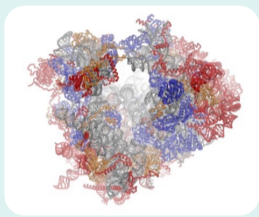


What is Bionanotechnology?

Bionanotechnology explores nanoscale structures, natural or synthetic hybrids, bringing them from lab to applications. From organic to inorganic/carbon and hybrids, nanomaterials are changing how we monitor our health, develop therapies, design new batteries and catalysts for sustainable manufacturing, and capture carbon.

Nature loves nano!

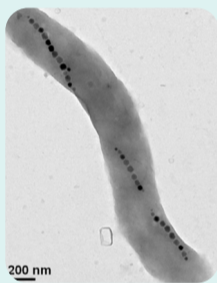
There are plenty examples of nanostructures occurring in nature.



Ribosome proteins – at just 25 nm across – are miniature machines that are essential to the translation of DNA information into protein structures.

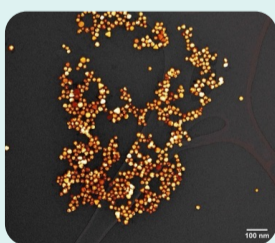
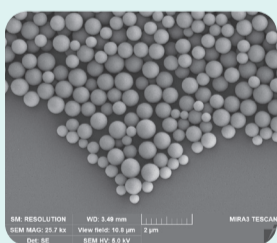
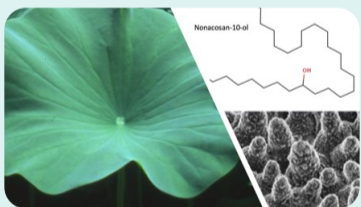


Gecko feet use tiny nanobrushes that make them sticky enough for the animal to walk on walls and ceilings

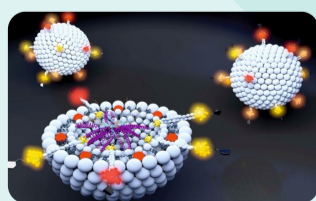


Magnetotactic bacteria use magnetic nanomaterials to align themselves to the Earth's magnetic field

The nanocrystals on the lotus plant leaf create nanostructures which are water repellent protecting the leaf from dirt or damaging water-loving bacteria or viruses. The leaf is self-cleaning.



Nanoparticles made from metals like gold and iron are used in industrial and biomedical processes, including environmental decontamination, catalysis, cancer treatment, drug delivery and Magnetic Resonance Imaging.

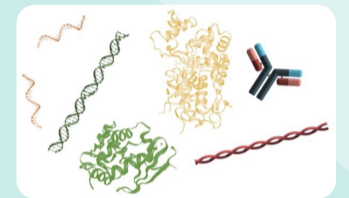


Nanocarriers such as lipid or polymeric nanoparticles are used to encapsulate drugs and deliver them specifically to diseased cells or pathogens.

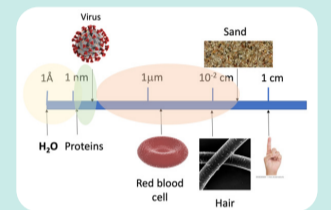
Nano loves Bio!

Nano-bio hybrids are changing fields ranging from medicine to sustainable manufacturing

Nanotechnology uses the special properties of chemical and biological materials that exist at the 'nanoscale' – between approximately 1 and 100 nanometres (nm) long.



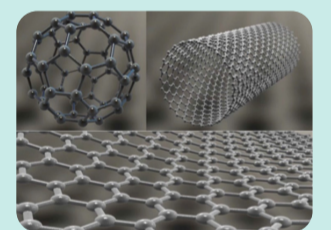
A nanometre is a million times smaller than a millimetre. It's the best unit of measurement for many important molecules in chemistry and biology, as well as bacteria and viruses.



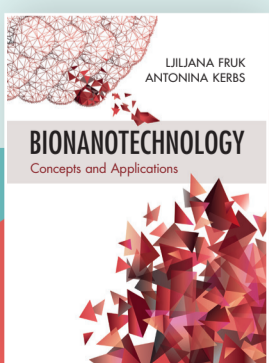
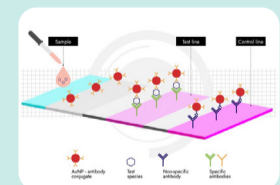
There are lots of applications of nanotechnology, and it's a thriving area of research, with numerous recent Nobel Prizes awarded to researchers in nanotechnology.



One of the best known nanomaterials is Graphene: a sheet of single atoms about a nanometre thick, it has a higher tensile strength than steel and is a better conductor of electricity and heat. It has applications in biomedical science, materials science, electronics and many more areas



One example of Bionanotechnology in action is lateral flow immunoassay, which has gained a degree of public recognition for its role in the lateral flow kits used in COVID testing.



Read more about **Bionanotechnology** in this book by Ljiljana Fruk and Antonina Kerbs



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