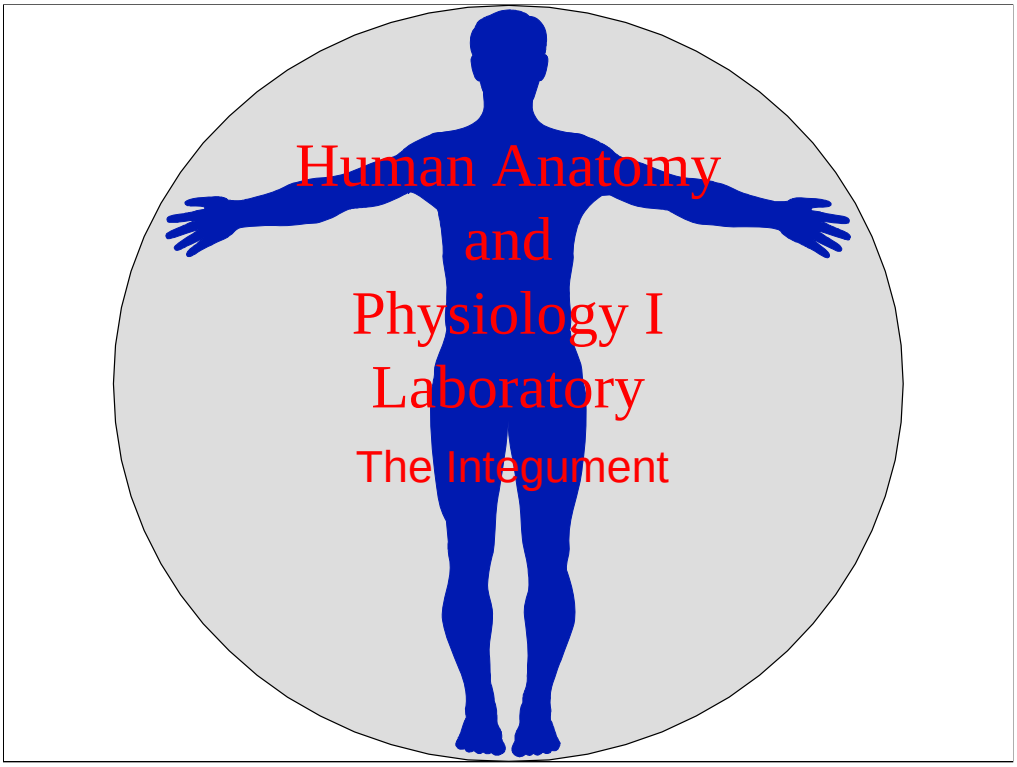
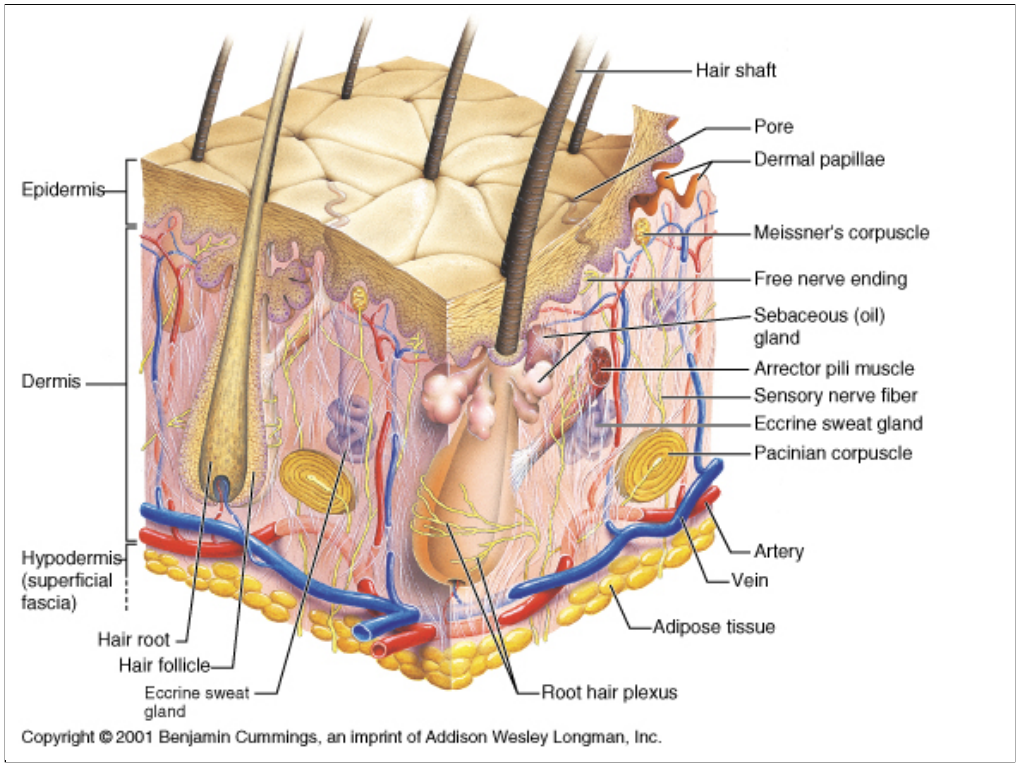
mp3

