Subject: **BIOCHEMISTRY 2**Year of education: **2**nd
Study branch: **Gen. Med.**

2012/13

Summer term 3/3

Week	Lectures	Practical exercises and seminars
MAGGN	Locialos	http://portal.lf.upjs.sk
1	METABOLISM OF AMINO ACIDS I.	Lipid metabolism
-	- Catabolism - degradation of AA	The safety rules in laboratory
	- General catabolic processes of AA	2. Determination of β-lipoproteins in blood
	- NH ₃ - formation and urea synthesis	serum - 4.3.5
	- Anabolism - biosynthesis of AA	3. Determination of the presence of double
	- Intermediates of glycolysis and Krebs cycle and their role	bonds in fatty acids
	in AA metabolism	Seminar:
	- Metabolic transformation of individual AA prof. Mareková	Repetition of metabolism of lipids RNDr. Mašlanková
2	METABOLISM OF AMINO ACIDS II.	Metabolism of proteins
2	- Biosynthesis of catecholamines	Determination of total concentration of
	- Metabolism of serotonine, thyroxine and creatine	proteins (<i>patient</i>) – 7.4.1
	- Biosynthesis of tetrapyrroles	2. Isolation of albumin and globulin of
	- Pathobiochemistry of amino acid metabolism	blood serum
	METABOLISM OF NUCLEOTIDES	Seminar:
	- Synthesis of ribonucleotide and deoxyribonucleotides	Digestive system
	- Inhibitors of purine and pyrimidine biosynthesis - relation	Digestion of proteins
	to the chemotherapy of cancer	PNDr Mačlanková
	- Regulation of nucleotide production prof. Mareková	RNDr. Mašlanková
3	INTERMEDIARY METABOLISM RELATIONSHIPS	Metabolism of amino acids I. 1. Chromatographic determination of
	Metabolic interrelation of saccharides, lipids and proteins Metabolic pathways	Chromatographic determination of disorders in amino acid metabolism
	- Metabolic pathways	Determination of urea in blood serum
		(patient) - 8.1
		Seminar:
	Repetition test from lipids and aminoacids	Nitrogen balance
	Repetition test from lipius and aminoacius	Metabolism of proteins
	prof. Mareková	Disorders of amino acid metabolism
	·	RNDr. Mašlanková
4	NUCLEIC ACIDS AND REPLICATION OF DNA	Metabolism of amino acids II.
	- Organization of genetic material in DNA (genes)	Determination of uric acid in blood
	- Replication of DNA in E. coli and in higher animals	serum (patient)
	- Molecular basis of mutations	Determination of ammonia in urine (notice)
	- Methods in molecular biology (gene cloning)	(patient) Seminar:
	TRANSCRIPTION OF DNA AND PROTEOSYNTHESIS	1. Metabolism of amino acids
	- Biosynthesis of tRNA, mRNA, rRNA	Detoxication of ammonia - 2.4
	- Molecular mechanism of proteosynthesis, activation of AA	
	- Initiation, elongation and termination of proteosynthesis	
	- Regulation and inhibition of proteosynthesis	
	RNDr. Mašlanková	RNDr. Mašlanková
5	REGULATION OF GENE EXPRESSION AND GENE	Nucleic acids I
	ENGINEERING	Isolation of deoxyribonucleoproteins -
	- The principles of gene expression and regulation	5.1 2. Quantitative determination of DNA - 5.2
	- Induction and repression of the transcription	2. Quantitative determination of DIVA - 5.2
	- Gene manipulation and therapy - Reverse transcriptase and AIDS virus	Seminar:
	MODIFICATION AND SYNTHESIS OF NATIVE	Metabolism of nucleotide - 2.5
	PROTEINS	Methods of DNA isolation
	- Folding process - formation of the three dimensional	3. Video: Nucleic acids
	protein molecules	
	- Cotranslation and posttransl. modification of proteins	
	- Distribution of the newly synthesized proteins	
	RNDr. Mašlanková	RNDr. Mašlanková
6	BIOCHEMISTRY OF BLOOD	Nucleic acids II
	- Specificity of erythrocyte metabolism	Hydrolysis of nucleoprotein or DNA - 5.3
	- Role of blood plasma proteins	2. Proof of nucleic acid components in their
	- Blood clotting as a biochemical process	hydrolysate - 5.4.2
	ACID-BASE BALANCE AND BIOCHEMICAL	Seminar:
	CONSEQUENCES	Seminar: 1. Biochemistry of nucleic acids
	- Maintenance of acid-base balance (ABB)	Restriction endonucleases – 5.4.1
	- Buffering of pH in organs	3. The principle of PCR reaction – 5.4.4
	- Disorders of ABB and their correction mechanism	RNDr. Mašlanková
	prof. Mareková	

7 CHEMICAL COMMUNICATIONS IN LIVING SYSTEMS • Chemical compounds as signal molecules Regulation of the metabolism on cellular level - The role of adenylate cyclese Regulation of the metabolism on cellular level - The role of adenylate cyclese Regulation fest from metabol. of nucleic acid (3-6 week) Repetition test from metabol. of nucleic acid (3-6 week) 6 LIVER AND METABOLISM OF FOREIGN COMPOUNDS - XENDBIOCHEMISTRY - Bilochemical function of the liver Pathobiochemistry of the liver Pathobios of lords of kidney Pathobiochemistry of the liver Pathobiochemistry of the liver Pathobiochemistry of Normal Pathobiochemistry of the liver Pathobiochemistry of Normal Pathobiochemistry		·	
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