



Fund “Nauka” Project № 21001 Resume – Competitive-based Session 2021:

“Development of a green phycocyanin manufacturing process from *Spirulina* with potential applications in pharmacy and food technology”

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The increased content of biologically active substances, the high productivity in cultivation and assimilation in the human body define the freshwater micro algae as the food of the future. Of great importance for the pharmacology and the nutrition are their high antioxidant activity, determining antidiabetic, antiacetylcholinesterase, antimicrobial, anticancer, antitumor, anti-inflammatory, photoprotective, antiviral properties.

The current project is focused on the development of a green method for the extraction of phycocyanin from *Spirulina platensis* grown in a bioreactor. The compound has immunostimulatory, immunomodulatory and anti-inflammatory action.

The aim of the proposed project is to study the possibilities of green methods for the production of phycocyanin from *Spirulina platensis* grown in a bioreactor and to develop:

1. Phycocyanin therapeutic systems with immuno-stimulating and antibacterial action,
2. Food product (healthy cupcakes) with high phenolic content, biologically active substances and high antioxidant activity.

The object of study of the developed pharmaceutical and food systems are physico-chemical and rheological properties, sensory quality indicators, their visco-elastic behavior, textural and porous properties, and microbiological stability. The change in the antioxidant activity of the developed innovative foods with the addition of phycocyanin will be monitored. The aim is to enrich the products with biologically active substances and to develop a therapeutic system with immunostimulating action.

Methods such as liquid chromatography, visible, infrared, flame and fluorescence spectroscopy, as well as determination of rheological and texturometric parameters, electron microscopy and measurement of hydrodynamic particle diameter by dynamic and static light scattering (DLS) will be used for the research.

The proposed research project is aimed at and corresponds to the objectives of the National Research Strategy and the regional, national and European priority areas for the development of science and innovation, and can be referred to priority area 2. “Health and quality of life, biotechnology and ecologically clean foods” from the strategy for development of science in Bulgaria until 2020.