

**Course name: Immunobiology** (USOS Code: B-BSR.2015E)

**ECTS: 4**

**No. of hours:** 45 (15 lectures + 30 classes)

**Course coordinator:** Dr hab. Iwona Wojda, prof. UMCS

**Prerequisites:** Basic knowledge from biology and chemistry

**Course description:** Lectures: Red Queen Hypothesis, 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: CRISPR / Cas system in bacteria and its use in biotechnology, Dscam receptors in insects, VLR receptors in jawless, somatic gene rearrangement in vertebrates; Annelides as a source of biologically active molecules and as environmental bioindicators; Insects as objects for studying the mechanisms of innate immunity and as a source of bioactive compounds. Immune proteins and peptides; In vivo RNA interference technique for analyzing infection-regulated gene expression; Immune peptides, types, mechanism of action; Methods for detecting antimicrobial activity in biological material: analysis of antimicrobial activity, lysozyme activity, phenol oxidase activity, coagulation index analysis; Limulus test - detecting the presence of pyrogens in the injection material; Basics of immunotoxicology

Laboratory: Getting acquainted with the workshop's regulations and OHS coverage; The use of insects as model organisms on the example of greater wax moth *Galleria mellonella*; Involvement of the phenoloxidase system in defense reactions in invertebrates; The role of lysozyme in immune response; Analysis of antimicrobial activity of immune peptides; The role of extracellular proteases of entomopathogenic bacteria in breaking down insect resistance mechanisms based on the example of *G. mellonella*. Detection and analysis of proteolytic activity in *G. mellonella* larvae homogenates.

**Recommended literature:** The up-to date literature on the subject is provided during classes.