

**Just a spoonful of nanoparticles:
Enhancing antioxidant activity
with polymeric delivery systems.**

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RII: Louisiana Alliance for
Simulation-Guided Materials
Applications (LA-SiGMA)
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***What is the outcome or
accomplishment?***

A team of researchers led by Dr. Cristina Sabliov at Louisiana State University Agricultural Center is researching the use of nanoparticles as a delivery system for antioxidants. The team is systematically testing the properties of the nanoparticles, such as solubility, toxicity and stability, to confirm that pharmaceutical companies will be able to successfully adopt the materials to make vitamins that can be swallowed in pill or liquid form.

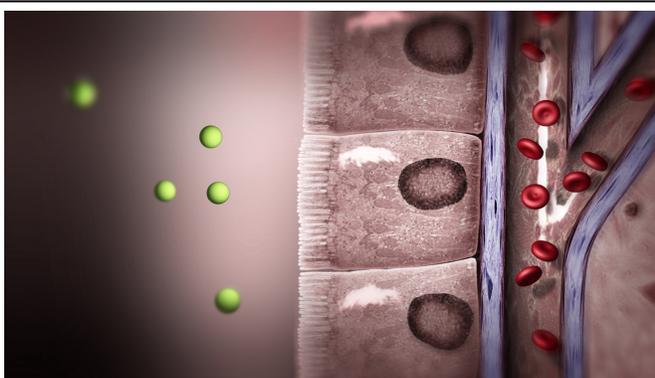
The nanoparticles used in the experiments are made out of a special polymer that entraps the antioxidants inside. Once ingested, the nanoparticles travel to the gut, where they release the antioxidants, enhancing the cellular uptake of the antioxidant and improving drug efficacy and stability. This application is less toxic to the patient because the nanoparticles are biodegradable, safely dissolving away over time, and biocompatible, not causing any undesirable reactions while inside the body.

What is the impact?

Targeted delivery of antioxidants will improve their effectiveness in the prevention and treatment of degenerative and cardiovascular diseases, like Alzheimer's disease, cancer, stroke, and atherosclerosis.

***What explanation/background does the lay
reader need to understand the significance of
this outcome?***

Nanoparticles are not only extremely small in size (1-100 nanometers), they are quite multifunctional. Their properties can be engineered to create new functionalities, such as "hydrophobicity," which determines whether the nanoparticle is attracted to water or fat, control of the vitamin release time, and improved biological interactions.



***Illustration of nanoparticles in proximity to
intestinal cells where the antioxidants contained
inside will be released.***

*Credit: Matthew Faust, Louisiana State University
AgCenter, lsu.faust@gmail.com.*



***Dr. Cristina Sabliov preparing
samples for testing.***

*Credit: Dr. John Wozniak, Louisiana
State University AgCenter,*