layers of the epidermis do you have to get through and in what order?

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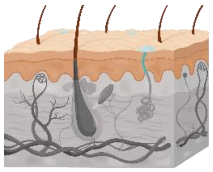
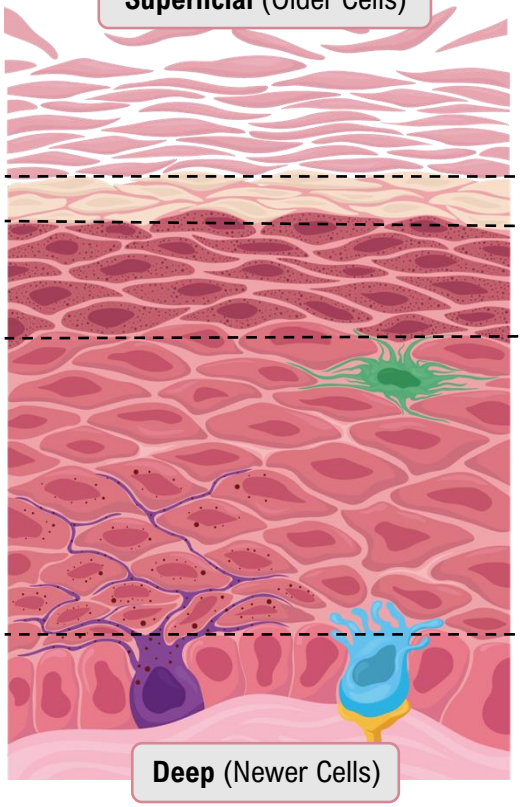


Keratinocyte Development in Epidermal Layers

- Keratinocytes in the layers of the epidermis are in *various* stages of development.
  - Cells *originate* in Stratum _____ & over time are "pushed" _____ into superficial layers.



Stratum **C**orneum

*Ker*ry is a "**C**loud-top" "**C**asper" "**C**asting" off ___orneum.

Stratum **L**ucidum

Lifeless *Ker*ry is "**L**ocked" in *THICK* coffin in ___ucidum.

Stratum **G**ranulosum

*Ker*ry is a "**G**ranny" in ___ranulosum.

Stratum **S**pinosum

*Ker*ry "**S**prouts" in ___pinosum.

Stratum **B**asale

*Ker*ry the *Ker*atinocyte "**B**orn" in ___asale.

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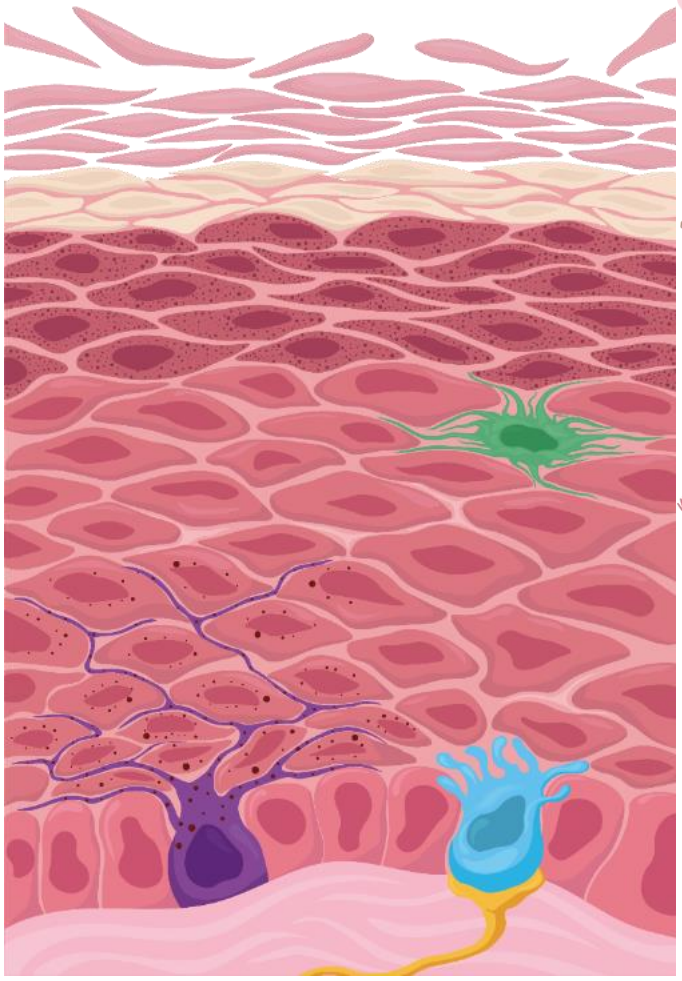
EXAMPLE: Label the epidermal strata in the image below:



