ABSTRACT | Adaptive and Auto-Immunity

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Health supplement Spirulina induces inflammatory cytokine production via monocyte derived dendritic cells and classical monocyte activation in Dermatomyositis

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The popular herbal supplement Spirulina has previously been shown to stimulate inflammatory cytokine production in Dermatomyositis (DM) patients in vitro. We sought to evaluate whether Spirulina’s immunostimulatory effects differ in healthy controls (HCs) compared to DM. We performed ELISA on Spirulina stimulated HC and DM PBMC supernatants, demonstrating effects on both TNFα and IFNγ levels. We confirmed TNFα and IFNγ increases were also noted in MDDC from both groups compared to BMDC. Our data demonstrate that Spirulina increases CM and moDC activation in DM, likely via TLR4 or TBK1 activation.

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Hyperthermia controls DAB2 transcription in macrophage through inducing the separation of cJun and cFos heterodimers

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Atopic March (AM) represents a typical progression of allergic diseases that often begin early in childhood. The mechanism underlying the development of AM in patients with atopic dermatitis (AD) is still unknown. To elucidate the possible mechanisms which might be engaged in AM, we analyzed skin biopsies of AM, AD, and healthy controls. Metabolic pathways-related genes were one of the most prominent categories in the AM skin compared to AD skin. Genes related to fatty acid metabolism were significantly up-regulated in AM skin tissues, while genes related to myeloid differentiation were down-regulated in AD skin tissue. Moreover, we found that the expression of fatty acid binding protein 5 (FABP5) was significantly increased in AM skin tissue, which was related to increased expression of CCL11. Analyses of cytokine networks demonstrated a relatively milder cytokine storm in AM compared to AD skin tissue. Taken together, our results indicate that hyperthermia can effectively treat sporotrichosis and induces CM and moDC activation in DM, likely via TLR4 or TBK1 activation.

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Multiplexed skin immunophenotyping of new-onset dermatomyositis following the first use of Spirulina platensis

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Multiplexed skin immunophenotyping was performed on a cohort of 17 patients with sporotrichosis, including 10 new-onset dermatomyositis (Spir-DM) patients. We performed high-plex, in situ, single-cell level analysis of lesional biopsies of DM and Spir-DM skin using Imaging Mass Cytometry (IMC). We utilized two separate panels of 17 metal-conjugated antibodies against various surface markers, intracellular cytokines, and phosphorylated signaling molecules of interest. We observed an increased expression of DAB2 in all cytokine and activated pathway signal in Spir-DM skin. Our results demonstrated that hyperthermia, a common mechanism in sporotrichosis, is involved in the development of new-onset dermatomyositis. The use of Spirulina, an immunostimulatory superfood, may provide a novel therapy for the treatment of new-onset dermatomyositis. Our findings suggest that hyperthermia, a common mechanism in sporotrichosis, is involved in the development of new-onset dermatomyositis.