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BURNS ACROSS THE AGES

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Can we eliminate donor sites using dermal replacement matrices?

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Introduction

- More than 3,000 patients in Queensland are treated for burns in Brisbane
- Split-thickness skin grafts (STSG), are the gold-standard for treating deep partial or full thickness burns, however they create another wound on an already injured patient
- We propose that there may be a way to reduce, if not eliminate, the need for a donor site by using CEA combined with a dermal replacement matrix (DRM).
- We aim to optimise cell growth both in monolayer culture and in a dermal matrix

Figure 1: Grafted torso, image courtesy of the RBWH

Methods and Expected Results for Dermal Matrix Culture

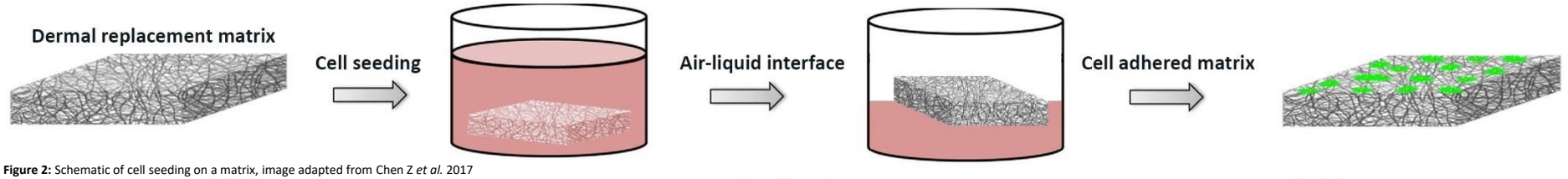

Figure 2: Schematic of cell seeding on a matrix, image adapted from Chen Z *et al.* 2017

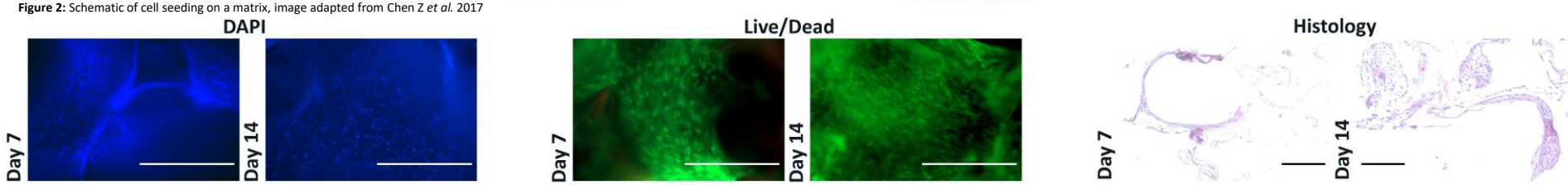

Figure 3: Fluorescent and histology images of unpublished data from Cuttle lab

Methods and Expected Results for Monolayer Culture

Figure 4: Tissue culture plates, image taken from FisherScientific website

Figure 5: IncuCyte Zoom, image taken from Sartorius website

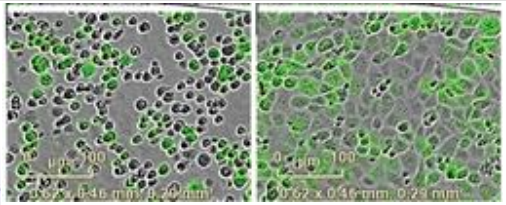

Figure 6: Cell viability using calcein staining, image taken from Dukic AR *et al.* 2017

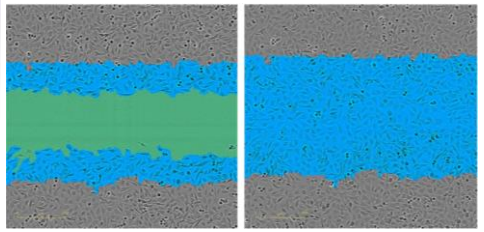

Figure 7: IncuCyte migration and invasion assay, image taken from Sartorius website

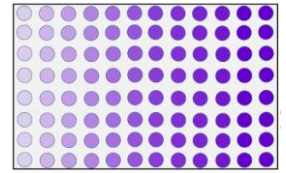

Figure 8: Schematic of an MTT assay 96 well plate set-up, image taken from Sigma Aldrich website

Conclusion

- We hypothesise that a DRM will support cell growth and the localization of the cells will be similar to native skin.
- We believe that a DRM, combined with CEA and patient cells can provide a replacement for traditional STSGs.
- This will provide surgeons with an extensive supply of replacement skin and save the patient from painful donor sites.