

Skin Tissue Culture Lab

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Scientists

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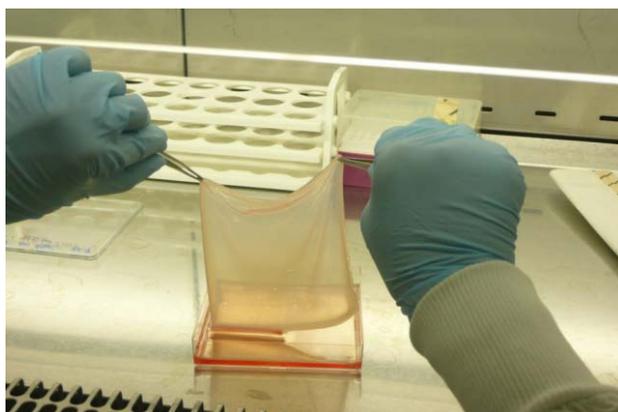
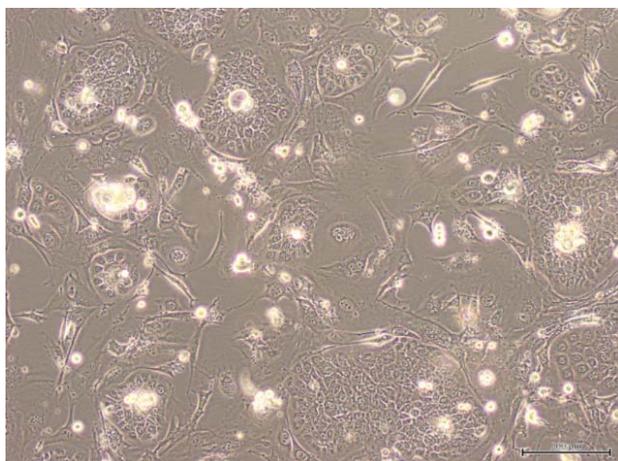
Dr Marisa Herson, Donor Tissue Bank of Victoria

**Postgraduate courses are available.
Please contact Dr Shiva Akbarzadeh
for further information.**

Research Programmes

Cultured Epithelial Autografts (CEA)

CEAs are produced by culturing a patient's own keratinocytes (skin cells) *in vitro* to apply as autografts on major burns (Shown below).



Skin Tissue Engineering

A major limitation of CEA sheets is that they require signals from the dermis *in vivo* to proliferate and to form functional skin upon grafting and cannot be used alone to treat deep burns. Our main goal is to develop an autologous skin composite to replace both dermis and epidermis in a one stage procedure. We are currently conducting experiments to determine optimal methods for keratinocyte culture on commercially available 'dermal' scaffolds.

Optimising Adult Keratinocyte Growth Conditions

Adult keratinocytes have limited proliferative abilities in culture. Established techniques for CEA culture rely on murine fibroblasts as feeders and may not be ideal for clinical applications.

We are examining alternative methods to optimize keratinocyte proliferation in culture using defined factors.

Identification/Isolation of Stem Cell population from Adult Skin

In vivo, epidermal proliferation occurs in the basal layer. Basal layer epidermal cells (mostly keratinocytes, shown below) can be divided into three subpopulations: keratinocyte stem cells (KSC), transit amplifying cells (TA), and cells committed to differentiation (ED) based on cell kinetics. We are interested in using known stem cell markers as well as novel methods to isolate human adult epithelial stem cells to enhance regeneration capacities of engineered skin.

