

Skin from hair and further therapeutic potential of the hair root outer root sheath cell pool

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Non-invasively gained stem cells with low-sample requirements are a definitive 'one-up' in regenerative therapies. Perhaps the most non-invasively accessible source of adult stem cells - hair follicle - has been unjustly utilized only to a modest extent. The harmlessly obtained hair follicle Outer Root Sheath (ORS) carries a resident cell pool with developmental potential for more than ten types of differentiated cells.

Our research at the Translational Centre for Regenerative Medicine in Leipzig (TRM) focuses on melanocytes and keratinocytes from ORS. Those cells are used for growing 'patches' of in-vitro-ex-vivo developed autologous artificial skin. ORS keratinocyte-based epidermal equivalents have already been used as grafts for treating chronic wounds at the Department of Dermatology, Leipzig University Clinic and marketed as Epidex® by Euroderm Biotech@Aesthetics GmBH.

For the purposes of producing a melanocyte-pigmented graft, we have differentiated ORS adult stem cells from plucked anagen hair follicle into a pure culture of functional melanocytes. Those melanocytes are ready to be grafted as cell suspension or stabilized by a synthetic or epidermis-based carrier. Such melanocyte-containing graft, with an absolutely harmless sampling and end application, is the most promising candidate for a causative, non-invasive autologous treatment of Vitiligo and other depigmentation disorders brought about by melanocyte deficiency.

Additional to yielding epidermal precursors, the hair root harbours potential of giving rise to chondrocytes, osteocytes, smooth muscle, cardiomyocytes, neurons, glia and other cell types. Such promise of broad regenerative propensity, along with its non-invasiveness, makes hair root an extremely attractive model for future regenerative medicine applications.

Biography

Vuk Savkovic is a Group Leader at the Translational Centre for Regenerative Medicine (TRM) in Leipzig. He worked at Belgrade University in the field of Genetics before taking up PhD Program in cellular biochemistry at Leipzig University. He was involved in embryonic stem cell research at Fraunhofer Institute for Cell Therapy and Immunology and later on joined TRM. His research deals with developmental potential of adult stem cells from hair follicle and its applicative end, with an intensive focus on melanocytes. Besides his research at TRM, he is currently involved in international cooperations dealing with skin and cartilage cell development.

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