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Nanotechnology in agriculture

Arti Goel
Amity University, India

Agriculture has long dealt with improving the efficiency of crop production, food processing, food safety and environmental consequences of food production, storage and distribution. Nanotechnology provides a new tool to pursue these historically relevant goals. Today in agriculture, if a plant or animal becomes infected with disease, it can be days, weeks, or months before disease presence is detected by whole-organism symptoms. By that time infection may be widespread and entire herds/fields might need to be destroyed. Nanotechnology operates at the same scale as a virus or disease infecting particle, and thus holds the potential for very early detection and eradication. Nanotechnology holds out the possibility that "Smart" treatment delivery systems could be activated long before macro symptoms appear. For example, a smart treatment delivery system could be a miniature device implanted in an animal that samples saliva on a regular basis. Long before a fever develops, the integrated sensing, monitoring and controlling system could detect the presence of disease and notify the farmer and activate a targeted treatment delivery system. Smart treatment delivery systems are envisioned for biology and bioactive systems such as drugs, pesticides, nutrients, probiotics, nutraceuticals and implantable cell bioreactors. In agriculture, the fundamental life processes are explored through research in molecular and cellular biology. New materials that have special characteristics at the nanoscale could offer a tremendous breakthrough for pathogen and contaminant detection.

Biography

Arti Goel received her Master's degree in Botany in 2003 and PhD degree in Microbiology in 2008 from Mohan Lal Sukhadia University, Udaipur (Rajasthan), India, then she entered to Central Arid Zone Research Institute, Jodhpur (Rajasthan) for a Postdoctoral Fellowship in Microbial Nanotechnology. Her research involved medicinal plants antimicrobial properties as well as synthesis, characterization and applications of microbially synthesized nanoparticles on agrosystem. Currently she is working as an Assistant Professor at Amity Institute of Microbial Biotechnology, Amity University, Noida (UP), India. Her publications in this field include research papers (National and International), articles (National and International) and patents (filed). Apart from this, she is the Managing Editor of a scientific magazine named as "Bioevolution" of GIAP's Publication India.

agoel2@amity.edu