

Prevention of SARS-CoV-2 Infection: A Liposomal Functional Food Approach

Known as COVID-19, the coronavirus disease is currently a global pandemic caused by the severe acute respiratory syndrome coronavirus-2. On February 11, 2020, the International Committee on the Taxonomy of Viruses declared “severe acute respiratory syndrome coronavirus 2” (SARS-CoV-2) as the scientific name of this new virus.^[1] This name was chosen based on the fact that the virus is genetically related to the coronavirus responsible for the SARS outbreak of 2003. The infection thus far has manifested variable clinical outcomes. The mortality and morbidity statistics are increasing on a daily basis and no proven curative therapy or vaccination platform has been discovered till now. This is mainly due to the fact that the virus is going through unpredictable, random mutations. Vaccine strategies are mainly based on nucleic acids (e.g., DNA, mRNA), peptides, live viruses, attenuated viral vaccines, and recombinant vaccines.^[2] Although reports show that some liposomal and nonliposomal vaccine formulations have entered the clinical phases,^[3] none are on the horizon as yet. Current strategies of pandemic management are in the developmental stages with guidelines changing frequently as newer data are emerging. No drug is found to be successful in eradicating the disease and researchers are continuing their fight to find potent therapeutic strategies in different labs all over the world.

In this time of lockdowns and social-distancing norms, balanced and healthy diets and supplements are extremely critical in decreasing the rates of mortality and morbidity associated with viral and other diseases such as cancer. It is well known that food supplements and nutraceuticals play a very important role in the preventive as well as curative aspects of certain viral and nonviral diseases. Recent data, including blood test results of infected individuals, can be extrapolated to the current SARS-CoV-2 infection. Modification of dietary intakes as well as balanced food and nutrition are extremely helpful in better prognosis and boosting the immune system of the patients.^[4] Considering the diverse eating habits of the world population, intake maintenance and monitoring of micronutrients involved in immunocompetence against viral infections are essential. Micronutrients including vitamins A, C, D, and E, in addition to Fe, Zn, and Se, may be deficient in individuals suffering from malnutrition as well as those suffering obesity. Balanced intake of micronutrients, bioactive compounds, essential oils, antioxidants, and probiotics are strategies for COVID-19 prevention. Consequently, a healthy and balanced diet can significantly contribute to the improvement of the immune response to viral infections. A potent and well-established strategy to ensure maximum absorbance and bioavailability of the mentioned nutrients

and bioactive compounds is liposome technology.^[5] Liposomes and related technologies such as nanoliposomes and tocosomes^[6] are known to increase the shelf-life of food supplements by encapsulating and thus protecting the structure/function of the active compounds from enzymatic degradation, temperature, extreme pH values, and other environmental factors. A combination of liposomes and well-studied selection of aforementioned nutrients and minerals has the potential to augment immune system and improve human health and well-being. Liposomes are not only a leading protocol for COVID-19 vaccine formulation, but also an extremely useful technology for the design and formulation of preventive food supplements and immune-boost products. One important aspect of liposomes and other phospholipid vesicles is that they are made of natural ingredients found in our body; hence, they are completely safe and biocompatible. As a matter of fact, liposomes are even naturally present in the first food of all humans, that is, mother’s milk.^[7] This fact is a very strong evidence of their vital role in the boosting of our immune system.

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Conflicts of interest

There are no conflicts of interest.

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