

Subject:	Bioorganic Chemistry	Code:	<i>ULCHBKB/BCHM-V/10</i>
Study Programme:	<i>General Medicine</i>	Study Period:	<i>2nd summer term</i>
Evaluation:	<i>Graduated</i>	Subject Type:	<i>elective</i>
Content:	<i>1 h lecture and 1 h seminar/week</i>		<i>Total 28 hours</i>

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

Week	Lectures https://portal.lf.upjs.sk/index-en.php	Seminars https://portal.lf.upjs.sk/index-en.php
1.	ORGANIC CHEMISTRY IN MEDICINE I <ul style="list-style-type: none"> – Characteristics of carbon – Classification of organic compounds – Reactions in organic chemistry – Aliphatic and aromatic hydrocarbons – Alcohols, aldehydes, ketones, quinones, carboxylic acids and their medical significance 	
2.		Reaction of hydrocarbon derivatives <ul style="list-style-type: none"> – structure and reactions of medically important hydrocarbons (e.g. alcohols, aldehydes) – organic compounds and their derivatives – esterification of carboxylic acids
3.	ORGANIC CHEMISTRY IN MEDICINE II <ul style="list-style-type: none"> – Biological significance of sulfur compounds (e.g. thiols, disulfides, sulphonamides) – Nitrogen compounds (e.g. amines, polyamines, derivatives of carbonic acid) 	
4.		Organic compounds of S, P, N <ul style="list-style-type: none"> – reactions of sulfur compounds (e.g. thiols, disulfides) in biochemical processes – reactions of nitrogen compounds (e.g. amines, polyamines, imides, amides) in biochemical processes <p>Revision test: Hydrocarbon derivatives</p>
5.	HETEROCYCLES AND NUCLEIC ACIDS <ul style="list-style-type: none"> – Five and six-membered ring heterocycles with one or more heteroatoms – Biochemically and medically important derivatives (e.g. purines, pyrimidines, drugs) – Nucleotides and nucleosides – Biochemically important nucleotides 	
6.		Heterocycles and nucleic acids <ul style="list-style-type: none"> – pyrimidine and purine derivatives – structure, importance – reactions – e.g. oxidation-reduction – diagnostic importance <p>Revision test: Organic compounds of S, P, N</p>

7.	<p>AMINO ACIDS AND PROTEINS</p> <ul style="list-style-type: none"> – Classifications of amino acids, biochemical properties and their use in biochemistry – Amino acid derivatives and their biochemical significance – Peptides – structure, peptide bond, properties – Proteins – structure, classification, biological and biomedical importance 	
8.		<p>Amino acids, proteins</p> <ul style="list-style-type: none"> – essential amino acids – reaction of amino acids and peptide bonds – structure of proteins, properties, the effect of pH, temperature <p><i>Revision test: Heterocycles and nucleic acids</i></p>
9.	<p>LIPIDS</p> <ul style="list-style-type: none"> – Basic structure and classification of lipids – Fatty acids, their medical importance – Complex lipids e.g. TAG, phospholipids, lipoproteins, sphingolipids and others – Steroids – classification, importance 	
10.		<p>Lipids – properties and reactions</p> <ul style="list-style-type: none"> – essential fatty acids and their derivatives – reactions of TAGs and phospholipids (e.g. hydrolysis, saponification) – steroids – structure and biosynthesis <p><i>Revision test: Amino acids and proteins</i></p>
11.	<p>SACCHARIDES</p> <ul style="list-style-type: none"> – The relationship between structure and biological properties of saccharides – Biologically important monosaccharides and their derivatives – Disaccharides, polysaccharides and complex saccharides 	
12.		<p>Saccharides – structure and reactions</p> <ul style="list-style-type: none"> – isomerization, cyclisation, hydrolysis – oxidation-reduction reactions – disaccharides and oligosaccharides, glycosidic bonds – complex saccharides e.g. GAG, proteoglycans <p><i>Revision test: Lipids and saccharides</i></p>
13.	<p>NATURAL COMPOUNDS, VITAMINS</p> <ul style="list-style-type: none"> – Terpenes, alkaloids and flavonoids – structure, properties, biological significance – General properties of vitamins – structure and their importance in biochemistry (e.g. coenzymes) and medicine 	
14.		<p>Individual assessment of students' work</p> <ul style="list-style-type: none"> – summary and evaluation of student's work