Mpeg 4 for iPod

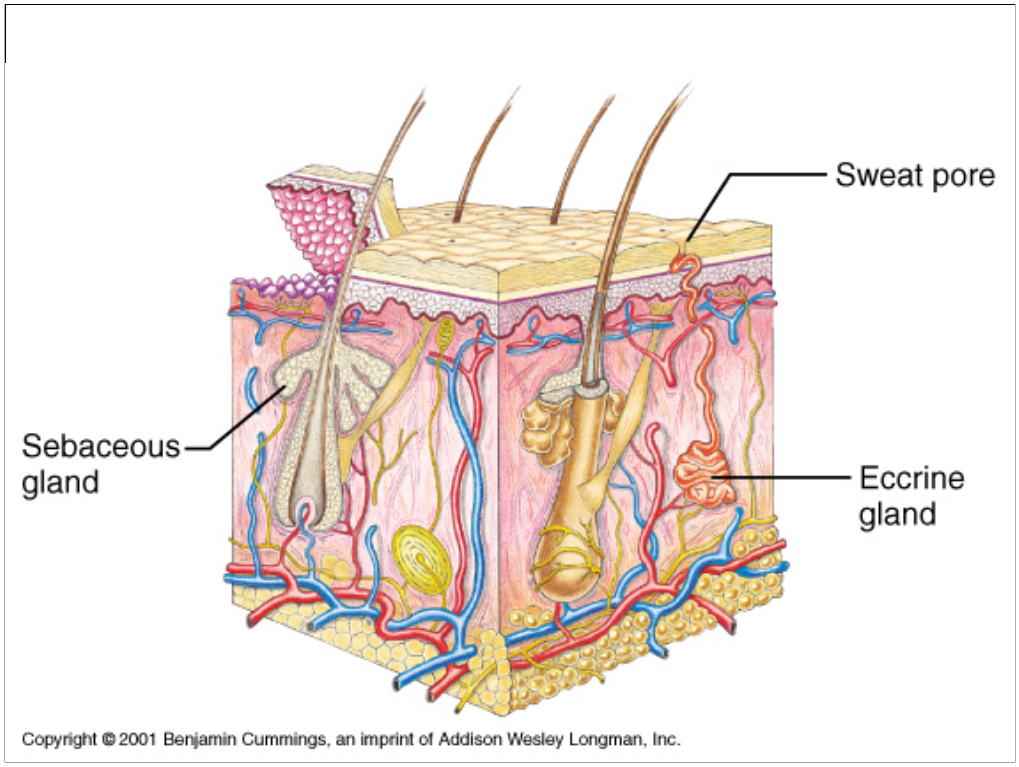


The Integument lab involves study of the appropriate laboratory exercise, completing the Review Sheet for the exercise, and taking the relevant quiz.

Click on the sound icon for the audio file (mp3 format) for each slide. There is also a link to a dowloadable mp4 video which can be played on an iPod.

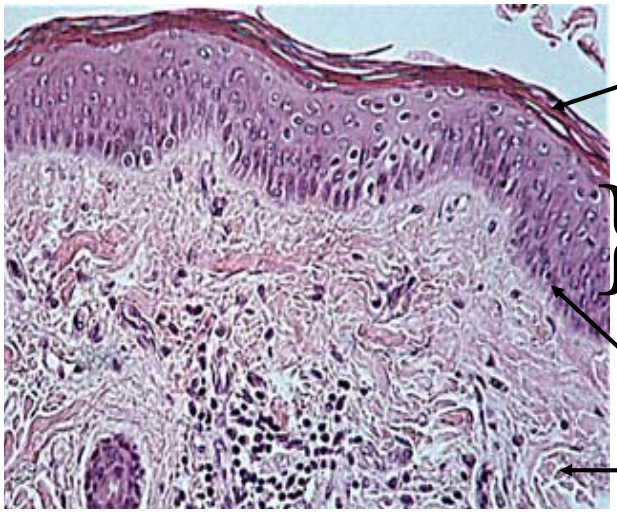


A section of the skin showing the **epidermis**, **dermis**, and **hypodermis**. Within the dermis are the sensory receptors, glands, hair follicles, and blood vessels for thermoregulaton. The dermis extends into the epidermis as **dermal papillae** which contain touch receptors known as **Meissner's corpuscles**. Capillaries also extend into the dermal papillae in order to radiate heat in thermoregulation. Also found in the dermis are **Pacinian corpuscles** which respond to pressure and vibration, **sebaceous glands** which secrete an oily sebum at the base of the hairs for waterproofing, **sudoriferous (sweat) glands**, **hair follicles**, and **arrector pili** muscles.

