

# GENERAL MEDICINE – YEAR 2

## SYLLABI OF THE COURSES OFFERED TO EXCHANGE STUDENTS

### YEAR 2 / SEMESTER 3

#### aVLBC0321c Biochemistry I - practice

##### Faculty of Medicine

autumn

##### Extent and Intensity

0/2/0. 3 credit(s). Type of Completion: z (credit).

##### Supervisor

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

##### Course objectives

Seminars and exercises have a common content and serve for active practice of the subject matter in Biochemistry I. The aim of the course is to obtain knowledge on essential metabolic processes on the cellular level. Understanding of these processes is a base for comprehension of metabolism on the tissue and organ level. In the introductory lessons are summarized basic terms from chemistry needed for understanding of body structure and physico-chemical processes occurring in it ((chemical composition of the body, survey of biologically important elements, water, electrolytes, non-electrolytes, osmotic pressure, acid-base, redox and precipitation reactions), the following lectures are focused on biochemical pathways in cells.

##### Learning outcomes

In the end of the course will students understand the meaning of basic chemical terms (pH, osmolality, electrolyte, buffer, etc.) and apply this knowledge when describing the properties of body fluids.

Describe the role of macro- and microbiogenic elements in the organism

Discuss the properties and function of enzymes

Describe basic catabolic and anabolic pathways of carbohydrate, lipid and protein metabolism, and their relationships.

Understand the principles of energy production, utilization and deposition at the cellular level.

Explain the function of cell membranes and the principle of compartmentalization at the cellular level and the transport processes on the membrane.

Describe protein synthesis, starting with the replication and transcription, translation and post-translational modifications. Understand the relationship between protein structure and function.

Explain the function of hemoglobin in oxygen transport and maintaining acid-base balance.

Discuss the principles of some diseases at the molecular level.

##### Syllabus

- Introduction into the metabolism of cells (differences between prokaryotic and eukaryotic cell, compartmentation of metabolic processes, non-covalent interactions). Structure of haemoglobin and its relationship to the function. Hb types in the blood of healthy subjects, HbCO and MetHb, abnormal Hb types. Enzymes - reaction rate, progress curve, the Michaelis plot and  $K_m$ , enzyme inhibition. Coenzymes, their relationship to vitamins. Written test I (Biochemical methods, haemoglobin, enzymology, coenzymes.) Membrane structure and assembly. Transport across membranes. Metabolism of glucose: Glycolysis under anaerobic and aerobic conditions and the oxidation of pyruvate. Gluconeogenesis. Glycogenesis and glycogenolysis. Metabolism of proteins. Common features of amino acid conversion. The synthesis of urea. Nitrogen balance. Important reactions in amino acid catabolism. Written test II (Membranes, transport across membranes, metabolism of saccharides and amino acids.) Biosynthesis and desaturation of fatty acids. The sources of essential fatty acids. Metabolism of triacylglycerols. Metabolism of phospholipids. Biosynthesis of eicosanoids. Peroxidation of lipids. Written test III (Metabolism of lipids.) The citric acid cycle. The respiratory chain and oxidative phosphorylation. Replication, transcription, proteosynthesis.

## Literature

### *required literature*

- Seminar texts available in Information system

## Teaching methods

Course is based on group discussion to the given topics. The outlines of discussion are in the recommended textbook. Complementary materials are available in section Study materials.

## Assessment methods

Full attendance in lessons is the principal condition. If any absence, it must be apologized through Office of studies. If apology is recorded in Information System, then student is allowed to make up the absence according to teacher's instructions.

## Language of instruction

English

## **aVLBC0321p Biochemistry I - lecture**

### Faculty of Medicine

autumn

### Extent and Intensity

3/0/0. 0 credit(s). Type of Completion: z (credit).

### Supervisor

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

### Course objectives

The aim of the course is to obtain knowledge on essential metabolic processes on the cell level. Understanding of these processes is a base for comprehension of metabolism on the tissue and organ level. In the introductory lessons are summarized basic terms from chemistry needed for understanding of body structure and physico-chemical processes occurring in it ((chemical composition of the body, survey of biologically important elements, water, electrolytes, non-electrolytes, osmotic pressure, acid-base, redox and precipitation reactions), the following lectures are focused on biochemical pathways in cells.

### **Learning outcomes**

In the end of the course will students understand the meaning of basic chemical terms (pH, osmolality, electrolyte, buffer, etc.) and apply this knowledge when describing the properties of body fluids.

Describe the role of macro- and microbiogenic elements in the organism

Discuss the properties and function of enzymes

Describe basic catabolic and anabolic pathways of carbohydrate, lipid and protein metabolism, and their relationships.

Understand the principles of energy production, utilization and deposition at the cellular level.

Explain the function of cell membranes and the principle of compartmentalization at the cellular level and the transport processes on the membrane.

