Poster ID - **P0028**

Controlling Inflammation at clinical level: The Combined Efficacy of Niacinamide and Silybum Marianum for Mild-to-Moderate Acne

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Introduction & Objectives

Acne vulgaris is a common chronic inflammatory disorder of the pilosebaceous unit, characterized by hyperkeratinization, increased sebum production, and dysbiosis of the cutaneous microbiota. Beyond its visible manifestations, acne involves **complex immuno inflammatory mechanisms** that sustain lesion persistence and recurrence. Among emerging therapeutic strategies, topical actives capable of modulating cutaneous inflammation while supporting skin barrier balance are of particular interest. **Niacinamide** (vitamin B3) and **Silybum marianum fruit extract** (SMFE) have both been reported to exhibit **anti inflammatory and antioxidant properties**, suggesting potential synergistic benefits in acne management. This study investigates the clinical efficacy of a topical combination of niacinamide and SMFE in patients with mild to moderate acne and explores the molecular mechanisms underlying its action using proteomic profiling of comedones and an in vitro macrophage model.

Materials & Methods

Clinical design:

Moisturizing Formula: Face Application only if discomfort

Control Group N=25

Formula with niacinamide and SMFE: Face Application **2x/day**

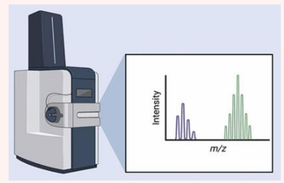
Tested Group N=25

D0 — D57

Teenagers **(13 - 17 yo)**
Acne Vulgaris mild to moderate (GEA 2 to 3)
Min. 20 open comedones within a non inflammatory area
At least 25 patients with sensitive skin



T0
C_0



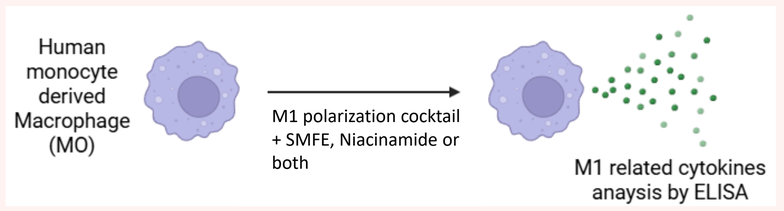




Tfinal
C_{final}

Proteomic analysis (Phylogene) : T_{final} VS C_{final}

In vitro inflammation:



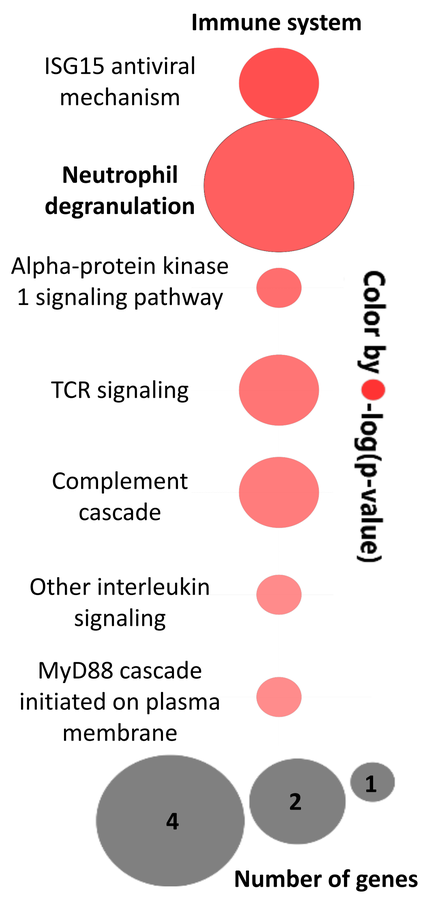
Human monocytes were cultured for 5 days with m-CSF. Cells were then stimulated with IFNg/LPS for 48h, in the presence or not of niacinamide, SMFE or both. Luminex analysis was performed on supernatants to measure the inflammatory response.

