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Role of transcription factor CTIP2/Bcl11b in hair follicle stem cells during wound healing

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Wound healing is a major health concern and hair follicle stem cells (HFSC) play an important role in the repair process. We have characterized the function of transcriptional regulator COUP-TF interacting protein 2 [(Ctip2)/Bcl11b in a mouse model of cutaneous wound healing. We have shown that loss of Ctip2 in epidermis affects wound healing by directly or indirectly regulating gene expression involved in keratinocyte proliferation/differentiation, migration, and cell adhesion and remodeling of extracellular matrix. To understand the role of hair follicle bulge cells expressing Ctip2 during wound repair, we have now generated and characterized a ligand (RU486) inducible mouse line by selectively deleting Ctip2 in the bulge area of the hair follicles. Deletion of Ctip2 in the hair follicle bulge stem cells demonstrated reduced expression of PCNA and HF-specific transcription factors such as NFATC1 in HF bulge region. Preliminary studies indicate that similar to our previous report, selective loss of Ctip2 in HF bulge delays wound healing in mice by affecting the re-epithelialization process. Additional mechanisms of action are currently being investigated. We have also identified Ctip2-regulated novel genes and signaling pathways during cutaneous wound healing on wounded and unwounded skin from control and mutant mice lacking Ctip2 in the entire epidermis. Specifically, expression of Igf1, Egf and Cxcl11 were found to be significantly altered in the mutant skin, compared to the controls. The genes/pathways identified in our study will serve as potential therapeutic targets for pharmacological manipulation to promote efficient wound repair and tissue remodeling.

Biography

Gitali Ganguli-Indra has done her PhD in 2001 from "Institut Génétique Biologie Moléculaire Cellulaire (IGBMC), Université Louis Pasteur, ILLKIRCH, France and did her postdoctoral studies at the same place. She is an Associate Professor in the College of Pharmacy at Oregon State University and member of Knight Cancer Institute, OHSU. She holds a patent on a biomarker for head and neck cancer. She has published more than 33 papers in reputed journals and has been serving as an editorial board member for many journals. She also serves as a reviewer on NIH study section for skin research.

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