

Odesa National Medical University

Medical faculty

Department of Pharmacology and Pharmacognosy

Syllabus of elective course

PHARMACOGENETICS AND PERSONALIZED THERAPY

Scope	1,5 credits ECTS, 45 hours,
Semester, year of study	9 th semester, 5 th year of study
Days, time, place	According to the schedule in the classrooms № 1-5 of the Department of Pharmacology and Pharmacognosy (cycle of pharmacology): Odessa, Olgievskaya 4 str.
Teachers	Rozhkovsky Ya.V., Head of the Department, D.Med.Sci., Professor; Kresyun V.Y., Member-correspondent of NAMSU, D.Med.Sci., Professor; Antonenko P.B., D.Med.Sci., Professor ; Lobashova K.G., Candidate of Medical Sciences, Associate Professor; Shemonaeva K.F., Candidate of Medical Sciences, Associate Professor; Timchishin O.L., Candidate of Medical Sciences, senior teacher; Ostapchuk K.V., Candidate of Medical Sciences, senior teacher; Sokolik O.P. , Candidate of Medical Sciences, Assistant; Antonenko K.O., Candidate of Biological Sciences, assistant; Paniotova G.P., assistant; Al-Nadawi N.D., assistant.
Contact phone	(048) 717-35-45
E-mail	pharmacology@onmedu.edu.ua
Workplace	Odessa, Olgievskaya 4 str. , Department of Pharmacology and Pharmacognosy (cycle of pharmacology)
Consultations	Consultations are conducted by teachers of the department according to the schedule: Face-to-face consultations: Thursday from 14.30 to 17.00; Saturday from 9.00 to 13.00 Online consultations: Thursday from 15.00 to 17.00; Saturday from 9.00 to 13.00 https://moodle.odmu.edu.ua/ or via Microsoft Teams / Telegram / viber / Zoom

COMMUNICATION

Communication with students will be through face-to-face meetings. In case of transition to distance learning, communication with students will be carried out by e-mail pharmacology@onmedu.edu.ua and programs: Microsoft Teams, Zoom, Telegram, Viber.

COURSE ANNOTATION

The subject of study of the discipline "Pharmacogenetics and personalized therapy" is a hereditary basis of variability of action of the medicines that allows to predict efficiency and safety during medicines prescriptions

Prerequisites: pharmacogenetics and personalized therapy as a discipline is based on the study of medical biology, physiology, pathological physiology, pharmacology, clinical pharmacology, propaedeutics of internal diseases, infectious diseases, family medicine, internal medicine that allows disciplines' integration.

Postrequisites: paved the basis for the formation of the skills to apply knowledge of pharmacogenetics and personalized therapy in the process of further studying and in professional activities.

The purpose of the course: to handle a complex of knowledges, skills, capability of rational and safe for human health use of the drugs, considering human genetic polymorphism, which should reduce the frequency or prevent the occurrence of the adverse effects, as well as improve the effectiveness of the diseases treatment.

The main tasks of studying the discipline "Pharmacogenetics and personalized therapy" is to provide to the students a theoretical knowledge about the human hereditary mechanisms, which determine the peculiarities of the action of drugs in a person; a knowledge of the most clinically significant genetic polymorphisms that affect the effectiveness and toxicity of pharmacotherapy; a knowledge of predicting the action of drugs in a person according to his/her genetic characteristics, to be able to use available literature data / databases, as well as adjust a dose of the drugs.

Expected results:

As a result of studying of the elected course, students should know:

- Genetic factors of the patient that affect the effectiveness and safety of the drugs;
- Requirements and indications for pharmacogenetic tests;
- Indications for pharmacogenetic testing;
- Interpretation of the results of pharmacogenetic testing and possible changes in the mode of drug administration in accordance with the results of pharmacogenetic testing.

To be able:

- to evaluate the results of pharmacogenetic tests;
- to choose the dosage regimen of the drugs or to provide the replacement of drugs depending on the test results;
- to use the primary sources and electronic databases, which provide information on known genetic polymorphisms.

