Scar Free Healing – from embryonic mechanism to potential adult human pharmaceutical

Professor Mark WJ Ferguson
University of Manchester and Renovo, Core Technology Facility, 48 Grafton Street, Manchester, M13 9XX, UK

Email: mark.ferguson@renovo.com

Embryonic wounds, which heal without a scar, contain high levels of transforming growth factor beta 3 (TGFβ3): a key morphogenetic protein in skin development. Administration of recombinant TGFβ3 to adult wounds in mice, rats and pigs results in markedly reduced or absent scarring. We have developed human recombinant TGFβ3 (Juvista, Avotermin) as a potential new pharmaceutical agent for the prevention and reduction of scarring. To date, we have conducted 16 Phase I and Phase II double-blind, placebo-controlled, randomised clinical trials in a variety of indications exploring various aspects of dosing administration, scar measurement etc. We concluded that injection of 500ng/100μL/linear cm wound margin of Juvista, at the time of wound closure and 24 hours later, leads to a statistically and clinically significant improvement in scarring. Juvista treated scars blend in better with the surrounding skin, are less noticeable, flat and less red compared to placebo treated scars in the same individual. This has been shown in incisional wounds made under the arms of volunteers and in clinical trials in patients e.g. following bilateral varicose vein surgery or scar revision surgery. The first EU Phase III trial for Juvista in scar revision surgery (Revise) is fully recruited and should report data in H1 2011.

These studies demonstrate that knowledge of the cellular and molecular basis of scar free versus scarring healing can lead to the identification of therapeutic targets to which novel pharmaceutical agents can be developed. Juvista shows promise in clinical trials as a therapy for the reduction of scarring.