Stem Cell Therapy in Dermatology: Challenges and Opportunities

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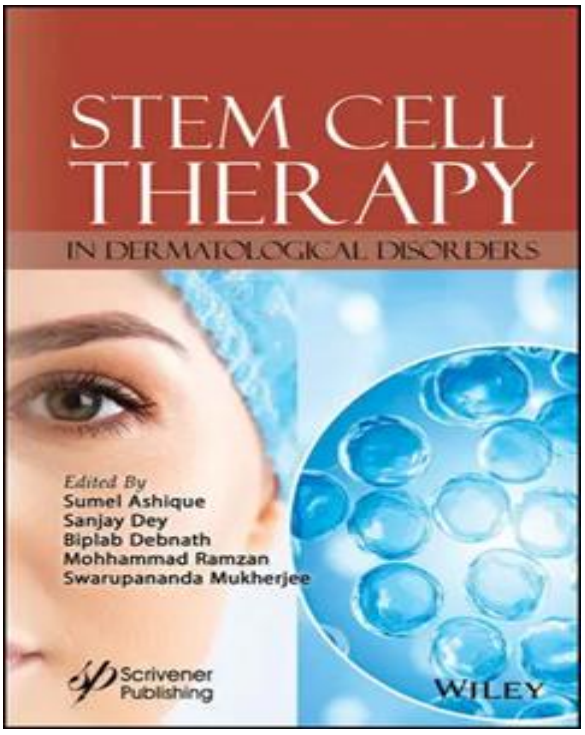

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Abstract

Utilizing stem cells' properties as an immunomodulator and regenerative approach in the treatment of autoimmune skin diseases, such as systemic lupus erythematosus, systemic sclerosis, pemphigus vulgaris, psoriasis, etc.; skin pigmentation; chronic ulcers; scarring; and even aesthetic medicine has varying degrees of success. Because of their capacity to regulate inflammatory responses and differentiate into skin-specific lineages, mesenchymal stem cells, epidermal stem cells, and induced pluripotent stem cells are the most studied multipotent cell types for regenerative skin treatment. Even though stem cell therapy has a lot of potential, there are a lot of obstacles in the way of its practical application in dermatology. These include hazards such as immunological rejection, tumor formation, high production costs, scaling up challenges, and ethical concerns. Furthermore, the absence of defined techniques for cell isolation, culture, and transplantation casts doubt on the efficacy and reproducibility of treatments. Nonetheless, chances to improve the safety, effectiveness, and applicability of stem cell–based therapies are presented by developments in more recent technologies like three-dimensional bioprinting, gene editing, and biomateriality. This chapter discusses the latest advancements, difficulties, and potential for sustainable and focused therapies in the field of stem cell therapy for dermatological disorders.