We all know that excessive consumption of alcohol is bad for our health. Moderate quantities of alcohol, however, can be beneficial to our health in some circumstances. In a paper recently published in Nature, a team of researchers from Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) shows that alcohol modifies the immune system in a very specific way and inhibits the development of autoimmune diseases.

The intoxicating effect of alcohol is well researched. A team of researchers led by Prof. Dr. Mario Zaiss from the Chair of Internal Medicine 3 at FAU studied one lesser known effect of alcohol, namely how it affects the immune system.

There are several indications in medical literature that alcohol can have a positive effect on impaired immune systems. As early as 1995, scientists reported that liver transplant patients who consumed moderate amounts of alcohol had a significantly lower risk of rejecting the donor liver than those who did not drink at all.

Furthermore, several large epidemiological studies have shown that consuming alcohol on a regular basis can lower the risk of developing both rheumatoid arthritis and multiple sclerosis. Both these conditions are autoimmune diseases where the immune system attacks and destroys the body’s own tissue. An important factor in this process are special immune cells, called T follicular helper cells, located in the lymph nodes and in inflamed tissue that trigger autoimmune reactions.

How alcohol affects the immune system

During their work, the team were able to demonstrate for the first time how alcohol inhibits excessive immune reactions which lead to autoimmune diseases such as rheumatoid arthritis and multiple sclerosis. Alcohol is broken down by the body into acetate, which inhibits the function of T follicular helper cells and thus autoimmune diseases. T follicular helper cells are very sensitive to the presence of acetate as it permanently changes the metabolism of these cells and suppresses the production of the immune messenger substance interleukin 21.

Moderate quantities of alcohol thus do not generally suppress the immune system, rather they have an effect on a very specific type of immune cell that works as a switching point for the acquired immune system. However, Prof. Zaiss points out: ‘The negative effects of excessive alcohol consumption should also always be considered in light of this data, even if the moderate consumption of alcohol can have a beneficial effect on health and can generate a therapeutic immune tolerance effect.’

This effect may be responsible for the clinical observation that rheumatoid arthritis patients who regularly consume alcohol experience significantly fewer inflammatory episodes.

The research was carried out as part of the PANDORA research group and Collaborative Research Centre 181 ‘Switching points for resolving inflammation’ at FAU, that are funded by the German Research Foundation. The researchers
involved are members of the German Centre for Immunotherapy (DZI) at Universitätsklinikum Erlangen.

wissenschaftliche Ansprechpartner:
Further information
Prof. Dr. Georg Schett
georg.schett@uk-erlangen.de