COURSE DESCRIPTION

Forms and methods of teaching

The course will be presented in the form of lectures (6 hours) and practical classes (24 hours), organization of independent work of students (15 hours).

The following teaching methods are used in teaching of the discipline: lectures, explanations, multimedia presentations, situational studying, simulational

studying, oral interviews, testing, individual tasks, self-preparation work with the textbook.

The content of the discipline

Topic 1. The establishment and development of pharmacogenetics. The basis of individual human sensitivity to the drugs.

Topic 2. The characteristics of pharmacogenetic tests - their informativeness, interpretation of results, and practical application.

Topic 3. Pharmacogenetics of the drugs that affect hemostasis.

Topic 4. Pharmacogenetics of the drugs that regulate the function of the cardiovascular system (beta-blockers, statins, etc.).

Topic 5. Pharmacogenetics of the neurotropic drugs.

Topic 6. Pharmacogenetic features that determine the sensitivity to anticancer drugs.

Topic 7. The peculiarities of drugs' action that are associated with polymorphism of pharmacokinetic processes.

Topic 8. Adverse reactions that depend on genetic polymorphism.

Topic 9. Checkup of practical skills and theoretical knowledges. Final class.

Final control of the studied course.

Recommended literature

1. Pharmacology [Text] : a textbook for students of higher medical educational establishments of the IV level of accreditation with English as the language of instruction / V. M. Bobyrov, O. M. Vazhnicha, T. O. Devyatkina, N. M. Devyatkina ; Ukrainian Medical Stomatological Academy. - 4th ed., updated. - Vinnytsia : Nova knyha, 2018. - 551 p.

2. Pharmacology [Text] / K. Whalen; contributor: Sh. Anderson, A. K. Birnbaum, N. Carris [et al.] ; ed.: R. Finkel, Th. A. Panavelil, 2015. - 664 p.

3. Pharmacogenomics: Challenges and Opportunities in Therapeutic Implementation / Yui-Wing Francis Lam, Stuart R. Scott. - Academic Press, 2018. - 442 p.

4. Betram G Katzung Basic and Clinical Pharmacology, 14th Edition. - McGraw-Hill Medical, 2018.- 1235.

5. Human pharmacogenetic peculiarities affecting the action of anti-tuberculosis medicines [Текст] / P. B. Antonenko [et al.] // Клініч. фармація. - 2016. - Том 20, № 1. - С. 6-11 DOI: <https://doi.org/10.24959/cphj.16.1374>

EVALUATION

Current control

Carried out at each practical lesson with the help of testing, written works on base of prescriptions, solving situational tasks.

The current assessment of students on relevant topics is carried out according to the traditional 4-point system (excellent, good, satisfactory, unsatisfactory).

The value of the assessment is "excellent". The student shows special creative abilities, is able to acquire knowledge independently, without the help of the teacher finds and processes the necessary information, is able to use the acquired knowledge and skills for decision-making in unusual situations, convincingly argues answers, independently reveals own talents and inclinations.

The value of the assessment is "good". The student is fluent in the studied amount of material, applies it in practice, freely solves problems in standard situations, and independently corrects mistakes, the number of which is insignificant.

The value of the assessment is "satisfactory". The student reproduces a significant part of the theoretical material, shows knowledge and understanding of the basic principles; with the help of the teacher can analyze the educational material, correct mistakes, among which there are a significant number of significant ones.

The value of the assessment is "unsatisfactory". The student knows the material at the level of individual fragments, which are an insignificant part of the study material.

At the end of the discipline, the current academic performance is calculated as the average score of all grades obtained by the student on a traditional scale, rounded to 2 (two) decimal places.

Final control

The study of the discipline ends with a differential test. Students who do not have missed lectures and seminars or have completed missed classes and have an average score of not less than 3.0 are admitted to the differential test.

