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Skin's own cells offer hope for new ways to repair wounds, reduce impact of aging on the skin

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Scientists at King's College London have, for the first time, identified the unique properties of two different types of cells, known as fibroblasts, in the skin – one required for hair growth and the other responsible for repairing skin wounds. The research could pave the way for treatments aimed at repairing injured skin and reducing the impact of ageing on skin function.

Fibroblasts are a type of cell found in the connective tissue of the body's organs, where they produce proteins such as collagen. It is widely believed that all fibroblasts are the same cell type. However, a study on mice by researchers at King's, published today in *Nature*, indicates that there are at least two distinct types of fibroblasts in the skin: those in the upper layer of connective tissue, which are required for the formation of hair follicles and those in the lower layer, which are responsible for making most of the skin's collagen fibres and for the initial wave of repair of damaged skin.

The study found that the quantity of these fibroblasts can be increased by signals from the overlying epidermis and that an increase in fibroblasts in the upper layer of the skin results in hair follicles forming during wound healing. This could potentially lead to treatments aimed at reducing scarring.

Professor Fiona Watt, lead author and Director of the Centre for Stem

Cells and Regenerative Medicine at King's College London, said: 'Changes to the thickness and compostion of the skin as we age mean that older skin is more prone to injury and takes longer to heal. It is possible that this reflects a loss of upper dermal fibroblasts and therefore it may be possible to restore the skin's elasticity by finding ways to stimulate those cells to grow. Such an approach might also stimulate hair growth and reduce scarring.

'Although an early study, our research sheds further light on the complex architecture of the skin and the mechanisms triggered in response to skin wounds. The potential to enhance the skin's response to injury and ageing is hugely exciting. However, clinical trials are required to examine the effectiveness of injecting different types of fibroblasts into the skin of humans.'

Dr Paul Colville-Nash, Programme Manager for Regenerative Medicine at the MRC, said: 'These findings are an important step in our understanding of how the skin repairs itself following injury and how that process becomes less efficient as we age. The insights gleaned from this work will have wide-reaching implications in the area of tissue regeneration and have the potential to transform the lives patients who have suffered major burns and trauma.'

More information: Distinct fibroblast lineages determine dermal architecture in skin development and repair, *Nature*, 2013.

Provided by King's College London