

Course Unit Descriptor

Study Programme: PhD in Molecular Biology			
Course Unit Title: Mechanisms of cellular stress responses			
Course Unit Code: DMB023			
Name of Lecturer(s): Prof. Jelena Purać, PhD, Elvira Vukašinović, PhD			
Type and Level of Studies: Doctoral studies			
Course Status (compulsory/elective): elective			
Semester (winter/summer): winter/summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated: 15			
Requirements:			
Course Aims: The goal of this course is to provide students with knowledge about the mechanisms of cellular responses to stress.			
Course Outcomes: After completing the course, students should understand the different mechanisms of cellular response to stress and that different systems function cooperatively as an integrated cellular defense system. Given the universality of these mechanisms, the students will be able to understand knowledge gained in this course in the context of different biological disciplines.			
Syllabus: <i>Theoretical lectures</i> All organisms need to have a system to defend against stress, which is in addition to that role, is involved in re-establishment of a normal physiological state after stress. Defense mechanisms are found in every cell and some of these are preserved from prokaryotes to eukaryotes, indicating their great importance for the survival of cells. Defense against stress is associated with the idea of homeostasis, the tendency to regulate the internal state, regardless of changes in the environment. During the course, students will be introduced to five different systems for defense against stress: a) systems for basal signal transduction b) stress proteins, c) response to oxidative stress, d) metallothionein and related systems and e) mixed function oxygenase. Students need to understand that there is a significant overlap and connection between different systems which help in coordinating cellular responses. <i>Practical lectures</i> Students will be required to write term paper that will be consistent with the theoretical material covered in the course, as well as the subject they deal with for their doctoral research.			
Required Reading: Nico M. van Straalen, Dick Roelofs (2011) An Introduction to Ecological Genomics, 2nd edition, Oxford University Press Andre Korsloot, Cornelis A. M. van Gestel, Nico M. van Straalen (2004) Environmental Stress and Cellular Response in Arthropods, Taylor & Francis Ulrich Feige (1996) Stress-Inducible Cellular Responses, Springer Downes, C. P., Wolf, C. R., Lane, D. P. (Eds.). (2014) Cellular responses to stress (Vol. 85) Princeton University Press			
Weekly Contact Hours:	Lectures: 5	Practical work: 5	
Teaching Methods: Theoretical instructions are taught in lectures or consultations.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligation	Points	Final exam	Points
Course activity	30	Term paper	70