Health supplement Spirulina induces inflammatory cytokine production via monocyte derived dendritic cells and classical monocyte activation in Dermatology and Immunology, D. Diaz et al., 2021.

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 PBMCS supernatants, demonstrating similar effects in both HCs and DM with Spirulina significantly increasing TNFα and IFNγ levels. Inhibition of TNFα or IFNγ significantly decreased Spirulina’s immunostimulatory effects on both TNFα (p<0.0001) and IFNγ (p<0.05) at 0.3 mg/ml Spirulina. Using flow cytometry, we investigated Spirulina’s immunostimulatory effects at the cellular level, demonstrating that TNFα and IFNγ secretion, Spirulina has the greatest effect on monocyte-derived dendritic cells (MoDCs) and classical monocytes (CMs) at 0.3, 1, and 1 mg/ml of Spirulina, the percent of MoDCs secreting IFNγ increased from a mean (SEM) of 0.1% to 96.40% and 96.90% (1.80) (p<0.0001), respectively and the median fluorescent intensity (MFI) increased similarly, (n = 3, p<0.05). The mean percent of CMs secreting IFNγ also increased (p<0.0001), and pre-treatment with TLRL4 inhibitor suppressed CM activation (p<0.05). Moreover, the MFI of CMs secreting IFNγ increased significantly (p<0.0005). TLK or TBK1 inhibition decreased MFI for both MoDC and CMs (p<0.05) and p<0.001, respectively). TNFα+ MoDCs increased from 1.14% of total MoDCs with no stimulation to 49.10% (12.40) at 0.3 mg/ml Spirulina (p<0.01). TLK and TBK1 inhibition suppressed the percentage of Spirulina-induced MoDCs secreting TNFα (p<0.05). TLK4 inhibition trended towards significance in CMs (p<0.033). These data demonstrate that Spirulina induces CM and MoDC activation in DM, likely via TLRA or TBK activation.

Demystification of the effects of docosahexaenoic acid on the PPAR signaling pathway in psoriasis
M. Srivastava et al., 2021.

1 Swiss Institute for Allergy Research (SIAF), 2 Institute of Molecular Life Sciences, University of Zurich, Zurich, Switzerland, 3 UniversitätsSpital Zürich, Zürich, Switzerland, 4 University Zurich, Faculty of Medicine, Zurich, Switzerland, 5 University Zurich, Molecular Life Sciences, University of Zurich, Zurich, Switzerland, 6 UniversitatsSpital Kantonsspital Zurich, Zurich, Switzerland, 7 University Zurich, Faculty of Medicine, Zurich, Switzerland, 8 University of Zurich, Faculty of Medicine, Zurich, Switzerland, 9 University of Zurich, Molecular Life Sciences, University of Zurich, Zurich, Switzerland, 10 University of Zurich, Faculty of Medicine, Zurich, Switzerland, 11 Intron Biopharma, Toronto, Canada, 12 CHU de Quebec-Universite Laval, Quebec, Quebec, Canada, 13 Department of Dermatology, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, United States, 14 Dermatology, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania, United States

Spirulina is a microalga that is known to contain high levels of docosahexaenoic acid (DHA), which is known to have numerous anti-inflammatory effects in several pathologies, including psoriasis. Although, the beneficial effects of DHA in psoriasis have been widely reported, the molecular mechanisms involved remain largely unknown. In this study, we aimed to investigate the beneficial effects of DHA on the molecular mechanisms involved in psoriasis, with a focus on understanding the mechanisms by which DHA reduces the severity of psoriasis. We used a combination of in vitro and in vivo experiments to assess the effects of DHA on the expression of key inflammatory cytokines and chemokines in psoriasis. Our results showed that DHA treatment led to a reduction in the expression of pro-inflammatory cytokines, such as tumor necrosis factor alpha (TNFα) and interleukin-1 beta (IL-1β), as well as chemokines, such as interleukin-8 (IL-8) and chemokine ligand 12 (CCL12). These results suggest that DHA is a potential therapeutic agent for the treatment of psoriasis.

FABPs-induced Th17 polarization in atomatic murine
J. Lee et al., 2021.

1 Department of Dermatology and Cutaneous Biology Research Institute, Yonsei University College of Medicine, Seodaemun-gu, Seoul, Korea, 2 Department of Dermatology, Pusan National University School of Medicine, Busan, Korea (the Republic of), 3 Department of Allergy, Yonsei University College of Medicine, Seodaemun-gu, Seoul, Korea (the Republic of), 4 Department of Dermatology & Harvard Skin Disease Research Center, Brigham and Women’s Hospital, Boston, Massachusetts, United States

Atopic dermatitis (AD) is a chronic inflammatory skin disorder that affects 2-3% of the world’s population. It is characterized by dry, itchy skin and the development of eczematous plaques. The pathogenesis of AD is not fully understood, and the disease is often difficult to treat. In this study, we investigated the role of fatty acid binding proteins (FABPs) in the development of AD. FABPs are a family of proteins that are expressed in various tissues and are involved in lipid transport and storage. We found that FABPs are upregulated in the skin of AD patients and that these proteins are involved in the polarization of T helper type 17 (Th17) cells, which are known to play a role in the development of AD. Our results suggest that FABPs may be a potential target for the development of new therapies for AD.