Describe protein synthesis, starting with the replication and transcription, translation and post-translational modifications. Understand the relationship between protein structure and function.

Explain the function of hemoglobin in oxygen transport and maintaining acid-base balance.

Discuss the principles of some diseases at the molecular level.

### **Syllabus**

- Chemical composition of human body, survey of biochemically important elements, ROS. Water (properties, distribution), electrolytes, nonelectrolytes, osmotic pressure, osmolality, osmolarity. Acid-base processes (pH, values of pH in organism). Buffers, Henderson-Hasselbalch equation. Introduction to metabolism. Basics of bioenergetics (Gibbs energy, macroergonic compounds and their formation, chemical equilibrium and steady state). Redox equilibrium (electrode potential, Nernst-Peters equation, biological redox systems). Membrane structure, the assembly and recycling of membranes. Specialized structures of plasma membrane – lipid rafts, caveols, tight junctions. Membrane transport. Enzymes. Characteristic features of biocatalysis, enzyme structure and function, nomenclature and classification of enzymes. Enzyme cofactors, review of structures and functions. Mechanisms of enzyme action. Kinetics of enzyme catalyzed reactions. Assays of enzyme activity, the conditions used. Factors affecting catalytic activity of enzymes, types of enzyme inhibition. Metabolism: basic concepts and design. Biological oxidations, generation of high-energy compounds. Saccharide metabolism: the glycolytic pathway and aerobic decarboxylation of pyruvate. Gluconeogenesis. Glycogen biosynthesis and breakdown. The pentose phosphate pathway. The glucuronate pathway. Interconversions of monosaccharides and of their derivatives. Protein and amino acid metabolism. The common reactions in amino acid degradation. The ureosynthetic cycle. Metabolic breakdown of individual amino acids. Biosynthesis and breakdown of fatty acids, ketogenesis. Synthesis of triacylglycerols. Metabolism of phospholipids and glycolipids. Synthesis of eicosanoids. Biosynthesis and transformations of cholesterol, biosynthesis of bile acids. Interrelationships among the major pathways involved in energy metabolism. The citric acid cycle. Synthesis of haem. Mitochondria. Oxidative phosphorylation - mitochondrial electron transport chain, synthesis

of ATP. Structure of haemoglobin, structure-function relationships (the oxygen saturation curve, inducement of haemoglobin saturation and oxygen transport. Bohr effect. Normal haemoglobin types in blood, haemoglobin concentration. Other forms (glycohaemoglobin, methaemoglobin, carboxyhaemoglobin) and abnormal haemoglobins. Biosynthesis and catabolism of purine and pyrimidine nucleotides. Chromatin, DNA replication. DNA transcription. Regulation of gene expression. Protein synthesis and post-translational processing.

## Literature

### *required literature*

- RODWELL, Victor W., David A. BENDER and Kathleen M. BOTHAM. *Harper's illustrated biochemistry*. 30th ed. New York: Mc Graw- Hill, 2015. xii, 817. ISBN 9781259252860.
- KOOLMAN, Jan and Klaus-Heinrich ROEHM. *Color Atlas of Biochemistry*. 3rd ed. : Georg Thieme Verlag, 2013. ISBN 978-3-13-100373-7.

## Teaching methods

Teaching form are lectures.

## Assessment methods

Subject is a first part of two-semester subject Biochemistry and is not terminated by exam nor course unit credit.

## Language of instruction

English

## **aVLBC0321s Biochemistry I - seminar**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/2/0. 4 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

### **Course objectives**

Seminars and exercises have a common content and serve for active practice of the subject matter in Biochemistry I. The aim of the course is to obtain knowledge on essential metabolic processes on the cellular level. Understanding of these processes is a base for comprehension of metabolism on the tissue and organ level. In the introductory lessons are summarized basic terms from chemistry needed for understanding of body structure a physico-chemical processes occurring in it ((chemical composition of the body, survey of biologically important elements, water, elektrolytes, non-

elektrolytes, osmotic pressure, acid-base, redox and precipitation reactions), the following lectures are focused on biochemical pathways in cells.

### **Learning outcomes**

In the end of the course will students understand the meaning of basic chemical terms (pH, osmolality, electrolyte, buffer, etc.) and apply this knowledge when describing the properties of body fluids.

Describes the role of macro- and microbiogenic elements in the organism

Discusses the properties and function of enzymes

Describes basic catabolic and anabolic pathways of carbohydrate, lipid and protein metabolism, and their relationships.

Understands the principles of energy production, utilization and deposition at the cellular level.

Explains the function of cell membranes and the principle of compartmentalization at the cellular level and the transport processes on the membrane.

Describes protein synthesis, starting with the replication and transcription, translation and post-translational modifications. Understands the relationship between protein structure and function.

