



Coronavirus treatment and prevention strategies



The following information is not intended as medical treatment, but rather a review of the current science. This information is not comprehensive and will be updated as new information emerges in the literature. The addition of any nutrient or compound may impact viral replication or human cellular function differently during prevention and over the course of disease progression.

As a follow-up to my newsletter earlier this week wherein I highlighted basic facts about the COVID-19 pandemic, here's a discussion of our best understanding of treatment and prevention strategies, both conventional and natural.

The *New York Times*, always quick to condemn natural therapies, lost no time maligning supplements for COVID-19. Their lurid headline proclaims, "Supplements for Coronavirus Probably Won't Help, and May Harm".

But I have compelling reasons to demur. In a recent *Intelligent Medicine* podcast, Dr. Leo Galland—who many consider the Tony Fauci of integrative medicine—shared the results of his scrupulous research. His protocol can be found [here](#).

Dr. Galland was careful to caution that just because a vitamin, mineral or nutraceutical has demonstrated efficacy against familiar upper respiratory tract infections like ordinary colds and flus doesn't mean we can merely extrapolate these findings to the coronavirus, which is new and may have unique properties. Borrowing from his analysis, there are several possible ways that certain supplements may impede the virus:

1. By enhancing innate immunity. Many vitamins and natural products, like vitamins A, C, and D and selenium and zinc support overall immune responses, and may boost natural killer (NK) cells, which are critical defenders against viruses
2. By blocking viral "docking". Viruses attack respiratory tissue via receptors on cells. Preliminary research suggest that the coronavirus attaches to a protein on the cell surface called ACE-2. Dr. Galland speculates that several natural substances including curcumin, rosemary, oregano and certain types of ginseng attenuate viral attachment via this pathway.
3. By reducing inflammation and protecting cells. The body's natural response to infection is to release inflammatory substances (cytokines) which help to fight viruses, but also account for the "misery factor" that spikes fevers and results in malaise and mucus production. This is initially defensive, but some of the sickest COVID-19 patients who require hospitalization and end up on ventilators are exhibiting "cytokine storm"—a malignant meltdown caused by an out of control, excessively exuberant immune response. Antioxidant and anti-

inflammatory nutrients could tamp down that maladaptive process.

4. By preventing viral replication. Our success in managing AIDS has come via deft application of synthetic “protease inhibitors” that interrupt the reproductive cycle of the HIV virus. There are natural compounds like elderberry that exhibit protease inhibition which might be relevant to the coronavirus.

Keep in mind that natural compounds—unlike most drugs which are more specific in their action—might work simultaneously on a multiplicity of pathways. For example, elderberry has been shown to enhance cytokine production, as well as demonstrating protease inhibition. This is good in the early phases of mild to moderate infection, but raises the specter that its indiscriminate deployment in critically ill patients might exacerbate cytokine storm, a view held by Dr. Galland. Nevertheless, many experts in the natural medicine community argue that these effects are negligible, and that elderberry is safe to use under any circumstances. We really don’t know, since elderberry has been studied and found to be effective vs. common influenza, but we have limited experience with the new coronavirus. Hopefully, clinical trials will eventually better define its applicability.

So bearing these considerations in mind, let’s look at some of the most plausible natural therapies for COVID-19.

Vitamin D: Vitamin D has demonstrated efficacy for respiratory health. Vitamin D modulates T-cell responses and has anti-inflammatory properties, but boosts innate immune responses by induction of the human gene for cathelicidin, CAMP. Cathelicidin is a key antimicrobial protein that has been shown to promote survival in critically ill patients. It would be interesting to do a retrospective study on the vitamin D status of patients with COVID-19 and how it influences outcomes. Take 2000-5000 IU per day and consider “loading” with 50,000 IU per day—but for no more than 3 days—if you feel as though you’re coming down with something.



Zinc: A trace mineral essential for immunity, via a multiplicity of pathways. It’s a potent antioxidant, and it supports natural killer cell function. Many U.S. adults have suboptimal zinc levels, especially the elderly. Take 50-80 mg per day, but don’t chug handfuls of zinc lozenges. Their efficacy is controversial vs. the common cold (usually a coronavirus), and too much zinc (>120 mg/day) turns immunosuppressive.

Selenium: In addition to supporting production of glutathione, selenium deficiency predisposes to viral susceptibility. A couple of Brazil nuts per day with 68-91 mcg selenium per nut will suffice in lieu of supplements.

