



ФАРМАЦЕВТИЧЕН ФАКУЛТЕТ МЕДИЦИНСКИ УНИВЕРСИТЕТ - СОФИЯ

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Approved by the Faculty Council with protocol № 10/ 30.11.2023

Dean:

(Prof. A. Zlatkov, DSc)

SYLLABUS

FOR THE ELECTIVE COURSE “NANOSIZED DRUG DELIVERY SYSTEMS”

**DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY AND
BIOPHARMACEUTICS**

Included in the curriculum of the specialty: **Pharmacy**

Degree of education: **Master**

Credits (ECTS): **6**

ANNOTATION

The program is focused on the basic principles of pharmaceutical nanotechnology. It presents the biological prerequisites for the targeted delivery of drugs and diagnostic agents, as well as the main technological approaches for the practical implementation of the targeted delivery. The different types of nanosized carriers (liposomes, solid lipid nanoparticles, polymeric nanoparticles, polymeric micelles, hydrogel nanoparticles, inorganic nanoparticles) and their advantages will be discussed. The main methods for preparation and biopharmaceutical characterization of nanosized drug delivery systems will be reviewed. The program also includes the most promising areas of application of nanosized drug delivery systems, in particular nanoparticles for targeted delivery of drugs, for diagnostics, for vaccines and for DNA delivery. Special attention is given to nanoscale drug systems approved for clinical use, as well as promising systems in advanced clinical trials.

SYLLABUS

1. Pharmaceutical nanotechnology – development and challenges.
2. Biological prerequisites for targeted delivery of drugs.
3. Nanosized drug carriers - classification, characteristics.
4. Liposomes and solid lipid nanoparticles.
5. Macrocyclic nanoparticles.
6. Dendrimers.
7. Polymeric nanoparticles.
8. Polymeric micelles.
9. Hydrogel nanoparticles.
10. Inorganic nanoparticles.
11. Methods for physicochemical and biopharmaceutical characterization of nanosized drug delivery systems.

12. Stability of nanoscale systems.
13. Nanoparticles for diagnostics.
14. Nanoparticles in vaccine development.
15. Nanoscale drug delivery systems in clinical use.

Program author:

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Head of the Department:

(Prof. K. Yoncheva, PhD, DSc)