



Department of Chemistry
Haflong Government College

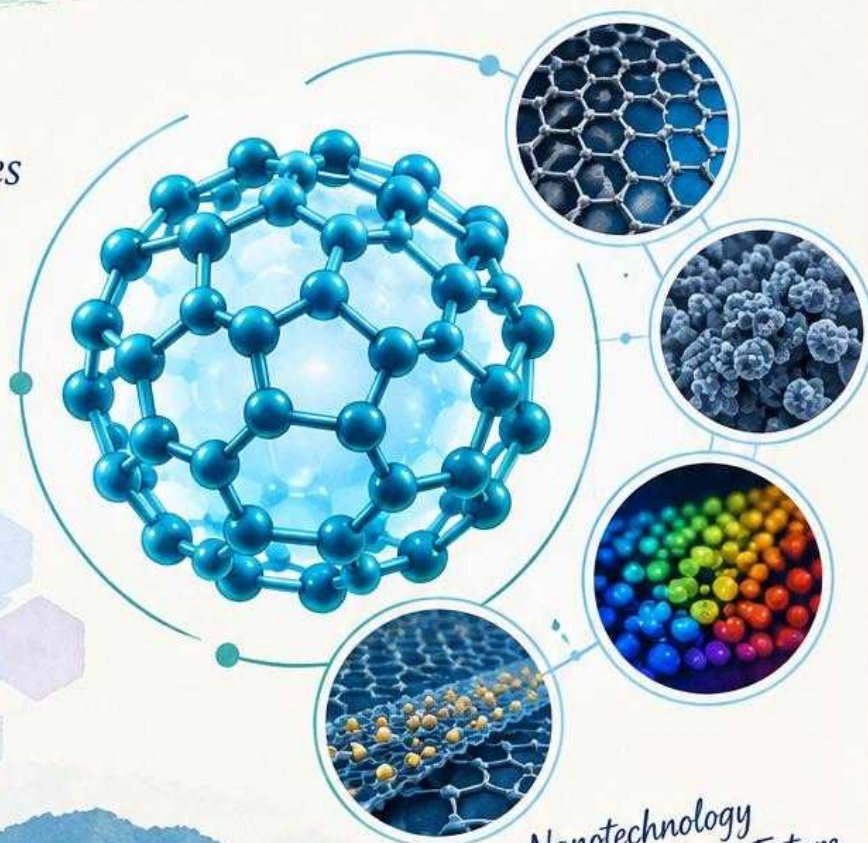
Inspire • Explore • Create

Wall Magazine

Theme:

Nanotechnology

*Tiny Particles...
Big Possibilities*



*Nanotechnology
for a Sustainable Future*



Nanotechnology in biomedical remediation :

Nanotechnology in biomedical remediation refers to the use of nanoscale materials (1 to 100 nanometres) to neutralize, remove or detoxify harmful substances from biological systems. Key applications of the use of nanotechnology in the biomedical field are-

Drugs development and therapy :

Drugs development is a nanoscale activity. The class of drugs which includes aspirin, the anti-cancer drug cis-platin and complex molecules like beta blockers or anti-inflammatories such as cortisone are nanoscale drugs. Drug therapy has had a number of successes, such as in the development of drugs now used in AIDS therapy. One of the major impacts of nanoscience and nanotechnology is in facilitating development of entirely new drugs with fewer side effects and more beneficial behaviour.

Nanotechnology is very useful in developing entirely new schemes for increasing bio availability and improving drug delivery. For example, molecules can be encapsulated within nanoscale cavities inside polymers. The polymer can then be swallowed as part of a tablet, and as the polymeric structure opens within the body, the enclosed drugs can be released.

Nanoluminescent Tags :

Nanoluminescent tags are quantum dots (2-10 nm) attached to proteins to help them penetrate cell walls. These quantum dots have nanoscale optical properties and can be made from bio-inert materials.

Different-sized quantum dots fluoresce at different frequencies, allowing multiple tags to be detected using a single light source. They overcome the limitations of traditional organic dyes, such as toxicity and inability to use multiple colours simultaneously.

