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Psoriasis: White Paper

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Introduction

Psoriasis is a chronic, immune-mediated inflammatory disorder characterized by dysregulation of the immune system and aberrant keratinocyte proliferation. In this condition, immune cells mistakenly identify healthy skin cells as pathogenic, triggering a sustained inflammatory response. This immune activation accelerates the epidermal life cycle, resulting in excessive keratinocyte turnover, erythema, and the accumulation of thick, pruritic, scaly plaques (Chakith M. R. et al., 2025). At the molecular level, psoriasis is largely driven by dysregulation of the TNF-α / IL-23 / IL-17 axis. Elevated levels of TNF-α, IL-23, and IL-17 promote inflammatory signaling and stimulate rapid skin cell proliferation, contributing to plaque formation (Sieminska et al., 2024; Gao et al., 2025). IL-23 plays a pivotal upstream role by promoting the release of IL-17A and IL-22 from Th17 cells, amplifying downstream cytokine cascades and perpetuating a self-sustaining inflammatory cycle that is often difficult to interrupt (Sieminska et al., 2024).

Importantly, psoriasis is increasingly recognized as a systemic inflammatory condition rather than solely a dermatologic disorder. Many patients experience comorbidities including psoriatic arthritis, metabolic and endocrine dysfunction, cardiovascular complications, and elevated rates of depression (Chularojanamontri, 2025). Although biologic therapies targeting TNF-α and the IL-23/IL-17 pathway have demonstrated significant efficacy, they are often associated with high cost, long-term immune suppression, and variable durability of response (ten Bergen et al., 2020). These limitations have renewed interest in integrative approaches that aim to modulate inflammatory signaling while supporting skin barrier repair and systemic balance. This paper explores a mechanistically grounded therapeutic strategy incorporating zeolite extract, curcumin, resveratrol, and aloe vera. The proposed model aligns with known inflammatory pathways, oxidative stress mechanisms, and emerging insights into the gut–skin axis. Recent clinical findings further support the biological plausibility of targeting immune modulation, redox balance, and barrier integrity as complementary strategies in psoriasis management.

How Psoriasis Develops

Immune System Problems

The pathophysiology of psoriasis involves a complex interplay between immune cells and keratinocytes, creating a self-amplifying inflammatory environment within the skin. Activated dendritic cells and other antigen-presenting cells produce key cytokines such as TNF-α and IL-23, which drive the differentiation and expansion of T helper cells—particularly Th17 and Th1 subsets. These activated

T cells secrete pro-inflammatory cytokines including IL-17, IL-22, and IFN-γ, which are central to the psoriatic inflammatory cascade (Sieminska et al., 2024). These cytokines directly stimulate keratinocytes, accelerating their proliferation and disrupting normal maturation. As a result, epidermal turnover increases dramatically, leading to epidermal hyperplasia, impaired barrier formation, and the development of thickened, scaly plaques (Sieminska et al., 2024). Under normal physiological conditions, inflammatory responses resolve once the triggering stimulus subsides; however, in psoriasis, this regulatory shutdown fails, allowing inflammatory T cells to persist and perpetuate the cycle (Chularojanamontri, 2025). IL-17, IL-22, and IFN-γ not only activate keratinocytes but also induce the production of additional chemokines and cytokines, recruiting more immune cells into the skin and reinforcing the inflammatory loop. Concurrently, increased oxidative stress and reactive oxygen species contribute to cellular damage and dysregulated apoptosis. The combination of rapid keratinocyte turnover, sustained immune activation, and oxidative stress creates a chronic, self-sustaining inflammatory state that characterizes psoriasis (Sieminska et al., 2024).

The Gut-Skin Connection

A growing body of evidence supports a strong gut–skin axis in the pathogenesis of psoriasis. The composition and diversity of the gut microbiota play a critical role in immune regulation, maintenance of intestinal barrier integrity, and the production of anti-inflammatory metabolites that influence systemic and cutaneous health (Thye et al., 2022). In individuals with psoriasis, significant dysbiosis has been observed. Studies report reduced microbial diversity, lower overall bacterial abundance, and diminished production of beneficial short-chain fatty acids (SCFAs), which are essential for maintaining mucosal integrity and modulating inflammation (Sikora et al., 2020; Thye et al., 2022). This microbial imbalance contributes to increased intestinal permeability, commonly referred to as "leaky gut," allowing microbial fragments, endotoxins, and metabolites to translocate into the bloodstream. Once systemic, these inflammatory mediators can reach the skin and amplify immune activation, reinforcing the chronic inflammatory state characteristic of psoriasis (Thye et al., 2022). Markers of intestinal permeability and systemic inflammation have been shown to correlate with disease severity, further underscoring the clinical relevance of gut dysfunction in psoriasis (Sikora et al., 2020; Thye et al., 2022). Bacterial endotoxins can stimulate innate and adaptive immune responses, promoting T-cell activation and perpetuating inflammatory cytokine signaling within the skin (Thye et al., 2022; Chen et al., 2020). Taken together, these findings highlight the gut–skin axis as a significant therapeutic target. Addressing microbial imbalance and intestinal barrier dysfunction may represent an important adjunctive strategy in the comprehensive management of psoriasis.

