

# Natural Products **Insider**



## Vitamin P versus inflammatory cytokines

***Ingredients from nature like bioflavonoids have the potential to help the body maintain a proper balance of inflammatory cytokines and influence the immune system while also providing a holistic approach for the many systems that rely on a balanced inflammatory response.***

Rob Brewster | Jul 07, 2020

Sometimes, too much of a good thing can cause more harm than good. This isn't any less applicable when discussing the body's functions for better health. When an ailment arises, the immune system gets right to work, attempting to heal the disparity and restore proper balance. But when the body overextends, more issues may arise.

# Inflammation: For good or bad?

The immune system is a complex structure of cells that each play a different role to help prevent or limit infection. Some cells serve as watchdogs, able to recognize certain danger cues called danger-associated molecular patterns (DAMPs) or pathogen-associated molecular patterns (PAMPs), as described by the National Institutes of Health (NIH). Once DAMPs or PAMPs are recognized, helper T cells, some of the most important cells in the immune system, may then be activated to help fight off infection. Without helper T cells, the body cannot defend itself, even against microbes that are normally harmless.<sup>1</sup>

Helper T cells, along with other immune cells such as macrophages, help bolster the immune system by producing pro-inflammatory cytokines—which induce inflammation—to combat harmful stimuli, removing them and initiating the healing process.<sup>2</sup> However, if there is an excess of pro-inflammatory cytokines, they will instead cause additional damage which can lead to further and more serious complications. Untreated infections and injuries, long-term exposure to irritants, and conditions associated with smoking, obesity and chronic stress are all potential reasons why this normal and healthy reaction can take a turn for the worst, according to an article at Healthline.com. Fortunately, a healthy lifestyle paired with proper supplementation can help.

## The power of vitamin P

Bioflavonoids have been studied for more than 80 years with more than 5,000 identified. When they were first discovered in citrus in 1936, bioflavonoids were labeled as vitamin P because of the many health benefits they offer for overall health. Research into bioflavonoids has commonly exhibited their unique benefits related to immune health. This is because bioflavonoids, especially the citrus derivative, have powerful antioxidant and anti-inflammatory properties that help to properly maintain the function of cells within the immune system.<sup>3</sup>

Bioflavonoids can be split into six separate and distinct classifications, flavanones being those exclusively found in citrus which have been known to synergistically function with vitamin C for enhanced immune support. There has been a lot of research into the benefits of these citrus bioflavonoids—with the lemon flavonoids naringenin, hesperidin and eriocitrin receiving even greater notice in recent years—including their ability to help support a proper inflammatory response.<sup>4</sup>

One recent study on a blend of these flavanones found promising results against chronic inflammation over 12 weeks of supplementation.<sup>5</sup> Subjects in the study were prediabetic, which is recognized by the presence of low-grade systemic inflammation because of higher-than-normal blood glucose levels. The citrus flavonoids were able to provide significant support in the reduction of pro-inflammatory cytokines, such as interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- $\alpha$ ) and C-reactive protein (CRP).

Other studies have also observed the effect that even short-term intervention with citrus flavonoids can have on chronic inflammation. Eriocitrin and hesperidin helped to decrease the production of pro-inflammatory cytokines by reducing nitric oxide production and inhibiting the protein complex in charge of cytokine secretion, NF $\kappa$ B.<sup>6</sup> This is done as the flavonoids help to activate PPAR $\gamma$  expression, which has the ability to inhibit expression of inflammatory cytokines and directs immune cells toward anti-inflammatory production<sup>7,8</sup>

Inflammation plays such a large role for good or ill, from injuries to specific ailments, and supplementing with citrus bioflavonoids provides fundamental support. Citrus bioflavonoids are powerful agents for better health, yet research is still only showing the tip of the iceberg. These ingredients from nature have so much potential to help the body maintain a proper balance of inflammatory cytokines and thereby influence not only the immune system but provide a holistic approach for the many systems that rely on a balanced inflammatory response. Consuming a nutritious diet, getting enough exercise and a little citrus flavonoid zest on a daily basis will contribute to a healthier and happier life.

*Rob Brewster is president of Ingredients by Nature , a world leader of citrus bioflavonoids and extracts. Rob takes pride in citrus science and continues to invest heavily in citrus flavonoid science for condition specific applications and holistic wellness.*

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