

Study finds Cannabis compounds can prevent COVID-19

Hemp compounds identified by Oregon State University (OSU) research via a chemical screening technique invented at OSU can prevent the virus that causes COVID-19 from entering human cells.

The findings of the study led by Richard van Breemen, a researcher with Oregon State's Global Hemp Innovation Center, College of Pharmacy and Linus Pauling Institute, was published in the *Journal of Natural Products*. Van Breemen and collaborators, including scientists at Oregon Health & Science University, found that a pair of cannabinoid acids bind to the SARS-CoV-2 spike protein, blocking a critical step in the process the virus uses to infect people.

The compounds are cannabigerolic acid, or CBGA, and cannabidiolic acid, CBDA, and the spike protein is the same drug target used in COVID-19 vaccines and antibody therapy.

"These cannabinoid acids are

abundant in hemp and in many hemp extracts," van Breemen said. "They are not controlled substances like THC, the psychoactive ingredient in marijuana, and have a good safety profile in humans. And our research showed the hemp compounds were equally effective against variants of SARS-CoV-2, including variant B.1.1.7, which was first detected in the United Kingdom, and variant B.1.351, first detected in South Africa." The two variants are also known as the alpha and beta variant, respectively.

"Any part of the infection and replication cycle is a potential target for antiviral intervention, and the connection of the spike protein's receptor binding domain to the human cell surface receptor ACE2 is a critical step in that cycle," he said. "That means cell entry inhibitors, like the acids from hemp, could be used to prevent SARS-CoV-2 infection and also to shorten infections by preventing virus particles



from infecting human cells. They bind to the spike proteins so those proteins can't bind to the ACE2 enzyme, which is abundant on the outer membrane of endothelial cells in the lungs and other organs."

"These compounds can be taken orally and have a long history of safe use in humans," van Breemen said in a news release from the University. "They have the potential to prevent as well as treat infection by SARS-CoV-2. CBDA and CBGA are produced by the hemp plant as precursors to CBD and CBG, which are familiar to many consumers. However, they are different from the acids and are not contained in hemp products."

Benefits of black seed oil and vitamin D3

Researchers have now examined the possible effect of black seed oil standardized to contain 3% thymoquinones and a low free fatty acid content, in combination with vitamin D3's immune-modulating activities. The oil is marketed as ThymoQuin by nutraceutical company TriNutra.

Based on the percentage of thymoquinone (TQ) and low or high free fatty acid (FFA) content, the study compared the antifungal and antibacterial properties of different black seed oil formulations to investigate the ingredient's range of antimicrobial activity.

The findings revealed that low TQ, high FFA oil did not inhibit fungal growth and the low TQ, low FFA provided moderate support. However, the oils containing 3% thymoquinone showed the most potent inhibition of *M. furfur* and *C. albicans* fungi, with the low FFA oil delivering the best results. The oils were also tested on the bacteria *S. aureus*.



All of the tested black seed oils effectively inhibited its growth. The researchers say an additional component or combination of them (not yet identified) is likely responsible for the anti-bacterial effect by the oil. The study concluded that cold-pressed black seed oil stan-

standardised to 3% thymoquinone with low free fatty acid is a safe option to regulate the growth of key microorganisms influencing skin health and to assist in balancing the skin and gut microbiome.

This research follows an already completed application study using the company's standardised black seed oil for treatment of scalp redness, itch, seborrhea

and scaling. The study conducted on humans showed significant scalp soothing and relief of redness, scaling, seborrhea and itch after no later than two weeks of use, reported *Nutraceutical Business Review*.

Extracted using a patented cold-press process, the oil consists of black seed oils standardised to 3% thymoquinone with very low free fatty acid.

Curcumin may help reduce use of analgesics in osteoarthritis patients

According to a new study published in the journal *Nutrients*, osteoarthritis patients that were administered pain relief medication were found to benefit significantly upon supplementation with curcumin extract.