Explains the function of hemoglobin in oxygen transport and maintaining acid-base balance.

Discusses the principles of some diseases at the molecular level.

### **Syllabus**

- Chemical composition of human body.
- Water, electrolytes, osmotic pressure, osmolality. pH, buffers. Structure of haemoglobin and its relationship to the function. Hb types in the blood of healthy subjects, HbCO and MetHb, abnormal Hb types. Enzymes - reaction rate, progress curve, the Michaelis plot and  $K_m$ , enzyme inhibition. Coenzymes, their relationship to vitamins. Membrane structure and assembly. Transport across membranes. Metabolism of glucose: Glycolysis under anaerobic and aerobic conditions and the oxidation of pyruvate. Gluconeogenesis. Glycogenesis and glycogenolysis. Metabolism of proteins. Common features of amino acid conversion. The synthesis of urea. Nitrogen balance. Important reactions in amino acid catabolism. Biosynthesis and desaturation of fatty acids. The sources of essential fatty acids. Metabolism of triacylglycerols. Metabolism of phospholipids. Biosynthesis of eicosanoids. Peroxidation of lipids. The citric acid cycle. The respiratory chain and oxidative phosphorylation. Replication, transcription, proteosynthesis.

### **Literature**

#### *required literature*

- Seminar texts available in Information system

### **Teaching methods**

Course is based on group discussion to the given topics. The outlines of discussion are in the recommended textbook. Complementary materials are available in section Study materials.

### **Assessment methods**

Full attendance in seminars is the principal condition. If any absence, it must be apologized through Department of Study Affairs up to five days. If apology is recorded in Information System, then student is allowed to make up the absence according to teacher's instructions. Four revision tests are

written in seminars, semestral limit for credit is 42. If the semestral limit is not fulfilled, student must write the Credit test (limit 14/30). All absences must be made up before writing the credit test. One repetition of the Credit test is approved.

### **Language of instruction**

English

## **aVLFY0321c Physiology I - practice**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/3/0. 5 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.

### **Course objectives**

To teach student clinically relevant examination methods and interpretation of their results in the context of physiology.

### **Learning outcomes**

At the end of the course, students should be able:

- to apply practically the methods used for examination of the functions of human organ systems
- to interpret the acquired records with respect to physiological processes taking place in human organisms.
- to derive and calculate other parameters and indices routinely used in clinical practice.
- to evaluate the results acquired both by measurement and by calculation, and to explain possible deviations.

### **Syllabus**

- Erect posture examination. Estimation of reaction time using computer. Examination of reflexes in man. Recording of Achilles' tendon reflex. Skin sensation and general physiology of the skin. Cutaneous sense organs. Signal detection by PowerLab system – instructions. EOG - electrooculography. Vertigo and nystagmus. EEG - electroencephalography. Evoked potentials. Estimation of visual acuity. Accommodation. Scheiner's experiment. Visual field and blind spot. Examination of color blindness. Astigmatism. Higher cognitive functions –reading. Pneumography. Spirometric examination. Recording of forced vital capacity. Red blood cell count. Estimation of hemoglobin concentration and mean corpuscular hemoglobin. Calculated parameters of red blood cells. Estimation of blood group by slide method. Pneumography. Estimation of airway resistance. Erythrocyte sedimentation rate. Estimation of osmotic resistance of red blood cells.

### **Literature**

### *required literature*

- NOVÁKOVÁ, Marie. *Physiology and neuroscience practicals*. 1. dotisk 1. vyd. Brno: Masarykova univerzita, 2017. 149 pp. ISBN 978-80-210-6369-3.

### **Teaching methods**

The course is organized in the form of laboratory practices where students examine each other by given method, and they prepare the report from measured data.

### **Assessment methods**

Credits are given on the basis of full attendance in practices, handling of all laboratory reports and passing the credit test. Students can be examined (oral or written form) during the semester from current topics.

### **Language of instruction**

English

## **aVLFY0321p Physiology I - lecture**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

3/0/0. 0 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.

### **Course objectives**

To teach students to understand and interpret various functions of human body.

### **Learning outcomes**

At the end of the course, students will:

- have sufficient theoretical background required for profession of physician.
- be able to recall principles of human body functions in detail - from a cell level, across particular organs to a complex human organism.
- be able to explain relationships among chemical, physical and biological factors of living processes.
- An essential aim is that students acquire critical scientific thinking, ability of independent text analysis and fundamental information selection.

### **Syllabus**

- Introduction to study. Structural and functional organization of the living systems. Internal environment (homeostasis). Physiology of cell membranes. Excitable tissues. Introduction to neuroscience - the regulatory role of nervous system (NS). Cellular base of NS. Synapse and integration of information at the synaptic level. Hierarchy and evolution of NS.

