

**MINISTRY OF HEALTH PROTECTION OF UKRAINE**  
**ODESSA NATIONAL MEDICAL UNIVERSITY**  
 Department of general and clinical epidemiology and biosafety

**Syllabus of the academic discipline**

"Molecular genetic studies in the epidemiology of infectious diseases"

<b>Scope of the academic discipline</b>	Total number of hours per discipline: 90 hours, 3 credits. IX - X semester, 5th year of study
<b>Days, time, place of educational discipline</b>	According to the schedule of classes. Department of general and clinical epidemiology and biosafety, str. Primorsky Boulevard, 13
<b>Teacher(s)</b>	Golubyatnikov M.I., doctor of medicine, professor, head of the department. Professors: Doctor of Medicine Bachynska O.V., Doctor of Medicine. A. I. Savchuk, Doctor of Medicine. K.O. Talalaev, Doctor of Medicine. Haidey V.R. Associate professors: Servetskyi S.K., Fedorenko T.V. Assistants: T.V. Gerasimenko, G.M. Jurtubaeva, O.A. Melnyk, K.S. Hrytsenko, L.V. Kostolonova, M.O. Makarenko.
<b>Contact Information</b>	Help by phone: Melnyk O.A., phone - 0965920621, responsible for organizational and educational work of the department phone Gavrushko T.G., laboratory assistant of the department; phone number - 0681241260 <a href="mailto:olena.kozishkurt@onmedu.edu.ua">olena.kozishkurt@onmedu.edu.ua</a> Face-to-face consultations: from 2:00 p.m. to 5:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday Online consultations: from 4:00 p.m. to 6:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday. The link to the online consultation is provided to each group during classes separately.

**COMMUNICATION**

Communication with applicants will be conducted in the classroom (face-to-face).

During distance learning, communication is carried out through the Microsoft Teams platform, as well as through e-mail correspondence, Viber messengers (via groups created in Viber for each group, separately)

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through the head of the group).

**ABSTRACT OF THE EDUCATIONAL DISCIPLINE**

*The subject of study of the discipline:* molecular genetic studies for the indication of the causative agents of infectious diseases.

*The goal of discipline:* Acquaintance of applicants with modern molecular genetic research, using the example of PCR and its varieties.

*Tasks of the discipline:*

1. To increase the theoretical level of knowledge regarding modern diagnostics of pathogens of an infectious nature.
2. Formulate knowledge about technique security under time work with microorganisms of I - IV pathogenicity groups,
3. Acquaint with methodology intralaboratory and external quality control of molecular genetic research.
3. Formulate knowledge about molecular genetic research
4. Familiarize with the rules of collection, delivery and storage of samples of biological material of patients and samples of environmental objects

*Expected learning outcomes.*

*As a result of studying the academic discipline, the applicant must:*

*Know:*

- Principles molecular and genetic methods in diagnostics infectious diseases
- The principle of PCR.
- Stages of conducting PCR.
- The problem of contamination.
- Principles of modern laboratory diagnostics of acute diarrheal diseases
- The nature of mutations and their solutions in modern genetics.
- Principles of modern laboratory diagnostics of zoonotic infections
- Principles molecular and epidemiological monitoring mechanisms resistance of pathogens
- Methods of DNA sequencing

*Be able:*

- Apply methods molecular genetic diagnostics.
- Use results of phylogenetic analysis for diagnosis.
- To carry out molecular genetic monitoring for the causative agents of infectious diseases

**DESCRIPTION OF THE EDUCATIONAL DISCIPLINE**

Discipline will be to teach in form practical classes (30classroom hours); organization of the applicant's independent work (60 hours).

*Teaching methods:* story, explanation, conversation, instruction, discussion, debate, discussion of problem situations, situational learning.

*Content of the academic discipline*

Topic 1. Molecular and genetic methods in diagnostics infectious diseases The principle of PCR. The history of the discovery and development of this method.

Topic 2. Stages of conducting PCR. The problem of contamination.