Specifically, patients who consumed the extract, which was standardized to contain 50% curcuminoids, exhibited improved performance-based metrics, reductions in self-reported pain, and also reported that they were using pain relief medicines, significantly less than those in the control group.

Previous studies have found curcumin supplementation to be helpful in cases of arthritis; however, few have actually included functional assessments of joint performance to reduce evaluation biases.

In the double-blind study, randomized, placebo-controlled trial, 101 osteoarthritis patients were asked to undergo performance-based tests, in addition to other measures such as the Knee Injury and Osteoarthritis Outcome Score (KOOS), knee pain ratings, Japanese Orthopedic Association Score for Osteoarthritic Knees (JOA), and PROMIS-29, a quality-of-life assessment.

The findings of the study revealed that KOOS scores averaged out to 11.98 for the curcumin group, well above the average score of 5.52 seen in the placebo group at week 8. Moreover, the group receiving the 500mg twice-daily supplement, 19 of the 51 were able to decrease their analgesic medication by the endpoint

of the study.

Compared to the placebo, curcumin supplementation was associated with significantly greater improvements in a timed up-and-go test, a six-minute walk test, and scores in JOA, which involves scoring based on observations of walking ability, stair climbing, joint function, and pain. No significant differences were observed for the 30-second chair stand test or the 40-meter fast-paced walk test, however.

"The results of this trial identified a standard level of translatability to larger audiences, which compares very well with other studies in the area of knee joint pain. The data has been obtained for Curcugen to identify it as a promising, well-tolerated, and naturally-derived joint-support option," said Adrian L. Lopresti, PhD, principal investigator of the study.



Plant-based protein matches whey for muscle mass in muscle building

Plant-based protein consumption supplemented with soy can build the same muscle mass as animal-based foods, says a study published in the journal *Sports Medicine*. Researchers from the University of Sao Paulo analyzed how muscle development differed between people with vastly different dietary preferences.



The study, led by Hamilton Roschel, included 38 men out of which 19 were omnivores and 19 of them were fully vegan. The participants were subjected to two weekly training sessions for three months while the scientists analyzed the changes in muscles building between the two populations.

Both the omnivores and vegans

consumed 1.6 grams of protein per kilogram of body weight to properly examine the built muscle, reported The Beet. The plant-based participants were given a soy-based protein supplement whereas the omnivores ate a whey protein supplement. After the three-month period, the researchers concluded that there was no significant difference in whole muscle, muscle fiber, or muscle mass and thus, proving that soy protein supports the muscle just as well when supplemented with a plant-based diet. The vegan group showed the same muscle gains as whey protein.

The researchers wrote in the study, “A high-protein, exclusively plant-based diet (plant-based whole foods plus soy protein isolate supplementation) is not different than a protein-matched mixed diet (mixed whole foods plus whey protein supplementation) in supporting muscle strength and mass accrual, suggesting that protein source does not affect resistance training-induced adaptations in untrained young men consuming adequate amounts of protein.”

The study highlights how well plant-based protein can match up with whey protein – believed to be

the prime protein source for building muscle. Several athletes have demonstrated that it is not necessary to consume animal-based protein for optimal performance, with several of them switching to plant-based alternatives. While the study uses a soy supplement, there are plenty of vegan alternatives that will provide a healthy level of protein and simultaneously reduce the risk of diseases including cardiovascular issues. Animal-based protein like meat can be switched out for legumes and vegetables including asparagus and spinach, nuts, seeds, and other supplements.

Vitamin K supplementation may improve COVID-19 outcomes

Researchers from Netherlands, have performed a study describing associations between both vitamin D and Vitamin K status with inflammation in those patients hospitalized with COVID-19. The research which has now been published in the journal *Frontiers in Nutrition* revealed that Vitamin D and Vitamin K may play a role as potential immunity modulators.

Rob Janssen from Canisius-Wilhelmina Hospital spearheaded the research when he discovered that there was a deficiency of vitamin K in Covid-19 infected individuals. He assessed vitamin D and K status by measuring circulating 25-hydroxyvitamin D and desphospho-uncarboxylated Matrix Gla-Protein (dp-ucMGP), respectively in 135 hospitalised COVID-19 patients in relation to inflammatory response, elastic fiber degradation and clinical outcomes.

