

# Application of Nanotechnology

**Assoc. Prof. Mohamed Frahat Foda**

**Associate Professor of Biochemistry, Agriculture Biochemistry Department,**

**Faculty of Agriculture, Benha University, Egypt**

**Email: [m.frahat@fagr.bu.edu.eg](mailto:m.frahat@fagr.bu.edu.eg)**

**Univ. Website: Dr. Mohamed Frahat Foda**

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# Applications of Nanotechnology

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# Applications of Nanotechnology in

## 1. Agriculture

**Nanoagrochemicals**, such as nanopesticides, nanofertilizers or plant growth stimulating nanosystems, were primarily designed to:

- a) Increase solubility,
- b) Enhance bioavailability,
- c) Targeted delivery,
- d) Controlled release and/or protection against degradation resulting in the reduced amount of applied active ingredients and finally in a decrease of dose-dependent toxicity/burden.



# Applications of Nanotechnology in

## 2. Medicine

Researchers are developing customized nanoparticles the size of molecules that can deliver drugs directly to diseased cells in your body. When it's perfected, this method should greatly reduce the damage treatment such as chemotherapy does to a patient's healthy cells.



# Applications of Nanotechnology in

## 3. Electronics

Nanotechnology holds some answers for how we might increase the capabilities of electronics devices while we reduce their weight and power consumption.



# Applications of Nanotechnology in

## 4. Food

Nanotechnology is having an impact on several aspects of food science, from how food is grown to how it is packaged. Companies are developing nanomaterials that will make a difference not only in the taste of food, but also in food safety, and the health benefits that food delivers.



# Applications of Nanotechnology in

## 5. Fuel Cells

Nanotechnology is being used to reduce the cost of catalysts used in fuel cells to produce hydrogen ions from fuel such as methanol and to improve the efficiency of membranes used in fuel cells to separate hydrogen ions from other gases such as oxygen.





# Applications of Nanotechnology in

## 6. Solar Cells

Companies have developed nanotech solar cells that can be manufactured at significantly lower cost than conventional solar cells.



# Applications of Nanotechnology in

## 7. Batteries

Companies are currently developing batteries using nanomaterials. One such battery will be a good as new after sitting on the shelf for decades. Another battery can be recharged significantly faster than conventional batteries.



# Applications of Nanotechnology in

## 8. Space

Nanotechnology may hold the key to making space-flight more practical. Advancements in nanomaterials make lightweight spacecraft and a cable for the space elevator possible. By significantly reducing the amount of rocket fuel required, these advances could lower the cost of reaching orbit and traveling in space.



# Applications of Nanotechnology in

## 9. Fuels

Nanotechnology can address the shortage of fossil fuels such as diesel and gasoline by making the production of fuels from low grade raw materials economical, increasing the mileage of engines, and making the production of fuels from normal raw materials more efficient.



# Applications of Nanotechnology in

## 11. Better Water Quality

Nanotechnology is being used to develop solutions to three very different problems in water quality. **One challenge** is the removal of industrial wastes, such as a cleaning solvent called **TCE**, from groundwater. Nanoparticles can be used to convert the contaminating chemical through a chemical reaction to make it harmless. Studies have shown that this method can be used successfully to reach contaminants dispersed in underground ponds and at much lower cost than methods which require pumping the water out of the ground for treatment.



# Applications of Nanotechnology in

## 12. Better Air Quality

Nanotechnology can enable sensors to detect very small amounts of chemical vapors. Various types of detecting elements, such as **carbon nanotubes**, **zinc oxide nanowires** or **palladium** nanoparticles can be used in nanotechnology-based sensors. Because of the small size of nanotubes, nanowires, or nanoparticles, a few gas molecules are sufficient to change the electrical properties of the sensing elements. This allows the detection of a very low concentration of chemical vapors.



# Applications of Nanotechnology in

## 13. Sporting Goods

If you're a tennis or golf fan, you'll be glad to hear that even sporting goods has wandered into the nano realm. Current nanotechnology applications in the sports arena include increasing the strength of tennis racquets, filling any imperfections in club shaft materials and reducing the rate at which air leaks from tennis balls.



# Applications of Nanotechnology in

## 14. Fabric

Making composite fabric with nano-sized particles or fibers allows improvement of fabric properties without a significant increase in weight, thickness, or stiffness as might have been the case with previously-used techniques.





**THANK YOU**