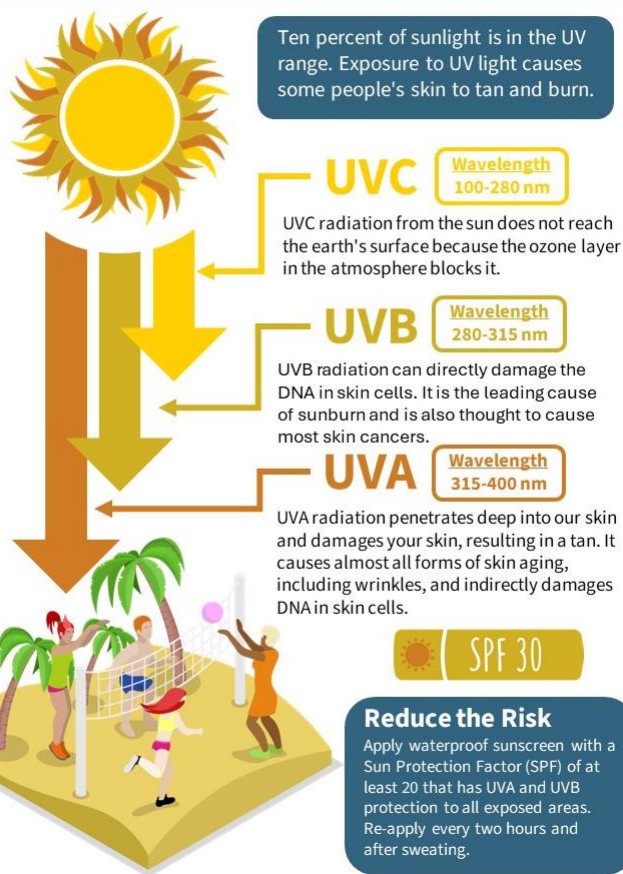
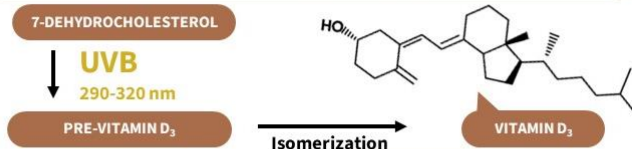


THE SUN AND UV RADIATION



THE SUNSHINE VITAMIN

Vitamin D is the sunshine vitamin. During exposure to sunlight, UVB photons enter the skin and photolyze 7-dehydrocholesterol to pre-vitamin D₃, which is then isomerized by the body's temperature to vitamin D₃.



Good Sources

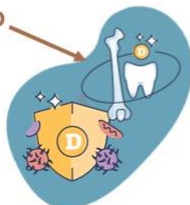
UVB rays from the sun cause the body to produce vitamin D. Optimal exposure is 5 to 30 minutes.

Food sources of vitamin D are fatty fish, eggs, beef liver, and mushrooms.

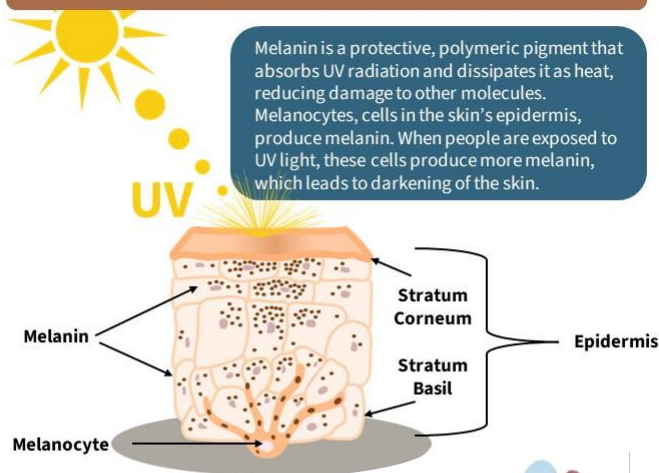
Function

Vitamin D is essential for maintaining healthy bones and teeth. That's because your body can only absorb calcium, the primary component of bone, when vitamin D is present. Vitamin D also regulates inflammation and immune function.

VITAMIN D



MELANIN PRODUCTION AND TANNING



Reduce the Risk

In addition to wearing sunscreen, remember to cover and protect your skin with broad-brimmed hats, lightweight long-sleeved shirts, and long pants. Wear UV-blocking sunglasses to protect your eyes.



DNA DAMAGE AND SUNBURNS

UV radiation can directly damage DNA by causing two types of DNA lesions. The first type causes bases to react with each other, forming products like cyclobutane pyrimidine dimers (CPDs); the second type produces 6-4 photoproducts (6-4PPs). Both types of lesions distort DNA structure, which can impede transcription and replication. The light can also damage DNA indirectly when excited melanin generates reactive oxygen species.

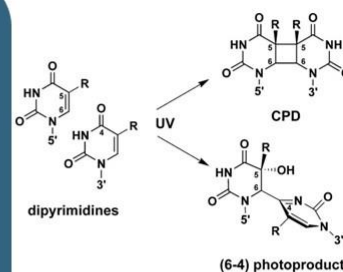


Image from reference 4



DNA-repair enzymes can fix damaged DNA by removing and correcting defective sections. But if cells become too damaged, they self-destruct, signaling immune cells with proteins, including prostaglandins and cytokines. These proteins cause increased blood flow and inflammation, leading to pain, redness, and sunburn.

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