Vitamin C: Unquestionably, vitamin C deficiency undermines immune defenses, as in scurvy. Studies are +/- about high dose vitamin C for colds and flus. Keep in mind that it’s better to dose moderate amounts of vitamin C (500 mg) several times a day than a big dose all at once (the body limits the amount of vitamin C that can be absorbed at one time). More intriguing is the potential benefit of mega-dosing vitamin C via the intravenous route, which bypasses the limits of oral absorption. Vitamin C at these high concentrations may have a direct antiviral effect. This is being explored in small clinical trials in China, and some U.S. doctors are putting extra vitamin C in the IV bags of their sickest COVID-19 patients.

Melatonin: A scholarly paper argues that melatonin—at low doses like 0.5 or 1 mg per day—might curb virulence of the coronavirus. Melatonin has been found to inhibit the action of an inflammasome known as NLRP3 – one of the primary inflammasomes involved

in the exaggerated immune response seen in critical coronavirus cases. The paper's authors note that melatonin production soars after birth and remains high until middle age, which might account for the relatively low mortality among younger people. Aging, electronic device use, and synthetic lighting all deplete melatonin.

Mushrooms Traditional Chinese Medicine has long prized mushrooms in formulas that boost resistance. In fact, mushrooms have been shown to enhance immunity. Additionally, ergothioneine, an amino acid found in common edible mushrooms like Porcini as well as medicinal mushrooms like Reishi and Shiitake, was found to reduce inflammation and tissue damage and increase survival in an animal model of cytokine-induced lung injury.

Oregano and Rosemary: Phenolic compounds like rosmarinic acid have antimicrobial properties. Per Dr. Galland's analysis, they also favorably impact the ACE-2 pathway involved in viral pathogenicity.



Garlic: Especially Aged Garlic Extract has evinced immune-supportive properties, enhancing natural killer cell activity and T-cell function.

Nitric oxide: Insufficient nitric oxide due to genetic variations may lead to compensatory inflammatory immune responses, as well as a reduced capacity to stop viral replication. In fact, nitric oxide has been shown to inhibit the SARS virus, the coronavirus predecessor. Therefore, consider nitrate-rich vegetables like raw beets and arugula, or take clinically proven nitrate supplements.

CBD: Yes, it might be good for alleviating stress and supporting restorative sleep during this anxiety-producing crisis, but there's more: cannabidiol reduces the inflammatory response to both bacterial and viral infections. Studies show CBD protects against sepsis, the most serious manifestation of unchecked infection according to CBD expert, Dr. Philip Blair.

NAC: N-acetyl cysteine is a building block for glutathione, an essential defensive compound. Studies have demonstrated its positive impact on influenza. And if you're taking glutathione-depleting Tylenol for fever, NAC will replete it.

Lipoic acid: In a manner similar to NAC, alpha lipoic acid exerts its antiviral effects by supporting glutathione production.

SPMs: Specific Pro-Resolving Mediators are high-octane derivatives of fish oil, with potent anti-inflammatory effects that may put the brakes on lung damage in severe cases of COVID-19.

DHEA: Dehydroepiandrosterone is an androgenic supplement, available over the counter. It is suitable for both men and women. Studies show it boosts resistance to viruses: "DHEA not only reduced viremia and death rate, but also significantly delayed the onset of the disease and mortality," according to a study.

Beta glucans: These are naturally-occurring polysaccharides (complex sugars) found in the walls of yeast and certain foods. They have powerful immune-enhancing properties vs. respiratory viruses. A popular yeast-derived beta glucans product is AHCC, marketed variously under brand names like Immpower, EpiCor, and Immunokinoko.

Andrographis: Part of the Traditional Chinese Medicine armamentarium, andrographis is a proven antiviral and anti-inflammatory and is currently under investigation for

application vs. the coronavirus.

Stinging Nettle: *Urtica dioica* has been shown to prevent SARS virus-induced lethal lung disease in a mouse model. It's one of influential naturopath Peter D'Adamo's favorite remedies for respiratory infections.

Skullcap: *Scutellaria baicalensis* has proven its mettle against influenza, and has a plausible mode of action against coronavirus.

Probiotics: In a recent podcast, we explored the crucial role of probiotics in supporting immunity.

Xylitol nasal spray: While xylitol is antibacterial, and not conclusively shown to inhibit viruses, moistening the nasal passages even with just saline solutions alone has been shown to shorten the duration and severity of colds, and reduce viral shedding.

To these you might add the aforementioned **elderberry**, and **Houttuynia**, **curcumin**, **resveratrol** and **quercetin** as suggested by Dr. Galland. And don't forget your multi because B vitamins, E and other sundry micronutrients also support immunity.

In an upcoming newsletter, we'll look at some of the *conventional* treatments being proposed for COVID-19. It's a rapidly emerging picture, including proposals for vaccines, repurposing old drugs like hydroxychloroquine, azithromycin and losartan, convalescent serum, and immune boosters. Stay tuned—and be sure to share these important newsletters with your loved ones!