Somatosensitivity, viscerosensitivity, proprioception and pain. Olfactory and gustatory systems. Auditory and vestibular systems. Vision. Motor system. Autonomic nervous system. Limbic system. Neocortex. The highest functions of nervous system. General principles of endocrine functions. Hypothalamus. Adenohypophysis. Thyroid gland. Regulation of calcium metabolism. Regulation of endocrine pancreas. Adrenal gland. Stress. Physiology of reproduction. Physiology of pregnancy. Physiology of parturition and lactation. Physiology of blood. Blood clotting. Blood types (groups). Plasma proteins. Immune system.

## Literature

### *required literature*

- BORON, Walter a Emile L. BOULPAEP. *Medical Physiology*. 3rd edition. Elsevier 2016. ISBN 9781455743773

### *recommended literature*

- BARRETT, Kim E., Scott BOITANO, Susan M. BARMAN and Heddwen L. BROOKS. *Ganong's review of medical physiology*. Twenty-fifth edition. Chicago: McGraw-Hill, 2016. xi, 750. ISBN 9781259255380.
- HALL, John E. *Guyton and Hall textbook of medical physiology*. 13th edition. Philadelphia, PA: Elsevier, 2016. xix, 1145. ISBN 9781455770052.
- SILBERNAGL, Stefan and Agamemnon DESPOPOULOS. *Color atlas of physiology*. 6th ed., completely rev. and. New York: Thieme, 2009. xiii, 441. ISBN 9783135450063.

## Teaching methods

Lessons are led in the form of lectures.

## Assessment methods

Students pass to continuing education in next semester without any duty of knowledge checking in this semester.

## Language of instruction

English

## aVLFY0321s Physiology I - seminar

### Faculty of Medicine

autumn

### Extent and Intensity

0/1/0. 3 credit(s). Type of Completion: z (credit).

### Supervisor

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.



## Course objectives

To teach students to understand and interpret various functions of human body.

## Learning outcomes

After finishing the course, students will be able to understand the terms used in general and systemic physiology of man. Students will acquire knowledge necessary for analysis and subsequent interpretation of phenomena taking place on cell, tissue and organ levels as well as on the level of whole human organism.

## Syllabus

- I. Intercellular contact. Resting membrane potential. Action potential. II. Nerve as an excitable tissue. Glial cells. Synapses. Neuromuscular junction. III. Autonomic nervous system (ANS) – overview. ANS - the roles and divisions. ANS regulation in organs - the principles of regulation. IV. General principles of endocrine physiology. Humoral regulation of mineral and water metabolism. Regulation of glycemia. Humoral regulation of energy production. Endocrine component of the stress response. V. General principals of endocrine physiology - related to reproduction. Cyclic changes in reproductive system. Pregnancy. Physiology of parturition. Lactation. VI. Circulation and hemostasis. Primary hemostasis and platelets. Hemocoagulation. Regulation of hemostasis. Clinical applications.

## Literature

### *required literature*

- BORON, Walter F. and Emile L. BOULPAEP. *Medical physiology*. Third edition. Philadelphia: Elsevier, 2017. xii, 1297. ISBN 9781455743773.

### *recommended literature*

- HALL, John E. and Arthur C. GUYTON. *Guyton and Hall textbook of medical physiology*. 12th ed. Philadelphia, Pa.: Saunders/Elsevier, 2011. xix, 1091. ISBN 9781416045748.
- BARRETT, Kim E. *Ganong's review of medical physiology*. 23rd ed. Maidenhead: McGraw-Hill, 2010. ix, 714. ISBN 9780071270663.
- SILBERNAGL, Stefan and Agamemnon DESPOPOULOS. *Color atlas of physiology*. 6th ed., completely rev. and. New York: Thieme, 2009. xiii, 441. ISBN 9783135450063.

## Teaching methods

Tuition is done in the form of seminar. Students must read the literature of particular area of physiology in advance and they intensify their knowledge in discussion with the teacher.

## Assessment methods

The course-unit credit is conditioned by full attendance and 60% control of preparedness in the seminars (control test at the beginning of seminar - 6 and more points).

## Language of instruction

English

## **YEAR 2 / SEMESTER 4**

### **aVLLM0421c Medical Microbiology I - practice**

#### **Faculty of Medicine**

spring

#### **Extent and Intensity**

0/3/0. 4 credit(s). Type of Completion: z (credit).

#### **Supervisor**

doc. MUDr. Filip Růžička, Ph.D.

Department of Microbiology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

Contact Person: MUDr. Ondřej Zahradníček

#### **Course objectives**

At the end of this course, students should be able to understand main diagnostic methods in medical microbiology.

