

Periodic graphics

A collaboration between C&EN and
Andy Brunning, author of the popular
graphics blog **Compound Interest**

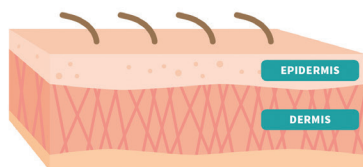
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To see more of
Bunning's work, go
to **compoundchem.com**. To see all of
C&EN's Periodic
Graphics, visit **cenm.ag/periodicgraphics**.

DO ANTIAGING CREAMS WORK?

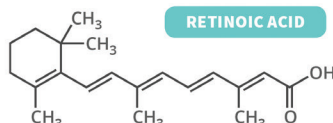
Antiaging creams promise to make your skin look younger and help reduce the appearance of wrinkles. Here, we look at some of the active ingredients and whether there is any evidence for their effects.

WHAT CAUSES WRINKLES?



The dermis layer in the skin contains collagen, a protein produced by cells that imparts strength and elasticity. The production of collagen slows as you age, and this can lead to the appearance of wrinkles. Ultraviolet radiation from the sun can penetrate the skin and accelerate wrinkle formation by degrading collagen.

RETINOIDS



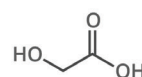
PROPOSED MECHANISM

Retinoids act on retinoic acid receptors and retinoid X receptors in cells, increasing the production of collagen. They thicken the dermis where wrinkles start to form.

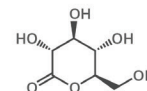
THE EVIDENCE

These are considered the gold standard in antiaging but must be used for months to take effect and can irritate the skin.

α -HYDROXY ACIDS (AHAs) & POLYHYDROXY ACIDS (PHAs)



GLYCOLIC ACID (AHA)



GLUCONOLACTONE (PHA)

PROPOSED MECHANISM

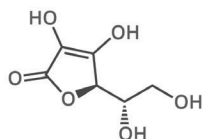
AHAs and PHAs are exfoliants that strip dead skin cells from the epidermis. It's suggested that they boost collagen production, though exactly how is unknown.

THE EVIDENCE

Many clinical studies have shown their ability to lessen wrinkles. Issues with AHAs include skin irritation and UV sensitivity.

VITAMINS C & E

VITAMIN C



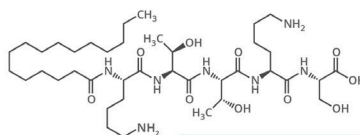
PROPOSED MECHANISM

Vitamins C and E are antioxidants. They protect the skin from destructive free radicals produced by UV exposure that can damage skin cells and collagen.

THE EVIDENCE

Vitamin C has been proven to reduce wrinkles on human skin, but clinical evidence in support of using vitamin E is more limited.

PEPTIDES



PALMITOYL PENTAPEPTIDE-4

PROPOSED MECHANISM

Peptides are made of amino acids. Certain types stimulate the synthesis of collagen in the dermis. Binding them to fatty acids increases their ability to penetrate the skin.

THE EVIDENCE

Both laboratory and human studies have demonstrated the antiwrinkle efficiency of some peptides used in antiaging creams.

DO THEY WORK?

A number of the ingredients in antiaging creams seem to have evidence for efficacy. However, scientific trials on specific over-the-counter formulations are more limited. And any improvements seen are usually modest rather than drastic.



Studies suggest 80% of visible facial aging is caused by exposure to UV rays from the sun. Wearing sunscreen prevents not only sunburn but also the aging effects caused by UV exposure.



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