Results

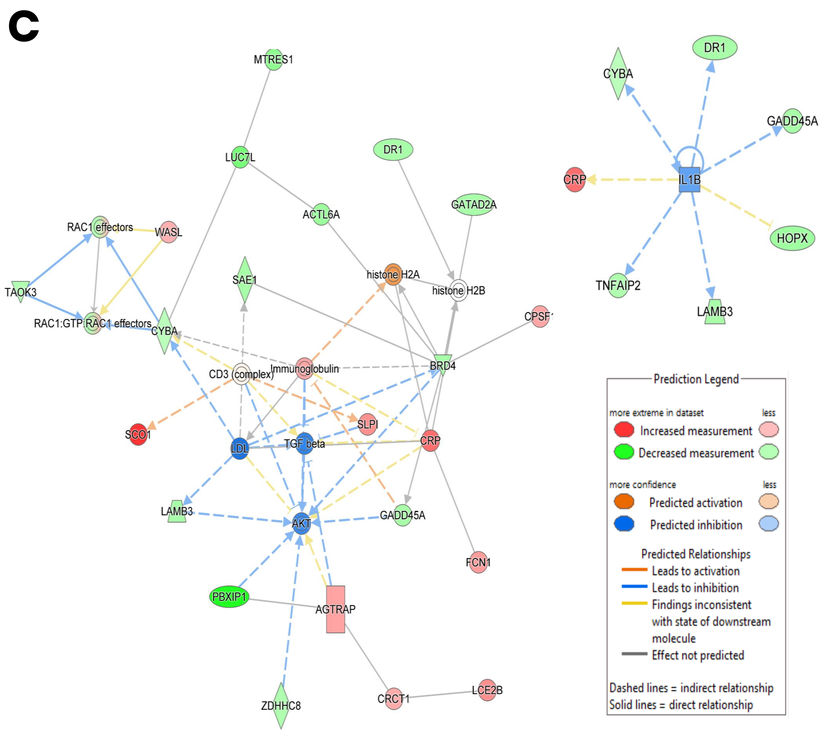
A

	TEST Group Niacinamide + SMFE (intra-goup) D57-D1	CONTROL Group Moisturizing formula (intra-goup) D57-D1
Acne severity (GEA)	**-12,1%** (p=0,008) (S) ☑ 28% of subjects had a GEA improvement	**-3,5%** (p=0,157) (NS) ☒ 8% of subjects had a GEA improvement
Open comedones (Lucky Method)	**-29,4%** (p<0,001) (S) ☑	**-18,2%** (p=0,001) (S) ☑

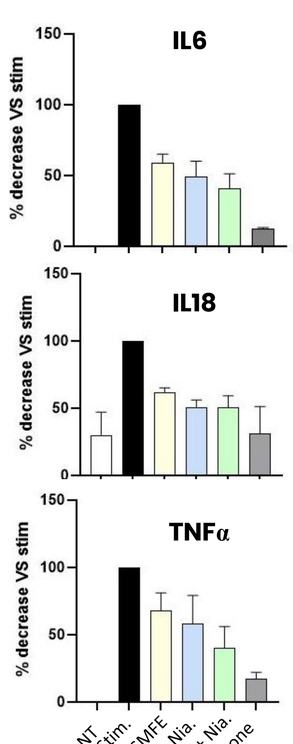
B



C

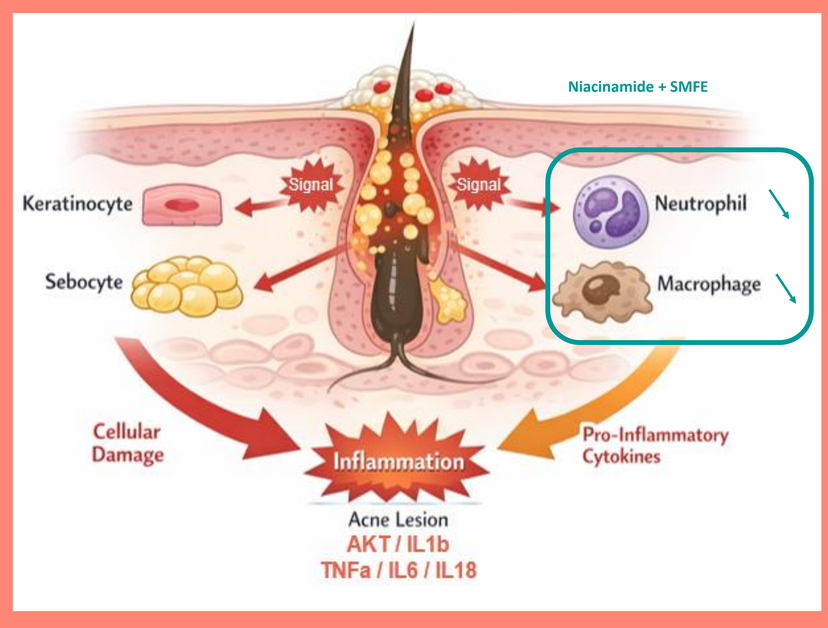


D



Conclusions

Our integrated clinical, proteomic, and cellular findings highlight the multimodal anti-inflammatory potential of the niacinamide + *Silybum marianum* fruit extract (SMFE) combination in mild-to-moderate acne. It positions the niacinamide + SMFE topical formulation as a promising strategy for targeting early immuno-inflammatory events in acne. By modulating key innate immunity pathways within the comedone (neutrophils, Akt pathway and macrophage), this combination may help reorient lesion microenvironments toward resolution, supporting its role as a next-generation anti-inflammatory dermocosmetic option.



Proteomic analysis showed an enrichment of the **neutrophil degranulation pathway**, significantly regulated by the active treatment versus control, consistent with the role of neutrophils as early orchestrators of cutaneous inflammation. Pathway analysis further predicted downregulation of **Akt signaling and IL-1β–related inflammatory pathways**, key drivers of NF-κB–dependent responses, supporting an early immuno-switch toward reduced inflammation. In line with these mechanistic effects, the active formula improved clinical outcomes, reducing **open comedones (-29.4% vs -18.2% control)** and **GEA score (-12.1% vs -3.5%)**. Additionally, in an M1 macrophage model relevant to early acne lesions, niacinamide and SMFE significantly **reduced LPS-induced TNF-α, IL-6 and IL-18**.

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