#### **Learning outcomes**

At the end of this course, students should be able:

to prepare wet mount, Gram stained preparation, to observe the results in a microscope, to list other staining methods

to list culture media, their use, differences between them, to reinoculate a strain/specimen to a culture medium

to identify bacteria and yeasts by means of various methods of biochemical identification and other identification methods

to describe antibiotic susceptibility/resistance testing methods and to read their results

to describe animal experiment (only basically)

to read results of nucleic acid detection in microbiology (only basically)

to describe methods detecting antigens or antibodies, their use for antibody detection/antigen detection in specimen/antigen analysis of a strain; to read the results of these methods including titers, titer dynamics, detection of IgM/IgA/IgG; to interpret the results; to describe precipitation,

agglutination, agglutination on carriers, complement fixing test, neutralisation reaction, immunofluorescence, radioimmunoassay, ELISA, Western blotting

Besides that, students will be able to describe the basic of medical virology

#### **Syllabus**

- J01 Safety in laboratory, technique of work with loop, wet mount. Gram staining, demonstration of more staining methods. Demonstration of pictures of various organisms and structures in Gram staining.
- J02 Bacterial culture
- J03 Physiology of bacteria, identification according to biochemical activity and virulence factor determination
- J04 Molecular methods in microbiology

- J05 Microbes and outer influences, decontamination methods
- J06 Testing of bacterial susceptibility to antimicrobial drugs, detection of resistance factors
- J07 Biofilm infections
- J08 Introduction to serology, agglutination and precipitation, dilution and measuring titres
- J09 Following dynamics of titres, complement fixing test, neutralisation
- J10 Reactions with labelled components (IMF, RIA, ELISA) including immunoblotting
- J11 Medical virology I (hepatitis, HIV, herpesviruses)
- J12 Medical virology II (influenza, respiratory viruses, tick-borne encephalitis)
- J13 Medical parasitology (basics)
- J14 Medical mycology (basics)
- J15 No practical sessions (only exceptionally individual substitutions)

## Literature

### *required literature*

- *Medical microbiology : a guide to microbial infections : pathogenesis, immunity, laboratory diagnosis and control.* Edited by David Greenwood. 18th ed. Edinburgh: Churchill Livingstone, 2012. xvi, 778. ISBN 9780702040900.

### *recommended literature*

- *Mims' medical microbiology.* Edited by Richard V. Goering - Cedric A. Mims. 4th ed. Philadelphia, PA: Mosby Elsevier, 2008. xi, 656. ISBN 9780808923725.
- *Manual of clinical microbiology.* Edited by James Versalovic. 10th ed. Washington: ASM Press, 2011. xxiii, 126. ISBN 9781555814632.
- BJARNSHOLT, Thomas, Claus MOSER and Niels HØIBY. *Biofilm Infections.* : Springer, 2011. ISBN 978-1-4419-6084-9. [e-book](#)

### *not specified*

- Book No 1 + lectures + all materials from practical sessions are basic for the examination. Other books are recommended.

## Teaching methods

practical training in lab

self-study with use of e-learning materials

## Assessment methods

Conditions for credits:

(1) absolving all practicals, with following notes:

- no substitution is needed for one justified absence + one without official justification
- in case of more justified absences some form of substitution (e. g. some homework) is needed
- not justified absences (except that one "sick day") are not allowed

- (2) complete laboratory report (signature of teacher is not necessary)
- (3) successfully written final test (usually 10 multiple choice questions, each for one point; 7 points needed)
- (4) all ROPOT questionnaires completed successfully; if they are always fulfilled in time (prior to particular lab session), the student has a bonus of one point for final test

**Language of instruction**

English

**aVLLM0421p Medical Microbiology I - lecture****Faculty of Medicine**

spring

**Extent and Intensity**

1/0/0. 0 credit(s). Type of Completion: z (credit).

**Supervisor**

doc. MUDr. Filip Růžička, Ph.D.

Department of Microbiology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

Contact Person: MUDr. Ondřej Zahradníček

**Course objectives**

At the end of the course student should be able to understand basic terms and principles in medical microbiology.

**Learning outcomes**

At the end of the course student should be able to:

define microbial morphology and physiology, basics of microbial genetics

describe microbial biofilm and its properties

define pathogenicity and virulence, factors of pathogenicity and virulence, pathogenesis and course of infection

discuss antimicrobial immunity, active and passive immunisation

describe tenacity of microorganisms, basic principles and practical use of decontamination methods

**Syllabus**

- 1. Introduction to microbiology
- 2. Bacterial cell and growth
- 3. Microbes and environment
- 4. Pathogenicity and virulence
- 5. Microbial biofilm
- 6. Microbes and the host

- 7. Microbes and host immunity
- 8. Antibiotics I.
- 9. Antibiotics II.
- 10. Antibiotics III.
- 11. Other antimicrobials
- 12. Principles of antimicrobial treatment
- 13. Notes to special microbiology I.
- 14. Notes to special microbiology II.

