

<b>Study programme(s): PhD in Biology</b>				
<b>Level:</b> Doctoral degree				
<b>Course title:</b> Mechanisms of cellular stress responses				
<b>Lecturer:</b> dr Jelena Purać				
<b>Status:</b> elective				
<b>ECTS:</b> 15				
<b>Requirements:</b>				
<b>Learning objectives</b> The goal of this course is to provide students with knowledge about the mechanisms of cellular responses to stress.				
<b>Learning outcomes</b> 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.				
<b>Syllabus</b> <i>Theoretical instruction</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 instruction</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.				
<b>Literature</b> 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 Heribert Hirt, Kazuo Shinozaki (2003) Plant Responses to Abiotic Stress, Springer				
<b>Weekly teaching load</b>				Other:
Lectures: 5	Exercises:	Other forms of teaching:	Student research: 5	
<b>Teaching methodology</b> Theoretical instructions are taught in lectures or consultations.				
<b>Grading method (maximal number of points 100)</b>				
Term paper: 70 points				
Course activity: 30 points				