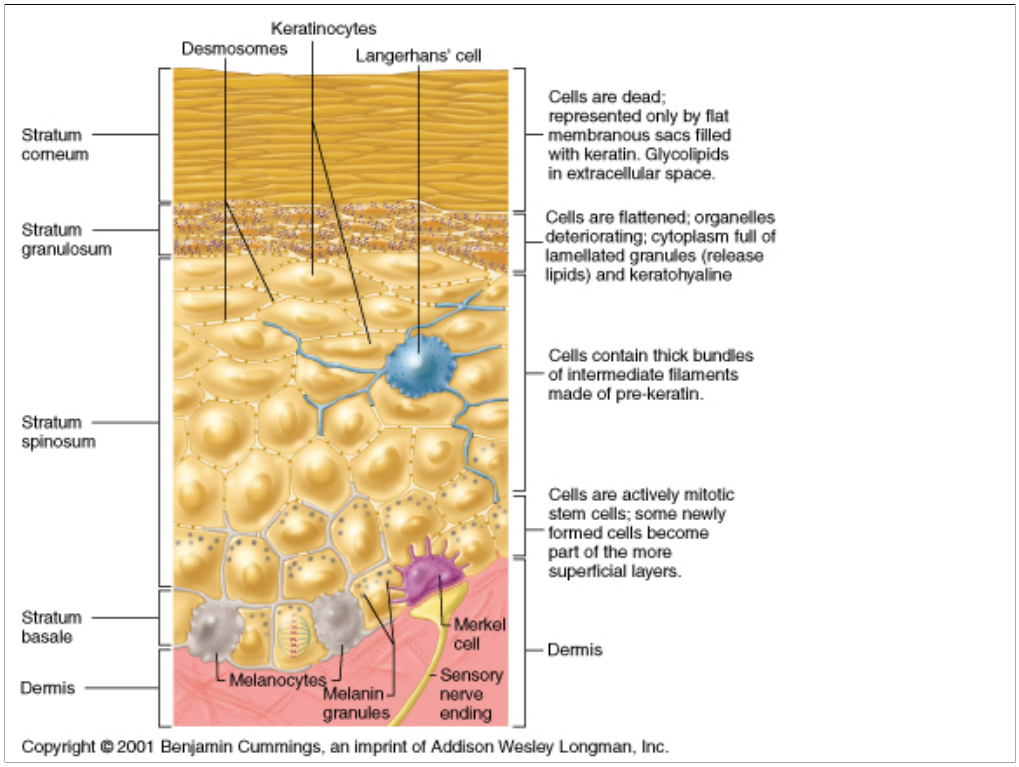


A better view of the **sebaceous** and **eccrine sweat glands**. The eccrine sweat glands are widely distributed on the skin and serve primarily for thermoregulation. A different sweat gland, known as **apocrine glands**, are primarily located in the groin and axilla and secrete a viscous fluid in response to stress and sexual arousal.

