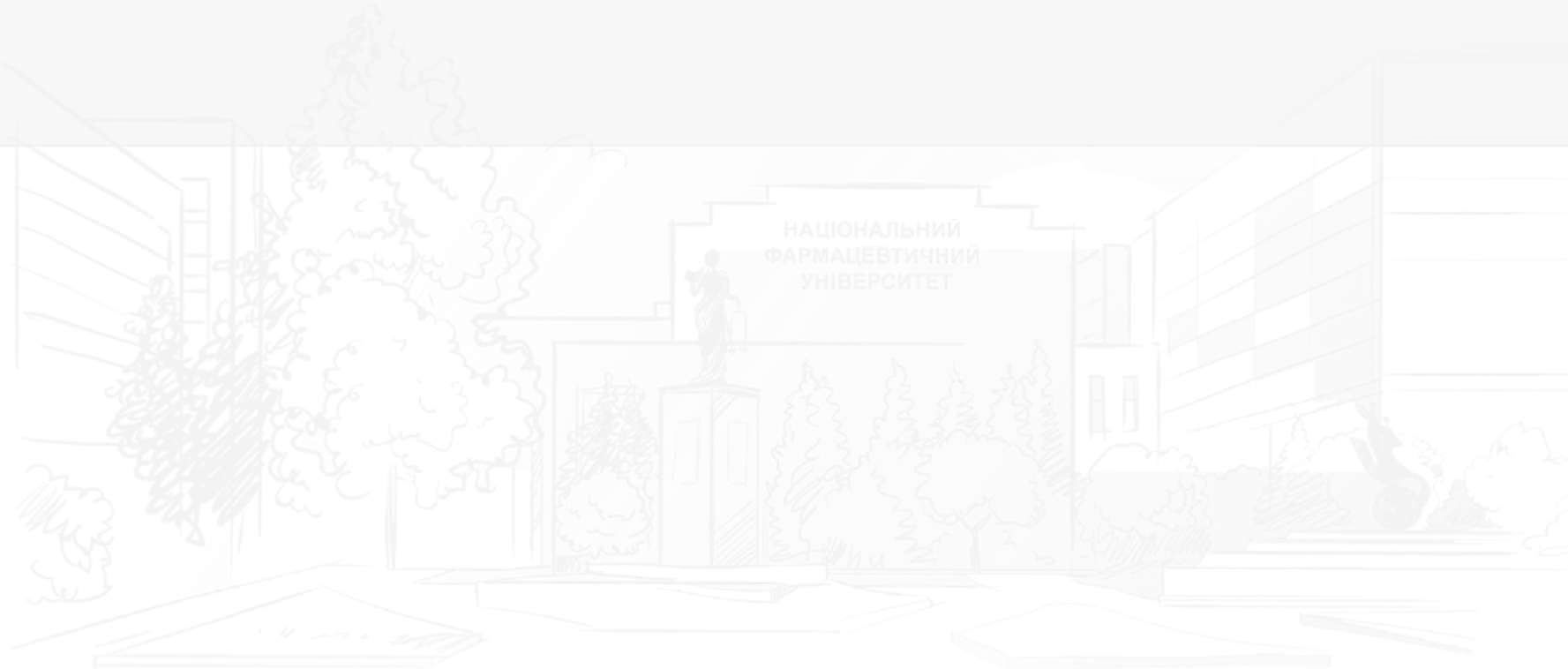




МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

DEPARTMENT OF BIOLOGICAL CHEMISTRY AND VETERINARY MEDICINE

CELLULAR BIOLOGY

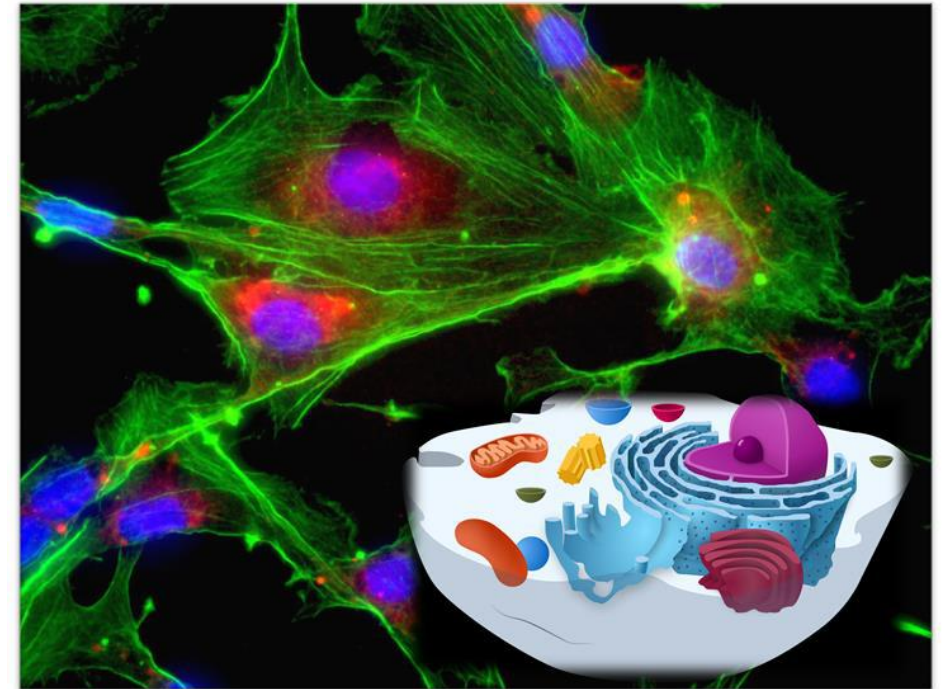


2023-2024 academic year

DESCRIPTION OF THE EDUCATIONAL COMPONENT

Cellular Biology is an educational component, the purpose of which is teachingis:

- ✓ formation of students of higher education in-depth basic theoretical knowledge and practical skills about the structure of cells, chemical processes occurring in living cells for use in biotechnology;
- ✓ obtaining basic ideas about the structure and properties of the most important organelles, membranes, the role of their spatial organization in ensuring the specificity of biochemical processes of cells;
- ✓ study of the main metabolic pathways related to energy supply processes and familiarity with the principles of regulation of metabolic processes of cells;