Comparing good and poor disease outcomes of COVID-19 patients, vitamin 25(OH)D levels were not significantly different, reported Nutraceutical Business Review. A patient’s level of extrahepatic vitamin K status was associated with their IL-6 levels, while vitamin D levels were borderline statistically significant, correlated with IL-6. A significant association was al-



so found between IL-6 and elastic fiber degradation. Contrary to vitamin K status, vitamin D did not correlate with elastic fiber degradation. However, IL-6 levels were significantly higher in patients with poor outcomes, compared to patients with good outcomes.

“IL-6 is a pro-inflammatory cytokine that plays a key role in the development of severe COVID-19 and is regarded as an important therapeutic target” said Senior Author Jona Walk, PhD. “We demonstrated a highly significant correlation between elevated IL-6 levels and poor vitamin K status, whereas the association with vitamin D was only borderline significant.”

How a prebiotic may help ease anxiety in young adults

According to new research, published in 2020 in the journal *Current nutrition* reports probiotics alone or in combination with prebiotics – which feed the friendly bac-

teria that are already in the gut – may be effective treatments for depression.

Research has suggested that prebiotics may help people cope with

stress, and that they can reduce milder forms of anxiety.

In 2014, a study published in *Psychopharmacology* has revealed that a type of prebiotic supplement



called galacto-oligosaccharides (GOS) reduced healthy adults' production of the stress hormone cortisol and improved their emotional processing skills.

GOS are a type of indigestible carbohydrates that reach the intestine intact, where they can feed the microbiota that inhabit the intestines. GOS are found naturally in

dairy products, beans, and certain root vegetables.

Adding on previous research, psychologists at the University of Surrey in Guildford in the United Kingdom conducted several studies trying to assess if GOS could have long-term mental health benefits in adolescent females on the threshold of adulthood.

The transition from adolescence to adulthood is a key developmental stage for the emergence of a person's ability to regulate emotions such as fear and anxiety. The new study, which was published in the journal *Scientific Reports*, suggests that the supplement may reduce anxiety in individuals with the

highest trait anxiety levels. It also found a small but noteworthy increase in the abundance of a genus of bacteria called *Bifidobacterium* in the gut of those individuals, which may explain this change, reported *Medical News Today*.

Dr. Kathrin Cohen Kadosh, senior author of the study, said, "This new research marks a significant step forward in that we were able to show that we can use a simple and safe food supplement such as prebiotics to improve both the abundance of beneficial gut bacteria in the gut and to improve mental health and well-being in young women."

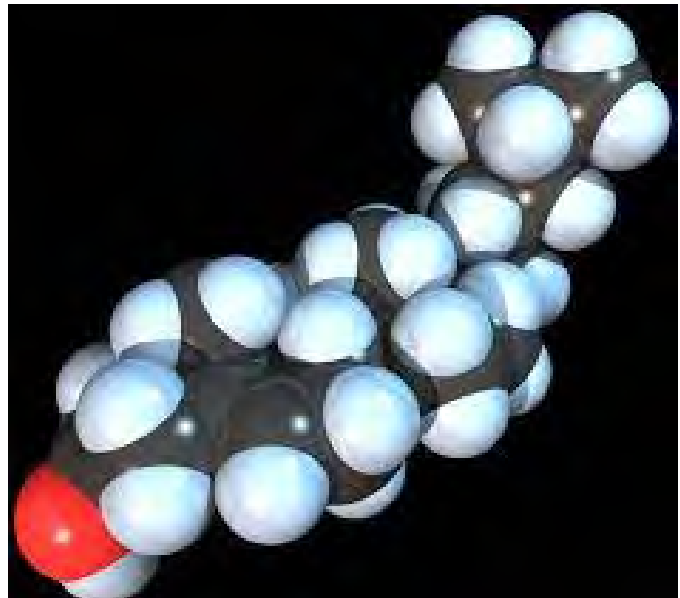
Interplay of Vitamin D and Cholesterol in Mild Cognitive Impairment

Researchers have now found that higher concentrations of vitamin D in the blood may reduce the risk of developing mild cognitive impairment, and the interplay of Vitamin D along with the cholesterol levels, as well as the metabolism of cholesterol and lipids, could be relevant to this.

