

SYLLABUS

Subject:	Bioorganic Chemistry		
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 http://portal.lf.upjs.sk	Seminars http://portal.lf.upjs.sk
1.	<p>DERIVATIVES OF HYDROCARBONS</p> <ul style="list-style-type: none"> – Functional groups in organic compounds – Alkyl halides and hydroxyderivates – The reactions of aldehydes, ketones and quinones – Amines, hydroxylamines – Medically important derivatives of sulphur, phosphorus and arsene 	
2.		<p>Safety in chemical laboratory, organization</p> <ul style="list-style-type: none"> – structure and reactions of medically important hydrocarbons (e.g. alcohols) – biomedically important hydrocarbon derivatives
3.	<p>CARBOXYLIC ACID</p> <ul style="list-style-type: none"> – Functional and substitution derivatives of carboxylic acids - medical and toxicological significance – Derivates of carbonic acid – biochemical importance 	
4.		<p>Reaction of hydrocarbon derivatives</p> <ul style="list-style-type: none"> – organic compounds and their derivatives – aldehydes (Cannizaro, Schiff, Aldol) – esterification of carboxylic acids <p><i>Revision test: Hydrocarbon derivatives</i></p>
5.	<p>HETEROCYCLES</p> <ul style="list-style-type: none"> – Five and six-membered ring heterocycles with 1 or more heteroatoms (including condensed rings) – Biochemically and medically important derivatives (e.g. vitamins, coenzymes, amino acids, purines, pyrimidines, dyes, drugs). 	
6.		<p>Heterocyclic compounds – structure, properties and reactions</p> <ul style="list-style-type: none"> – pyrimidine and purine derivatives – structure, importance – reactions - e.g. oxidation – reduction, addition <p><i>Revision test: Carboxylic acids</i></p>

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7.	<p>NUCLEIC ACIDS.</p> <ul style="list-style-type: none"> - Nucleosides, nucleotides - Nucleic acids - primary, secondary structure, function, importance - Nucleotides with high energy bonds 	
8.		<p>Nucleic acids</p> <ul style="list-style-type: none"> - DNA, RNA - reactions, diagnostic importance <p><i>Revision test: Heterocycles</i></p>
9.	<p>AMINO ACIDS, PEPTIDES, PROTEINS</p> <ul style="list-style-type: none"> - Structure of amino acids and their important reactions - Isoelectric point (neutral), acidic and basic pH - Peptide bond and peptides (glutathione, insulin) - The primary, secondary, tertiary and quaternary structure of proteins 	
10.		<p>Amino acids –structure</p> <ul style="list-style-type: none"> - essential amino acids - reaction of amino acids and peptide bond - structure of proteins, properties, the effect of pH, temperature <p><i>Revision test: Nucleic acids</i></p>
11.	<p>SACCHARIDES</p> <ul style="list-style-type: none"> - Monosaccharides and their important reactions - Epimers, mutarotation of saccharides - Disaccharides, polysaccharides - Complex saccharides e.g. GAG, proteoglycans 	
12.		<p>Saccharides –structure and reactions</p> <ul style="list-style-type: none"> - proof reactions - oxidation-reduction reactions - glycosidic bond <p><i>Revision test: Amino acids and saccharides</i></p>
13.	<p>LIPIDS</p> <ul style="list-style-type: none"> - The structure of fatty acids - Complex lipids e.g. TAG, phospholipids, lipoproteins, sphingolipids and others - Cholesterol and their derivatives 	
14.		<p>Lipids– properties and reactions</p> <ul style="list-style-type: none"> - essential fatty acids - complex lipids – structure, function <p><i>Evaluation of student work</i></p>