~~This version is much shorter but keeps the main~~

Treatment of Cancer by Nanotechnology

Nanotechnology is revolutionizing modern medicine by using extremely small materials, generally 1-100 nanometres in size, to diagnose, prevent, and treat diseases. This field, known as nanomedicine, offers new possibilities for more precise and effective healthcare.

Targeted Cancer Treatment

Some nanoparticles can be designed to recognise features found on cancer cells. This allows the treatment to be directed more specifically towards the tumor instead of affecting all cells equally.

Gold Nanoparticles

Gold nanoparticles can absorb certain types of light and convert it into heat. Researchers use this property in photothermal therapy, where heat can damage and destroy the cancer cells.

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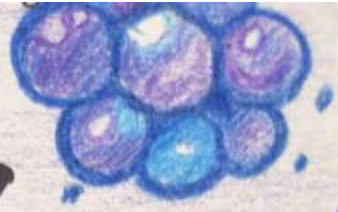
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system.

$\sim 1-100 \text{ nm} \rightarrow$



WHY USE NANOTECHNOLOGY?

- ✓ Better texture - helps create smooth and easily spreadable formulations.
- ✓ Improved stability - can help protect certain sensitive ingredients.
- ✓ Controlled delivery - Some nanosystems can release ingredients in a controlled manner.
- ✓ New possibilities - allows scientists to design innovative cosmetic formulations.



ANTI-AGEING PRODUCTS

- Some anti-ageing formulations use nanoscale delivery system for ingredients such as vitamin C, vitamin E, and retinol.
- These systems may help protect ingredients and improve their delivery.



the stability and delivery
of selected ingredients.

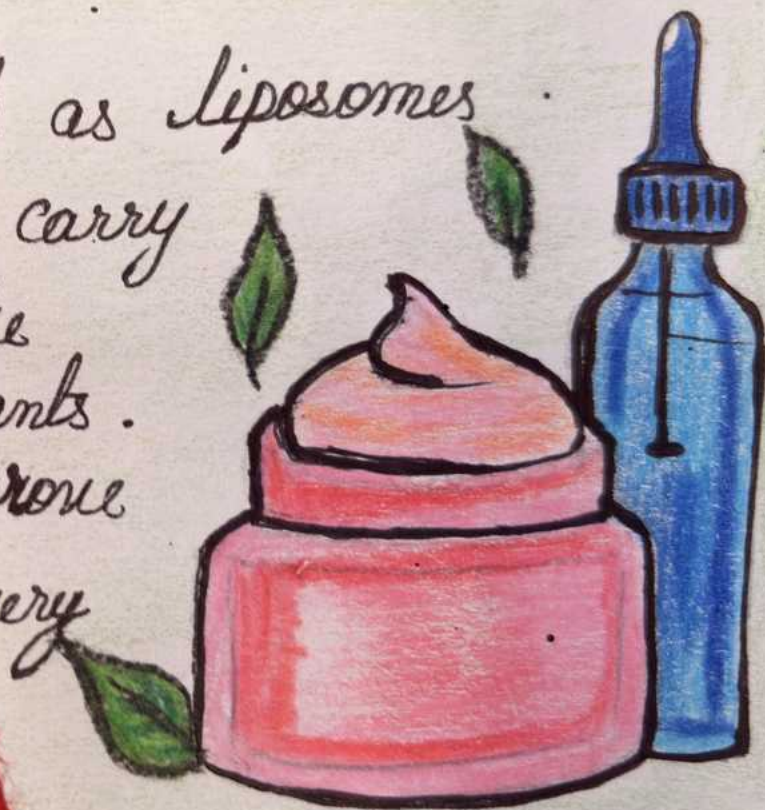


Tiny
particles,
real
benefits!



SKIN CARE

- Tiny structures such as liposomes and nanosemulsions can carry cosmetics ingredients like vitamins and antioxidants.
- They can help improve the stability and delivery of selected ingredients.





COSM



SUNSCREEN

- Nanoparticles such as Zinc Oxide and titanium dioxide are used in some sunscreens to provide UV protection.

- Their small size can also help the product spread smoothly and reduce the visible white appearance on the skin.



- Tiny and nanocosmetics vitamins
- They the stable selected