- ✓ to get acquainted with the features of the functioning of germ cells and the features of tumor cells.

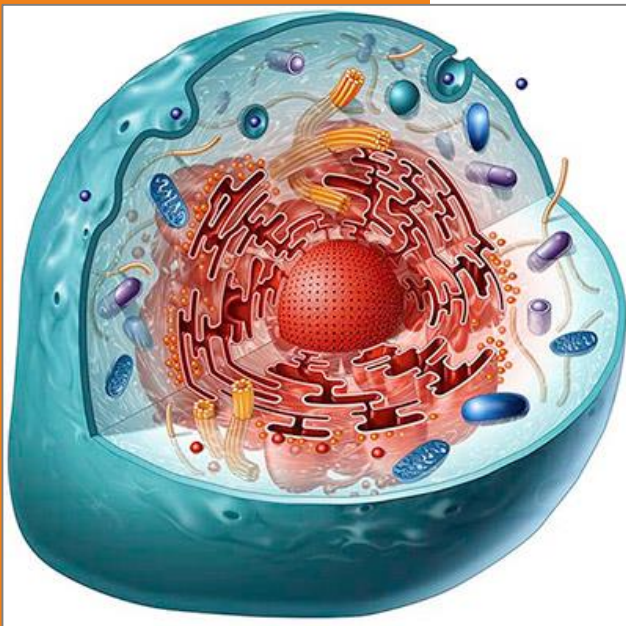


SCOPE OF EC "Cellular Biology"

90 hours, 3 credits ECTS

TASKS of the educational component are:

- obtaining holistic ideas about the matrix processes occurring in a living cell: replication, transcription and translation;
- study at the current level of knowledge of the structural organization of the most important biopolymers: proteins and nucleic acids;
- acquaintance with modern enzymology, the structure and functions of enzymes, enzyme systems and their regulation in the cell;
- study of the main metabolic pathways, bioenergetic mechanisms, interrelationship of carbohydrate, lipid and protein exchanges and regulatory systems of cell metabolism.



