

Human Secretome Treatment for Psoriasis Patients: Literature Review

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ABSTRACT

Psoriasis is a chronic, immune-mediated inflammatory skin disease with systemic implications, including strong associations with metabolic disorders such as type 2 diabetes. Despite numerous treatment modalities—from topical agents to biologics—many patients experience suboptimal outcomes, adverse effects, or disease relapse. In recent years, the human secretome, particularly that derived from mesenchymal stromal cells (MSCs) and dental pulp stem cells (DPSCs), has gained increasing attention as a novel therapeutic avenue. The secretome encompasses a complex array of bioactive molecules, including cytokines, growth factors, extracellular vesicles, and microRNAs, which exhibit potent immunomodulatory, anti-inflammatory, and regenerative properties. This literature review aims to synthesize current evidence on the composition, mechanisms, and therapeutic potential of the human secretome in the context of psoriasis. We also explore its dual role in addressing both cutaneous symptoms and systemic comorbidities. By critically evaluating preclinical and early clinical studies, this review highlights the promise and challenges of secretome-based therapies, and outlines future directions for their clinical translation in dermatology. The findings support the growing interest in cell-free regenerative medicine as a safer, more targeted alternative to conventional psoriasis treatments.

KEYWORDS: Psoriasis, Human Secretome, immunomodulation, chronic inflammation, skin regeneration.

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I. INTRODUCTION

Psoriasis, a chronic inflammatory skin condition characterized by red, scaly patches, affects millions of individuals worldwide, significantly impacting their quality of life. Traditional treatments, including topical therapies and systemic medications, often yield limited success and can carry adverse side effects. Recent advancements in biotechnology have opened new avenues for therapeutic interventions, notably through the exploration of human secretome—extracellular proteins, peptides, and other bioactive molecules secreted by cells. This innovative approach offers the potential to harness the body's natural mechanisms for regulating inflammation and skin repair. By concentrating on the secretome, researchers aim to develop targeted therapies that could not only alleviate symptoms but also address the underlying pathophysiology of psoriasis. This essay will explore the promising role of human secretome treatment in managing psoriasis, highlighting its

potential advantages and the emerging evidence supporting its efficacy in clinical settings.

Psoriasis, affecting approximately 2% of the global population, extends beyond mere physical symptoms to significantly impair patients' quality of life. The disease is characterized by hyperproliferative skin lesions that often lead to discomfort, itching, and visible disfigurement, which can result in social stigmatization and psychological distress. Research indicates that psoriasis not only contributes to a reduced quality of life but may also be linked to comorbid conditions such as type 2 diabetes, suggesting a complex interplay between skin inflammation and systemic health (Abel et al. 2020). Furthermore, mesenchymal stem cells (MSCs) have been recognized for their role in tissue regeneration and homeostasis, indicating potential therapeutic avenues through secretome-derived products (Costa et al. 2019). Consequently, understanding psoriasis's multifaceted effects underscores the urgency for innovative treatment modalities like human secretome therapy aimed at

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alleviating both physical symptoms and enhancing overall quality of life for affected individuals.

II. HUMAN SECRETOME

The human secretome, encompassing a diverse array of bioactive molecules secreted by cells, plays a crucial role in intercellular communication and modulating immune responses, particularly in autoimmune conditions such as psoriasis. By understanding the components and functions of the secretome, researchers can identify potential therapeutic targets for treatment. For instance, the manipulation of specific secreted factors may reduce the hyperactive immune responses characteristic of psoriasis, promoting a more controlled inflammatory response. Recent studies have highlighted the potential for immunomodulatory products derived from parasitic worms, which effectively modulate immune pathways without compromising overall host immunity (Al-Riyami et al. 2014). This insight, coupled with funding support to advance secretome research, underscores the promise of human secretome treatments in offering new avenues to manage psoriasis effectively (Caton et al. 2017). As research progresses, these insights are likely to inform innovative therapeutic strategies that improve patient outcomes.