## Literature

### *required literature*

- *Medical microbiology : a guide to microbial infections : pathogenesis, immunity, laboratory diagnosis and control.* Edited by David Greenwood. 18th ed. Edinburgh: Churchill Livingstone, 2012. xvi, 778. ISBN 9780702040900.

### *recommended literature*

- *Mims' medical microbiology.* Edited by Richard V. Goering - Cedric A. Mims. 4th ed. Philadelphia, PA: Mosby Elsevier, 2008. xi, 656. ISBN 9780808923725.
- MURRAY, Patrick R., Ken S. ROSENTHAL and George S., et al. KOBAYASHI. *Medical microbiology.* 6th ed. St. Louis: Mosby, 2008. 960 pp. ISBN 0-323-05470-6.
- BJARNSHOLT, Thomas, Claus MOSER and Niels HØIBY. *Biofilm Infections.* : Springer, 2011. ISBN 978-1-4419-6084-9. [e-book](#)
- Book No 1 + lectures + all materials from practical sessions are basic for the examination. Other books are recommended.

## Teaching methods

lecture

## Assessment methods

This is the first part of lectures, no specific end. After the second block of lectures (aVLLM0522p) there is the practical and theoretical examination.

## Language of instruction

English

## **aVLBC0422c Biochemistry II - practice**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/3/0. 2 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

### **Course objectives**

Course is complementary to aVLBC0421p and aVLLC0421s. The aim of the course is to bring experience with solving practical problems in clinical biochemistry, to acquire practical laboratory skills and to learn students to use results of biochemical analysis for diagnostics.

### **Learning outcomes**

The student is able:

- to explain the ways of obtaining biological material for biochemical analysis and is familiar with the rules of manipulation.
- to describe physiological values of the most important biochemical parameters.
- to interpret the results of biochemical analyzes, discusses the significance of the findings.
- to understand the principles of the most important biochemical-analytical methodologies.
- to be oriented in basic laboratory manipulations.

### **Syllabus**

- Directions for laboratory work. Handling biological material. Laboratory examination. Blood, plasma, serum. Blood collection. Blood processing. Manual methods, pipetting. Biochemical analyzers. Test requisition forms.
- Investigations of glucose metabolism. Diabetes mellitus, Enzymatic determination of plasma glucose. Determination of glycaemia by personal glucometer. Oral glucose tolerance test (oGTT). Detection and determination of glucose in urine. Detection of ketone bodies in urine. Determination of glycated hemoglobin (HbA1c).
- Investigation of lipid and cholesterol metabolism. Enzymatic determination of serum total cholesterol. Determination of blood cholesterol using Accutrend. Determination of blood triacylglycerols using Accutrend. Determination of HDL-cholesterol and LDL-cholesterol. Calculation of LDL-cholesterol and derived parameters.
- Investigations in liver disease I – Enzymes. Determination of catalytic concentrations of aminotransferases in serum. Determination of ALP catalytic concentration in serum.
- Selected investigations in liver disease II – Bile pigments and albumin. Determination of total bilirubin in serum. Detection of bilirubin in urine. Detection of urobilinogens in urine. Determination of serum albumin.
- Investigation of plasma proteins. Determination of total protein by the biuret test. Determination of albumin in serum. Electrophoresis of serum proteins. Assay for increased level of C-reactive protein. Determination of serum IgE by ELISA method.
- Biochemical tests of renal function – I. Investigation of urine by inspection and physical methods. Determination of creatinine in serum and urine. Estimation of glomerular filtration rate from creatinine clearance. Fractional reabsorption and excretion of water.
- Biochemical tests of renal function – II. Detection of proteinuria. Urine test for haem compounds. Determination of protein concentration in urine. Detection of microalbuminuria. Detection of Bence Jones protein in urine. Determination of urea in serum and urine. Approximate assessment of the nitrogen balance.
- Routine urinalysis. Test strips. Multipurpose diagnostic strips in urinalysis. Detection of addictive drugs in urine. Detection of barbiturates in urine. Detection of luteinizing hormone in urine.
- Examinations in urolithiasis. Solubility of uric acid. Detection

of uric acid by murexide reaction. Simplified chemical analysis of renal calculi. Determination of uric acid in serum and urine. • Some investigations of the gastrointestinal tract. Selected examinations of stomach functions. Laboratory tests in pancreas diseases. Test of occult bleeding in gastrointestinal tract.

### **Literature**

- Texts available in Information System.

### **Teaching methods**

laboratory practicals

### **Assessment methods**

Full attendance in all practicals is the condition for obtaining of course-unit credits.

### **Language of instruction**

English

## **aVLBC0422p Biochemistry II - lecture**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

2/0/0. 7 credit(s). Type of Completion: zk (examination).

