

Module name	<b>Invertebrate immunology</b>
Module code	B-BE.231
ISCED code	0511: Biology
Study cycle	II <sup>o</sup>
Semester	summer
Responsible for this module	Małgorzata Cytryńska Department of Immunobiology email: cytryna@poczta.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	Knowledge in biochemistry and microbiology
ECTS	3.5
ECTS points hour equivalents	Contact hours (work with an academic teacher) - 40 - lectures: 15 - labs: 25  Non-contact hours (students' own work) – 47 - preparation for the exam: 25 - preparation for labs: 10 - literature study: 12  <b>Total number of ECTS points for the module – 3.5</b>
Learning outcomes verification methods	Continuous evaluation of laboratory classes, written or oral exam (lectures)
Course full description	The module covers the knowledge in the area of invertebrate immunity. <u>Lectures</u> cover the following issues: Essential features of invertebrate immunity on the example of insect innate immunity. Recognition of non-self (pathogen/microbial associated molecular patterns, pattern recognition receptors). Mechanisms of invertebrate immunity: anatomical and physiological barriers, cellular response (types of hemocytes, phagocytosis, nodulation, encapsulation), humoral response (hemolymph coagulation, phenoloxidase system, defense peptides and proteins). Regulation of gene expression of defense peptides in <i>Drosophila</i> . The role of proteins containing immunoglobulin domains in invertebrate immunity (hemolin, Dscam, FREPs). Entomopathogenic organisms. <u>Laboratory classes</u> : <i>Galleria mellonella</i> (Lepidoptera) as a model organism (isolation of fat body, microscopic observation of hemocytes). Analysis of phenoloxidase activity in hemolymph of naive and immune-challenged insects. Detection of antimicrobial activity (lysozyme, defense peptides) in <i>G. mellonella</i> hemolymph. The role of proteases of entomopathogenic bacteria in overcoming the insect immune response.
Bibliography	Recommended papers of the current scientific

	literature.
Learning outcomes	<p><b>KNOWLEDGE</b> The student has knowledge of the essential mechanisms of invertebrate immunity, understands the differences between invertebrate and vertebrate immune response, can explain the complex mechanisms leading to activation of the immune response in invertebrates and the mechanisms of overcoming the insect immunity by entomopathogenic organisms. The student knows and understands the techniques and methods used in research on invertebrate immunity.</p> <p><b>SKILLS</b> The student can use an integrated knowledge of the various fields of biology (biochemistry, microbiology, immunology), knows and applies the techniques and methods used in research on invertebrate immunity, is able to use basic laboratory equipment, properly interprets the empirical data.</p> <p><b>SOCIAL COMPETENCES</b> The student understands the need for continuous updating of knowledge. The student follows ethical principles. The student can work in a team.</p>
Practice	
Teaching methods	presentation, discussion, practical laboratory