A. Definition and components of the human secretome

The human secretome comprises a complex network of bioactive molecules, including proteins, lipids, and metabolites, secreted by various cells throughout the body. This dynamic system performs critical roles in intercellular communication, inflammation modulation, and tissue homeostasis. Notably, adipose tissue has emerged as a significant contributor to the secretome through the release of adipokines, which influence immune responses and have implications for inflammatory conditions like psoriasis (Tolusso B et al. 2014). Moreover, senescent cells, characterized by a stable state of cell cycle arrest, engage in the senescence-associated secretory phenotype (SASP), which further complicates the secretomes landscape (A Alimonti et al. 2014). The multifaceted interactions within the secretome not only provide insights into psoriasis pathogenesis but also highlight potential therapeutic targets for treatment, emphasizing the need for comprehensive research to unravel its components and functions in managing this chronic inflammatory disease.

III. HUMAN SECRETOME TREATMENT IN PSORIASIS

In recent years, the therapeutic potential of the human secretome has garnered attention in the treatment of psoriasis, particularly due to its multifaceted mechanisms of action. The secretome, which comprises bioactive factors released by cells, offers anti-inflammatory properties that can mitigate the chronic inflammatory response characteristic of psoriasis. Research suggests that the multipotent mesenchymal stromal cells secretome, which includes a variety of cytokines and

growth factors, plays a pivotal role in reducing inflammation and promoting skin barrier repair in psoriasis patients (Bondarev et al. 2019). Furthermore, studies have established a link between psoriasis and metabolic dysfunction, particularly the increased risk of developing type 2 diabetes. Investigations into mouse models have revealed that skin inflammation might drive metabolic changes mediated by the skin secretomes endocrine-like effects on adipose tissue and pancreatic islets (Abel et al. 2020). These insights underscore the importance of understanding the human secretome's role in devising effective psoriasis treatments.

The human secretome, comprising various bioactive molecules released by cells, plays a pivotal role in modulating immune response and facilitating skin regeneration, particularly in the context of psoriasis. Conditions such as psoriasis are characterized by heightened inflammation and dysregulation in skin physiology, necessitating effective therapeutic approaches. Research indicates that skin inflammation might not only perpetuate psoriatic symptoms but could also induce a pre-diabetic state through altered metabolic functions that implicate the secretome's role in systemic health (Abel et al. 2020). Furthermore, the regenerative capacities of mesenchymal stromal cells (MSCs), which secrete exosomes and other factors, have been shown to enhance wound healing and immune modulation, suggesting a therapeutic avenue for psoriasis management (Santiago A et al. 2021). Thus, investigating the human secretomes effects could yield significant insights into improving skin regeneration and mitigating immune dysregulation inherent in psoriatic patients.

IV. CONCLUSION

In conclusion, the exploration of human secretome treatment for psoriasis patients offers a promising avenue for therapeutic intervention, emphasizing the potential of using biologically active substances derived from mesenchymal stromal cells and dental pulp stem cells. Research highlights that the secretome contains a plethora of anti-inflammatory factors, which can significantly mitigate the excessive inflammatory responses characteristic of psoriasis, providing a safer alternative to conventional treatments (Bondarev et al. 2019). Additionally, the immunomodulatory capabilities of DPSCs suggest that their secretome regulates various immune cells through complex signaling pathways, thereby fostering tissue regeneration and reducing inflammation (Li F et al. 2023). As ongoing studies continue to validate these findings, the human secretome presents a transformative approach that may enhance the quality of life for psoriasis patients, paving the way for innovative clinical applications in the treatment of this chronic condition.

The future implications and potential of human secretome therapy for psoriasis management present an innovative frontier in dermatological treatment. This approach harnesses the complex biological signals found in the secretome—essentially the collection of proteins, peptides, and other

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molecules secreted by cells—to modulate immune responses and promote skin regeneration. As researchers continue to unravel the intricate networks of cytokines and growth factors within the secretome, the possibility of tailored therapies emerges, offering a personalized touch to psoriasis management. Furthermore, the non-invasive nature of secretome therapies could significantly enhance patient adherence and comfort, addressing common concerns associated with traditional treatments. With advancements in biotechnology and a deeper understanding of psoriasis pathophysiology, the promise of human secretome therapy not only signifies a potential paradigm shift in treatment strategies but also raises hopes for improved quality of life for millions enduring this chronic condition.

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