COMPETENCES AND PROGRAM LEARNING OUTCOMES

1

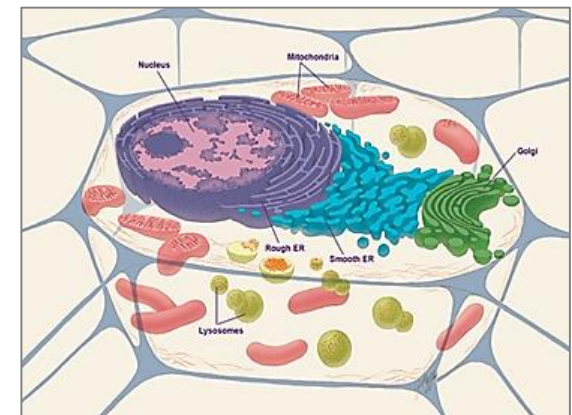
- skills of researching the cells of the human body and experimental animals;
- research and trace the effect of pharmaceuticals at the cellular level;

2

- be able to use knowledge about cells in pharmacy and medicine;

3

- explore cells on cytogenetic levels;
- to be able to use fundamental knowledge in practical and scientific activities;
- Cryopreservation germ cells.



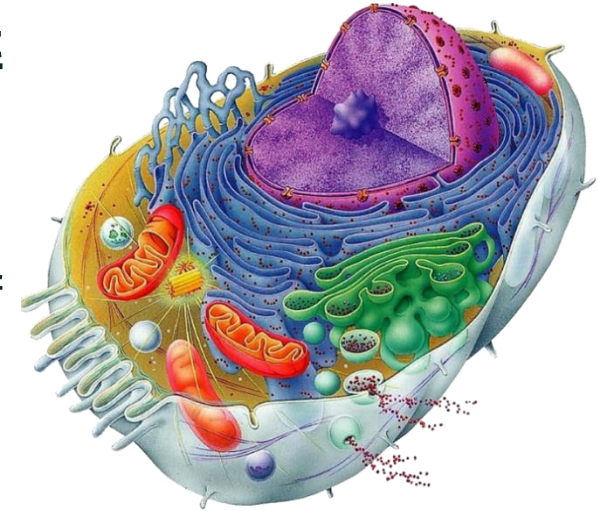
BRIEF CONTENTS OF THE PROGRAM of the educational component

Content module 1. General ideas about the cell as an elementary unit of life. Cell membranes.

Topic 1. Subject and methods of cytological research. Optical systems in biological research

Topic 2. Structure and functions of cell membranes. The cell membrane of plants, its chemical composition, structure and functions.

Topic 3. Mechanisms of transport of substances through the cell membrane.



Content module 2. Structure, chemical composition and functions the most important structures of the protoplast.

Topic 4. General plan of the cell structure. Vacuolar cytoplasmic system.

Topic 5. Plastids, their types, structure, chemical composition and functions of chloroplasts. Photosynthesis.

Topic 6. Cytoskeleton, its structure and functions. Locomotor structures of the cell: microfilaments, intermediate filaments, microtubules.

Topic 7. Cell nucleus, its structure and functions.

BRIEF CONTENTS OF THE PROGRAM of the educational component

Content module 3. Cell reproduction. Life expectancy and cell pathology.

Topic 8. Life cycle of a cell. Mitosis is a way of dividing somatic cells.

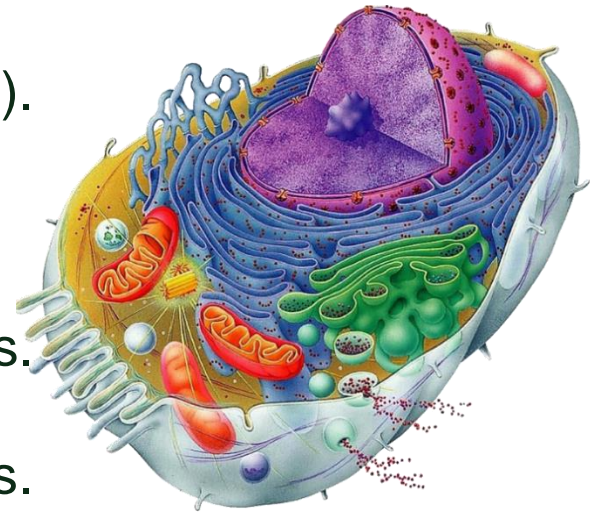
Topic 9. Alternative ways of cell division. Direct cell division (amitosis). Endoreproduction, polythenia, polyploidy.

Topic 10. Meiosis, types of meiosis and their characteristics.

Topic 11. Cell growth and development, cell differentiation. Stem cells.

Topic 12. The lifespan of cells in various tissues and organs. Theories of aging.

Topic 13. Cell pathology. Tumor growth. Theories oncogenesis. Reproductive biotechnology.



ДЯКУЮ ЗА УВАГУ!



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