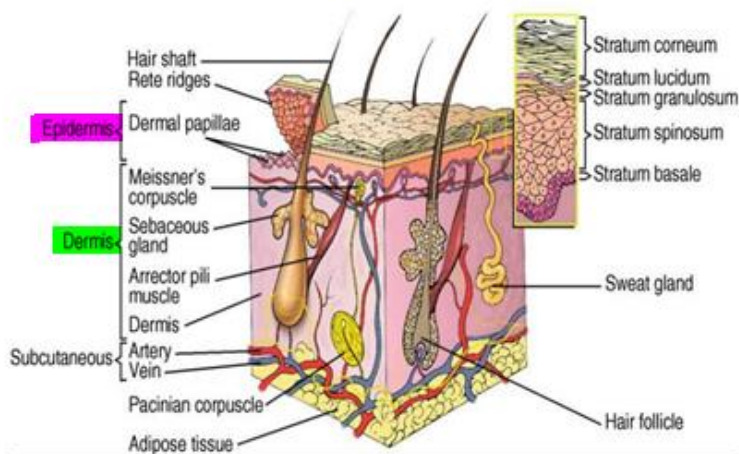


SKIN WOUND HEALING

The skin is the biggest organ in the body. It keeps the outside world out, therefore it is important that wound heals quickly.

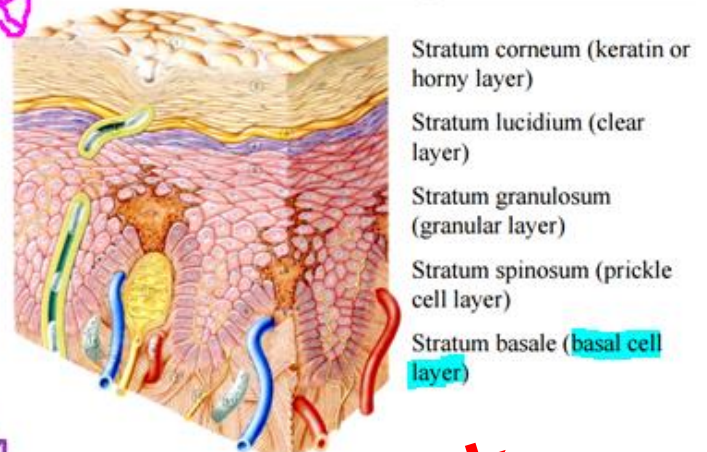
Anatomy of the skin



The **epidermis** is made up of skin cells or keratinocytes and is an avascular tissue.

The **dermis** is connective tissue made up of many cells including fibroblasts, blood vessels, nerves, fat and glands etc.

When you wound the skin all these cells need to communicate rapidly for repair.

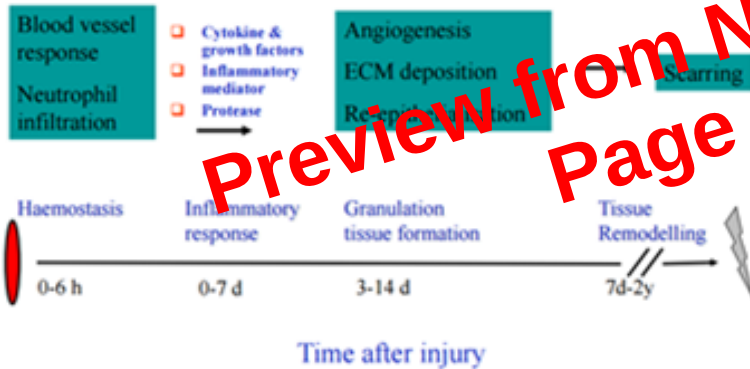


The **basal layer** is where the stem cells are. SCs differentiate as they go towards the surface of the epidermis, and are dead by the time they reach the surface, where they are shed.

All cells are joined by **junctions**:

- desmosomes (for strength),
- tight junctions (zip together and stop the loss of fluids),
- gap junctions (allow communication between cells).

Wound Healing Process



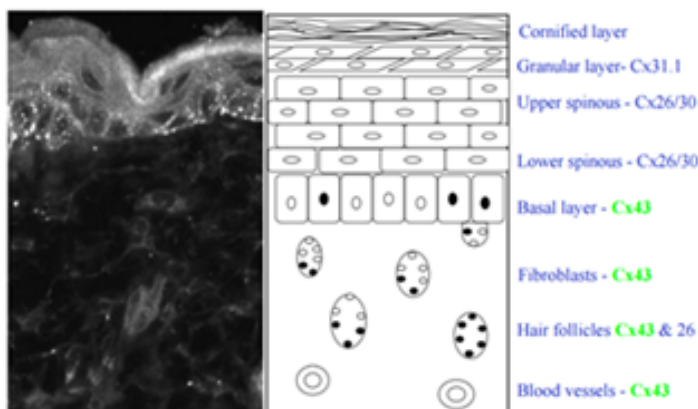
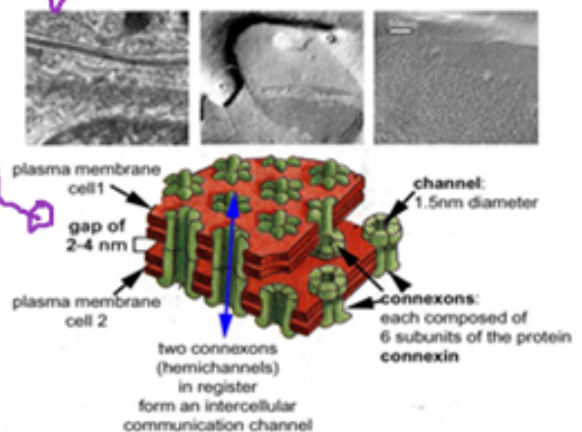
All junctions have to be dismantled as cells migrate towards a healing wound. This is an important part of the healing process.

Blood vessel response and **neutrophil response** are key in wound healing, as they set up the **inflammatory response**. This has effects in the epithelial **migration** process. Human don't get perfect wound healing - scar.

Gap junction have a specific function in embryonic development and in wound healing.

Gap junctions are between two cell membranes. Each junction is made up of 2 subunits called **connexons** and these are made up of 6 subunits called **connexins**. There are 21 connexins in the human genome and they are expressed in **every** cell type in the body (bar skeletal muscle). They **cluster** in the membrane (look like spots on EM).

Have short half life of 1-2 hrs, so a rapid turn over. We can target their expression.



Connexin (Cx) staining in the skin of a mouse shows lots of Cx in the epidermis layer. Down in the dermis there are far fewer junctions. There are loads of different types of Cx expressed in the skin.

On wounding, both the amount and location of connexin expression in mouse neonatal skin changes.