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## Are we close to achieving scarless wound healing? A systematic review of studies on scarless wound healing and its progression with regards to the current concepts and future perspectives

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Since the discovery of scarless wound healing in human foetuses in 1979 by Rowlatt U., an intensive research has been conducted to unravel the mechanisms underlying it. This study aims to summarise the progression thus far and identify areas which are less understood in order to guide further research. Pubmed was the main database used to source suitable journal articles, using the terms 'scarless', 'wound' AND 'healing'. The inclusion criteria were papers in English, articles done on humans and published in the last 5 years. Exclusion criteria are articles without a full text. Differences between the foetal and adult wound healing are well documented. It is essentially divided into different components, namely the cells, extracellular matrix, growth factors and cytokines. Their respective differences are summarised in the table beside. Another recent discovery was the interaction between MG53, a novel tripartite motif family protein and TGF- $\beta$  signalling. This interaction promotes scarless wound healing via three mechanisms, a facilitator of rapid injury repair, a mediator of cell migration and a modulator of myofibroblast differentiation. Another comparative study on oral mucosa shows a higher level of expression of fibronectin and chondroitin sulphate, which resembles foetal skin. Another study was done on the human gingiva regarding the function and expression of Connexin (Cx) 43 in fibroblasts to promote migration and accelerated healing. Lastly, advancement on regenerative medicine have elucidated the contribution of stem cells and growth factors to scarless wound healing. To date, specific cellular differences in foetuses and adults have been identified. The less well understood areas are the cell populations, particularly fibroblasts and transitions from scarring to scarless healing, which can be further looked into. However, regenerative medicine remains the most promising research area thus far.

### Biography

X Teo is currently a foundation year 1 doctor that is passionate in surgery and in improving the health and wellbeing of her patients. Her consistent engagement in research and quality improvement creates new pathways for improving healthcare. She has also built an interest in cosmetic surgery and minimal wound healing after several years of clinical experience in plastic surgery, otolaryngology, trauma and orthopaedics surgery, vascular surgery, general surgery and general medicine both in hospital and education institutions. She is aspiring to be an ENT surgeon.

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