

Video: "Smart" packaging kills harmful bacteria, keeps produce fresh

Marie Donlon | January 18, 2022



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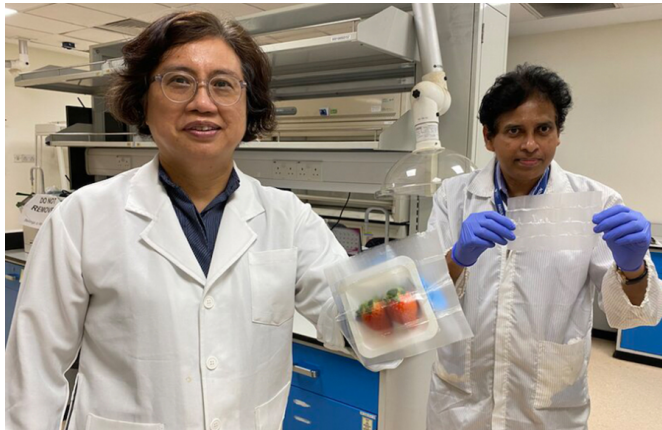
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Teams from Nanyang Technological University (NTU Singapore) and Harvard T.H. Chan School of Public Health have developed a smart packaging material that extends the shelf life of produce and kills harmful microbes.

The biodegradable packaging is comprised of the corn protein zein, starch and naturally derived polymers infused with natural microbial compounds including oil from the herb thyme and citric acid from citrus fruits.



Source: NTU Singapore

Via electrospinning — a method of fiber production that applies electric force to draw charged threads of polymer solutions up to fiber diameters in the order of some hundred nanometers — the zein and the antimicrobial compounds were combined with cellulose and acetic acid to form the packaging material.

When exposed to an increase in humidity or enzymes from harmful bacteria in the lab during testing, the packaging fibers reportedly released the antimicrobial compounds, killing dangerous bacteria that contaminate food — for instance, *E. coli*, *Listeria* and fungi. According to its developers, the material is triggered only by the addition of humidity and the presence of harmful bacteria.

In the lab, researchers also demonstrated that the packaging extended the shelf life of strawberries to seven days from their typical three to four days in traditional packaging.

The study, Enzyme- and Relative Humidity-Responsive Antimicrobial Fibers for Active Food Packaging, appears in the journal *ACS Applied Materials and Interfaces*.