

Skin stem cells: where do they live and what can they do?

What do we know?

Skin is a special organ that both protects us and allows us to sense the world around us.

Skin is made of three layers, each containing specialised cells.

A variety of stem cells are needed to maintain and repair our skin on a daily basis. Researchers have identified stem cells responsible for making the epidermal layer, hair follicles and skin pigments.

Epidermal stem cells are currently used in clinics to grow skin for patients with life-threatening burns. However, the process is difficult, expensive and the skin is not normal. It lacks sweat glands, hair follicles and sebaceous (oil) glands.

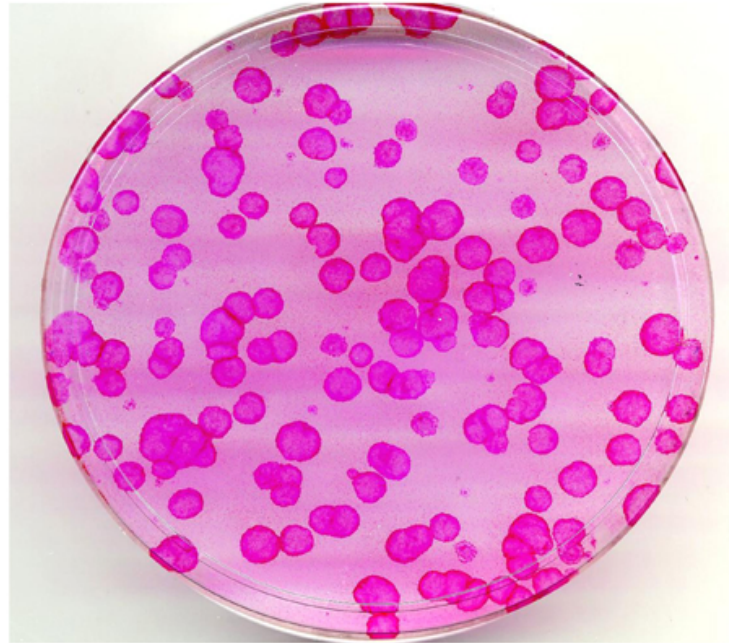


Image: Melissa Maggioni, École Polytechnique Fédérale de Lausanne

What are researchers investigating?

Researchers are currently working to develop methods to grow skin that contains more of the normal functional components, such as sebaceous glands and hair follicles. This will make skin grafts more durable and natural looking.

Currently lab-made skin requires using animal cells for the human skin cells to grow on. This has been shown to be safe, but researchers are trying to develop methods that don't require animal cells for treatments.

Researchers are also working on using genetically modified skin stem cells to treat skin diseases, such as epidermolysis bullosa.

What are the challenges?

Recently, great progress has been made on growing skin that contains components such as hair follicles and glands. However, our body has many different types of skin; just compare the palms of your hand to your scalp. Learning how to grow these different types of skin will be an important challenge to overcome.

The largest challenge for developing skin stem cell treatments is creating methods that are readily available and affordable for patients.