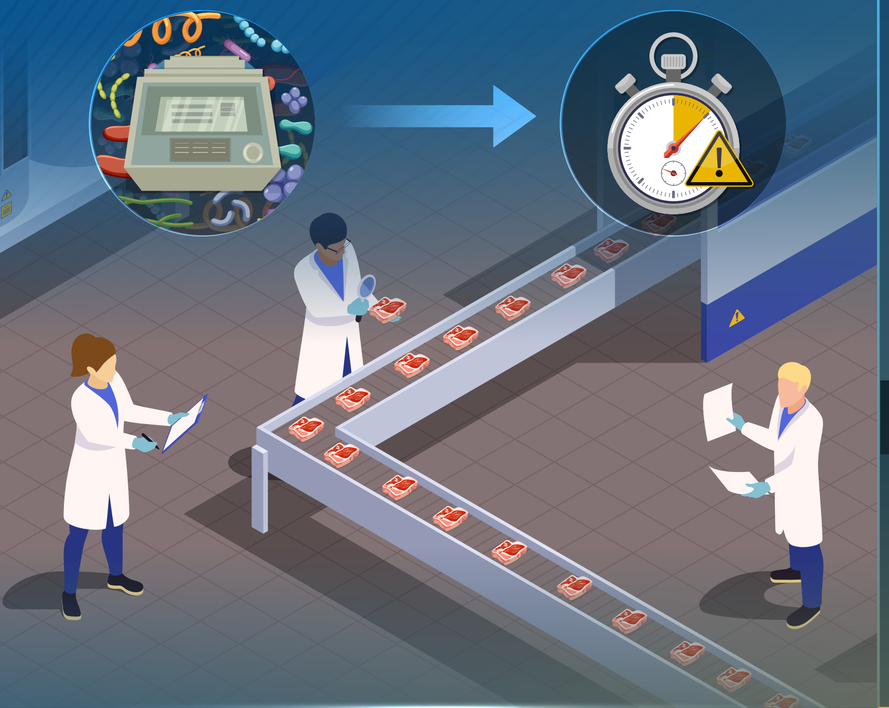
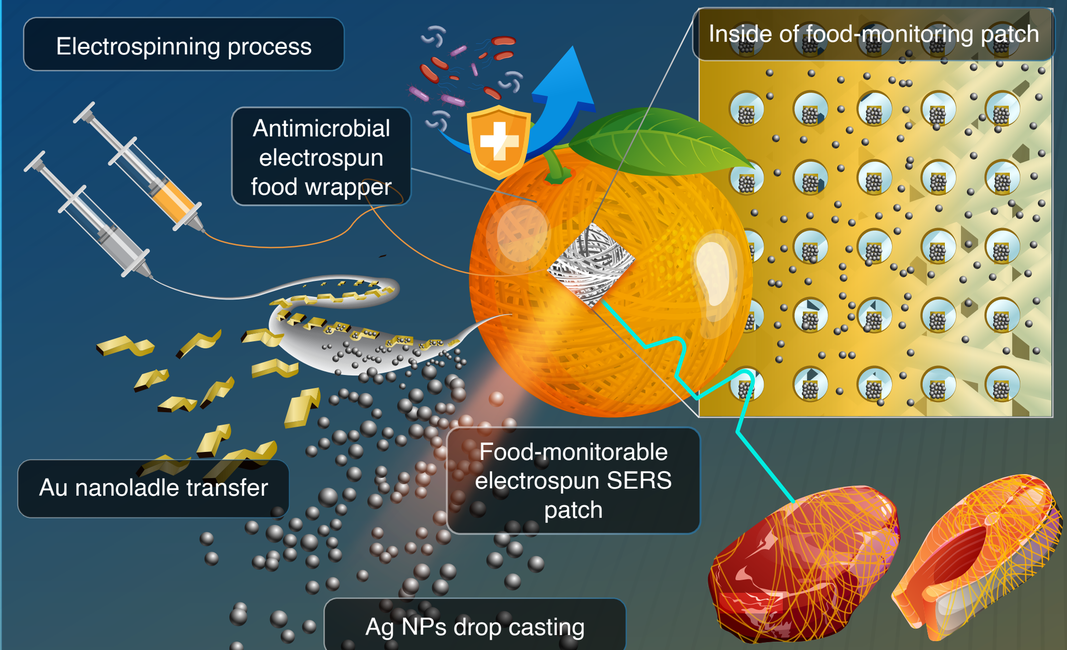
Smart Food Quality Monitoring and Preservation Using Nano-structured SERS Sensor-Integrated Antimicrobial Wrapper

While food quality and safety have become important in the current era of wellness, traditional food-monitoring methods are often destructive and time-consuming, with limited practical application



SERS sensing, a real-time, non-destructive, and sensitive food-monitoring technique, is a promising alternative to traditional methods

Fabrication and application of a nanostructured SERS sensor integrated into a stretchable and antimicrobial wrapper (NSSAW)



Nanostructured SERS sensor

- Up to 30.11-fold enhancement in Raman signal
- Real-time, non-destructive detection of nutritional content, freshness, and toxicants in food

Curcumin-based electrospun

- Highly stretchable and conformal
- Strong antimicrobial activity

NSSAW

- Detects purines, proteins, lipids, and carotenoids in food
- Tracks and delays spoilage progression via the bacterial emission marker, dimethyl disulfide
- Prevents microbial growth and enhances food preservation

SERS: Surface-enhanced Raman scattering; Au: Gold; Ag: Silver; NPs: Nanoparticles

NSSAW holds the potential to replace traditional food packaging materials, enabling smart food monitoring and preservation, and ultimately contributing to improved food safety and quality

SERS Sensor Integrated in Stretchable and Antimicrobial Wrapper for Food Quality Monitoring and Preservation
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