Efficacy of fullerene capsule with amphipathic antioxidants vitamin

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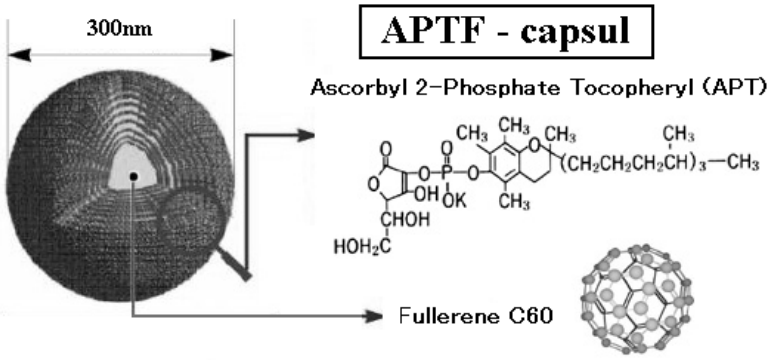
Ascorbyl 2-Phosphate Tocopheryl (APT) was developed as amphipathic antioxidants vitamin. APT is a water-soluble derivative of ascorbate and tocopherol that is little soluble to oil but has a surface activity and can be used as an emulsifier and nanocapsule clathrate. Fullerene was capsuled with this amphipathic vitamin. This emulsification capsule was called an APTF- capsule. As for the APTF-capsule, performance as an external preparation ingredient for ultraviolet rays was evaluated.

When preparation that contained an ascorbic acid at a high concentration was exposed to a radical environment, such as ultraviolet rays, radicals of ascorbic acid were produced. However, when fullerene was added to the APT-capsle, the generation of ascorbic acid radicals was reduced significantly. Our experiment showed that fullerene controlled the generation of ascorbic acid radicals by ultraviolet rays under the presence of amphipathic vitamin c. APTS-capsule was also found to inhibit the decomposition of carotenoids, such as β carotene and astaxanthine, under a hyperoxidation condition of lipids. We also found that APTS-capsule inhibited the generation of superoxide radicals in the skin by infrared laser irradiation at 1.440 nm significantly. Our experiments suggested that APTS-capsule inhibits oxidization of both water-soluble and lipid-soluble antioxidants, the property of which possibly acts synergistically with amphipathic vitamins and fullerene such as APTF.



The APTF-capsule are likely promising tools for developing anti-aging systems with an effective redox balance, in which water-soluble and lipid-soluble redox molecules resonate with each other, and for applications in diverse industrial fields, including cosmetics and medical supplies.