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Mayumi Ito PhD is an Associate Professor in The Ronald O. Perleman Department of Dermatology at New York University School of Medicine (NYU). Her research program focuses on understanding stem cell regulations in cutaneous tissues including the hair follicle and the nail. Her research team identified signaling pathways that govern regenerative behaviors of melanocyte stem cells and hair follicle stem cells for hair pigmentation and wound healing. Her group also demonstrated the role of hair follicle melanocyte stem cells to regenerate melanocytes of the skin epidermis. Her studies provide unique insights into great promise to understand pigmentation problems including hair graying and vitiligo.

**Abstract****“Melanocyte Stem Cells and Wound Healing”**

Melanocyte stem cells (McSCs) identified in the hair follicle are necessary for hair pigmentation. Like many adult stem cells, they are relatively quiescent but become activated to give rise to mature, pigment producing melanocytes during hair follicle regeneration and wound healing. Utilizing multiple genetic mouse models, we demonstrated that Wnt signaling and Endothelin signaling are essential regenerative signaling pathways for McSCs to give rise to differentiated mature melanocytes. Additionally, we showed that McSCs undergo malignant transformation to produce melanoma upon induction of oncogenic mutations. This process depends upon regenerative signals including Wnts and Endothelins emitted from epithelial microenvironment during natural hair regeneration. Our results suggest a mechanism of how extrinsic microenvironment designed to regulate normal stem cells and regeneration can dictate the transformation events.