**Keloid Fibroblast Heterogeneity and the Development of an Anti-Recurrence Keloid Biomaterial Treatment**

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**AIM: DEVELOP A KEOID FIBROBLAST-INHIBITING DERMAL SCAFFOLD**

**Proposed Treatment Method**  
- Surgical incision allows application of a dermal scaffold, 2 benefits:  
  1) Management of wound healing – i.e. tension, shape  
  2) Specific anti-cell activity  
- Can still use adjunct treatment

**Scaffold design criteria**  
- Minimal inflammation  
- Usability consistent with current scaffolds  
- Tailored persistence in wound / resorption  
- Biological activity: distinguish pathological fibroblasts from normal

**RAFT cell bank**  
- Fibroblasts derived from keloid biopsy 1996-2003 (n=30)  
- Cells recovered, expanded and characterised (n=12, process ongoing)

**Proliferation of keloid cells**  
- kFBs reported as more proliferative, with lower serum requirement than normal fibroblasts¹  
- kFBs highly variable, some lines more proliferative, some not

**Metabolic rate of keloid cells**  
- kFBs reported as more metabolically active than normal fibroblasts²  
- kFBs and controls given AlamarBlue reagent (“AB”, 2hrs), measure fluorescent change as substrate metabolised.  
- Highly active kFB still show contact inhibition

**Heterogeneity present in keloid fibroblast isolates**  
- In vivo, keloid tumours show heterogeneity³: in kFB culture?  
- Seed kFBs at low density on 96 well plate (5000 cells / well)  
- Follow AB metabolism  
- Heterogeneity: single well with +2 SD increased AB metabolism, compared to the other 95 wells, at 3 consecutive time-points.  
- Likely due to paracrine signalling

**Growth in 3D scaffolds**  
- kFB differential growth reported on chitin derived scaffold⁴  
- kFB growth on other natural polymers?  
- Differences with NHDF?

**Conclusion**  
Keloid fibroblast behaviour is more varied than reported in the literature  
Evidence of sub-populations of metabolically distinct cells common to keloid fibroblast isolates: important for scaffold development

kFBs show similar behaviour on natural polymer scaffolds

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**References**  