Immune-boosting **glucans**

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Introduction

A good immune system is essential for maintaining health and preventing illness caused by pathogens (viruses, bacteria, and fungi).[1] When the immune system is compromised, we are more likely to get sick. A healthy lifestyle is the first step towards maintaining immunity. Medicines that help to regulate the immune system are called immunomodulators. Some vitamins and minerals (e.g. vitamin C and zinc) are essential for good immune function. Some herbal extracts (e.g. Echinacea and mistletoe) have also been shown to boost the immune system.[2] Another well-researched group of natural immune supporters is the beta-glucans (β-glucans). These carbohydrate-based substances have been shown to help maintain the immune system in both adults and children.[3]

The immune system

The immune system is made up of many cells and processes that work together to protect the body from pathogens. The skin and the mucous membranes of the nasal passages and intestines are the first lines of defence against invaders. These prevent pathogens from entering the body. The two main components of the immune system are innate (non-specific) and adaptive (specific) immunity. If foreign invaders enter the body, the cells of the innate immune system (phagocytes) are activated. Phagocytes identify and destroy foreign substances and initiate the release of other immune cells (proinflammatory mediators and cytokines). After ingesting the pathogen, phagocytes process the invader's information. This information is presented as an 'antigen' to the cells of the adaptive immune system (T-helper cells and B lymphocytes). The T and B cells then recognise, bind to, and destroy specific invaders at a rapid rate.[4] The immune system needs to be strong for this process to effectively eliminate pathogens and prevent illness.[5]

Maintaining your immune system

The best way to keep the immune system strong is by following a healthy lifestyle. It is therefore important to eradicate unhealthy habits. Smoking, excessive alcohol consumption, psychological stress, and inadequate sleep should be avoided. A balanced diet and regular exercise are advised to promote overall health and immunity. The body needs a constant supply of nutrients to maintain normal function. This can be achieved by consuming sufficient fruits, vegetables, whole grains, lean meats, legumes, dairy products, and healthy fats regularly. Vitamins A and C, as well as iron and zinc, are examples of micronutrients that are essential for immune function. Nutrient deficiencies are linked to a weaker immune system. In cases where these deficiencies cannot be corrected through diet alone, nutritional supplements may help to restore immunity. Herbal substances such as Echinacea, mistletoe, flavonoids, plant sterols and lignin may also have potential immune benefits.[1,6,7] Furthermore, the extensive research carried out on β-glucans as an immunomodulator show promising results.[1]

ß-glucans and immunity

What are β-glucans?

β-glucans are a group of naturally occurring polysaccharides made from chains of glucose (sugar molecules). The type of β-glucan is determined by the position of the side chain on the polysaccharide. Examples include (1,3)-β-glucan and (1,6)-β-glucan. β-glucans are important structural components of cell walls and provide an energy source for bacteria, plants, fungi, and algae.[1,3] Years before β-glucans were isolated and identified as immunomodulators, the beneficial effects in β-glucan-containing mushrooms were utilised in traditional Oriental medicine for boosting the immune system. Most of the health benefits of β-glucans were discovered within the last two decades.[1]

How do β-glucans work?

Both the innate and adaptive immune systems are activated by β-glucans. This is because β-glucan receptors are found on the surface of immune cells.[2,3] β-glucans interact with the mucosal cells in the

intestines and promote the release of cytokines. Increased cytokine levels increase resistance to infection. β-glucans also enhance the production of antibodies against specific pathogens by B cells.[3]

Immune benefits of β-glucans

Many studies have shown that β-glucans reduce susceptibility to viral, bacterial, protozoan, and fungal infections. β-glucans can improve overall health and reduce stress levels.[3] Furthermore, β-glucans reduce the incidence and severity of upper respiratory tract infections (URTIs) in both adults and children.[3,5] These infections are mostly caused by viruses (e.g. rhinoviruses and coronaviruses).[5] β-glucans also elicit various anti-cancer effects. Intense exercise can compromise the immune system. Research shows that β-glucans reduce the incidence of respiratory infections in athletes.[3] The oral intake of β-glucans is a convenient and simple way of boosting the immune system.[1]

Conclusion

The immune system is a complex combination of cells and processes that work together to fight infection. Eating a healthy diet and following good lifestyle practices is the best way to maintain good immune function. Some vitamins, minerals, and herbal extracts have immune-boosting properties. β-glucans are carbohydrate-based structures that may help enhance immune function and prevent illness.

References

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