

Category of Nanomaterials	Description	Application
<b>Carbon-Based</b>	Carbon-based nanomaterials include fullerenes, carbon nanotubes, graphene and its derivatives, graphene oxide, nanodiamonds, and carbon-based quantum dots.	Due to their unique structural dimensions and excellent mechanical, electrical, thermal, optical and chemical properties, these materials have attracted significant interest in diverse areas, including biomedical applications.
<b>Ceramic</b>	Ceramic nanoparticles are inorganic solids made up of oxides, carbides, carbonates and phosphates.	These nanoparticles have high heat resistance and chemical inertness. They have applications in photocatalysis, photodegradation of dyes, drug delivery, and imaging.
<b>Metal</b>	Metal nanoparticles are prepared from metal precursors.	These nanoparticles have applications in research areas, detection and imaging of biomolecules and in environmental and bioanalytical applications.
<b>Semiconductor</b>	Semiconductor nanoparticles have properties like those of metals and non-metals. These particles have wide bandgaps, which on tuning shows different properties.	They are used in photocatalysis, electronics devices, photo-optics and water splitting applications.
<b>Polymeric</b>	Polymeric nanoparticles are organic based nanoparticles. Some of the merits of polymeric nanoparticles are controlled release, protection of drug molecules, ability to combine therapy and imaging, specific targeting	They have applications in drug delivery and diagnostics. The drug deliveries with polymeric nanoparticles are highly biodegradable and biocompatible.
<b>Lipid-Based</b>	Lipid nanoparticles are generally spherical in shape with a diameter ranging from 10 to 100nm. It consists of a solid core made of lipid and a matrix containing soluble lipophilic molecules. The external core of these nanoparticles is stabilized by surfactants and emulsifiers.	These nanoparticles have application in the biomedical field as a drug carrier and delivery and RNA release in cancer therapy.

Source: "[What are the Different Types of Nanoparticles?](#)" by Unmesha Ray (Published June 30, 2018) (Last visited: April 2, 2021)