Mild cognitive impairment (MCI) is characterized as a transitional stage between a healthy mental state and age-related dementia. It is considered by researchers to be an area that has critical potential for diagnoses, intervention, prevention, and therapeutic interventions for Alzheimer's disease, reports *Nutraceuticals World*.

The study involved 209 MCI patients and 209 age- and gender-matched healthy individuals in a control group who were aged between 59 and 66. Serum concentrations of 25(OH)D, the metabolite of vitamin D, were measured, along with serum lipids and oxysterols, an oxygenated derivative of cholesterol which can pass through cell membranes and the blood-brain barrier.

The findings revealed that subjects with vitamin D deficiency were three times more likely to develop MCI compared to those with adequate vitamin D concentrations greater than 30 ng/mG. Of importance, vitamin D concentrations were negatively correlated with cholesterol, while cognitive test scores (the Montreal Cognitive Assessment and symbol digit modalities test) were higher among those with higher vitamin D



concentrations.

The researchers also found that vitamin D and cholesterol shared common metabolic pathways. Further, a marker of vitamin D deficiency called cytochrome P450 27A1 has been previously shown to catalyze the conversion of cholesterol to an oxysterol known as 27-OHC. In fact, the present study examined several oxysterols and found that they were correlated with MCI compared to the healthy control group, including 27-OHC, 4 β -OHC, 24S,25-epoxy-CHO, and 24-OHC. The study has been published in the *Journal of Nutrition*.

Krill oil reduces cardiovascular risk factors

Cardiovascular diseases (CVD) have been a leading cause of mortality worldwide. According to new study, krill oil may potentially benefit those suffering from CVDs.

Triglycerides are a type of fat (lipid) found in the blood. In the US, one-third of the population have elevated triglyceride levels in their blood, which increases the risk of heart disease.

The new study which was published in the journal *JAMA Network Open*, studied the effects of including krill oil in the diets of 520 patients with severely high triglyceride levels in their blood (hypertriglyceridemia). Participants were randomly assigned to receive krill oil capsules or placebos over the course of the experiment. The patients' triglyceride levels, plasma omega-3s, and cholesterol levels were measured before, during and after the 26-week duration of the trials. The current publication pools the data from 2 large clinical trials conducted by American and Canadian scientists.

The findings show that patients consuming the krill oil experienced a 26.0% reduction in blood triglyceride levels from baseline, versus a 15.1% reduction among the placebo group after 12 weeks, giving a significant treatment difference of -10.9%.

After 26 weeks, the patients consuming the krill oil experienced a 33.5% reduction in blood triglyceride levels from baseline, versus a 20.8 % reduction among the placebo group, giving a significant treatment difference of -12.7%.

Krill oil treatment had even stronger effect in those who also took medication for hypertriglyceridemia. The study authors found that participants in the placebo group were more likely to see large variations in their triglyceride levels in the screening period before entering the trial. They therefore decided to look at a subsection of the participants who were most at risk, using medication to help with their high triglyceride levels.



“When analyzing only those patients receiving medications for their hypertriglyceridemia at study start, the authors observed even stronger reductions in the krill oil group and less reductions in the placebo group”, says Katina Handeland, Research & Development Director for Human Health and Nutrition, Aker BioMarine ASA. “This is interesting as these patients may represent an even more “true” hypertriglyceridemia patient population” she continues.

Antarctic krill is an efficient delivery form of vital nutrients such as choline and omega-3s. Powered by phospholipids, krill oil ensures that omega-3s EPA & DHA and choline are delivered to parts of the body that need them the most, such as the heart but also the brain, joints, and skin.

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