Stratum _____

Stratum _____

Stratum _____

Stratum _____

Stratum _____

PRACTICE: Which of the epidermal layers is likely to have the greatest regenerative capacity (ability to divide)?

a) Stratum basale.

b) Stratum spinosum.

c) Stratum granulosum.

d) Stratum lucidum.

e) Stratum corneum.

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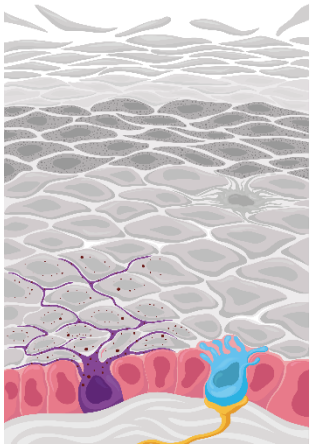
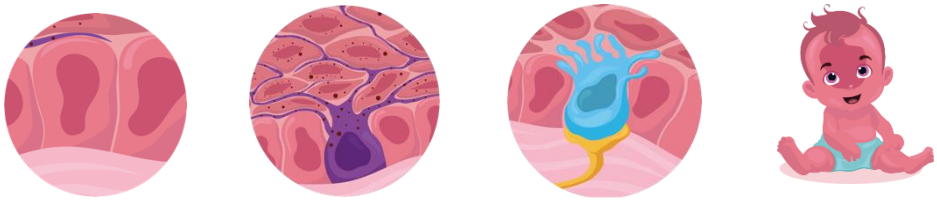
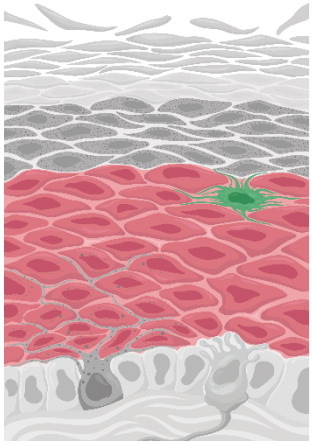
Key Features of the Epidermal Layers

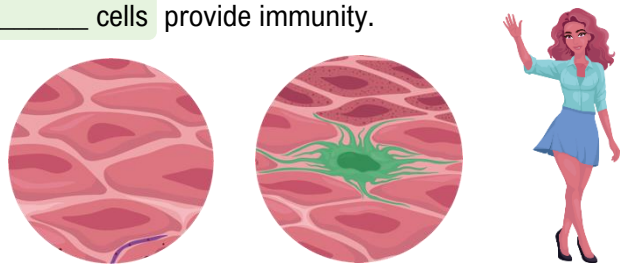


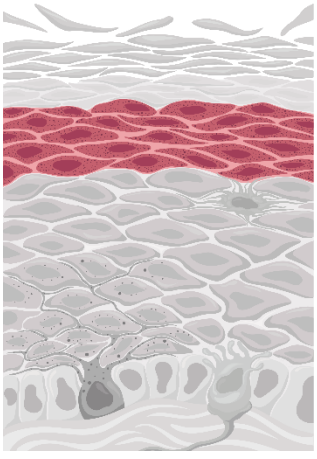
1) **Stratum Basale (Basal layer):** bottom layer made of ____ single row of cells.
   - _____ cells proliferate (divide) & differentiate (change) to *maintain* epidermis.
   - Contains keratinocytes, melanocytes & tactile epithelial cells.



