

# Skin Depigmentation and Sun Protection



**Natural e<sup>3</sup>**  
DavosLife Tocotrienols

## Hyperpigmentation

The production of melanin, the chemical that gives the skin its natural color, begins with the activation of a protein called tyrosinase within skin cells. Increased melanin synthesis can lead to skin darkening or hyperpigmentation, a common skin condition that is a major cosmetic concern.

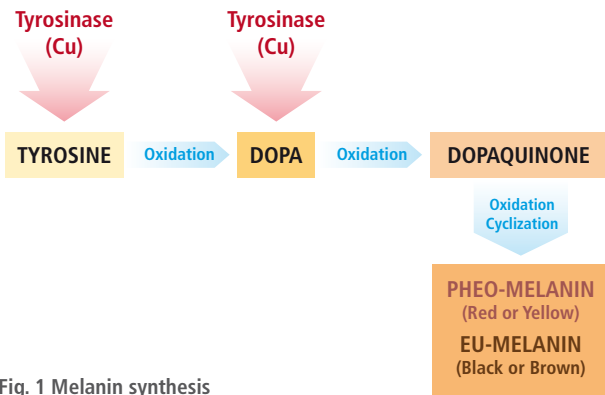


Fig. 1 Melanin synthesis

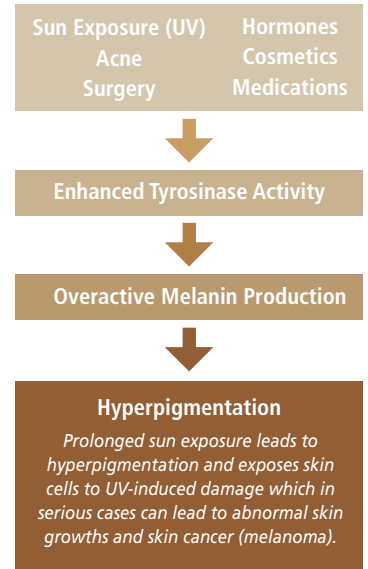


Fig. 2 Causes of hyperpigmentation

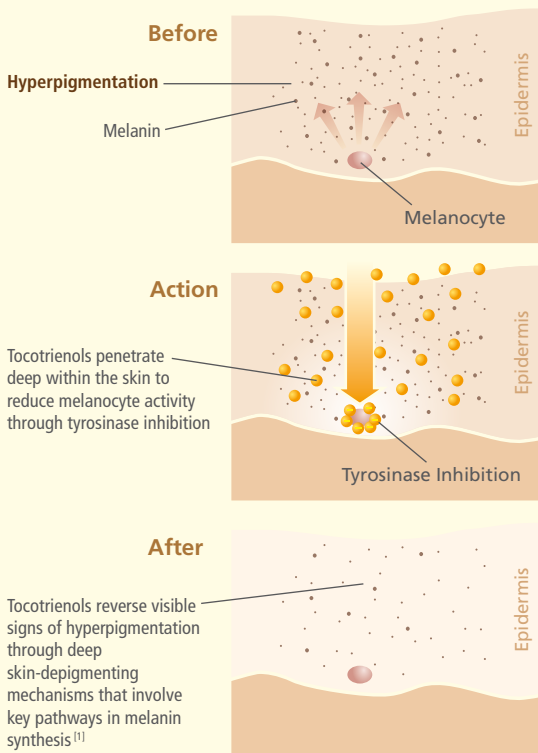
## Natural e<sup>3</sup> Palm Tocotrienols

DavosLife produces Natural e<sup>3</sup>, a rich blend of tocotrienols extracted using state-of-the-art technology from GMO-free palm fruits fully traceable to its parent company's plantations (RSPO certified). Natural e<sup>3</sup> includes a balanced formula of all tocotrienol isoforms to take full advantage of tocotrienols' skin-depigmenting and sun protection properties.



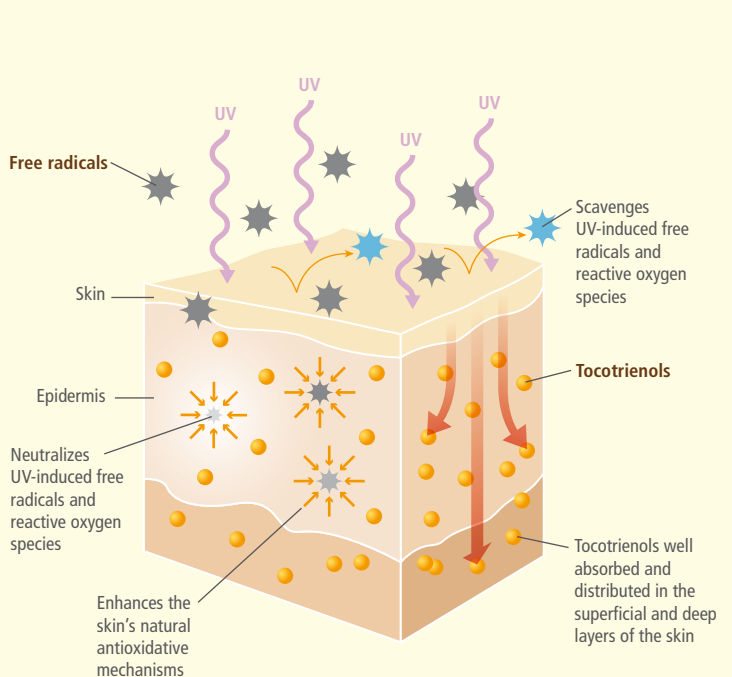
### Skin Depigmentation

Lightens Skin Naturally Through Scientifically Proven Deep Skin-Depigmenting Action [1]



