Seminars Series
2020-2021

Stem Cells for Skin Regeneration: from Expectations to Reality
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Chair: Prof. Antonella Motta

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Zoom Platform

Abstract
Skin wound healing main purpose comprehends wound closure by tissue restoration. While this is sufficient to have de novo tissue formation and to re-establish the skin natural barrier function, most of other skin functions are compromised. Even when natural cutaneous healing in adults is successful, non-functional scar tissue is formed. Moreover, as a result of this physiological adaptation neo-skin lacks structures such as skin appendages, nerves, pigmentation, and the lymphatic plexus. This is very serious for patients with massive skin loss, which is often caused by extensive burns or by surgical removal of malignant skin. Equally important, skin repair rather than regeneration has had an impact on the recurrence rates of chronic wounds, reinforcing the fact that current treatments are not yet capable of leading to a satisfying and permanent outcome. Considering the particularly alarming growing number of chronic wounds worldwide because of an increasingly elderly population and chronic healthcare conditions such as hypertension, diabetes, and obesity, as well as the connection between dysfunctional skin tissue healing and lifelong disability, the consequences on patient’s quality of life, as well as on economic are catastrophic.

Despite the limitations of current products, skin tissue engineering (TE) strategies remain as one of the strongest alternative and most promising way to attain full skin regeneration. The possibility of off-the-shelf availability and the option of producing, in a relatively short period of time, stem cell-based constructs capable of responding to the full biological signaling complexity, as well as providing environmental cues to attain permanent wound closure is envisioned. Moreover, massive skin loss cases or chronic wounds, especially if associated to pathological conditions that determine the healing environment, where current treatments are yet not capable of reaching a satisfying tissue response and a permanent outcome, are also of major focus of the field.