

- *Squamous cell carcinoma (SCC)* : cancerous squamous cells caused by UV damage to DNA. Results in uncontrolled tumour growth. More aggressive than BCC because it can metastasise (cancer cells can break off from tumour and propagate elsewhere in body). Note these cells are more vulnerable to DNA damage than basal cells.

### Dermis - the inner skin layer

The dermis lies beneath the epidermis, and is comprised primarily of dense connective tissue and skin accessory structures. It supports tissues, and contains collagen and elastic fibres that provide strength and elasticity (helpful to prevent skin ripping as well as abrasion resistance). With age, collagen and elastic fibres degrade (is there an internal repair mechanism?), causing wrinkles. The dermis contains a variety of cells, including fibroblasts (synthesise extracellular matrix and collagen), mast cells and other white blood cells, and fat cells (for insulation)

### Dermis accessory structures

- *Hair* : the shaft extends above the skin surface, while the follicle is embedded in the dermis. The cells at the follicle base are constantly dividing, pushing the hair root upwards.
- *Smooth muscle* : small muscles attached to hair follicles, which contract in response to cold/fright, causing hair to assume an upright position (stand on end), and signalling a massive hormonal response in body.
- *Sebaceous (oil) glands* : secrete sebum, which moistens and softens skin and hair, thus preventing the epidermis from drying out and shedding too much.
  - o Pimples result from sebum clogging the hair follicle.
- *Sweat glands* : secrete sweat (contains water, salt, dermcidin, and more) to help with temperature regulation.
  - o Dermcidin helps protect against bacteria - useful property considering sweat glands form pores
  - o Body odour results not from the sweat itself, but the metabolic byproducts of microbes consuming the various compounds in sweat.
- *Blood vessels* : supply nutrients, remove waste/byproducts of cellular metabolism, assist in temperature regulation through contraction/dilation
- *Sensory nerve endings* : skin contains many receptors, allowing us to detect heat, cold, pressure, and vibrations - but not wetness! Wetness is inferred through processing sensory information in the brain.

### Homeostasis

*Homeostasis* is the maintenance of relative constancy of internal environment conditions via a negative feedback control system. A significant amount of metabolic energy is used to detect cues from the external environment and adjust internal conditions accordingly. Thus we can infer it is critically important for the human body to maintain a constant internal environment.

*Negative feedback control system* : components include a controlled variable ), sensor/s, control centre, and effector/s. These components cooperate in a cycle to ensure any deviation from expected conditions can be detected and counteracted.