Thin Skin

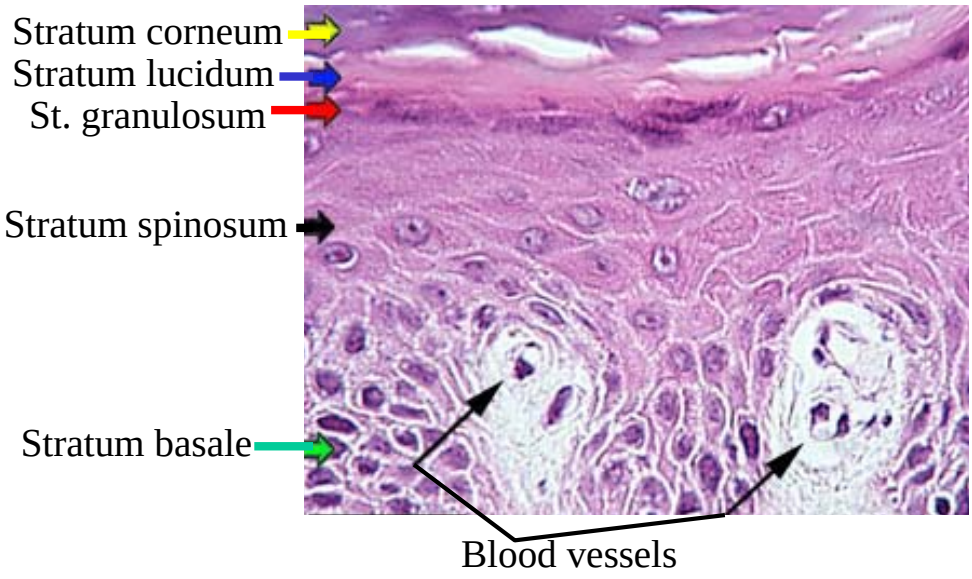


The designation as **thin skin** is given to skin without the **stratum lucidum** layer. The stratum lucidum is found only in skin on the palms and soles and such skin is known as **thick skin**.



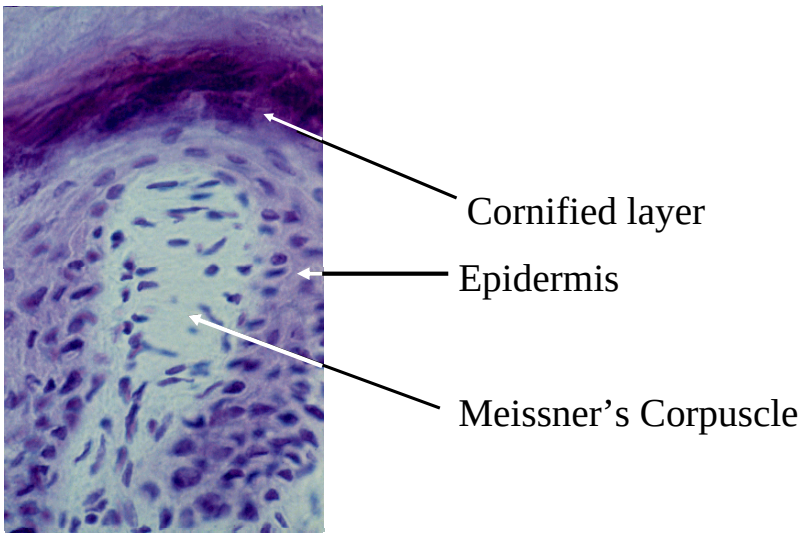
The epidermis has four or five layers depending on whether it is thin or thick skin. At the base of the epidermis lie the **Merkel discs**, which are discriminative touch receptors. Within the stratum basale are the **melanocytes**. Present within intermediate layers of the epidermis are **Langerhans cells**, which are phagocytic cells and stimulate an immune response when they encounter disease causing microbes. Question: Is this thick or thin skin? Cells produced by mitosis in the **stratum basale** push upward to replace cells in the layers above, ultimately dying and becoming flattened, cornified cells in the **stratum corneum**.

Layers of the Epidermis



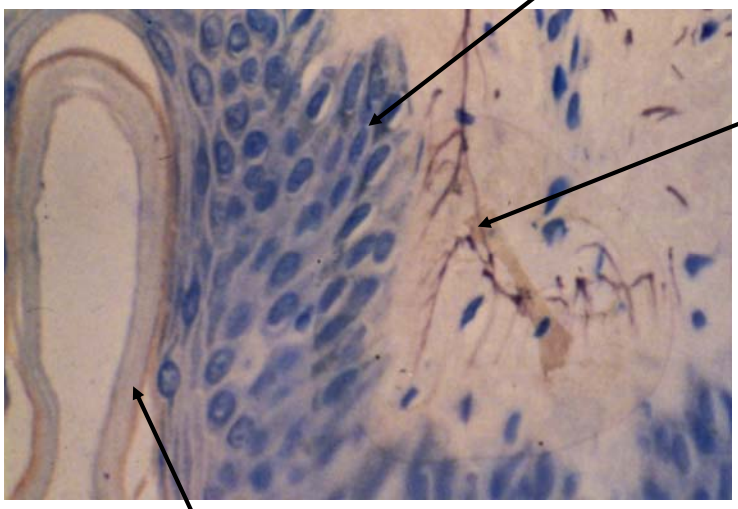
This is thick skin from the palms. The stratum lucidum has accumulated keratin but has not yet flattened to become the cornified cells of the stratum corneum.