Evaluation of Active Ingredients

Multiple Anti-Inflammatory Profiling

Curcumin, the principal bioactive compound in turmeric, has been extensively investigated for its therapeutic potential in psoriasis. A comprehensive meta-analysis reviewing 26 studies including seven clinical trials reported that curcumin significantly improved psoriasis severity compared to control treatments, supporting its clinical relevance as an adjunctive intervention (Zhang et al., 2022). Mechanistically, curcumin exerts its effects through multiple anti-inflammatory and antioxidant pathways. One of its primary targets is the NF-κB signaling pathway, a central regulator of inflammatory gene expression. By inhibiting NF-κB activation, curcumin downregulates the production of key pro-inflammatory cytokines implicated in psoriasis pathogenesis, including TNF-α, IL-17, IL-6, IL-8, and IL-22 (Kantasa et al., 2025). In addition to cytokine modulation, curcumin enhances endogenous antioxidant defenses by upregulating protective enzymes and reducing oxidative stress, thereby mitigating cellular damage within the skin. Furthermore, curcumin has been shown to inhibit abnormal keratinocyte proliferation, helping to normalize the excessive epidermal turnover characteristic of psoriatic plaques (Lorenzo et al., 2023). Through its combined anti-inflammatory, antioxidant, and antiproliferative properties, curcumin represents a biologically plausible and multifaceted strategy for supporting psoriasis management.

Curcumin has been investigated for psoriasis management through both topical application and systemic (oral) administration, with clinical data supporting its adjunctive use. In a randomized study of 63 patients, the combination of oral curcumin with topical corticosteroids demonstrated greater efficacy than corticosteroid therapy alone, including a significant reduction in circulating inflammatory markers (Antiga et al., 2015). Similarly, broader analyses indicate that adding curcumin to conventional treatment protocols enhances

overall therapeutic response compared to standard therapy alone (Zhang et al., 2022). At the cellular level, curcumin helps regulate abnormal keratinocyte proliferation, thereby addressing one of the core pathological features of psoriasis (Lorenzo et al., 2023). Topical formulations have shown promising localized effects; however, oral curcumin faces limitations related to rapid metabolism and low systemic bioavailability (Kantasa et al., 2025). To address this challenge, novel delivery systems including enhanced bioavailability formulations are being developed to improve absorption and therapeutic impact. Importantly, curcumin has a strong safety profile and is generally recognized as safe for human consumption, further supporting its consideration as a complementary strategy in psoriasis management (Zhang et al., 2022; Kantasa et al., 2025).

Aloe Vera

Aloe vera has been widely studied for its therapeutic potential in psoriasis due to its anti-inflammatory, wound-healing, barrier-supportive, and immunomodulatory properties. Clinical evidence supports its topical use, particularly in mild to moderate disease. In a controlled trial involving 60 patients with mild to moderate psoriasis, 83% of participants treated with topical aloe vera extract achieved a significant clinical improvement, compared to only 6.6% in the placebo group. The study also demonstrated a substantial reduction in psoriasis severity scores, with no reported adverse effects (Syed et al., 1996). Further research comparing topical aloe vera to standard corticosteroid therapy found that aloe vera produced superior improvements over an 8-week treatment period, with greater reductions in disease severity scores in the aloe-treated group (Choonhakarn et al., 2010). Mechanistically, aloe vera exerts multiple biological effects relevant to psoriasis. It helps inhibit inflammatory signaling pathways, reduce TNF-α levels, promote fibroblast activity, stimulate collagen synthesis, and modulate immune responses within the skin (Choonhakarn et al., 2010). Its bioactive compounds include antimicrobial agents, immunomodulatory polysaccharides, and enzymes that support gentle exfoliation and removal of damaged cells (Miroddi et al., 2015). Additionally, aloe vera enhances skin hydration and strengthens barrier integrity, both of which are critical in reducing irritation and supporting epidermal repair (Miroddi et al., 2015). Collectively, these properties position aloe vera as a biologically plausible and clinically supported adjunctive therapy in the management of psoriasis.

