

## SYLLABUS

<b>Subject:</b>	<b>BIOCHEMISTRY OF NUCLEIC ACIDS</b>		
<b>Field of study:</b>	<i>General Medicine</i>	<b>Degree of study:</b>	<i>III.</i>
<b>Study programme:</b>	<i>Clinical Biochemistry</i>	<b>Form of study:</b>	<i>Internal / External</i>
<b>Subject evaluation:</b>	<i>Exam</i>	<b>Subject type:</b>	<i>Compulsory optional</i>

Department: **Department of Medical and Clinical Biochemistry UPJŠ FM**

<i>Lectures, seminars and practical exercises</i>	
<b>DNA REPLICATION</b>	
<ul style="list-style-type: none"> <li>- Structure and organization of the genome</li> <li>- DNA replication and repair</li> <li>- DNA synthesis inhibitors</li> </ul>	
<b>TRANSCRIPTION</b>	
<ul style="list-style-type: none"> <li>- Transcription and transcription inhibitors</li> <li>- Synthesis of rRNA, tRNA, mRNA</li> <li>- Reverse transcription, HIV, SARS-CoV-2</li> </ul>	
<b>PROTEOSYNTHESIS</b>	
<ul style="list-style-type: none"> <li>- mRNA translation</li> <li>- Cotranslational and posttranslational modification of proteins</li> <li>- Synthesis of secretory and membrane proteins</li> <li>- Distribution of synthesized proteins (targeting)</li> </ul>	
<b>REGULATION OF GENE EXPRESSION</b>	
<ul style="list-style-type: none"> <li>- Regulation of gene expression and inhibition of proteosynthesis</li> <li>- Posttranslational modifications and control of protein activity</li> <li>- Molecular basis of cancer processes</li> </ul>	
<b>NON-CODING RNA</b>	<b>1<sup>st</sup> Revision test</b>
<ul style="list-style-type: none"> <li>- miRNA, snRNA, piwiRNA</li> <li>- Function and diagnostic use</li> <li>- Use of nucleic acid analysis and detection techniques in medicine</li> </ul>	
<b>ISOLATION OF NAs FROM BIOLOGICAL MATERIAL</b>	
<ul style="list-style-type: none"> <li>- Isolation of nucleic acids (NAs) - DNA, RNA, miRNA</li> <li>- Restriction enzymes</li> <li>- NAs detection</li> </ul>	
<b>MOLECULAR_BIOCHEMICAL METHODS</b>	
<ul style="list-style-type: none"> <li>- Amplification methods of NAs - PCR</li> <li>- Sequencing</li> <li>- Hybridization techniques</li> </ul>	
<b>BASICS OF GENETIC MATERIALS ANALYSIS</b>	
<ul style="list-style-type: none"> <li>- Determination of paternity</li> <li>- Cytogenetics, karyotype</li> <li>- FISH</li> </ul>	
<b>USE OF SPECIAL ANALYZES</b>	<b>2<sup>nd</sup> Revision test</b>
<ul style="list-style-type: none"> <li>- Use of recombinant DNA techniques</li> <li>- Genomics, proteomics, metabolomics</li> <li>- Nutrigenetics and nutrigenomics</li> </ul>	
<b>LATEST TRENDS IN MEDICAL LABORATORY DIAGNOSTICS</b>	
<ul style="list-style-type: none"> <li>- Gene therapy</li> </ul>	