Meissner's Corpuscles



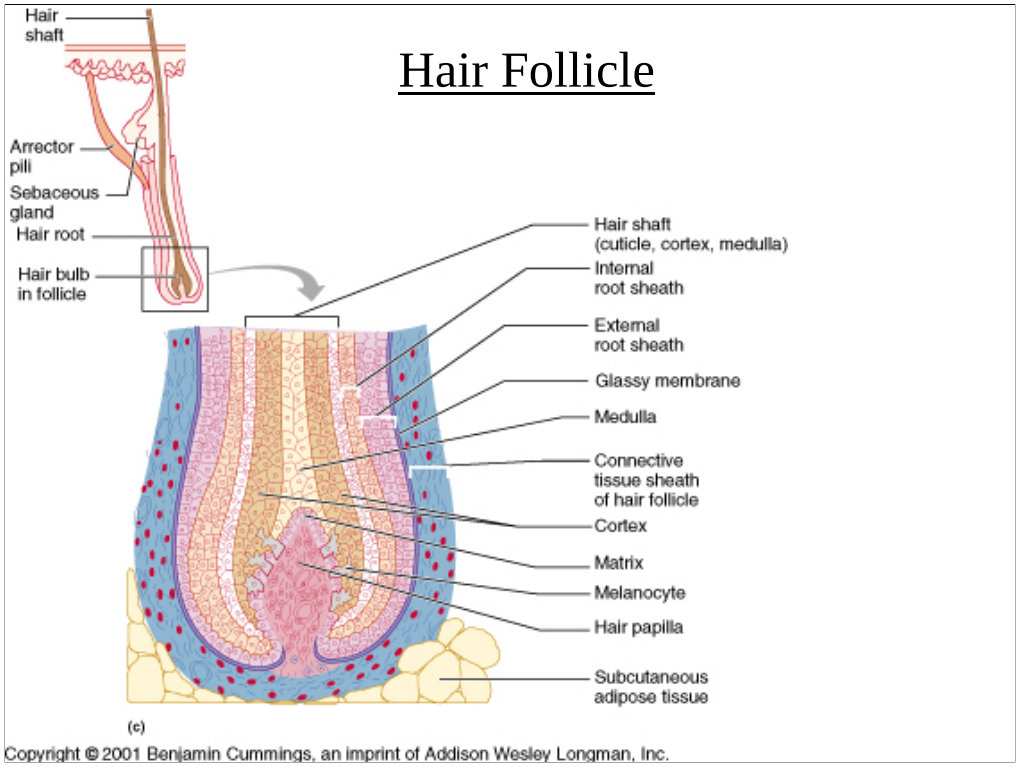
Meissner's corpuscles are non-discriminative touch receptors.

Free Nerve Endings



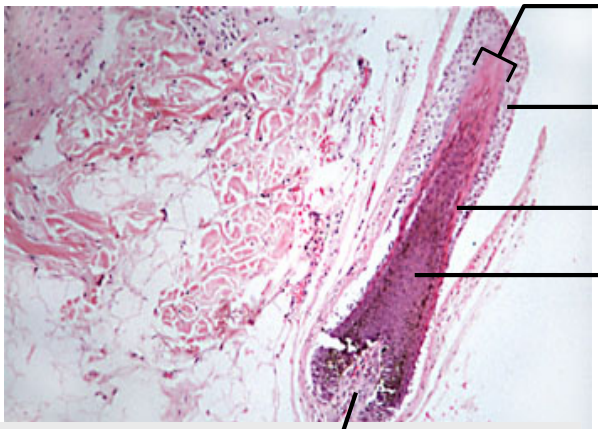
The free (unencapsulated) ends of neurons in the dermis act as pain receptors.

Hair Follicle



The hair follicle contains the hair papilla where the hair is produced by mitosis, much like the epidermis of the skin. Pigment is added by melanocytes, and the cells push upward and keratinize as they do in the epidermis. The hair is formed of stacked, flattened, keratinized cells. Vellus hair is fine, thin hair which lacks the pigmented cortex.

Hair Follicle



Sebaceous Gland and Arrector Pili Muscle

The **sebaceous glands** secret oily **sebum** at the base of the hairs. This acts to retain moisture in the skin to help prevent it from drying out. Repeated washings, while important for health and hygiene, remove this waterproofing sebum and cause the skin to become dry. Lanolin, present in cosmetics for many years is the sebum from wool. Lanolin has mostly been replaced by synthetics. The **arrector pili** muscles attach from the base of the hair follicle to the base of the epidermis. They raise the skin in “goose bumps” during cold temperatures and when aroused or frightened.

Lab Protocol

1) After studying the lab exercise and this PDF, complete the Review Sheet which accompanies the lab exercise.
2) Look at histology web sites for images of the skin.
3) Take the quiz on the integument.