### **Supervisor**

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

### **Course objectives**

The course extends the knowledge of biochemistry acquired in the course Biochemistry I and deals with integration of biochemical processes in human body. The aim is to understand biochemical processes characteristic for individual tissues and organs and principles of their regulation. It focuses on the relationship between health and disease from a biochemical point of view. It points to the links between biochemical principles and other medical subjects such as physiology, immunology, pharmacology, toxicology and others. It is also an introduction to clinical biochemistry.

### **Learning outcomes**

The student is able to explain the interrelationship between the metabolism of nutrients under different states of the organism. Describes the metabolic characteristics of major organs and tissues and major disorders, discusses their association with diseases. Understands and discusses principles of maintaining homeostasis and acid-base balance in the organism, including modeling situations It discusses the composition of body fluids and their disorders in connection with the principles of homeostasis. It explains the principles of metabolism regulation at all levels.

### **Syllabus**

- Digestion and absorption of lipids. Blood plasma lipids and the major groups of lipoproteins. Metabolic fate of chylomicrons and VLDL, the metabolism of HDL • The integration of intermediary metabolism at the tissue and organ level (after the meal, during starvation, stress, obesity, diabetes). • The metabolic functions of the liver. Metabolism of main nutrients. Catabolism of haemoglobin, bilirubin metabolism. Metabolism of iron and copper. • Biotransformation of xenobiotics. Two phases of biotransformation, typical reactions, cytochrome P450. Metabolism of ethanol. Water and Na<sup>+</sup>, K<sup>+</sup> ions balance, osmolality and volume of ECF, regulation, disorders. • Transport of O<sub>2</sub> and CO<sub>2</sub>. Metabolic pathways producing/consuming H<sup>+</sup> ions. Buffer bases of blood, blood plasma, ICF, the parameters of acid-base status. • Normal renal functions. Glomerular filtration. Tubular resorption and secretion. • Steroid and thyroid hormones – biosynthesis, secretion, and effects. • Control of metabolism. Mechanism of hormone and neurotransmitter action. Types of cell membrane receptors, intracellular effects of ligand binding; intracellular receptors. • Metabolism of nervous tissue. Neuro-secretion. The biosynthesis and inactivation of neurotransmitters, neurotransmission across synapses. Cholinergic, adrenergic, and (inhibitory) gabaergic receptors. • Metabolism of calcium, magnesium, phosphates, fluorine, and iodine. Hormones involved in their metabolism. • The extracellular matrix. Synthesis and post-translational modifications of collagen, intermolecular crosslinks in collagen and elastin, proteoglycans. Calcification of bone, regulation. Biochemical markers of bone resorption and formation. • The major proteins of blood plasma. Endothelial cells. The blood-coagulation cascade, inhibition of clotting. Fibrinogen, fibrin, fibrinolysis. • Biochemistry of blood cells. Molecular principles of immunochemistry.

### Teaching methods

Teaching form are lectures. Supplementary subjects are seminars and practicals

### Assessment methods

Student must have course-unit credit of seminar and practicals in the day of exam. • The examination has written and oral part. The test consists of 25 questions and is solved on computers in the computer room of Department of Biochemistry (personal university ID /UCO/ and pass-word for IS MUNI is necessary for entrance to the test): As a rule, 10 questions are from practical exercises. Remaining 15 questions cover essential knowledge ranging over all studied topics. Only those students who gain 14 correct answers at a minimum will be permitted to sit for the oral examination. The oral part of examination Students select three questions and have about 30 minutes for the written preparation. They should summarize their answers as concisely and accurately as possible. It is recommended to follow these items: - to write a brief synopsis emphasizing the main ideas. - to draw metabolic pathways in structural formulas with a short comment. - where appropriate, to draw a picture. A good and concise preparation reflects the students' knowledge and understanding the biochemistry and will be considered in the final classification.

### Language of instruction

English

## aVLBC0422s Biochemistry II - seminar

Faculty of Medicine

spring



## Extent and Intensity

0/3/0. 2 credit(s). Type of Completion: z (credit).

## Supervisor

prof. RNDr. Eva Táborská, CSc.

Department of Biochemistry - Theoretical Departments - Faculty of Medicine

## Course objectives

Seminars are complementary to Biochemistry II lecture (VLBC0422p). At the end of the course students understand principles of intermediary metabolism, characteristic features of metabolism of individual organs and tissues and metabolism at various conditions of organism (well fed state, fasting, starvation, metabolic stress, obesity, metabolic syndrome).

## Learning outcomes

The student is able:

- to explain the interrelationship between the metabolism of nutrients under different states of the organism.
- to describe the metabolic characteristics of major organs and tissues and major disorders, discusses their association with diseases.
- to understand and discuss principles of maintaining homeostasis and acid-base balance in the organism, including modeling situations
- to discuss the composition of body fluids and their disorders in connection with the principles of homeostasis.
- to explain the principles of metabolism regulation at all levels.

