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## Exciting Real-World Applications of Nanotech

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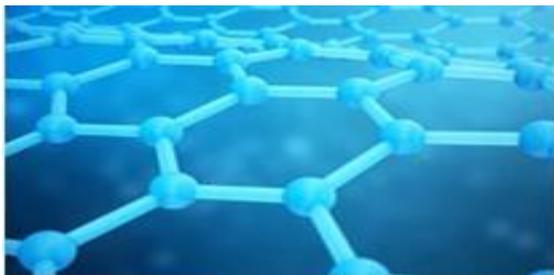
### Abstract

Nanotechnology is an exciting new area of science, with many available applications in this modern world. This article is dedicated to new evolving applications of nanotech, their importance, advantages to human beings, and so on.

**Keywords:** Future, nanotechnology, applications, advantages.

### INTRODUCTION

Nanotechnology is one of the most hotly discussed topics in science and technology today, and with good reason. Shrinking objects to nearly unimaginably tiny dimensions (a billionth of a meter) open the doors for powerful technologies that could impact all areas of our lives. The potential applications of nanotechnology are diverse, reaching areas like robotics, energy, medicine, artificial intelligence, and more. With this in mind, let's dive into the real-world applications of nanotechnology and its effects on people in this informative and scientific article.



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### APPLICATIONS OF NANOTECHNOLOGY

#### Tiny Robot Doctors

Perhaps the most exciting nanotech application is in medicine, where nanoparticles can be used to fight disease. We've already seen significant progress in this area, with developments like the fluorescent dye that can attach to specific molecules in the blood. Research is also advancing in nanoparticles for chemotherapy, wherein nanoparticles will attack tumor sites while leaving the rest of the body unharmed<sup>1</sup>.

While cancer seems to be a primary focus right now, scientists believe that nanobots could one day be used to conduct a range of other activities like solving dietary issues, reducing plaque in veins, and even constantly monitoring your body for signs of disease.

<sup>1</sup><https://www.labiotech.eu/in-depth/nanobots-drug-delivery/>

## **Food and Agriculture**

Nanotechnology has a wide range of promising applications for food science. For example, some scientists have proposed putting tiny particles of silver into foods to act as an antibacterial agent<sup>2</sup>. This could vastly elongate the life of fruits and vegetables and reduce food waste. As another example, agricultural scientists are working on nanofertilizers and nanopesticides to tailor specific nutrient levels in soils and protect against pests and microbial diseases<sup>3</sup>. These applications could dramatically increase crop viability and yields.

## **Computing and Data Storage**

Nanotechnology will enable us to create more powerful, lightweight computers with larger memory while functioning at cooler temperatures.

The field of big data is rapidly advancing right now. However, the number of valuable patterns and insights we can extract from the data we collect is limited by our ability to store data. Nanotechnology solves this problem by allowing for ultra-dense memory storage<sup>4</sup>.

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<sup>2</sup><https://carrington.edu/blog/benefits-nanotechnology/>

<sup>3</sup><https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5476687/>

<sup>4</sup><https://www.easytechjunkie.com/what-is-the-role-of-nanotechnology-in-computers.htm>

## **Miniscule Electronic Sensors**

Beyond the body, nanosensors could be used to monitor the health of critical societal infrastructures like bridges, nuclear reactors, and aircraft<sup>5</sup>.

## **Cleaning Up the Environment**

Environmental issues are a pressing concern in the modern world, and scientists are looking to technology, specifically nanotechnology, to help. Most of the focus in this area is around nanofilters that could remove pollutants and even bacteria and viruses from water<sup>6</sup>.

## **Reduced Dependence on Non-Renewable Energy Sources**

Almost all areas of renewable energy have the potential to become more efficient with nanotechnology. For example, scientists discovered that nanoparticles allow for unused solar energy to be stored as hydrogen, thereby reducing waste, and allowing for further power extraction during times of low solar activity<sup>7</sup>.

## **Advantages of Nanotech and Its Effects on People**

To summarize and really bring home the points we touched on in the last section, here are the most significant advantages of nanotech for people.

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<sup>5</sup><https://arstechnica.com/science/2010/04/feasibility-of-nanosensors-for-monitoring-infrastructure/>

<sup>6</sup><https://www.sciencedirect.com/topics/engineering/nanofilters>

<sup>7</sup><https://www.azocleantech.com/article.aspx?ArticleID=933>

- Faster computing and better electronic devices.
- Significant advances in treating human diseases, like cancer and heart disease.
- Moving away from non-renewable energy sources and developing more energy-efficient fuel products.
- Improved food security.
- A cleaner Earth.

### **How Soon Will Nanotech Come?**

The question of how soon we will see this potent emerging technology shape our human experiences depends on several factors. For example, scientists have multiple significant obstacles to overcome regarding how objects behave at tiny scales.

Shrinking devices can dramatically impact their performance, with atoms and molecules behaving strangely at nanoscales. Inherent physical properties like reactivity, melting point, and conductivity are drastically different at these scales. For this reason, significant study into materials and how they perform at small scales will be critical to the success of nanotech in the coming decades.

Dedicated areas of nanotechnology will also have unique challenges that could take varying degrees of time and resources to solve. For example, some scientists are concerned that nanoparticles are so small that they could cross the blood-brain barrier

and enter our bloodstreams. In other words, they could be poisonous<sup>8</sup>.

Ethical concerns around the potential to create increasingly powerful lethal weapons also come into play.

The question of how soon we'll see measurable and transformative impacts of nanotechnology in our lives isn't just one of technology. Make no mistake; the technology is rapidly advancing, and the sector is growing every year. By 2026, the medical nanotechnology market alone is projected to reach an eye-watering \$461,252 million<sup>9</sup>.

However, if scientists can overcome both the technological and social challenges facing nanotech, the technology could be just around the corner. Futurist Ray Kurzweil argues that in 20 to 30 years<sup>10</sup>, advancements in medical nanotechnology could make us close to immortal, with common diseases like Alzheimer's, diabetes, and obesity being wiped out.

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<sup>8</sup><https://science.howstuffworks.com/nanotechnology5.htm>

<sup>9</sup><https://seedscientific.com/19-magnificent-nanotechnology-statistics-for-2022/>

<sup>10</sup><https://www.computerworld.com/article/2528330/nanotech-could-make-humans-immortal-by-2040--futurist-says.html>