

Module name	<b>Molecular mechanisms of defence</b>
Module code	B-BTO.080
ISCED code	0511: Biology
Study cycle	II <sup>o</sup>
Semester	summer
Responsible for this module	Iwona Wojda Department of Immunobiology email: wojda@poczta.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	Basic information on biochemistry, immunology and animal physiology.
ECTS	4.0
ECTS points hour equivalents	Contact hours (with academic teacher): Lecture - 15 hours Laboratory - 30 hours Number of ECTS credits with academic teacher: 1.5  Hours without contact (own work): Student preparation to pass - 50 hours. Studying student literature on the subject - 10 hours. Preparation for mid-semester tests - 30 hours. Number of ECTS points without the participation of an academic teacher: 2.5
Learning outcomes verification methods	Method of verification of learning outcomes approved on the basis of Resolution of the Senate of Maria Curie-Skłodowska University No. XXII-39.6 / 12 of April 25, 2012, i.e. from the training cycle 2012/2013: Lecture: written exam (test): W1, W2 Laboratory: attending classes, correct performance of experiments and drawing conclusions, colloquium K_U03, K_K04  Method of verification of learning outcomes approved on the basis of Resolution of the Senate of Maria Curie-Skłodowska University No. XXIV-27.18 / 19 of May 29, 2019, i.e. from the training cycle 2019/2020:  Lecture: written exam (test): W1, W2, K1 Laboratory: attending classes, correct performance of experiments and drawing conclusions, colloquium: U1
Course full description	Lectures: - Host-pathogen antagonistic coevolution - Innate and acquired immunity; cellular and humoral - Janeway, Matzinger and Integrated model for infection recognition - Different strategies for 'remembering' infections found in living organisms: CRISP / Cas system in bacteria and

	<p>its use in biotechnology, Dscam receptors in insects, VLR receptors in jawless, somatic gene rearrangement in vertebrates</p> <ul style="list-style-type: none"> <li>- Annelides as a source of biologically active molecules and as environmental bioindicators.</li> <li>- Insects as objects for studying the mechanisms of innate immunity and as a source of bioactive compounds. Immunel proteins and peptides.</li> <li>- In vivo RNA interference technique for analyzing infection-regulated gene expression</li> <li>- Immune peptides, types, mechanism of action.</li> <li>- Methods for detecting antimicrobial activity in biological material: analysis of antimicrobial activity, lysozyme activity, phenol oxidase activity, coagulation index analysis</li> <li>- Limulus test - detecting the presence of pyrogens in the injection material</li> </ul> <p>Basics of immunotoxicology</p> <p>Laboratories:</p> <p>Getting acquainted with the workshop's regulations and OHS coverage.</p> <p>The use of insects as model organisms on the example of greater wax moth <i>Galleria mellonella</i>.</p> <p>Involvement of the phenoloxidase system in defense reactions in invertebrates.</p> <p>The role of lysozyme in immune response.</p> <p>Analysis of antimicrobial activity of immune peptides.</p> <p>The role of extracellular proteases of entomopathogenic bacteria in breaking down insect resistance mechanisms based on the example of <i>G. mellonella</i>. Detection and analysis of proteolytic activity in <i>G. mellonella</i> larvae homogenates.</p>
Bibliography	The up-to date literature on the subjects provided during classes.
Learning outcomes	<p>Based on the Resolution of the Senate of Maria Curie-Skłodowska University No. XXII-39.6 / 12 of April 25, 2012, i.e. from the 2012/2013 education cycle:</p> <p>In terms of knowlege, the graduate:</p> <p>W1: Has knowledge on molecular mechanisms of defence and related sciences as well as acquisition of funding for development and design of biotechnological processes based on mechanisms of organisms's immunity: K_W05</p> <p>W2: Describes the possibility of application of new sources of organisms for derivation of bioactive molecules: K_W07</p> <p>In terms of skills:</p> <p>K_U03: Effectively performs critical analyses of investigation results and literature data</p>

	<p>In terms of competences: K_K04: Is responsible for biological material and assigned tasks</p> <p>Based on the Resolution of the Senate of Maria Curie-Skłodowska University No. XXIV-27.18 / 19 of May 29, 2019, i.e. from the training cycle 2019/2020</p> <p>In terms of knowledge the graduate: W1: has profound knowledge and understanding of selected facts, objects, phenomena, and relevant methods used in the field of molecular mechanisms of defence as well as theories explaining the complex relationships between them, also with reference to other fields of science: K_W01</p> <p>W2: has advanced knowledge and understanding of basic phenomena and processes occurring at the molecular, cellular and organism levels with respect to defence against pathogens, and the relationships between the living environment of organisms and their products : K_W04</p> <p>In terms of skills: U1: is able to select properly and use adequate methods within the area of mechanisms of defence for design and comprehensive solution of research tasks and present results and conclusions in a written or oral form using advanced information and communication techniques</p> <p>In terms of competences: K1: is ready to fulfill social obligations, such as sharing knowledge concerning antimicrobial molecules with others and co-organizing activities for the benefit of the social milieu</p>
Practice	.....
Teaching methods	Presentation, show, scientific discussions, practical training