

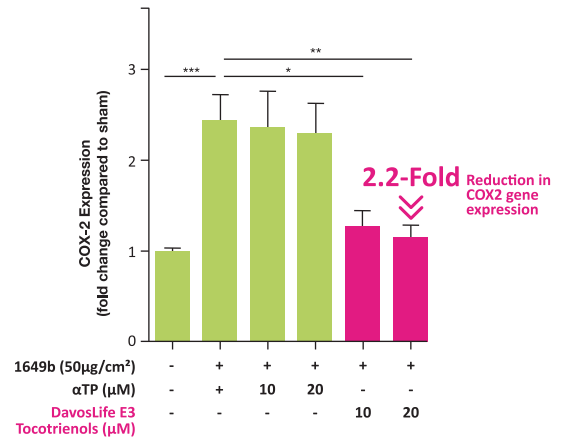
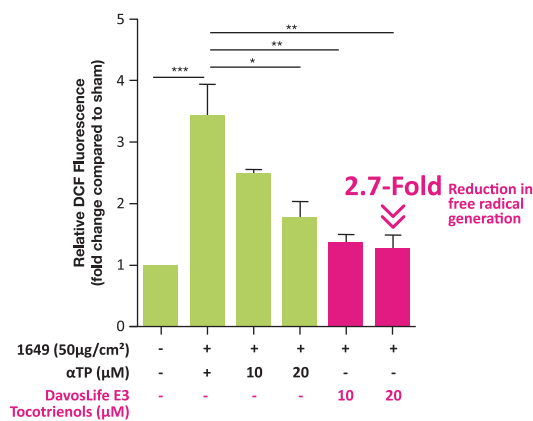
Tocotrienols: Powerful Bioactive for Anti-Pollution Skincare



Pollution (particulate matter) exposure induces excessive Reactive Oxygen Species (ROS), inflammatory cytokines and Matrix Metalloproteinases (MMPs) which trigger oxidative stress and inflammation in skin. These signalling cascades also increase the production of Prostaglandin E2 and COX2, subsequently decreasing filaggrin expression. This results in premature skin ageing, skin inflammation and the disruption of the skin's barrier function.

Davos Life Science studies have shown that Tocotrienols is a very effective bioactive to protect skin from the detrimental effects of pollution exposure and can help to promote healthy, plump, and elastic skin.

How Do Tocotrienols Protect Skin From Pollution?

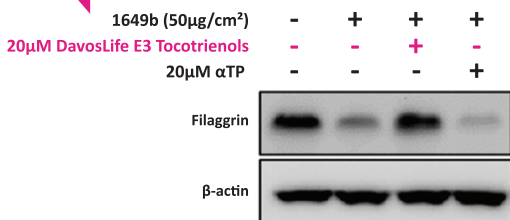


In our study, we evaluated the protective effects of DavosLife E3 Tocotrienols on PM2.5-induced skin damage using Human Dermal Fibroblast cells (HDF). HDF cells were treated with 50μg/ml PM2.5 in the presence or absence of DavosLife E3 Tocotrienols¹.

DavosLife E3 Tocotrienols have a significant anti-inflammatory effect, as seen in the significant attenuation of PM2.5-induced up-regulation of COX2. However, treatment with alpha-Tocopherol did not show amelioration of inflammation¹.

DavosLife E3 Tocotrienols inhibited PM2.5-induced free radical generation in HDF cells, and were more efficient at achieving this compared to alpha-Tocopherol¹.

How Do Tocotrienols Improve Skin Barrier Function?



Western blotting analysis revealed 20 μM DavosLife E3 Tocotrienols could potentially restore skin barrier function following exposure to PM2.5, based on the increased levels of Filaggrin protein expression. In contrast, this was not observed for alpha-Tocopherol when HDF cells were treated at the same concentration¹.

Reference:
1. Davos Life Science, Data on File.

