

## **Theoretical and Applied Aspects of Microorganism Genetics**

1. Lecturer: Vinnikova Olha Ivanivna, associate professor of the department of plant and microorganism physiology and biochemistry.
2. Status: optional for masters.
3. Course, semester: 2th academic year, 3th semester.
4. Number of credits – 5, general academic hours – 150, lectures – 40; seminars – 12; labs and practices – 20; self-study – 78.
5. Preliminary requirements: basics of Biochemistry, Microbiology, Genetics, Biotechnology, Molecular Biology, Plant Physiology and Biochemistry
6. Description of the course: the course "Theoretical and applied aspects of microbial genetics" is integrative. Within the course the features of genetic apparatus and biological bases of variability of prokaryotes are discussed, use of all types of variation of prokaryotes for recombinant DNA technology, gene engineering and compiling genetic maps of chromosomes. Based on the theoretical data the course includes a use of modern methods for genetic engineering of microorganisms to construct microbes with programmed properties, and various areas of their use.

Sections: 1) Features of genetics of prokaryotes, variability of bacteria and archaea; 2) genetics of viruses; 3) genetic engineering of microorganisms.

### Knowledge and skills:

- Knowledge of the genetic apparatus of prokaryotes and viruses, nature and mechanisms of variability of prokaryotes, methods used to study the genome of prokaryotes and viruses;
  - Understanding of the nature and the ways to apply genetic engineering and manipulation using microorganisms;
  - Ability to apply theoretical knowledge of genetics and genetic engineering of microorganisms in the performance of duties on the basis of biology.
7. Course organization: lectures, seminars, practices. Forms of control: tests, lab protocols, exam.
  8. Language: Ukrainian.
  9. Educational and methodological support: program, schedule of classes, educational and multimedia presentations, methodical complex, guidelines for practice.

### Studentbooks:

1. *Пуневич А.В.* Микробиология: біологія прокариотів: Т. 3. – СПб: Изд-во С.-Петербур. ун-та, 2009. – 457 с.
2. *Глик Б., Пастернак Дж.* Молекулярная биотехнология. Принципы и применение. – М.: Мир, 2002. – 589 с.
3. *Лотарева О.В., Прозоров А.А.* Особенности передачи некоторых хромосомных генов при конъюгации у *Bacillus subtilis* // Генетика. – 2009. – Т. 45, № 5. – С. 595-600.
4. *Патрушев Л.И.* Искусственные генетические системы. – М.: Наука, 2004. – 176 с.
5. *Современная микробиология.* Прокариоты: в 2 т. / Под ред. Й. Ленгелер, Г. Древис и Г. Шлегель. – М.: Мир, 2005.
6. *Щелкунов С.Н.* Генетическая инженерия. – Новосибирск: Сиб. унив. изд-во, 2004. – 496 с.