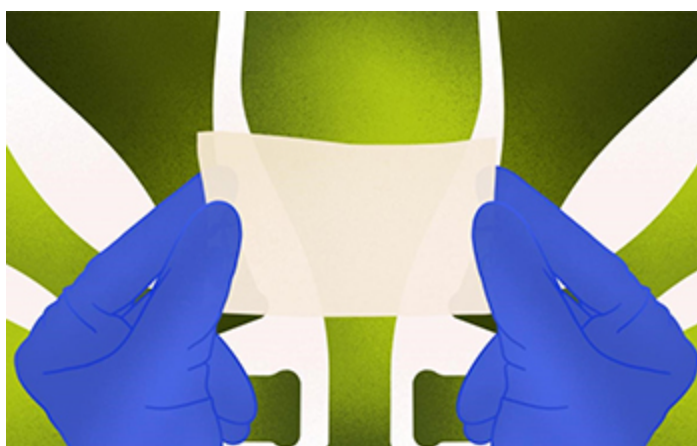




Research News

Nanofibers linked to a red wine chemical could help prevent oxidation

Mesh-like mats can help promote prolonged antioxidant activity



New mesh-like mats deliver antioxidant activity over prolonged periods.

[Credit and Larger Version \(/discoveries/disc_images.jsp?cntn_id=300573&org=NSF\)](#)

May 13, 2020

Spoiling foods, souring wine and worsening wounds have a common culprit -- a chemical reaction called oxidation. Although the ill effects of these chemical reactions can be curtailed by antioxidants, creating a sturdy platform capable of providing prolonged antioxidant activity is an ongoing challenge.

National Science Foundation <https://www.nsf.gov/awardsearch/showAward?AWD_ID=1905535&HistoricalAwards=false> -funded researchers at [Texas A&M University \(/cgi-bin/good-bye?https://today.tamu.edu/2020/05/06/mats-made-from-nanofibers-linked-to-a-red-wine-chemical-could-help-prevent-oxidation/\)](#) might have solved this problem with new antioxidant mats. Made from an intertwined network of ultra-fine strands of a polymer and an antioxidant found in red wine, the mats are strong, stable and capable of delivering antioxidant activity for prolonged periods of time, the researchers said.

"Our innovation is that we have fine-tuned the steps needed to spin defect-free, ultra-microscopic fibers for making high-performing antioxidant mats," said Adwait Gaikwad, a primary author of the study. "Each fiber is linked to several antioxidant molecules, so the final mat, which is made of millions and millions of such fibers, has enhanced antioxidant functionality."

Added Andy Lovinger, a program director in NSF's Division of Materials Research, "NSF has been supporting research on nanolayer polymer materials, and this latest application in antioxidants demonstrates the versatility of polymers in addressing a broad spectrum of societal needs."

The study was published in the journal *ACS Applied Materials & Interfaces* ([/cgi-bin/good-bye?https://pubs.acs.org/doi/10.1021/acsami.9b23212](https://pubs.acs.org/doi/10.1021/acsami.9b23212))

Although oxidation is a common natural phenomenon, it can be detrimental if left unchecked. In alcoholic beverages, too much oxidation leads to the formation of acetaldehyde from the alcohol, altering the drink's taste, color and aroma. In the body, oxidative stress causes a buildup of free radicals that can harm healthy cells and body tissue.

However, oxidative reactions can be kept under control by the action of antioxidants. Antioxidant compounds readily combine with ambient oxygen or donate electrons to neutralize charged radicals. Among many antioxidants, a molecule in red wine called tannic acid is also antibacterial and antiviral. The researchers said these remarkable properties are a result of groupings of atoms called polyphenols in tannic acid's molecular structure.

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