Concord Grapes and Immune System Health

Emerging research suggests that certain micronutrients and polyphenols, like those found in Concord grapes, have the potential to play a role in immune system health.[1-8] Because few studies have looked at the role of grapes and immunity in humans, this area is considered very preliminary until further data is available.

- A study by Rowe et al. of 85 healthy adults, some of which were given 360 mL of 100% grape juice made with Concord grapes, plus vitamin C, for 9 weeks vs. a placebo, found an increase in a specific type of immune cell, the gamma delta T-cell, in the grape juice group compared to the placebo group. (This type of T-cell detects potential pathogens and alerts the immune system to respond.) The study also found that, compared to the placebo group, subjects who consumed the 100% grape juice made with Concord grapes and vitamin C also had significantly higher levels of serum vitamin C, which functions as an antioxidant to support a healthy immune system; maintenance of serum antioxidant capacity levels (while the antioxidant capacity of those consuming the placebo drink dropped over the study period); and significantly lower induced DNA strand breaks, suggesting antioxidant protection against oxidative stressors that can damage healthy cells. The authors note that these observed effects could be the result of the micronutrient vitamin C, the polyphenols, or both. One theory is that gamma delta T-cells recognize and utilize the polyphenols, since their structures resemble foreign antigens.[7]

- Previous *in vitro* experiments have examined the role that certain polyphenols that may be found in Concord grapes play in immunity. Falchetti et al. reported that resveratrol exerted a dose-dependent protective effect on peripheral human immune cells, through stimulation of two different immune T-cells (CD4+ and CD8+).[9] Another *in vitro* and *in vivo* (mice) experiment by Zhang et al. in 2005 concluded that proanthocyanidins (polyphenols) from grape seed extract, in combination with doxorubicin (chemotherapeutic agent), inhibited tumor-growth by a proposed enhancement of immune function, including lymphocyte stimulation.[2]

Laboratory studies performed on animal and human cells also suggest that polyphenols may block or neutralize certain viruses.[3,6] However, a great deal of additional research is needed before we know if grape juice will protect humans against viruses in real-life conditions.

- In 2007 and 2010, Lipson et al. reported that both cranberry and grape juice extracts, or their purified proanthocyanidins, reduced infection of the reovirus (which is associated with gastrointestinal infection) in *ex vivo* animal kidney epithelial cells.[3,6]

- Other researchers have found that resveratrol inhibited different viruses, specifically the polyomavirus[10]and cytomegalovirus, from infecting cells.[11] Evers and colleagues (2004) found that in human embryonic lung fibroblasts, resveratrol thwarted all phases of infection from cytomegalovirus.[11] Similarly, Berardi et al. (2009) published findings from mice fibroblast and human tumor cell lines indicate that a dose-dependent relationship exists between resveratrol and the inhibition of polyomavirus proliferation.[10] The researchers suggest that polyphenols

may destroy the cells' membranes or entry into the cell, thus preventing the virus from getting into the cell and reducing its ability to replicate.[10,11]

Early research on fruit juices supports the findings of the work on polyphenol extracts, indicating a role for grape juice in reducing/inhibiting virus activity.[4,5]

- A laboratory study presented by Ferrari and colleagues in 2009 found that rotavirus introduced to monkey kidney cells treated with store-bought cranberry or grape juice beverages showed no virus attachment to or penetration within the cells.[4]

- A similar study using Concord and Niagara grape juices and cranberry juice cocktail found that cells treated with these juices helped prevent viruses from infecting by protecting tight junctions, regions between cell membranes. While all the beverages showed a significant protective effect on tight junctions, the effect was greater with Concord and Niagara grape juices.[5]

Bottom Line: Research in immune function and Concord grape juice has not been well studied in humans or animal models. *In vitro* studies at this point have focused on Concord grape products and other polyphenolic compounds, like resveratrol. Much additional research is needed in this area to support the initial findings.

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