Culture and Delivery of Autologous Keratinocytes on Micro-Carrier Beads for Cutaneous Repair
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Introduction
Burns and scalds are common and often devastating forms of trauma and continue to present a significant clinical problem. Sprayed autologous keratinocytes (AK) are well established as a therapy for treating such injuries. Micro-carrier beads have been developed for the culture and delivery of AK cells and may allow cells to be more rapidly delivered to the wound bed without the use of proteolytic enzymes or murine feeder cells (1). This in vivo study examines transplanted cell fate and the quality of wound repair in a pig model.

Materials and Methods
Twelve full thickness wounds were created in two large white pigs and isolated from the surrounding epidermis by PTFE chambers. These wounds were treated with green fluorescent protein (GFP) labeled AK cultured on Cultispher G gelatin micro-carrier beads. These wounds were compared with sprayed AK alone, beads only and untreated wounds.

Results
Histological analysis of the wounds showed a thin layer of flattened cells with an epithelial like morphology on the surface of the wounds treated with AK + micro-carrier beads and AK alone after 14 days. Immuno-staining for K14 indicated a greater quantity of cells exhibiting an epithelial phenotype in wounds treated with AK + micro-carrier beads (figure 1) when compared with control wounds. The surface of these wounds was similar in appearance to AK alone. GFP was detected in wounds treated with AK + micro-carriers and AK alone (figure 2).

Discussion and Conclusions
Our findings demonstrate the potential for using micro-carrier beads to culture keratinocytes for the clinical treatment of skin loss. The use of this technique could reduce costs, culture time and improve the quality of healing.

References

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