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| <b>Course title</b><br>Wykład monograficzny - Radiosensybilizatory w służbie onkologii /<br>Monographic lecture - Radiosensitizers - in the service of oncology  |             | <b>ECTS code</b><br>13.3.0884   |  |
| <b>Name of unit administrating study</b><br>Faculty of Chemistry   |             |   |  |
| <b>Studies</b>   |             |   |  |
| <b>Field of study</b>  | <b>Type</b> | <b>Form</b>   |  |
| Chemistry  | Masters     | Full-time studies   |  |
| <b>Teaching staff</b><br>Dr Lidia Chomicz-Mańka  |             |   |  |
| <b>Forms of classes, the realization and number of hours</b>   |             | <b>ECTS credits</b> 3   |  |
| <b>A. Forms of classes, in accordance with the UG Rector's regulations</b><br>lecture  |             | classes - 30 h<br>tutorial classes – 10 h<br>student's own work – 35 h  |  |
| <b>B. The realization of activities</b><br>in-class learning   |             | Total: 75 h - 3 ECTS  |  |
| <b>C. Number of hours</b><br>30 h lecture  |             |   |  |
| <b>The academic cycle</b><br>Second year, winter semester  |             |   |  |
| <b>Type of course</b><br>obligatory  |             | <b>Language of instruction</b><br>Polish  |  |
| <b>Teaching methods</b><br><br>Lecture with multimedia presentation<br>Led discussion  |             | <b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>  |  |
|  |             | <b>A. Final evaluation, in accordance with the UG study regulations</b><br>course completion (with a grade)   |  |
|  |             | <b>B. Assessment methods</b><br>Written or oral exam  |  |
|  |             | <b>C. The basic criteria for evaluation or exam requirements</b><br><br>To complete the course, students need to correctly answer at least 51% questions from written exam test. People who do not get the required threshold during written test, take an oral exam. |  |
| <b>Required courses and introductory requirements</b><br>Required courses: Physical and Organic Chemistry<br><br>Introductory requirements:<br>- knowledge of the structure and biosynthesis of DNA<br>- knowledge of the types and role of electromagnetic radiation<br>- the ability to present the mechanisms of simple radical reactions.  |             |   |  |
| <b>Aims of education</b><br>The aims are:<br>- to acquaint students with the basics of cancer treatment, with particular emphasis on radiotherapy and the role of radiosensitizers<br>- to develop the ability to describe the processes and reactions taking place in cancer cells during irradiation with high-energy radiation<br>- to develop skills to describe the mechanisms of action of basic types of radiosensitizers   |             |   |  |
| <b>Course contents</b><br><br>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.

### **Bibliography of literature**

#### **A. Literature required to pass the course**

1. „Onkologia. Podręcznik dla studentów i lekarzy” red. Radzisław 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.

#### **B. Extracurricular readings**

5. „Druga twarz tlenu” Grzegorz Bartosz; Wydawnictwo Naukowe PWN, Warszawa 2003.

### **Knowledge**

- the student knows the basics of anticancer treatment
- understands the role of high energy radiation in radiotherapy
- explains the process of the formation and role of genotoxic factors (hydroxyl radical and hydrated low energy electrons therein)
- identifies basic types of radiosensitizers and characterizes the mechanisms of their action
- knows the directions of development of novel anticancer treatments and understands the complexity of procedures for introducing new drugs into clinical practice.

### **Skills**

The student can use the suggested English literature in the process of self-education and can verify gained information in reliable sources of knowledge.

### **Social competence**

The student works independently, behaves with caution and criticism in expressing opinions, argues his opinion with the help of reliable information.