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Focus in drug delivery using nano medicine

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Nanotechnology involves the engineering of functional systems. One of the most active research areas of nanotechnology is nanomedicine, which applies nanotechnology to highly specific medical interventions for the prevention, diagnosis and treatment of diseases. Currently, nanomedicine is dominated by drug delivery systems, accounting for more than 75% of total sales in our country. Eucalypts give nano-medicine a golden boost. Murdoch University researchers have developed a 'green' method to create antibacterial gold nanoparticles for potential use in the medical field with the help of common eucalyptus leaves. Gold nanoparticles have proven to be very versatile across a range of treatments, including in the delivery of double-stranded DNA in the emerging gene therapy area," Dr Poinern said. "They can also be passively accumulated in tumours for thermal treatment therapies, where they are heated to damage and kill cancer cells. "And studies have shown that cancer drugs bonded to the surface of gold nanoparticles can effectively target tumours, improving delivery and minimising treatment durations and the side effects of anticancer drugs". Dr Poinern said, however, that up until recently, the particles' production had involved expensive chemical and physical processes that often used toxic materials with potential hazards such as environmental toxicity, cytotoxicity and carcinogenicity. "Thanks to the *Eucalyptus macrocarpa*, we're changing that. Our method is water-based, performed at room temperature and without the need for complex equipment and is clean and non-toxic," he said. The 'green' production of gold nanometer scale particles involves dissolving high purity gold wire into a mixture of nitric and hydrochloric acid to produce gold chloride. The gold chloride is then mixed with a water-based solution of leaf extracts from the common *Eucalyptus macrocarpa* and allowed to synthesize at room temperature. "Not only does this result in the creation of nanometer scale gold prisms, but the wax of the eucalypt leaf extract provides an additional antibacterial and antifungal quality," Dr Poinern said. "Since bacterial and fungal species have the ability to develop immunity against commonly used antibiotics over time, our gold nanometer scale particles also stand to be a new tool against antibiotic resistant forms of microorganisms." Nanotechnology could be strategically implemented in new developing drug delivery systems that can expand drug markets. We focus mainly on the application of nanotechnology to drug delivery and highlight several areas of opportunity where current and emerging nanotechnologies could enable novel classes of therapeutics. We look at challenges and general trends in pharmaceutical nanotechnology, and we also explore nanotechnology strategies to overcome limitations in drug delivery. However, this article can only serve to provide a glimpse into this rapidly evolving field, both now and what may be expected in the future.

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Response of gherkin to combined application of organic manures and biofertilizers

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The study was carried out at the Students Farm, College of Agriculture, Rajendranagar, Hyderabad during April to December 2007 and 2008 to find out the response of combined application of organic manures and biofertilizers on growth, yield and quality of gherkin (*Cucumis anguria* L.). The experiment was laid out in randomized block design with three replications using recommended dose of fertilizers, organic manures viz., vermicompost (10, 14 and 18 t/ha), castor cake (3, 4.2 and 5.4 t/ha), neem cake (3, 4.2 and 5.4 t/ha) combined with biofertilizers (*Azotobacter* and Phosphate solubilizing bacteria each @ 2 kg/ha) and control. Pooled results revealed that, higher growth, yield and quality parameters were recorded with application of recommended dose of fertilizers (150 N: 75 P: 150 K kg/ha) and were on par with the treatment receiving vermicompost 18t/ha + Biofertilizers when compared to control.

Biography

Y. Bindiya completed her Ph.D. in Horticulture, and nearly 10 articles are published by her. Now she is working as Senior Research Fellow in Precision Farming Development Centre, ANGRAU, Hyderabad.

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