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Nanobiotechnology : What? Why? How?

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Nanotechnology is the manipulation or self-assembly of individual atoms, molecules, or molecular clusters into structures to create materials and devices with new or vastly different properties. Nanotechnology can work from the top down (which means reducing the size to the nanoscale e.g. marble block to a statue or the bottom up (which involves manipulating individual atoms and molecules into nanostructures ie. we add matter till we end with the final or the desired product. Nanotechnology has been described as the new industrial revolution and both developed and developing countries are investing heavily in this technology to secure a market share.

The economy of the future will be a "knowledge-based economy" and maximizing knowledge through education, research and innovation will be important goals. Nanotechnology has a vast potential to revolutionize the critical sectors of the economy viz. health and agriculture: the subjects chosen for this talk. New tools for the treatment of diseases, disease detection, smart sensors and smart delivery systems for both mankind and agriculture are being developed and it will help to combat the viruses and other pathogens that effect both humans and the

agriculture sector. It is expected that In the near future it will become possible through nanotechnology to increase the efficiency of drugs and pesticides and yet using lower doses. In the recent years applications of nanoscale biotechnology to food systems have been identified and are being pursued. Some of the studies are directed towards developing nano-sensing technology for detecting trace components in food, preserving food nutrients for an extended term and developing technology for preserving functional components without negatively impacting the palatability of food.

The talk will cover what is nanobiotechnology, why we study nanobiotechnology and how to create the nanoengineered materials and what we can expect to get out of nanobiotechnology. The work in some of these areas being carried out at the Indian Institute of Chemical Technology will also be covered.