Zeolite

Zeolites are naturally occurring microporous aluminosilicate minerals characterized by a unique cage-like crystalline structure that allows them to selectively adsorb ions, toxins, and other charged particles. This structural property gives zeolites the capacity to bind unwanted substances while maintaining relative biological stability, making them of growing interest in dermatological and immunological research. Emerging evidence suggests that zeolites may offer therapeutic benefits in inflammatory skin conditions due to their adsorptive, barrier-forming, and immunomodulatory properties. Clinical investigations indicate that topical zeolite preparations demonstrate anti-inflammatory and antibacterial effects, supporting their potential utility in managing skin disorders (Dring et al., 2025). In preclinical studies, including murine models, the application of topical zeolite powder significantly reduced markers of skin inflammation without observable adverse effects, suggesting a favorable safety profile when used externally (Dring et al., 2025).

Several mechanisms have been proposed to explain these effects. Zeolites can adsorb pro-inflammatory mediators and microbial byproducts at the skin surface, potentially reducing local inflammatory signaling. Their ion-exchange capabilities may allow binding of heavy metals and other irritants, which could otherwise contribute to oxidative stress and immune activation (Smirnova et al., 2022). Additionally, zeolites may form a protective physical layer over the skin, supporting barrier integrity and reducing exposure to environmental triggers. Experimental data also suggest a role in modulating immune responses, potentially influencing cytokine signaling and inflammatory cell recruitment (Smirnova et al., 2022). Because of their multifunctional properties including adsorption, detoxification support, barrier enhancement, and potential immune regulation zeolites are being explored as promising adjunctive agents in inflammatory dermatologic conditions. While further controlled human studies are warranted to define optimal formulations and dosing strategies, current findings highlight their diversified mechanisms of action and expanding therapeutic potential.

Resveratrol

Resveratrol is a naturally occurring polyphenolic compound found in grapes, berries, and other plant sources, widely recognized for its antioxidant, anti-inflammatory, and cytoprotective properties. Its biological activity has generated significant interest in inflammatory and immune-mediated conditions, including psoriasis. Mechanistically, resveratrol exerts its effects through multiple molecular pathways relevant to psoriasis pathogenesis. One of its primary actions is the inhibition of NF-κB, a central transcription factor that regulates the expression of pro-inflammatory cytokines such as TNF-α, IL-6, and IL-17. By suppressing NF-κB activation, resveratrol reduces the downstream production of inflammatory mediators and helps limit immune cell recruitment into affected skin tissue (Thye et al., 2022). This action may contribute to attenuation of the chronic inflammatory cascade characteristic of psoriatic lesions. In addition to modulating inflammatory signaling, resveratrol has demonstrated antioxidant effects by scavenging reactive oxygen species (ROS) and enhancing endogenous antioxidant defense systems. Oxidative stress plays a key role in sustaining keratinocyte hyperproliferation and immune activation in psoriasis, and resveratrol's redox-balancing properties may help mitigate this component of disease progression.

Laboratory studies further suggest that resveratrol influences cellular energy and metabolic pathways, including activation of SIRT1 and modulation of AMPK signaling pathways involved in mitochondrial function, cellular stress responses, and inflammatory regulation (Thye et al., 2022). By impacting these bioenergetic and signaling networks, resveratrol may help restore cellular homeostasis within inflamed skin tissue. Although large-scale human clinical trials specific to psoriasis remain limited, the compound's well-documented anti-inflammatory, antioxidant, and metabolic regulatory effects provide a strong biological rationale for its inclusion in combination or adjunctive therapeutic strategies. Its multimodal mechanisms make resveratrol a promising complementary agent in integrative approaches targeting immune modulation, oxidative stress reduction, and overall inflammatory balance.

Treatment Approach

The protocol follows a structured, stepwise strategy designed to target the underlying inflammatory and immune pathways involved in psoriasis. Rather than relying on a single intervention, the approach integrates topical and oral support to address both localized skin inflammation and systemic immune dysregulation. The initial formulation administered both topically and orally contains zeolite extract, vitamin C, sea minerals, preservative, and purified water. Treatment begins with a low dose of 0.05 mL twice daily, with gradual weekly titration. This incremental dosing strategy is intended to promote tolerance, support physiological adaptation, and modulate inflammatory activity without overwhelming immune or detoxification pathways. After approximately three months, the formulation is expanded to include additional bioactive compounds: raspberry ketones , turmeric-derived curcumin, resveratrol, D-ribose, apple cider vinegar, aloe vera, and complementary supportive ingredients. The goal of this progression is to maintain the foundational benefits of the original formulation such as immune modulation and barrier support while introducing enhanced antioxidant, anti-inflammatory, metabolic, and tissue-repair mechanisms.

