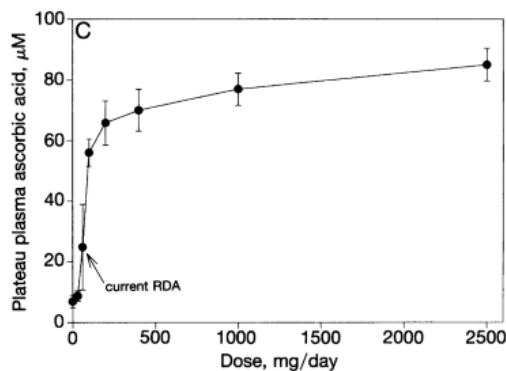


## EcoSupp liposomal vitamin C does improve the bioavailability of vitamin C.

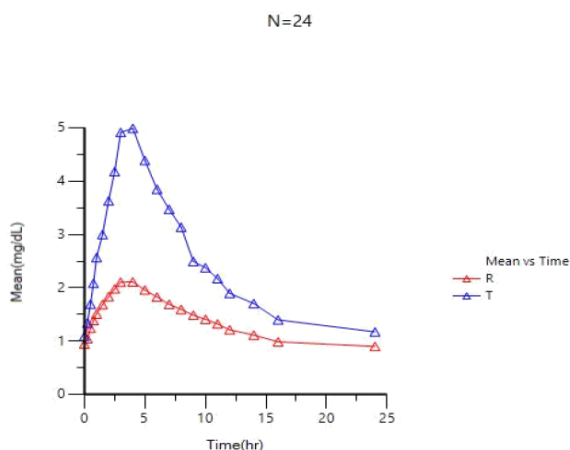
In a recent article by Shaked Ashkenazi it is suggested that liposomal vitamin C is just an expensive source of vitamin C and is not necessary at all. Moreover, it is suggested that liposomal vitamin C does not help for an increased bioavailability of vitamin C. Ashkenazi says there is no need for vitamin C, as a small hydrophilic molecule which dissolves quickly in water and moves freely through the body, to be encapsulated by the liposomal membrane. Ashkenazi also says there is no evidence that liposomes contribute to the absorption of vitamin C.

Levine et al. showed back in 1996 that the maximum plasma level of vitamin C is around 80 micromolar which translates to 1,4 milligrams per deciliter. In the study of Levine et al. the test subjects ingested vitamin C orally which resulted in this plateau at 80 micromolar. When vitamin C is injected intravenously a spike is achieved which rapidly decreases to the plateau level.



**FIG. 1.** Plasma ascorbic acid concentrations ( $\mu\text{M}$ ) in volunteers as a function of daily dose. All data represent morning fasting samples. (C) Steady-state plateau ascorbic acid concentrations in plasma as a function of dose. Values are the means of plateau ascorbic acid concentrations from all volunteers at all doses (see Table 1). Dose indicates the amount of vitamin C administered daily. Data from Levine et al.

Research on EcoSupp liposomal vitamin C compared to liquid non-liposomal vitamin C with the exact same concentration showed that plasma levels of vitamin C achieved a much higher concentration with the liposomal vitamin C before it restored back to the plateau level which was seen by Levine et al. The results shown in Fig 2 show that EcoSupp liposomal vitamin C does have an increased bioavailability compared to normal vitamin C supplements.



**FIG. 2.** Plasma ascorbic acid concentrations ( $\text{mg/dl}$ ) in volunteers as a function of a single 1000 mg dose. In red is seen the reference of non-liposomal vitamin C (1000 mg per 5 ml of water). In blue is seen the liposomal vitamin C (1000 mg per 5 ml liposomes). The graph shows the difference in plasma concentrations within the first 24 hours after a single dose was taken.

### Literature:

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Vitamin C pharmacokinetics in healthy volunteers: Evidence for a recommended dietary allowance (ascorbic acid/bioavailability)

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