The average score for the discipline is translated into the traditional grade from the discipline on a 4-point scale and is calculated as the ratio of this arithmetic mean to the percentage of assimilation of the required amount of knowledge in the subject.

Average score for the discipline	The ratio of the obtained average score to the maximum possible value	Grade on the discipline on a 4-point scale (national)
4.45- 5.00	90-100 %	5
3.74- 4.44	75-89 %	4
3.00- 3.74	60-74 %	3

The traditional mark from the discipline is converted into a mark on a 200-point scale and then ranked on a rating scale (ECTS).

Self-preparation of the students

Control of self-preparation of the students :

The control of self-preparation of the students, which is provided by the topic along with the classroom work, is carried out during the current control of the topic in the relevant classroom.

Topics of self-preparation of students:

1. The emergence and development of pharmacogenetics. Fundamentals of individual human sensitivity to drugs. Genetic differences in drug receptors. Clinical significance of pharmacodynamic polymorphisms of genes.

2. Varieties of methods for determining genetic polymorphism. Interpretation of pharmacogenetic tests and their significance for practical medicine.

3. Pharmacology of drugs that affect the blood clotting system, lipidemia. Gene polymorphism, which determines the features of anticoagulants, antiagrigants, statins and their clinical significance.

4. Pharmacology of beta-blockers and drugs that affect the renin-angiotensin system. Gene polymorphism, which determines the features of ACE inhibitors, beta-blockers and their clinical significance.

5. Pharmacology of neuroleptics, antidepressants, analgesics. Gene polymorphism affecting the pharmacokinetics and pharmacodynamics of neuroleptics, antidepressants and analgesics.

6. Pharmacogenetic features that determine the sensitivity to antitumor drugs.

7. Genetic polymorphism, drugs associated with polymorphism of pharmacokinetic processes.

8. Preparation for the final lesson.

COURSE POLICY

The policy of studying the elective course "Pharmacogenetics and Personalized Therapy" is determined by the system of requirements that the teacher imposes on the student in the study of the discipline. Requirements apply to attendance of all types of classes (inadmissibility of absences, delays), rules of behavior in the classroom (active participation, compliance with the required minimum of educational work), incentives and penalties. The policy of the academic discipline is built taking into account the norms of the legislation of Ukraine on academic integrity, the Statute and provisions of ONMedU, other normative documents.

Deadline and retakes policy

Students who have attended all types of classes (lectures, seminars) and have an average score of at least 3.0 are allowed to the final lesson (differential test). Retake of unsatisfactory grades and absences is allowed for 2 weeks without the permission of the dean on the days of consultations and working off missed

lessons, later - with the permission of the dean; in case of distance online learning - in the terms determined and agreed with the teacher.

Academic integrity policy

Independent completing of all types of work, tasks, forms of control provided by the work program of this discipline; providing reliable information about the results of their own educational (scientific) activities, used research methods and sources of information; copying and plagiarism are not allowed.

Attendance policy

Attendance at lectures and practical classes is mandatory, exceptions are possible only if an individual study schedule is approved for an individual student. Late classes are not allowed. The missing of classes, regardless of the reason for the missing, the student of higher education works for the teacher in accordance with the schedule of consultations and practice of missed classes.

Mobile devices

The use of a mobile phone, tablet or other mobile devices during the lesson is not allowed (except in cases provided by the curriculum and guidelines of the teacher).

Behavior in the audience

Keeping quiet among students in lectures, exceptions - students' questions to the teacher regarding the explanation of the material; working discussion atmosphere in practical classes during the survey; adherence to the ethics of academic relations.

Syllabus stacker

Doctor of Medical Sciences,
Professor

Antonenko P.B.

Corresponding Member NAMS of Ukraine,
Doctor of Medical Sciences, Professor

Kresyun V.Y.

Candidate of Medical Sciences,
Associate Professor

Lobashova K.G.

Candidate of Biological Sciences,
Assistant

Antonenko K.O.

Head of the Department,
Doctor of Medical Sciences,
Professor

Rozhkovsky Ya.V