

<b>Course title</b>	Molecular and Cellular Biology of Cancer				
<b>Course code</b>	MCB610				
<b>Course type</b>	Compulsory				
<b>Level</b>	Master's (2nd Cycle)				
<b>Year / Semester</b>	1st Year / 1st Semester				
<b>Teacher's name</b>	TBA				
<b>ECTS</b>	10	<b>Lectures / week</b>	3 Hours/14 weeks	<b>Laboratories / week</b>	None
<b>Course purpose and objectives</b>	The main objective of the Molecular and Cellular Biology of Cancer course is to provide a deep understanding and insights into the principles governing biology of cancer, while highlighting different molecular and cellular mechanisms of this profoundly complex disease.				
<b>Learning outcomes</b>	<p>Upon completion of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Describe the hallmarks of cancer</li> <li>• Develop an in depth understanding of the molecular and cellular mechanisms that lead to carcinogenesis, including oncogenes and tumor suppressor genes</li> <li>• Distinguish the role of cancer stem-like cells as tumor initiating cells</li> <li>• Differentiate between hereditary and sporadic forms of various cancer types</li> <li>• Describe different mechanisms of cellular communication as well as the commonly observed pathway alterations during cancer progression</li> <li>• Correlate the activity of each pathway to specific cellular functions and properties (e.g. apoptosis, proliferation, migration)</li> <li>• Describe the multistep process of cancer metastasis</li> <li>• Understand and evaluate the role of tumor microenvironment in cancer progression</li> <li>• Develop hypotheses to answer cancer-related questions and design the appropriate experimental strategies to address them.</li> </ul>				
<b>Prerequisites</b>	None		<b>Co-requisites</b>	None	
<b>Course content</b>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Definition and hallmarks of cancer. Multi-step tumorigenesis and the evolution of cancer. Cancer stem cells as tumor initiating cells.</li> <li>• Mutagens and mutations. Tumor viruses. DNA repair defects and carcinogenesis</li> <li>• Cellular senescence, telomeres and immortalization in tumorigenesis.</li> <li>• Cancer genetics and hereditary cancer types</li> <li>• Tumor suppressor genes: Cell cycle regulation and apoptosis</li> <li>• Oncogenes and mechanisms of oncogenic activation</li> <li>• Mechanisms of cellular communication: Gap junctions, autocrine, paracrine, endocrine signaling and implications for cancer.</li> </ul>				

	<ul style="list-style-type: none"> <li>• Integrin signaling in cancer and cell signaling cross-talk in the tumor microenvironment.</li> <li>• Types of cell receptors and signaling pathways. G-protein coupled receptor signaling, second messengers, receptor tyrosine kinase and Serine/Threonine receptor pathways: EGF, FGF, PDGF, IGF, TGF<math>\beta</math>, Wnt/<math>\beta</math>-catenin signaling.</li> <li>• Angiogenesis and hypoxic adaptation</li> <li>• Tumor microenvironment and cancer progression</li> <li>• Dormancy and mechanisms of cancer metastasis</li> </ul>										
<b>Teaching methodology</b>	Face-to-face										
<b>Bibliography</b>	<p>The Biology of Cancer, (ebook and print edition). Rober A. Weinberg Garland Science  <a href="https://www.routledge.com/The-Biology-of-Cancer/Weinberg/p/book/9780429258794">https://www.routledge.com/The-Biology-of-Cancer/Weinberg/p/book/9780429258794</a></p> <p>Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics (print edition), Lauren Pecorino, Oxford University Press</p> <p>Molecular Biology of the Cell, (ebook), Bruce Alberts, W. W. Norton &amp; Company  <a href="https://www.ebooks.com/en-cy/book/210562513/molecular-biology-of-the-cell/bruce-alberts/">https://www.ebooks.com/en-cy/book/210562513/molecular-biology-of-the-cell/bruce-alberts/</a></p> <p>Molecular Cell Biology, (print edition), Harvey Lodish, W. H. Freeman</p>										
<b>Assessment</b>	<table> <tr> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>Final Examination</td> <td>40%</td> </tr> <tr> <td>Assignments</td> <td>20%</td> </tr> <tr> <td>Class participation and attendance</td> <td>10%</td> </tr> <tr> <td><b>Total</b></td> <td><b>100%</b></td> </tr> </table> <p><i>It should be noted that completion of this course requires successful completion of every one of its evaluation components</i></p>	Mid-Term Examination	30%	Final Examination	40%	Assignments	20%	Class participation and attendance	10%	<b>Total</b>	<b>100%</b>
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<b>Language</b>	English										