



DRIVING FOOD INNOVATION FROM
CONCEPT TO COMMERCIALIZATION

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EUROPE, ASIA, SOUTH AMERICA

Food & Drink innovation to commercialization
Market, Industry and Consumer Analysis
Quality Assurance Experts



Food Research Lab
A Unit of **guires**

Nanofabrication technology for nutraceuticals

New Technologies Report
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INTRODUCTION

- The near-atomic manipulation of matter to produce new materials, structures, and devices is known as nanotechnology. The method promises advancements in science across domains, including manufacturing, consumer goods, energy, materials, and medicine.
- Nanotechnology is a promising and fast-growing field in food, beverage and nutraceutical industries.
- With an ever-increasing demand for products with health benefits, nutraceuticals are becoming popular. Nutraceuticals contain several bioactive compounds that are susceptible to degradation during handling and processing.
- Nanotechnology, or nanofabrication of bioactive compounds with better delivery strategies to improve the efficacy and stability of the nutraceuticals.

Nanofabrication for nutraceuticals:

- Advances in Nano-formulation processes reduce the limitations of bioactive molecules such as bioavailability, specificity, and solubility. This provides new insights into the discovery of novel materials, which are primarily suitable for various biomedical applications.

Advantages:

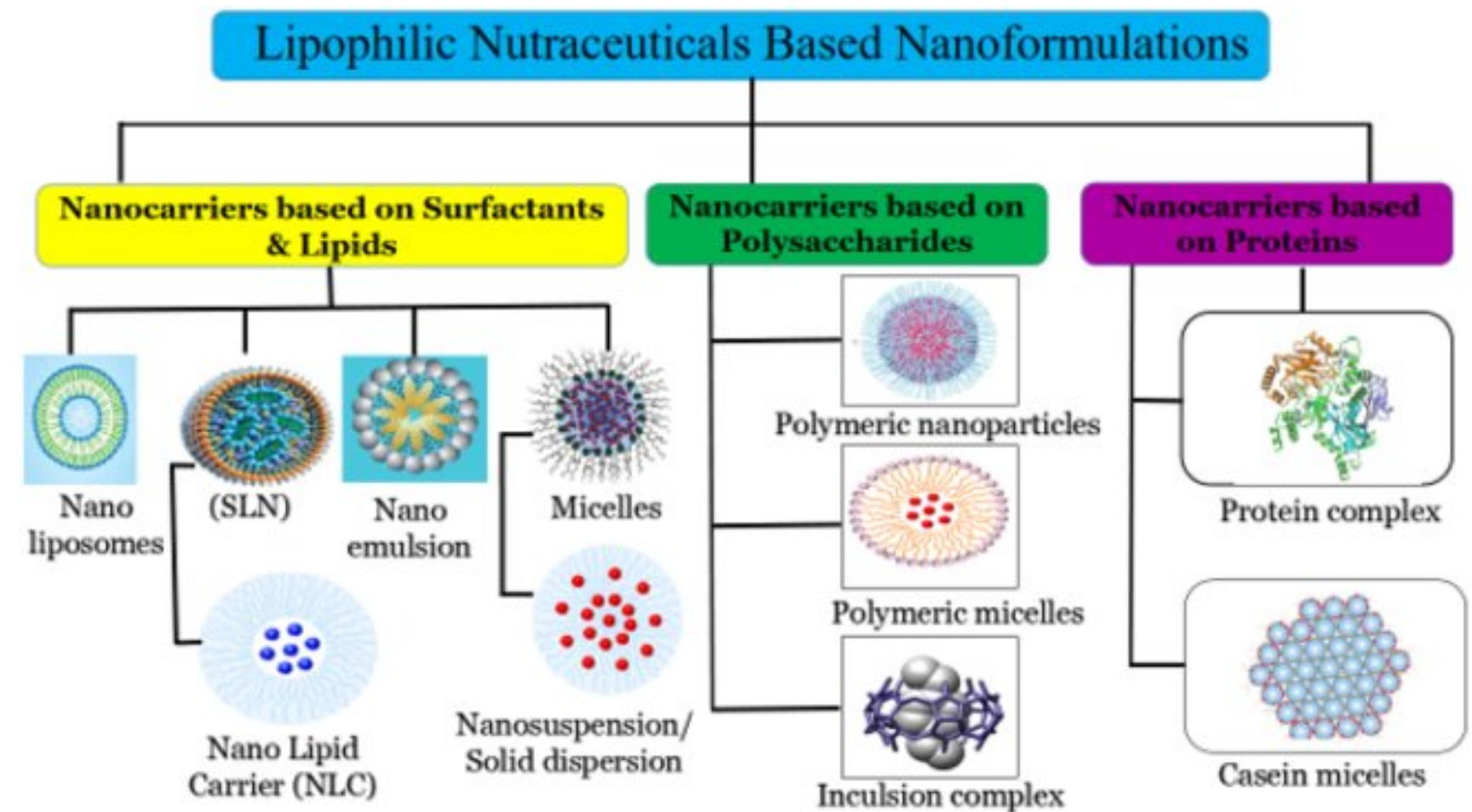
- Enhanced solubility, stability, bioavailability and efficacy of nutraceuticals with encapsulation of nutraceuticals by nanoparticles.
- One of the effective methods has been encapsulation with the “generally recognized as safe” (GRAS) nanomaterials which promote sustained release of the functional ingredients of the nutraceuticals in the body, simultaneously also increasing their nutritional quality and stability
- Nano emulsions are extremely small, transparent or translucent droplet emulsions. The size of the droplets varies from 50 to 200 nm which makes it easier for absorption.

Disadvantages:

- The main concern about human exposure to nanoparticles is that they can enter the body through several mechanisms such as digestion, inhalation, or skin absorption. Nanoparticles may enter the circulation after absorption and settle in various organs such as the brain, or they may provoke immunological reactions.
- Nanomaterials have unique qualities, such as a large surface area, which makes them more chemically active than bulk materials, allowing them to engage in the majority of biological reactions that might be damaging to human health or the environment.

Different delivery system with nanotechnology:

- Carbohydrate/Polysaccharides Delivery Systems
- Protein-Based Delivery Systems
- Lipid-Based Nano Delivery Systems
- Nanoemulsions
- Nanoliposomes
- Nanostructured Lipid Carrier
- Nanogels [1]



REFERENCES

1. <https://www.mdpi.com/2306-5354/9/9/478>

THANK YOU
