

Level: master				
Course title: Biochemistry of antioxidant systems (IB-501)				
Status: elective				
ECTS: 7				
Requirements: none				
Learning objectives To introduce students to the latest scientific knowledge about the biochemical and physiological role of toxic oxygen species in organism of humans and animals. To provide students with the knowledge of oxidative stress development and the development of chronic degenerative diseases.				
Learning outcomes Students are expected to identify and describe the most reactive radical species in the cell. To explain their production in the cell and role in the development of metabolic disorders and chronic diseases. It is also expected that students are able to explain the underlying mechanisms of these disorders and diseases and to describe antioxidant defence systems in the cell and organism.				
Syllabus <i>Theoretical instruction</i> The phenomenon of oxygen toxicity in aerobic organisms. Activation of oxygen and reactive oxygen species: superoxide anion radical, hydroxyl radical, singlet oxygen, organic peroxides and peroxy- and alkoxy- radicals, nitrogen oxides. Cellular sources of free radicals. Mechanisms of free radical toxicity: lipid peroxidation, oxidative damage of proteins, DNA and carbohydrates. Pathological changes in the cell and the organism as a result of oxidative stress. Free radicals and aging. Antioxidant mechanisms of cells: antioxidant enzymes and non-enzymatic cellular antioxidants. Antioxidants plants. <i>Practical instruction</i> Laboratory exercises follow theoretical instructions.				
Weekly teaching load				Other:
Lectures: 2	Exercises: 2	Other forms of teaching: 1	Student research: /	