

## Bioactive Compounds from Plants Used as Therapeutic Agents in Biomedical Applications - A Literature Review-

Gertrud-Alexandra PALTINEAN<sup>1</sup>, Sorin RIGA<sup>1,2</sup>, Gheorghe TOMOAI<sup>2,3</sup>,  
Aurora MOCANU<sup>1</sup>, Maria TOMOAI-COTISEL<sup>1,2</sup>

<sup>1</sup>Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering, Research Centre of Physical Chemistry, 11 Arany Janos Str., RO 400028, Cluj Napoca, Romania

<sup>2</sup>Academy of Romanian Scientist, 3 Ilfov, RO 050044, Bucharest, Romania

<sup>3</sup>Iuliu Hatieganu University of Medicine and Pharmacy, Department of Orthopedic Surgery, 47 General Traian Mosoiu Str., Ro 400132, Cluj Napoca, Romania

**Abstract.** This review proposes an extensive study of some bioactive compounds produced by plants (piperine - PIP, curcumin - CUC, resveratrol – RES, icariin - ICA) with beneficial effects on human health. In addition to these compounds, the need for natural pigments, carotenoids in the body's daily diet and implicitly in nano-science and medicine is also debated. This study points to complexes of proactive compounds as well as their interaction with other drugs (e.g., doxorubicin: DOX, 5-fluorouracil: 5-FLU, paclitaxel: PCT) and metal nanoparticles (such as: gold nanoparticles: GNP, AuNP, and silver nanoparticles: SNP, AgNP) with applications in cancer cell lines and bacterial investigation, as well as using viral and fungal strains. This study also opens new opportunities of multi-functional metallic nanoparticles, realized by self-assemblies through molecular recognition among bioactive compounds on GNP or SNP, for their biomedical applications that require continuous development in terms of infections and the need to treat cancer and other diseases.

**Keywords:** *plant extract, carotenoids, flavonoids, plant bioactive compounds, chemotherapeutic drugs, GNP, SNP, health effect*

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### 1. Introduction

Today, humanity is going through a difficult period in terms of public health. The medical system is overwhelmed by the large number of hospitalizations due to diseases caused by viruses, bacteria, pollution and other factors responsible for the disease of the living being. Despite the efforts of researchers and practicing physicians, the progression of disease has increased rapidly with the emergence of mutations and replication of microorganisms. In this sense, the need to develop nanostructures based on biomolecules such as piperine, curcumin, resveratrol, icariin, doxorubicin, 5-fluorouracil and paclitaxel can significantly contribute to understanding and improving the mechanisms of action in treating various diseases and eradicating the factors that cause disease.