

Subject card

Subject name and code	Monographic lecture - Radiosensitizers - in the service of oncology, PG_00021572						
Field of study	Chemistry						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		3.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Lidia Chomicz-Mańka				
	Teachers						
Lesson types	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		5.0		40.0	75
Subject objectives	The aims are: to acquaint students with the basics of cancer treatment, with particular emphasis on radiotherapy and the role of radiosensitizers to develop the ability to describe the processes and reactions taking place in cancer cells during irradiation with high-energy radiation to develop skills to describe the mechanisms of action of basic types of radiosensitizers						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	Understands the role of high-energy radiation in radiotherapy. Explains the genesis of the formation and role of genotoxic factors (hydroxyl radical and hydrated low-energy electrons). Knows the basics of prevention, diagnosis and treatment of cancer diseases.	[SW4] test/exam - oral or written
	[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	Knows the methods of research on mechanisms of drug action. Identifies the basic classes of radiosensitizers and characterizes the mechanisms of their action.	[SW4] test/exam - oral or written
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	The student works independently, is cautious and critical in expressing opinions, and argues his opinion using verified data. Is able to use the proposed English-language literature in the process of self-education and verify information in reliable sources of knowledge.	[SK1] oral statement/conversation/discussion
	[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	Draws conclusions about the structure and properties of chemical compounds based on photoelectron and UV-Vis spectra.	[SW1] oral statement/conversation/discussion
Subject contents	Carcinogens, basics of tumor biology, cancer cell hypoxia, survival of patients with malignant tumors, tumor markers and selected laboratory indicators, cancer treatment methods, chemotherapy, hormonal therapy, photodynamic therapy, targeted therapy, radiotherapy, combination therapy (including chemoradiotherapy), side effects of radiotherapy, radioprotectors and radiosensitizers, direct and indirect effects of irradiation with ionizing radiation, water radiolysis products, radiation-induced DNA damage, hydroxyl radical, hydrated electrons, types of radiosensitizers, uracil derivatives as radiosensitizers, oxygen mimetics, novel anticancer drugs and treatments as well as official procedures for their introduction into clinical practice, unconventional activities in oncology.		
Prerequisites and co-requisites	Required courses: Physical and Organic Chemistry Introductory requirements: - knowledge of the structure and biosynthesis of DNA - knowledge of the types and role of electromagnetic radiation - the ability to present the mechanisms of simple radical reactions.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	graded credit	51.0%	100.0%
Recommended reading	Basic literature	1. Onkologia. Podręcznik dla studentów i lekarzy red. Radziszław Kordek; Via Medica, Gdańsk 2007. 2. Chemical Radiosensitizers for Use in Radiotherapy P. Wardman, Clinical Oncology (2007) 19: 397-417. 3. Basic Clinical Radiobiology ed. Michael Joiner, Albert van der Kogel; Hodder Arnold, Londyn 2009. 4. Free-Radical-Induced DNA Damage and its Repair. A Chemical Perspective Clemens von Sonntag; Springer, Berlin 2006.	
	Supplementary literature	Druga twarz tlenu Grzegorz Bartosz; Wydawnictwo Naukowe PWN, Warszawa 2003	
	eResources addresses		

Example issues/ example questions/ tasks being completed	1. Anticancer treatment methods 2. Radiosensitizers in anticancer treatment 3. Impact of high energy irradiation on the living cell 4. Types of radiosensitizers 5. Carcinogens 5. Radioprotectors vs. radiosensitizers 6. Anti-cancer prevention - addictions, diet, lifestyle. 7. BRCA1 syndrome - what is it, what does it mean for the patient? 8. Oncological screening in Poland.9. Biological therapies - oncological immunotherapy and gene therapy. 10. Uracil derivatives as radiosensitizers - idea of action, examples, directions of research.24. Oxygen mimetics as radiosensitizers - idea of action, examples, directions of research.25. The role of solvated electrons in radiosensitization using uracil derivatives.
Work placement	Not applicable

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