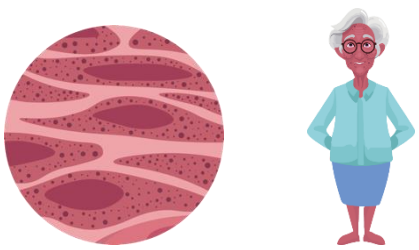


2) **Stratum Spinosum (Spiny layer):** 2nd deepest layer; many rows of dividing keratinocytes.
   - Thickest epidermal layer in thin skin.
   - Keratinocytes _____ at top of this layer.
   - _____ cells provide immunity.





3) **Stratum Granulosum (Granular layer):** keratinocytes *stop* dividing & begin to harden/die.
   - Keratinization: keratinocytes fill with lots of _____ & harden.
   - _____ promote hardening & waterproofing.
   - Nuclei & organelles start to disintegrate in this layer.



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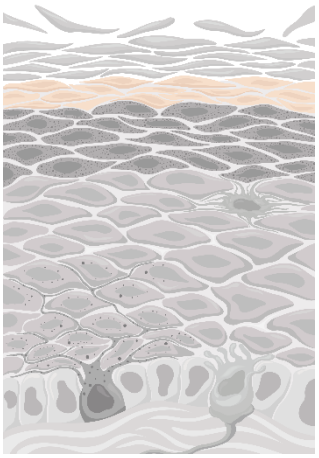
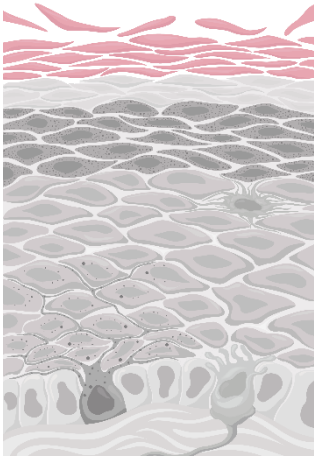
4) Stratum Lucidum (Clear layer): protective layer *only* present in _____ skin.

- Flattened, dead, densely packed, *transparent* cells that _____ organelles.



5) Stratum Corneum: dead cells, full of keratin, with H_2O-resistant glycolipid membranes.

- Cells regularly _____ or are **c**ast/washed off & replaced by underlying cells.



EXAMPLE: Imagine you're a pathogen trying to enter a human body via the skin on a person's arm. Which layers of the epidermis do you have to get through and in what order? What might be some challenges you encounter along the way? How would this journey differ if you were entering via the palm of their hand?

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PRACTICE: Which of the following layers of the epidermis is responsible for generating new epidermal cells?

a) Stratum basale.
b) Stratum spinosum.
c) Stratum granulosum.
d) Stratum corneum.

PRACTICE: Which of the following is true about thick skin?

a) Hair grows on thick skin.
b) There is no stratum corneum in thick skin.
c) Stratum lucidum is only found in thick skin.
d) Thick skin is only composed of stratum lucidum.

PRACTICE: Which epidermal layers contain dead, flattened keratinocytes?

a) Stratum basale and stratum corneum.
b) Stratum lucidum and stratum corneum.
c) Stratum granulosum and stratum spinosum.
d) Stratum granulosum and stratum lucidum.

PRACTICE: Why do the cells in the more superficial layers of the epidermis die?

a) They experience a great deal of mechanical stress.
b) They're exposed to oxygen in the air, causing them to age faster.
c) They're exposed to harsh chemicals contained in soaps, lotions, and other products.
d) They are far away from any blood supply, causing a lack of nutrients.