



**Olga Andreyeva
Ivan Gryshchenko**

NATURAL PRODUCTS CHEMISTRY



MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
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Olga Andreyeva, Ivan Gryshchenko

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Reviewers:

Oleksii Savchuk, Doctor of Biological Sciences, Professor, Head of the Biochemistry Department, Taras Shevchenko National University of Kyiv, Educational and Scientific Centre “Institute of Biology and Medicine”.

Halyna Sakalova, Doctor of Technical Sciences, Professor, Head of the Department of Chemistry and Chemistry Teaching Methods, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University.

Olena Mokrousova, Doctor of Technical Sciences, Professor, Head of the Department of Biotechnology, Leather and Fur, Kyiv National University of Technologies and Design, Winner of the State Prize of Ukraine in Science and Technology.

Olga Andreyeva, Ivan Gryshchenko

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This publication identifies the main types of natural products, their classifications, structural features, physical and chemical properties, schemes of characteristic chemical reactions, research methods, significant biological functions, practical application, and natural sources. The textbook contains eight chapters: Amino acids, peptides, proteins; Enzymes; Lipids; Carbohydrates; Vitamins; Hormones; Nucleic acids; Other natural products.

It is intended for students of institutions of higher education studying in biotechnological, chemical and other related specialties, and can be useful to everyone who is interested in natural organic substances with biological activity, their role in the life of living organisms, and application in practical human activities.

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INTRODUCTION

The proposed tutorial “Natural Products Chemistry” is an educational and methodological material for students of institutions of higher education studying in biotechnological, chemical and other related specialties, and can be useful to everyone who is interested in natural organic substances with biological activity, their role in the life of living organisms, and application in practical human activities.

The tutorial is devoted to the basics of the chemistry of natural products as a separate area of chemical research, which has always been of great importance in the history of developing chemistry, in searching for substances, in early preclinical studies and drug discovery, in understanding traditional medicine and ethnopharmacology, in developing biotechnologies related to chemical separation, as well as modern methods for determining the chemical structure and useful properties of various chemical compounds.

The purpose of the publication is to help students acquire competencies in basic natural products — biological active compounds of natural raw materials, their composition, structure, physical and chemical properties, effects on living organisms, applications in biotechnology, medicine, agriculture, food and light industry and other areas of the economy.

To achieve this goal, the following tasks were set:

- to form a general idea of natural products — organic, biological active compounds synthesized by living organisms;
- to master general and individual concepts of various classes and groups of natural products in the form of amino acids, peptides, proteins, enzymes, lipids, carbohydrates, vitamins, hormones, nucleic acids, and some other compounds (phenolic compounds, alkaloids, flavonoids, tannins, isoprenoids, saponins, essential oils),

having studied the features of their classification, chemical structure, physico-chemical properties, methods of determination, biological functions and practical application;

– to learn the necessary terms and definitions.

The tutorial contains eight chapters:

Chapter 1. Amino acids, peptides, proteins;

Chapter 2. Enzymes;

Chapter 3. Lipids;

Chapter 4. Carbohydrates;

Chapter 5. Vitamins;

Chapter 6. Hormones;

Chapter 7. Nucleic acids;

Chapter 8. Other natural products.

The authors express the hope that the knowledge acquired by students in the field of natural products chemistry will be useful in further education and will contribute to understanding the essence of technological processes, patterns of changes in the structure and properties of natural products at all stages of the life cycle, and are also sincerely grateful to the respected reviewers — Doctor of Biological Sciences, Professor, Oleksii Savchuk, Doctor of Technical Sciences, Professor, Halyna Sakalova and Doctor of Technical Sciences, Professor, Olena Mokrousova — for important comments and recommendations made while reviewing the manuscript.