

The relationship between macrophage subsets and subsequent scarring following paediatric burn injury.

Host School/Institute: Vascular Biology Research Centre, Western Clinical School

URL: <http://www.surgery.usyd.edu.au/research/vascular-biology.php>

Project Code: WCS1

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Description of Project:

Each year in Australia, 6000 children present to emergency centres due to a burn; with 10% of these being admitted to hospital. It is known that up to 35% of children who are hospitalized with a scald burn will subsequently develop severe scarring, known as a hypertrophic scar (HTS). Besides being painful, scarring can result in functional impairment that may permanently disable the child. In spite of continuous improvements in the management of acute burns, therapeutic strategies to treat this severe scarring remain limited. It is thus imperative that the process of HTS be understood so that its formation can be prevented. In this respect, we have recently shown that the presence of a macrophage subset, known as 'fibrocytes', in the paediatric burn wound is associated with the subsequent development of HTS. We now want to expand our study to further understand its role in scar development, and moreover to examine the relationship of other macrophage subsets (e.g. inflammatory or immune regulatory subgroups) to scar formation. The role of these subgroups in healing burns is currently unknown. Given that macrophages that can be sequentially converted from one phenotype to another however, it may be possible to inhibit scarring through modulating monocyte/ macrophage transformation away from the 'fibrocyte' phenotype. It is thus important to define the role of the different macrophage subgroups in HTS.

The project would be carried out on the Westmead campus working in collaboration with our team members and would involve a variety of techniques immunohistochemistry and immunofluorescence staining, cell counting and analysis.

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