Topic 3. Modern methods used in the identification of pathogens of infectious diseases.

Topic 4. The nature of mutations and their solutions in modern genetics.

Topic 5. Ensuring the safety and quality of laboratory diagnosis of infections when using molecular genetic research.

Topic 6. Improved quantitative version of real-time PCR and other types of PCR.

Topic 7. Nucleic acids - structure and structure of DNA.

Topic 8. Molecular and genetic monitoring of pathogens of infectious diseases.

Topic 9. Dangerous infectious diseases in the work of medical workers and their molecular genetic diagnosis

Topic 10. Modern laboratory diagnostics of acute diarrheal diseases. Topic 11. Viral hepatitis with parenteral and enteral transmission. Molecular and genetic methods of diagnosis.

Topic 12. Modern laboratory diagnostics of zoonotic infections.

Topic 13. Use of phylogenetic analysis methods for molecular genetic typing of pathogens using the example of tularemia infection

Topic 14. Molecular and epidemiological monitoring mechanisms resistance of HCAI pathogens to antimicrobial drugs

Topic 15. Isothermal PCR for rapid diagnosis of a person with a contagious SARS-COV-2 infection

Topic 16. Methods of DNA sequencing and methods of their use to study the function of genomes

*List of recommended literature Main*

1. Kirik D.L. Molecular methods in microbiological diagnostic practice and epidemiological analysis / Preventive medicine No. 1-2 (24) 2015. – P. 127
2. Clinical biochemistry / Textbook / by general edited by H.G. Lunova - K.: Atika, 2013. – 1156 p.

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*Additional:*

1. Clinical laboratory diagnostics. Workshop (3rd edition) / L.E. Lapovets, B.D. Lutsyk, G.B. Lebed, L.E. Porokhnavets, O.O. Yastremaska, O.Yu. Andrushevska, I.P. Kokodyniak, G.V. Maksymyuk, V.M. Akimova, N.D. Boykiv, A.S. Kost, Z.Ya. Lavro. - Lviv, 2011. - 252 p.
2. Selected lectures on laboratory medicine. /Lapovets L.E., Lebed G.B., Yastremaska O.O., Lutsik B.D., Porokhnavets L.E., Akimova V.M., Zaletskyi M.P. - Lviv: Taras Soroka Publishing House, 2011. – 338 p.
3. Clinical laboratory diagnostics by Ed. B.D. Lutsika / B.D. Lutsyk, L.E. Lapovets, G.B. Lebed, V.M. Akimov. - Kyiv: Medicine, 2011. - 288 p.
4. Guide to clinical laboratory diagnostics. Part 1-2 / Edited by A. Bazarnova. - Kyiv: Higher School, 1991. - 352 p.
5. Clinical biochemistry / Editors: S. Angelski, M.G. Dominichak, Z. Yakubovski. Persei Publishing House, Poland, 2000. - 445 p.
6. Stites DP, Terr AI, Parslow TG, editors. Medical immunology. - London: Appleton & Lange, 2001.
7. Tietz. Clinical guide to laboratory tests. 4th ed. Ed. Wu ANB- USA, WB Saunders Company, 2006. – 1798 p.
8. Young DS, editor. Effects of drugs on clinical laboratory tests. Washington, DC: AACC Press, 2001.
9. Young DS, editor. Effects of preanalytical variables on clinical laboratory tests. Washington, DC: AACC Press, 2007.

*Information*

*resources:*[bwbooks.net/index.php?id1=4&category=medicina&author=mandjoni...2004](http://bwbooks.net/index.php?id1=4&category=medicina&author=mandjoni...2004)

[https://vbaze.com.ua/en/product-vpliv-faktoriv-na-shoewww.bookvamed.com.ua/shop\\_content.php?coID=112](https://vbaze.com.ua/en/product-vpliv-faktoriv-na-shoewww.bookvamed.com.ua/shop_content.php?coID=112)

Sites on general clinical issues of laboratory

diagnostics<http://medbiol.ru/medbiol/har3/00057f6e.htm>

<http://mewo.ru/tumb/12/98/>

<http://ru.wikipedia.org/>

<http://webcache.googleusercontent.com/>

<http://www.astromeridian.ru/medicina>

Sites on issues of morphological research in the

laboratory[http://www.morphology.dp.ua/\\_mp3/respiratory](http://www.morphology.dp.ua/_mp3/respiratory)

**EVALUATION**

*Forms and methods current control:* oral (poll), practical (solving clinical situational problems).

