

## Skin Lycopene Supplementation and Disease Risk

Disease type	First Author	Study Title and Complete Citation	Date	Abstract	Study Type	G.Tom +, N, -	P.Tom +, N, -	F.Tom +, N, -	Lyc+ +, N, -	Other +, N, -
Skin	Aust O	Supplementation with tomato-based products increases lycopene, phytofluene, and phytoene levels in human serum and protects against UV-light-induced erythema.  Aust O, Stahl W, Sies H, Tronnier H, Heinrich U.  Int J Vitam Nutr Res. 2005 Jan;75(1):54-60.	2005	Carotenoids are suitable photoprotectants, and beta-carotene supplements are used for protection against ultraviolet (UV) light-induced erythema. Protective effects are also observed when carotenoids are provided with the diet. Here, we investigated the photoprotective effects of synthetic lycopene in comparison with a tomato extract (Lyc-o-Mato) and a drink containing solubilized Lyc-o-Mato (Lyc-o-Guard-Drink). With these different sources, the volunteers ingested similar amounts of lycopene (about 10 mg/day). After 12 weeks of supplementation, significant increases in lycopene serum levels and total skin carotenoids were observed in all groups. Significant increases in the serum levels of phytofluene and phytoene occurred in the Lyc-o-Mato and the Lyc-o-Guard-Drink group. At weeks 0, 4, and 12 an erythema was induced with a solar light simulator. Dorsal skin of each subject was irradiated with 1.25 minimal erythemal dose (MED). Reddening of the skin was evaluated before and 24 hours after irradiation by chromametry and expressed as positive a-values (red/green-axis). delta a-values (difference of a-value before irradiation and after 24 hours) were used as an index of erythema intensity. A decrease in the delta a-value from week 0 to week 12, indicating prevention of erythema formation, was observed in all groups. Compared to week 0, the delta a-value at week 12 was 25% lower in the synthetic lycopene group. The protective effect was more pronounced in the Lyc-o-Mato (38%) and Lyc-o-Guard-Drink (48%) groups. In the two latter groups, phytofluene and phytoene may have contributed to protection. Both of these carotenoids exhibit absorption maxima at wavelengths of UV light. Absorption of UV light protects skin from photodamage and might explain the differences observed between groups.	RCT				(-) ↓ erythema	(+) ↑ serum & skin [lyco] with DS
Skin	Greul AK	Photoprotection of UV-irradiated human skin: an	2002	Endogenous antioxidants are decreased in skin and blood during UV exposure. Combined supplementation of beta-carotene, alpha-tocopherol and ascorbic acid in addition	RCT				N	Slight ↓ in MMP-1

		<p>antioxidative combination of vitamins E and C, carotenoids, selenium and proanthocyanidins.</p> <p>Greul AK, Grundmann JU, Heinrich F, Pfitzner I, Bernhardt J, Ambach A, Biesalski HK, Gollnick H.</p> <p>Skin Pharmacol Appl Skin Physiol. 2002 Sep-Oct;15(5):307-15.</p>	<p>to topical sunscreens may help to lower the risk of sunburning. Acute UV erythema with sunburn reaction are the most important factors in conjunction with the cumulative life-long UV dose for inducing skin damage resulting in photoageing and precancerous and cancerous lesions. Therefore, a clinical, randomized, double-blind, parallel group, placebo-controlled study was conducted in healthy young female volunteers (skin type II) investigating the preventive, photoprotective effect of supplementation with Seresis, an antioxidative combination containing both lipid and water-soluble compounds: carotenoids (beta-carotene and lycopene), vitamins C and E, selenium and proanthocyanidins. In this study, the oral administration of Seresis appeared to be well tolerated. The preparation contains antioxidant compounds in quantities occurring at physiological levels and can therefore be used safely over a long period of time. Despite the fact that the assessment of the light sensitivity (minimal erythema dose, chromametry) of the skin did not show any statistically significant differences between the Seresis and the placebo group, a clear statistical trend, however, could be demonstrated, i.e. Seresis was able to slow down the time of the development and grade of UVB-induced erythema. The primary efficacy parameter matrix metalloproteinases 1 (MMP-1) between treatment and placebo group following UV irradiation showed a significant difference (<math>p &lt; 0.05</math>), which occurred due to the fact that after a 2-week UV irradiation, MMP-1 slightly increased (<math>p &lt; 0.03</math>) in the placebo group and decreased (<math>p &lt; 0.044</math>) in the treated group. The MMP-9 changes showed a clear tendency of decrease in the Seresis group (<math>p &lt; 1.393</math>) and increase (<math>p &lt; 0.048</math>) in the placebo group. These data emphasise that supplementation with Seresis decreases the UV-induced expression of MMP-1 and 9, which might be important in photoprotective processes. From our data, we thus finally draw the conclusion that by the combination of antioxidants, such as in the formulation of Seresis, a selective protection of the skin against irradiation can be achieved. This might be important for future recommendations for immediate suppression of the early phase of UV-induced erythema, that means pharmacological prevention of sunburn reaction as well as subsequent chronic skin damage.</p>							with supple
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