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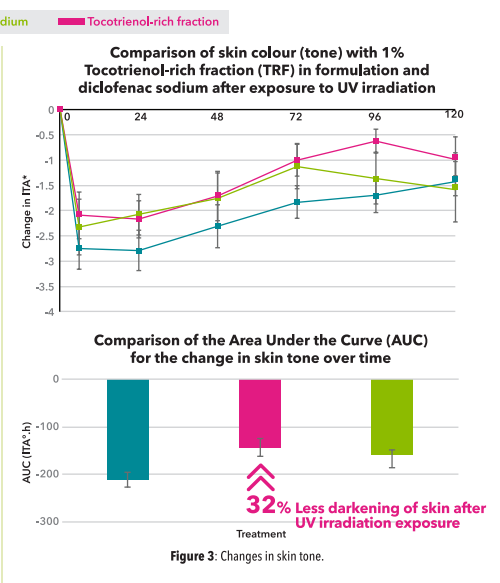
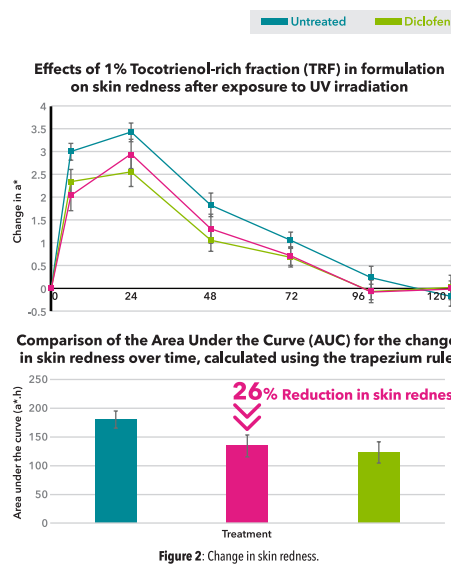
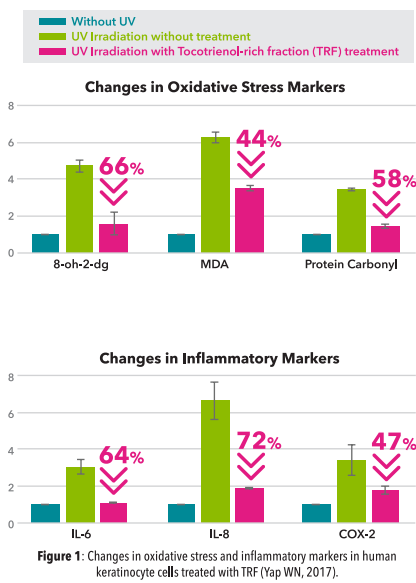
Sun Exposure Damages The Skin via Increased Oxidative Stress and Inflammation



Premature Ageing Hyperpigmentation

How Do Tocotrienols Reduce the Impact of Sun Exposure?

Tocotrienols do not block UV radiation the way more common sunscreens do. Instead, tocotrienols help to soothe the skin by reducing inflammation and by scavenging oxidative species. Clinical trials have confirmed tocotrienols' efficiency in reducing skin redness and pigmentation following UV irradiation⁵.

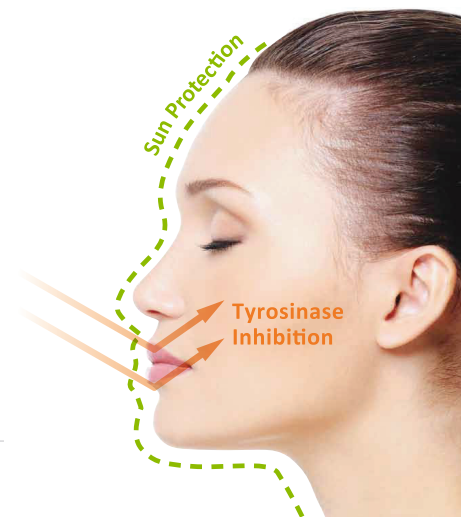
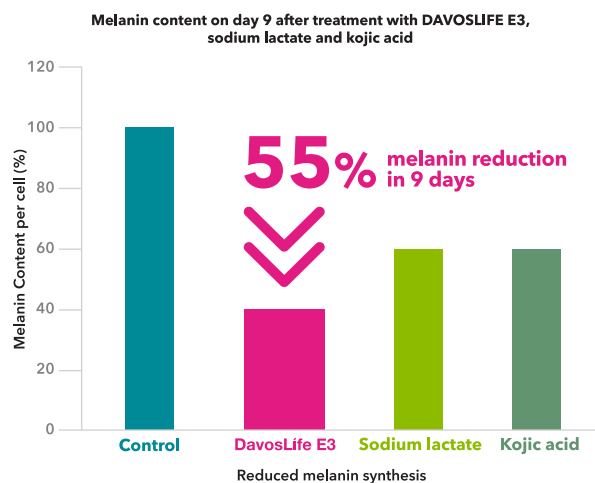


How Do Tocotrienols Reduce Hyperpigmentation?

Tocotrienols reduce hyperpigmentation by two actions.

First, it inhibits production of the enzyme tyrosinase, thereby reducing the amount of melanin produced⁶.

Second, it promotes the breakdown of melanin⁷.



For medical professional use.

References:
 1. Serbinova et al. (1991). *Free Radical Biology and Medicine*, 10: 263 – 275.
 2. Davos Life Sciences In-House Data on File.
 3. Hasan et al. (2018). *Journal of Oil Palm Research*, 30(1): 150 – 162.
 4. Fiume et al. (2018). Safety Assessment of Tocopherols and Tocotrienols as Used in Cosmetics. *International journal of toxicology*, 37(2): 615-945.

5. Yap, WN. (2017). *J. Cosmet. Dermatol.* : 1-11.
 6. Makpol et al. (2009). *Afr. J. Biochem. Res.* 3, 385-392.
 7. Choi et al. (2013). Tocotrienols enhance melanosome degradation through endosome docking/fusion proteins in B16F10 melanoma cells. *Food and Function*, 4(10): 1481 – 1488.
 8. Yap et al. (2010). *Pigment Cell Melanoma Res.* 23(5): 688-692.