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*Current evaluation criteria in practical training*

Perfectly "5"	It is presented to the applicant when he shows deep, solid and systematic knowledge in the scope of the curriculum, answers all questions without mistakes, reasonably formulates conclusions, using materials presented for independent work of the applicant, competently and consistently, with knowledge of the methodology, completed practical work ; right using scientific terms and concepts.
Fine "4"	The acquirer reveals the main content of the educational material; gives incomplete definitions of concepts; allows inaccuracies when using scientific terms, vaguely formulates conclusions, performed the practical work, but made minor mistakes during the research.
Satisfactorily "3"	The learner reproduces the basic educational material, but makes significant mistakes when presenting it, gives simple examples, definitions of concepts are insufficient, characterizes general issues of social medicine.
Unsatisfactorily "2"	The applicant discloses the content of the educational material fragmentarily, makes gross mistakes in the definition of concepts and when using terminology, did not complete the practical work.

*Forms and methods of final control:* Credit is awarded to an applicant who has completed all sections of the educational program of the elective discipline, has actively participated in seminars, has a current grade point average of at least 3.0, and has no academic debt.

*The possibility and conditions of obtaining additional (bonus) points:* not provided.

## **INDEPENDENT WORK OF HIGHER EDUCATION ACQUIRES**

Independent work involves preparation for each practical session.

### **EDUCATIONAL DISCIPLINE POLICY**

*Deadlines and Rescheduling Policy:*

- Absences of classes for non-respectable reasons will be worked out according to the schedule of the teacher on duty.
- skips with respectable reasons working out by individualschedule with the permission of the dean's office.

*Academic Integrity Policy:*

Observance of academic integrity by applicants is mandatory, and

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exactly:

- independent implementation everyone species works, tasks, forms control, provided by the work program of this academic discipline;
- references to sources of information in case of use of ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

Unacceptable in educational activities for participants of the educational process are:

- the use of family or official ties to obtain a positive or higher grade during any form of control of academic performance or academic merit;
- use of prohibited auxiliary materials or technical means (cheat sheets, notes, micro-earphones, telephones, smartphones, tablets, etc.) during control measures;
- going through procedures for monitoring the results of training by fake persons.

For violation of academic integrity, students may be held to the following academic responsibility:

- a decrease in the results of assessment of the control work, assessment in class, credit, etc.;
- retaking the assessment (test, credit, etc.);
- assignment of additional control measures (additional individual tasks, control works, tests, etc.);
- conducting an additional inspection of other works authored by the violator.

*Attendance and Tardiness Policy:*

Uniform: a medical gown that completely covers the outer clothing, or medical pajamas, a cap, a mask, and a change of shoes.

Equipment: notebook, pen, phonendoscope.

State of health: applicants suffering from acute infectious diseases, including respiratory diseases, are not allowed to attend classes.

A student who is late for class can attend it, but if the teacher has put "nb" in the journal, he must complete it in the general order.

*Use of mobile devices:*

Mobile devices may be used by students with the permission of the instructor if they are needed for the assignment.

*Behavior in the audience:*

The behavior of applicants and teachers in classrooms should be professional and

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calm, strictly comply with the established rules Provisions on academic integrity and ethics of academic relations in Odesa National Medical University, in accordance with of the Code of academic ethics and relations of the Odesa university community National Medical University, Provisions on prevention and detection of academic plagiarism in research and educational work students of higher education, scientists and teachers of Odesa National University medical university