GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Anticancer Drugs, PG_00058241		
Field of study	Biotechnology		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Agnieszka Potęga	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	1.0	19.0	50

Subject objectives

Gaining knowledge on existing antitumor drugs with their clinical applications and toxic side effects; problems with design of new antitumor drugs and therapeutic strategies.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U04] is able to predict potential properties of biomolecules and biologically active compounds on the basis of knowledge of their chemical structure and apply methods of molecular modelling of biomolecules	The student is able to propose modifications of pharmacological groups of chemotherapeutics in order to improve their physicochemical properties and/or interaction with molecular target.	[SU3] Assessment of ability to use knowledge gained from the subject
[K7_W05] knows the basis of civilization diseases, including cancer, and chemical structures and properties of various groups of active substances, including anticancer drugs	The student is able to discuss the factors contributing to the development of cancer, knows the classes of currently used chemotherapeutics and is able to give examples of chemotherapeutics individual classes. The student is able to describe the interactions of individual classes chemotherapeutics with their molecular targets.	[SW1] Assessment of factual knowledge
[K7_K02] is aware of the limitations and the necessity of continuous development of knowledge and technology; understands the need for education and constant training	The student understands the process of cancer formation and is aware of the need to develop new chemotherapeutics with much greater specificity and including new molecular targets.	[SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>1. History of cancer treatment and chemotherapy 2. The origin of cancer: carcinogenic factors and the process of carcinogenesis 3. Major types of human tumors, diagnostic methods and cancer treatment 4. Antitumor chemotherapy - a historical perspective 5. Antitumor chemotherapeutics accordign to their mechanism of action: a. DNA targeting drugs: drugs covalently binding to DNA drugs directly damaging DNA structure inhibitors of DNA topoisomerase I and II antimetabolites drugs interacting with telomeric DNA and telomerase inhibitors b. inhibitors of microtubule functions drugs destabilizing microtubules drugs stabilizing microtubules c. Antihormone therapies d. immunotherapies - application of monoclonal antibodies in anticancer therapy e. Kinase inhibitors: stress kinases kinases regulating cell cycle progression (Cdk1, Chk1, Aurora B) atypical kinases - Gleevec f. phosphatase inhibitors g. inhibitors of Ras pathway 6. problems in antitumor treatment: general toxicity, drug resistance (inherent and induced) 7. New directions and strategies in the treatment of human tumors and targeting cancer stem cells.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge in organic chemistry, cell biology and biochemistry.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
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<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>test 1; 45 min; open and test questions</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>test 2; 45 min; open and test questions</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>Lauren Pecorino; Molecular Biology of Cancer; Oxford University Press; Oxford; 2016; ISBN: 9780198717348

Krystyna Orzechowska-Juzwenko; Zarys chemioterapii nowotworów narządowych i układowych; Volumed; Wrocław 2000; ISBN: 83-87804-15-0

Alfred Zejc i Maria Gorczyca; Chemia Leków; PZWL; Warszawa 2009; ISBN: 978-83-200-3652-7</td></tr>
<tr><td>Supplementary literature</td><td>Recent review articles on new antitumor drugs and therapeutic strategies, materials obtained from pharmaceutical companies on new anticancer drugs (provided by lecturer).</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>What could be the causes of the decline of cases lung cancer? Why, are lung cancers still the main cause of death caused by cancer? What characteristics must posess a cancer cell in order to be susceptible to treatment with conventional chemotherapeutics such as DNA alkylators?</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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