

Application of microalgae in pharmacy

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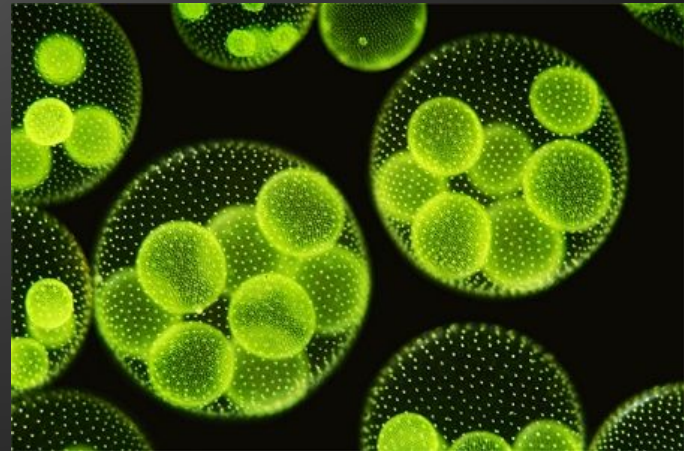
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Introduction

Microalgae are increasingly recognized for their therapeutic potential. Produce bioactive compounds like beneficial for human health. In pharmaceuticals, microalgae contribute to drug delivery systems, notably diatom-based nanoparticles for targeted cancer therapy. They also play a role in synthesizing growth factors, hormones, and vaccines. In cosmetics, microalgae antioxidant and anti-inflammatory properties are harnessed for skincare products. Their broad applications highlight their importance in sustainable solutions for health and beauty industries.



What are microalgae?

They are a type of phytoplankton predominantly found in freshwater and marine systems. Microalgae are crucial for life on Earth, performing photosynthesis to produce approximately half of the atmospheric oxygen.

Size: Microalgae vary significantly in size, ranging from a few micrometers (μm) to several hundred micrometers, depending on the species

Cell Structure: They are specially adapted to environments dominated by viscous forces. Their cell structure is simple yet efficient for photosynthesis and survival in various aquatic environments.

Adaptability: Microalgae exhibit remarkable adaptability to changing environmental conditions, which is reflected in their ability to alter their chemical composition. This allows them to thrive in a wide range of habitats.



Pharmaceutical properties of microalgae

The pharmacological properties of microalgae, including antioxidants, anti-inflammatory, and antimicrobial properties.

They can also have other properties such as: neuroprotective effects, cardioprotective effects or anti-diabetic activity:

However, further research is needed to fully understand the mechanisms of action and optimize the utilization of microalgae compounds for pharmaceutical applications.

Pharmaceutical applications of microalgae

Microalgae, such as Chlorella, Spirulina, and Dunaliella have different applications in the world of pharmacy, some examples are:

Nutraceuticals: Microalgae are rich sources of essential nutrients, including proteins, vitamins, minerals, essential fatty acids and antioxidants.

Anti-inflammatory Agents: Some microalgae produce bioactive compounds with anti-inflammatory properties.

Anti-cancer Agents: Some microalgae contain bioactive compounds with anti-cancer properties. These compounds may inhibit cancer cell proliferation, induce apoptosis (programmed cell death), and suppress tumor growth and metastasis

Examples of bioactive compounds

Spirulina polysaccharides: Spirulina contains various polysaccharides, including sulfated polysaccharides and glycoproteins, with immunomodulatory and antioxidant activities.

Astaxanthin: Astaxanthin is a carotenoid pigment responsible for the pink-orange color in many microalgae, such as *Haematococcus pluvialis* and *Chlorella zofingiensis*.

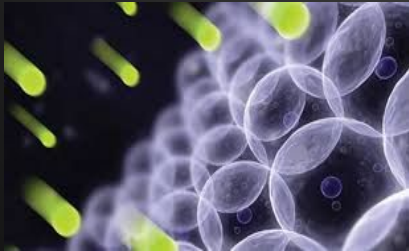
Chlorella Growth Factor (CGF): Chlorella contains a unique compound known as Chlorella Growth Factor (CGF), which is a complex mixture of nucleic acids, peptides, amino acids, vitamins, and minerals.

Cosmetics: Benefits of microalgae

Hydration: Microalgae are rich in polysaccharides, amino acids, and fatty acids, which are essential for maintaining skin hydration.

Antioxidant Protection: Microalgae contain high levels of antioxidants, such as vitamins C and E, carotenoids, and polyphenols.

Collagen Stimulation: Some species of microalgae produce peptides and other bioactive compounds that have been shown to stimulate collagen production in the skin.



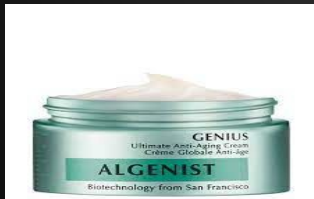
Cosmetic products based on microalgae

Facial Creams

-La Mer The Moisturizing Soft Cream



-Algenist Genius Ultimate Anti-Aging Cream



Serums

-Estée Lauder Advanced Night Repair Synchronized Multi-Recovery Complex



-Biotherm Blue Therapy Accelerated Serum



Masks

-Origins Drink Up™ Intensive Overnight Hydrating Mask with Avocado & Swiss Glacier Water



-Peter Thomas Roth Blue Marine Algae Intense Hydrating Mask



Bibliography

-<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8142882/>

-[La Mer | BB Beauty | The New Moisturizing Soft Cream](#)

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