United States Department of Agriculture
National Institute of Food and Agriculture
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PROJECT DESCRIPTIONS

USDA AWARDS $3.8 MILLION IN GRANTS FOR NANOTECHNOLOGY RESEARCH

THE U.S. DEPARTMENT OF AGRICULTURE'S (USDA) NATIONAL INSTITUTE OF FOOD AND AGRICULTURE (NIFA) announced on April 27, 2015 $3.8 million in funding to support grants focused on using nanotechnology to find solutions to societal challenges such as food security, nutrition, food safety, and environmental protection. The awards were made through NIFA's Agriculture and Food Research Initiative (AFRI), which is authorized by the 2014 Farm Bill.

University of Georgia, *Athens, GA*
$496,192 | Develop bio-nanocomposites-based, disease-specific, electrochemical sensors for detecting fungal pathogen-induced volatiles in selected crops with high sensitivity, ultra-low detection limits, and minimal interference. The project will also include the development of a smartphone application, bio-nanocomposite based electrodes, improved sensing platform, and a device for practical demonstration.

University of Iowa, *Iowa City, IA*
$496,180 | Support fundamental work to investigate a disruptive new method of the purification of vegetable oils and fatty acids. The purifications will be based on polymeric membranes that can complete separations that are currently impossible. This work has the potential to find wide applications in the purifications of vegetable oils and fatty acids so they can be used to develop new green products.

University of Kentucky, *Lexington, KY*
$450,000 | Investigate all aspects of flavonoid isolation nanoharvesting, so that it can be optimized and used to its full potential. The successful completion of this research will yield the information needed to establish the nanoharvesting method as a breakthrough approach to flavonoid research and flavonoid applications.

University of Massachusetts, *Amherst, MA*
$444,200 | Develop a platform for pathogen detection in foods that is superior to the current detection method in terms of analytical time, sensitivity, and accuracy using a novel, label-free, surface-enhanced Raman scattering (SERS) mapping technique. With the developed SERS platform, bacterial cells from food samples can be concentrated, identified, and quantified before distribution.

North Dakota State University, *Fargo, ND*
$149,714 | Design and employ permeable polymers to entrap nanoparticles (NP) that absorb hydrogen sulfide (H2S) from manure while reducing biocidal properties; quantify H2S and greenhouse gas emissions; determine the chemical and biological reactions controlling these emissions during anaerobic storage of manure in the presence of silver and zinc NPs; and study the fate and transport of NPs in livestock manure.

Rutgers University, *New Brunswick, NJ*
$450,000 | Complete a national survey that will examine the acceptance of food nanotechnology; assess consumers' beliefs about the relationship of nanotechnology to healthfulness; evaluate acceptability of nanomaterials in functional foods and pet food applications; examine the acceptable characteristics of nano-enabled smart food packaging; assess use value of visuals communicating the potential for nanotechnology; and examine how consumers use visuals to interpret nanotechnology concepts.

Pennsylvania State University, *University Park, PA*
$447,788 | Obtain a basic understanding of starch-nanoclay interactions in dispersion; evaluate the disintegration, release, and antimicrobial properties of cross-linked, crystallized, and iodine-loaded starch fibers; determine the effect of alignment and drawing on thermomechanical properties of starch fibers; and assess the feasibility of using a multi-jet electrospinning setup to scale the electrospinning process for starch fiber production.

West Virginia University, *Morgantown, WV*
$496,168 | Expound on the mechanisms of the thermostabilization of lignocellulosic cell walls and the oxidative transformation of the enhanced nanostructure into a precursor for highly-ordered mesoporous carbon (HOMC). A novel green technology will be developed to produce HOMC using the naturally-ordered nanostructure of lignocellulosic cell walls as a template.

University of Wisconsin, *Madison, WI*
$450,100 | Tailor polyanhydride nanoparticles to encapsulate and release antibiotics to protect shrimp against bacterial pathogens. Ultimately, this project will create a product that provides high-level protection with minimum dose, is environmentally stable, food safe, and can be rapidly adapted to respond to ever-evolving and emerging infectious disease issues in aquaculture.