University of Gdańsk

Subject card

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| Subject name and code | Animal models of autoimmunologic, neuredegenerative and metabolic diseases, PG_00203488 | | | | | | |
| Field of study | Medical Biology | | | | | | |
| Date of commencement of studies | October 2026 | | Academic year of realisation of subject | 2026/2027 | | | |
| Education level | Master's studies | | Subject group | Obligatory subject group in the field of study<br>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 | 3.0 | | | |
| Learning profile | academic | | Assessment form | exam | | | |
| Conducting unit | Laboratory of Experimental Animals -> Department of Animal and Human Physiology -> Faculty of Biology -> Rector | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr Dorota Myślińska | | | | |
| | 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 | | 4.0 | 41.0 | 75 | |
| Subject objectives | Learning basic information about the biology and maintenance conditions (according to EU directives and the Act on the protection of animals used for scientific or educational purposes) of laboratory animals.<br>Understanding the concepts of inbreeding, selective lines, inbred strains, and non-related populations.<br>Learning about the mechanisms and understanding the purpose of developmental programming and induction of genetic changes in laboratory animals.<br>Familiarisation with research trends using experimental animal models of selected autoimmune, neurodegenerative, metabolic and other diseases. Learning about the basic legal regulations (Polish and EU) concerning the protection of animals used for scientific purposes. | | | | | | |

## Learning outcomes

| Course outcome | Subject outcome | Method of verification |
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| [BIOLMEDMU2_U01] can proficiently, but critically, use the scientific literature and databases necessary in the activities of medical biology and related disciplines | The student is able to use scientific literature and databases necessary for activities in the field of medical biology and related disciplines based on research results using animal models. | [SU4] test/exam - oral or written |
| [BIOLMEDMU2_W07] knows the economic feasibility of meeting the needs of individuals and social groups in the field of neurobiology or molecular, biochemical and parasitological diagnostics | The student has in-depth knowledge of scientific fields and disciplines relevant to medical biology and the specialisation studied, and is familiar with the main trends in research on animal models of human diseases. | [SW4] test/exam - oral or written |
| [BIOLMEDMU2_W02] is oriented to the currently debated problems in medical biology and related disciplines | The student is familiar with the currently debated issues concerning experimental animal models of autoimmune, neurodegenerative and metabolic diseases. | [SW4] test/exam - oral or written |
| [BIOLMEDMU2_U06] knows and applies English-language specialized vocabulary of biological and medical sciences in daily professional/scientific activities | The student uses English vocabulary related to the nomenclature of out-bred and in-bred strains of laboratory animals. | [SU4] test/exam - oral or written |
| [BIOLMEDMU2_W01] has an in-depth knowledge of scientific fields and disciplines relevant to medical biology and the studied specialty and knows their main development trends | The student is familiar with the basic ethical and legal conditions related to scientific, teaching and implementation activities, in particular those related to the use of animals for scientific purposes. | [SW4] test/exam - oral or written |

## Subject contents

Biology of laboratory animals. Conditions for keeping laboratory animals. Relatedness, inbreeding, principles of breeding out-bred herds, selection lines and inbred strains. Induction of genetic changes in laboratory animals. Developmental programming. Structural and molecular mechanisms determining the adaptation of the organism to the environment during foetal development, leading to the development of metabolic disorders in adulthood. Epigenetics in the developmental programming of metabolic diseases (effects of DNA methylation, influence of histone modifications,
programming of mitochondrial function). Inbred strains most commonly used in research (e.g. DBA/2J, BALB/c, C57BL/6, AKR, Wistar, SHR, WKY). Experimental animal models of autoimmune diseases (e.g. multiple sclerosis, amyotrophic lateral sclerosis, myasthenia gravis, systemic lupus erythematosus, allergic encephalomyelitis), neurodegenerative diseases (e.g. Alzheimer's disease, Parkinson's disease, Huntington's chorea) and metabolic diseases (e.g. mucopolysaccharidosis, diabetes, atherosclerosis, hypercholesterolaemia). Animal models of other diseases: hypertension, obesity, ischaemic stroke, schizophrenia, depression and cancer.

## Prerequisites and co-requisites

## Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
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| test exam | 51.0% | 100.0% |

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| Recommended reading | Basic literature | Conn M. (ed) Animal Models for the Study of Human Disease, 2013, Elsevier.<br>Suckow M., Steward K. (eds) Principles of Animal Research for Graduate and Undergraduate Students, 2016, Academic Press.<br>Hav J., van Hoosier G. L. (eds) Handbook of Laboratory Animal Science, Animal Models, Vol. II, 2002, CRC Press.<br>Acts, regulations and directives:<br>Act of 15 January 2015 on the protection of animals used for scientific or educational purposes.<br>Regulation of the Minister of Science and Information Technology of 5 May 2015 on the National Ethics Committee for Animal Experiments and local ethics committees for animal experiments (Journal of Laws, item 630).<br>Regulation of the Minister of Science and Information Technology of 5 May 2015 on training, practical training and internships for persons performing activities related to the use of animals for scientific or educational purposes (Journal of Laws, item 628).<br>Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes<br>Materials (review papers in English and Polish) provided by the course instructor. |
| | Supplementary literature | Szarek J., Szweda M., Strzyżewska E. (eds) Laboratory Animals: Pathology and Use, 2013, University of Warmia and Mazury Press, Olsztyn. |
| | eResources addresses | |
| Example issues/ example questions/ tasks being completed | | |
| Work placement | Not applicable | |

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