This phased protocol reflects principles of integrative medicine by simultaneously addressing multiple disease drivers, including inflammatory cytokine signaling, oxidative stress, keratinocyte hyperproliferation, and gut–skin axis dysfunction. The combined oral–topical strategy allows for surface-level skin support while also influencing systemic immune balance and intestinal permeability. Emerging evidence suggests that multimodal interventions targeting several interconnected pathways may yield more sustainable outcomes compared to unimodal therapies that focus on a single mechanism (ten Bergen et al., 2020). By layering mechanisms over time and supporting both local and systemic processes, this protocol aims to create a comprehensive, biologically aligned framework for managing psoriasis.

Important Limitations

While the scientific rationale supporting each individual ingredient is compelling, several important considerations warrant discussion. First, clinical research specifically evaluating zeolites in psoriasis remains limited, and larger, well-controlled human trials are needed to confirm efficacy, optimal dosing, and long-term safety (Dring et al., 2025). Additionally, both curcumin and resveratrol

are known to have bioavailability limitations due to rapid metabolism and poor systemic absorption. Their therapeutic impact may therefore depend heavily on formulation strategy, including enhanced delivery systems designed to improve stability and absorption (Kantasa et al., 2025; Zhang et al., 2022). Without optimized formulations, clinical outcomes may not fully reflect their mechanistic potential. It is also important to recognize the limitations of case reports and small observational studies. Such reports often lack control groups, blinding, standardized outcome measures, and long-term follow-up. Robust conclusions regarding efficacy require randomized controlled trials, validated scoring systems, and extended monitoring to assess durability of response and safety (Armstrong & Read, 2020).

Furthermore, when combining multiple bioactive compounds, systematic evaluation of potential synergistic, additive, or antagonistic interactions is essential. Understanding how these agents influence shared inflammatory and metabolic pathways will strengthen the scientific foundation of combination protocols (Zhang et al., 2022). Safety remains a critical priority, particularly for patients concurrently receiving immunosuppressive or biologic therapies. Potential drug–nutrient interactions must be carefully evaluated, especially in dual-therapy scenarios where integrative formulations are used alongside conventional treatments (Chularojanamontri, 2025). Finally, any staggered or titrated dosing strategy should be supported by rigorous pharmacokinetic and dose-finding studies to ensure both therapeutic benefit and safety. In summary, while the mechanistic framework is promising, advancing this approach requires standardized clinical trials, careful pharmacological validation, and comprehensive safety assessments to establish its true clinical value.

Conclusion

The proposed treatment strategy is built upon a combination of naturally derived compounds that have been studied for their anti-inflammatory, antioxidant, and skin-protective properties. Rather than targeting a single pathway, the formulation is designed to address several interconnected mechanisms involved in psoriasis pathogenesis. These include dysregulated inflammatory signaling (such as the TNF-α / IL-23 / IL-17 axis), oxidative and cellular stress, gut microbiome imbalance and intestinal permeability, as well as impairment of the skin barrier. By targeting inflammation at multiple levels immune activation, cytokine production, oxidative stress, and epithelial repair the formulation reflects a systems-based approach. Curcumin, for example, has demonstrated the ability to modulate NF-κB–driven inflammatory cascades and reduce abnormal keratinocyte proliferation, while aloe vera contributes barrier repair, wound healing support, and localized immune modulation. Controlled studies evaluating these compounds individually and in combination have shown encouraging results, suggesting potential synergistic effects when used together.

At the same time, it is important to acknowledge that the precise formulation, dosing parameters, and delivery methods remain areas requiring further scientific clarification. Bioavailability challenges particularly with compounds such as curcumin and resveratrol necessitate optimized formulations to achieve meaningful systemic or tissue-level effects. Carefully designed human clinical trials are essential to determine optimal dosing schedules, safety profiles, long-term outcomes, and comparative effectiveness against standard therapies. This integrative model has the potential to serve as a complementary adjunct within comprehensive psoriasis management, particularly for patients seeking evidence-informed, non-pharmaceutical support alongside conventional care. However, responsible advancement of this approach requires rigorous validation. Future research should focus on confirming mechanistic pathways, evaluating compound interactions, improving absorption technologies, and conducting randomized controlled trials with long-term follow-up to assess sustained efficacy and safety. With appropriate scientific validation, this multimodal strategy could contribute meaningfully to a broader, patient-centered framework for psoriasis care.

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