PIGMENTATION

DEVELOPMENT OF A POST INFLAMMATORY HYPERPIGMENTATION MODEL IN RECONSTRUCTED SKINS

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Introduction: Post inflammatory hyperpigmentation (PIH) is a dermatological condition that evolves into a hyperpigmented area following an inflammatory insult, such as acne or a cutaneous injury. Although it affects people globally, it is most prominent in people of darker skin tones. While hyperpigmented areas fade with time, they can have lasting psychosocial effects on affected individuals. The exact cause remains unknown. A detailed cellular understanding of PIH has been limited by a lack of representative in vitro models.

Objective: To further understand the underlying biology of PIH and possible causes attributed to melanocyte migration or hypermelanosis, and subsequently, to influence those underlying pathways.

Methods: Melanocyte-containing reconstructed skin models were punctured with cosmetic needles. Due to observed hyperpigmentation due to wounding, skin models were subsequently treated with migration and tyrosinase inhibitors. Photometric and immunohistochemical techniques were used to assess melanin content and differences in color changes. In tandem, melanocytes treated with potential migration inhibitors were analyzed using an in vitro migration assay.

Results: A decrease in melanin was observed when the PIH model was challenged with a tyrosinase inhibitor. A visual decrease in pigmentation was observed as well as a decrease in the prominence of the pigmented halo around the wound when the PIH model was challenged with a cellular migration inhibitor (sodium orthovanadate) and an anti-inflammatory agent (hydrocortisone). Using the in vitro assay, additional potential migration inhibitors were screened.

Conclusion: Serendipitously, a potential PIH model was developed that provides a high-throughput approach to explore the underlying biological cause of PIH, as well as to test potential treatments that would help attenuate the recovery time post development of PIH. Within the migration assay, candidates that influence migration were screened that can be tested in the PIH model.