### Sun Protection

Natural Sun Protection Through Superior Antioxidation Mechanisms [2]



## Scientific Evidence

### SKIN DEPIGMENTATION

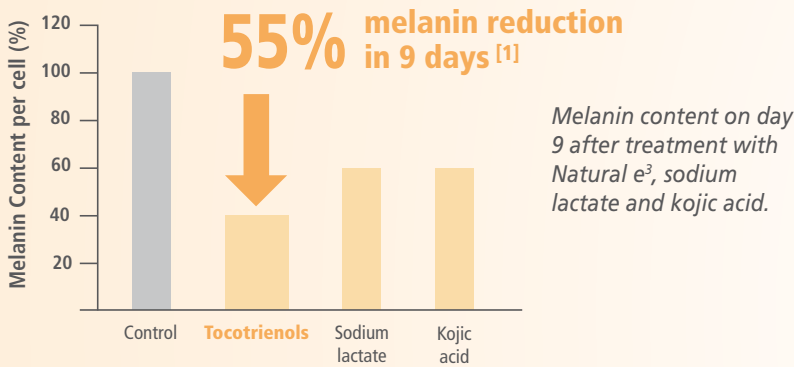


Fig. 3 Reduced melanin synthesis

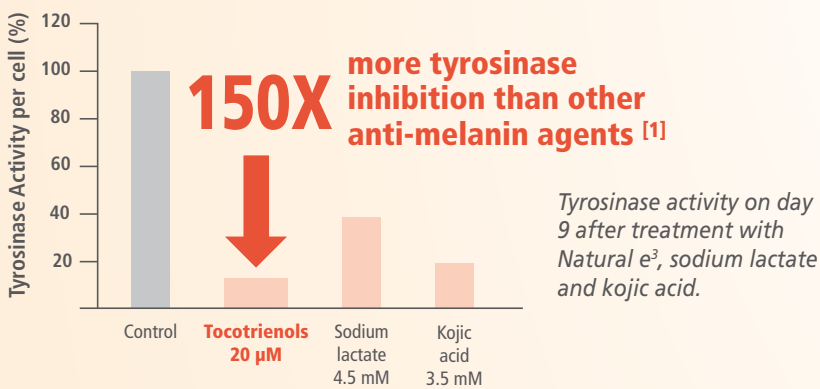


Fig. 4 Reduced UV-induced tyrosinase activation



### SUN PROTECTION

- Possess **60 times** more antioxidation properties compared to standard vitamin E [3]
- Reduce UV-induced free radicals by **~76%** with the highest radical skin factor at 4.15 [2]
- Displays skin antioxidative protection capacity of up to **150%** [2]

#### Dose and Safety

Recommended dosage for Natural e<sup>3</sup> is 0.5-2%. Natural e<sup>3</sup> is safe, non-skin irritant, non-mutagenic and ready for cosmetic use.

#### Application

Suitable for incorporation in cosmetics and personal care products as well as dietary supplement formulations to help prevent or reverse skin hyperpigmentation, to help protect against UV-induced skin damage and to help delay or reduce the signs of skin ageing.

Visibly reduced pigmentation after 1 month of twice daily application using cosmetic cream containing Natural e<sup>3</sup> [4]



#### Reference:

- [1] Yap WN, et al. Gamma- and delta- tocotrienols inhibit skin melanin synthesis by suppressing constitutive and UV-induced tyrosinase activation. 2010. *Pigment Cell Melanoma Research*.
- [2] Davos Life Science. Data on File.
- [3] Serbinova E, Kagan V, Han D & Packer L. Free radical recycling and intramembrane mobility in the antioxidant properties of alpha-tocopherol and alpha-tocotrienol. 1991. *Free Radic Biol Med*;10(5):263-75.
- [4] Chen A, et al. Palm tocotrienols inhibit hyperpigmentation by suppressing constitutive and UV-induced tyrosinase activity. Paper presented at: The 35th Annual Meeting of the Japanese Society for Investigative Dermatology; December 3-5, 2010; Wakayama, Japan.

Derived from Nature  
Driven by Science



## World Leader in High Quality, High Purity Palm Tocotrienols

### DavosLife - No.1 Supplier Of High Purity Palm Tocotrienols

#### Stable Supply

DavosLife produces a 100% natural tocotrienol-rich complex extracted using standards of the highest quality from GMO-free palm fruit fully traceable to the plantations of its parent Company, the Kuala Lumpur Kepong Berhad Group. Natural e<sup>3</sup> contains a balanced blend of all tocotrienol isoforms (alpha, beta, delta, gamma) at high concentration levels for maximum health benefits.

#### Science Driven

DavosLife has established the world's largest tocotrienol R&D center to spearhead cutting-edge tocotrienol research and innovation in chronic diseases and skin care. It was awarded the 2010 Asia Pacific Excellence in Research Award in Natural Vitamin E Market by Frost and Sullivan.

#### Unrivalled Technical Support

Our team of experienced in-house scientists is available to support your technical needs ensuring that you meet the demands of today's market.

#### Custom Formulations

We offer custom formulations for higher potencies to meet your needs.



**Natural e<sup>3</sup>**  
DavosLife Tocotrienols

#### Available Products:

**High Purity Palm Tocotrienol Oil**  
Up to 95% (total vitamin E)

**Palm Tocotrienol Powder**  
Up to 30% (total vitamin E)

**T3Boost™ - Water Soluble Tocotrienol**  
Up to 1.5% (total vitamin E)

**Tocotrienol Isomers**  
up to 97% (alpha, beta, gamma, delta)

**Palm Tocotrienol Analytical Test  
and Cell Culture Kits**



Merging Science with Nature

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