

<b>Subject name</b>	<b>Antioxidative Properties of Plants</b>	
<b>Subject code</b>	<b>E.1z.APP.SC.ECTIE.O (winter)</b> <b>E11.APP.SC.ECTIE.O (summer)</b>	
<b>Department</b>	<b>Unit of Botany and Plant Physiology</b>	
<b>Faculty</b>	<b>Faculty of Biotechnology and Horticulture</b>	
<b>Subject supervisor/Lecturer</b>	<b>Anna Kolton Ph.D.</b>	
<b>General information</b>	<b>Teaching period</b>	<b>1 semester / winter or summer semester</b>
	<b>ECTS credit</b>	<b>6</b>
	<b>Lectures total</b>	<b>15 h</b>
	<b>Lab classes</b>	<b>15 h</b>
<b>Objective and general description</b>	The main objective of the course is presentation and explanation of oxidative stress mechanism as well as resistance responses of plants to free radicals and active oxygen species. The subject comprises characteristic of radicals and their generation in the living cells. The special attention would be paid to biological activity of AOS and their negative/positive effect on cell constituents. Antiradical system of plants and influence of different environmental factors on plant antioxidants is discussed.	
<b>Lectures</b> <b>6 x 2 hours</b> <b>1 x 3 hours</b>	<ol style="list-style-type: none"> <li>Free radicals and active oxygen species. Chemical structure of AOS. Terminology of the important AOS. Reactions of free radicals. 3 hrs</li> <li>Generation of active oxygen species “in vivo’ and “in vitro”. Biological activity of AOS in cells. Reactions with cell structural compounds (lipids, proteins, nucleic acids, carbohydrates). 2 hrs</li> <li>Resistance mechanism of plants to AOS. Antioxidative enzymes, their structure and activity. Low-molecular antioxidants of hydrophilic and hydrophobic phases. 2 hrs</li> <li>Vitamins and their derivatives as antioxidants (ascorbic acid, carotenoids, tocopherols, bioflavonoids). 2hrs</li> <li>Metabolic effects of oxidative stress. AOS as positive agents of plant tissue. 2 hrs</li> <li>Antioxidant activity of various plant species (fruits, vegetables, herbs). 2 hrs</li> <li>Effect of growing conditions and post-harvest treatment on antioxidative properties of plants 2 hrs</li> </ol>	
<b>Lab classes</b> <b>7 x 2 hours</b> <b>1 x 1 hour</b>	<ol style="list-style-type: none"> <li>Determination of radical scavenging activity with DPPH</li> <li>Measurement of ascorbic acid concentration in plant tissue</li> <li>Measurement of carotenoids concentration in plant tissue</li> <li>Determination of activity of antioxidative enzymes: catalase</li> <li>Determination of activity of antioxidative enzymes: peroxidase</li> <li>Distribution of antioxidants within plant tissue</li> <li>, 8. Effect of stress factors on antioxidative capacity of plant tissue.</li> </ol>	
<b>References</b>	<ol style="list-style-type: none"> <li>Bartosz G. Oxidative stress in plants. 1993. Acta Physiologiae Plantarum, 19, 47-64.</li> <li>Larson R.A. The antioxidants in higher plants. 1988. Phytochemistry 27(4), 969-978.</li> <li>Amparo Asensi-Abado M, Munne-Bosh S. Vitamins in plants: occurrence, biosynthesis and antioxidant function. 2010. Trends in Plant</li> </ol>	

