

# STEM CELL RESEARCH, CELL & GENE THERAPY & CELL THERAPY, TISSUE SCIENCE AND REGENERATIVE MEDICINE &

## TISSUE PRESERVATION, LIFE CARE AND BIOBANKING

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### Repigmentation of human vitiligo skin by narrow band UVB is controlled by transcription of *GLI1* and activation of the $\beta$ -Catenin pathway in the hair follicle bulge stem cells

Stanca A Birlea, Nathaniel B Goldstein, Maranke I Koster, Kenneth L Jones, Bifeng Gao, Michael J Wright, Karoline A Lambert, Yiqun G Shellman, Mayumi Fujita, William A Robinson, Dennis R Roop and David A Norris  
University of Colorado, USA

Vitiligo is an autoimmune depigmentation disorder characterized by white spots on the skin that cause profound social and psychologic stigma in patients. Vitiligo is caused by CD8+ T cell-mediated destruction of epidermal melanocytes (MCs). Vitiligo repigmentation requires proliferation and migration of MC precursors from the hair follicle (HF) bulge to repopulate the interfollicular epidermis, and the strongest stimulus for this process is Narrow Band UVB (NBUBV). To better understand this process, we developed a research platform that used skin biopsies collected from 6 vitiligo patients treated with NBUBV and 6 untreated vitiligo patients, using rapid fluorescent immunostaining combined with laser capture microdissection to collect RNA from bulge MC precursors and mature MCs from the epidermis of the regenerated vitiligo skin. The total RNA captured from MCs was subjected to whole transcriptome RNA sequencing, followed by gene expression analysis. We found upregulation of *TNC*, *GJB6* and *THBS1* transcripts in the bulge MC precursors of NBUBV-treated vitiligo skin as compared with epidermal MCs of regenerated NBUBV-treated vitiligo skin, and of  $\beta$ -catenin as being the top upstream transcription regulator of this process. We also identified that *GLI1*, a candidate stem cell-associated gene, was significantly modulated by NBUBV in the bulge MCs. The above pathway and signals are potentially key-players in the activation of bulge MC precursors during vitiligo repigmentation.

#### Biography

Stanca A Birlea MD has completed her PhD at the age of 34 from the University of Medicine Cluj-Napoca Romania and postdoctoral studies on the Genetics of Vitiligo and Other Autoimmune Diseases in Professor Richard Spritz lab from University of Colorado School of Medicine. She is an Associate Professor in the department of dermatology at the University of Colorado. She has published more than 25 papers in reputed journals and has been serving as an editorial board member of reputed Pigment Cell & Melanoma Research Journal. Her projects focus is on melanocyte regeneration in vitiligo, a collaboration between Department of Dermatology—Chair Professor David Norris- and Gates Center for Regenerative Medicine-Director Dr Dennis Roop.

Stanca.Birlea@ucdenver.edu

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