

Editorial

Flavonoids Enhance Our Immune System to Fight the Covid-19

Bakr Rabie*

President and Founder of Tyjito Biotech Ltd, Retired Professor Hong Kong University, Hong Kong

Editorial

The development of a viral infection is often determined by the health of our immune system. The CDC reported that 80% of the CoV- 19 infected cases were presented with mild symptoms. Unlike in the case of medically compromised patients, the healthy immune system mounts a protective response that result in mild symptoms.

Hence, in the midst of the current pandemic, it is important to take extra measures to boost our immune system.

Fat soluble pollutants are a source of Reactive Oxygen Species (ROS) that could weaken our immune system and subsequently affect the severity of symptoms of a Covid-19 infection.

In January 2019 in *Frontiers in bioscience* I published the mechanism of action of lipiburn on fat metabolism. We demonstrated that this natural plant flavonoid breaks down fat thereby getting rid of the pollutant's storage. This serves as a true deep tissue detoxifying agent that eliminates a source of stress to our immune system. Additionally, a publication in *Viruses* in 2014 by Jin-Yuan Ho and coauthors reported that PF, the active ingredient in lipiburn, have an antiviral property and that it inhibits corona virus replication.

Another flavonoid that could be of value as an antibacterial agent is Naringin. In a study in *Phytotherapy* in 2008 my team reported that Naringin possesses significant antimicrobial properties on periodontal pathogens *in vitro*. It also has an inhibitory effect on some common oral microorganisms in low concentrations. Given that Zu P and coauthors in a recent study published in 2020 in *Nature*, reported that the Spike (S) protein of SARS-CoV-2 and SARS-CoV 19 enter human alveolar epithelial cells through ACE2 receptor. I would imagine that a compromised gingival epithelium would be more vulnerable to viral entry than a healthy oral tissue with a stronger immune system.

An additional line of defense against the Covid- 19 viral infection is to stop its entry into our cells.

The flavonoid Quercetin is a natural plant extract with antiviral and antibacterial properties. Wenjiao Wu and coauthors published a

comprehensive study in *Viruses*. In Jan 2016 that is worth sharing. In their study, they tested the effect of Quercetin on all known Corona virus strains, including SARS, Mers, H1N1 and the like. When Quercetin was added to the virus prior to incubation with human cells in culture, the virus failed to enter the cells. Mechanism studies identified that quercetin showed interaction with the viral envelope HA2 subunit. Indicating that Quercetin inhibits viral attachment and entry to the human cells.

A few years earlier, 2008, the DARPA, the defense advanced research agency of the US army funded research that dealt with a direct viral challenge in animals using highly pathogenic H1N1. They reported significantly lower morbidity in the Quercetin treated group when compared to the untreated. The DARPA researchers carried out a randomized placebo-controlled clinical study with the Quercetin. After 3 days of strenuous exercise, 50% of the soldiers in the control group became ill with colds and the flu. Only 5% of the Quercetin treated group became ill. This clearly points to a prophylactic role of the Quercetin against the corona virus infection. It is worth mentioning that the Quercetin has broad spectrum antibacterial properties. In 2010 my team published data in *Phytotherapy* demonstrating that Quercetin has an inhibitory effect on oral pathogens that cause periodontal disease.

In the current situation with the Covid- 19 pandemic, we need our immune system to be as strong as possible to fight the Corona virus. By inhibiting bacterial growth in the mouth, and by eliminating the pollutants, we leave our immune system focusing on fighting the Corona virus and not fighting on many fronts at the same time. Both The Quercetin and Naringin are USFDA approved as GRASE, generally recognized as safe and efficient. The PF is UK pharmacopeia approved as safe and efficient. All three flavonoids are available in the market as OTC supplements. The data presented above warrants a closer look by the readers of the AJCS at these natural plant extracts. It is our collective efforts that will put an end to the current pandemic.

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***Corresponding author:** Bakr Rabie, President and Founder of Tyjito Biotech Ltd, Retired Professor Hong Kong University, Hong Kong, E-mail: bkrabie@gmail.com