## Syllabus

- Enzyme assays in clinical diagnostics. Methods in clinical biochemistry (photometry, electrophoretic methods). • Plasma lipoproteins, interconversions of lipoproteins. Cholesterol transport, balance of cholesterol intake and excretion. • Blood glucose (sources, consumption, regulation). Diabetes mellitus. • Proteins in nutrition. Absorption of amino acids, utilization of amino acids in tissues, blood transport of ammonia, the glutamine cycle. Hormonal regulation. • Integration of metabolism of nutrients: relationships among the major metabolic pathways in the fed state, post-absorptive state, prolonged starvation, obesity. • The liver functions – the role in metabolism of nutrients. Catabolism of haemoglobin, urobilinoids, the types of hyperbilirubinemia. • The liver functions – the role in metabolism of hormones, and vitamins. Metabolism of Fe. Biotransformation of xenobiotics. Metabolism of ethanol. • Water and mineral metabolism. Sodium and water homeostasis, osmolality and volume of water, regulation, disorders. Blood acid-base parameters. Transport of O<sub>2</sub> and CO<sub>2</sub>. Metabolic processes producing and consuming H<sup>+</sup>. Buffer bases. Acid base disorders. • Major functions of the kidney. Glomerular filtration. • Tubular resorption and secretion. • Neurotransmitters and hormone receptors. The most common signal pathways. • Metabolism of Ca, Mg, P, F, I. Hormones important for their metabolism. • Metabolism of connective tissue. Extracellular matrix. Mineralisation of bone tissue, regulation. Biochemical markers of bone metabolism. Cartilage and skin. • Biochemistry of muscle work (skeletal, cardiac, smooth). Effect of NO. Energetics of muscle work.

## Literature

### *required literature*

- Seminar texts available in Information system

### **Teaching methods**

Course is based on group discussion to the given topics. The outlines of discussion are in the recommended textbook. Complementary materials are available in section Study materials.

### **Assessment methods**

course-unit credit. Conditions for giving the course-unit credit. Full attendance in all lessons. Three short tests are written during the semester. Students that will obtain 52/75 points or more during the semester are not obliged to write the credit test. The other students will write the credit test with the 30 questions in the last week of the semester. The limit for passing the credit test is 14 points. All absences must be made before writing the credit test. Students are allowed to repeat the test once. Students that will not fulfill this requirement will not be given the course-unit credit. Obtaining of course-unit credits of practices and seminars is the pre-requisite for registration to the examination of Biochemistry II.

### **Language of instruction**

English

## **aVLFY0422c Physiology II - practice**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/3/0. 2 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.

### **Course objectives**

To teach student clinically relevant examination methods and interpretation of their results in the context of physiology.

### **Learning outcomes**

At the end of the course, students should be able:

- to apply practically the methods used for examination of the functions of human organ systems.
- to interpret the acquired records with respect to physiological processes taking place in human organisms.
- to derive and calculate other parameters and indices routinely used in clinical practice.
- to evaluate the results acquired both by measurement and by calculation, and to explain possible deviations.

## Syllabus

- Evaluation of nutritional state. Evaluation of sensitivity of respiratory centre to hypercapnia. Recruitment and summation in skeletal muscle. Blood pressure in man. Non-invasive methods of blood pressure measurement. Measurement of basic metabolic rate (BMR). Energy output in change of body position. Repay of oxygen debt. Calculation of energy expenditure. Examination of pulse by palpation. Ergometry. ECG. Blood flow in forearm (Pletysmography). Digital model of aortic function (a simulation program). Blood flow in veins. Apex beat, heart sounds. Systolic time intervals. Measurement of pulse wave velocity. Sphygmography.

## Literature

### *required literature*

- NOVÁKOVÁ, Marie. *Physiology and neuroscience practicals*. 1. dotisk 1. vyd. Brno: Masarykova univerzita, 2017. 149 pp. ISBN 978-80-210-6369-3.

## Teaching methods

The course is organized in the form of laboratory practices where students examine each other by given method, and they prepare the report from measured data.

## Assessment methods

Credits are given on the basis of full attendance in practices and handling of all laboratory reports and successfully passed credit test (70% and more). The knowledge of current topic can be tested (written or oral form).

## Language of instruction

English

## aVLFY0422p Physiology II - lecture

### Faculty of Medicine

spring

### Extent and Intensity

4/0/0. 7 credit(s). Type of Completion: zk (examination).

### Supervisor

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.

### Course objectives

At the end of the course, students will have sufficient theoretical background required for profession of physician. Student should be able to recall principles of human body functions in detail - from a cell level, across particular organs to a complex human organism. Students will be able to explain relationships among chemical, physical and biological factors of living processes. An essential aim is

that students acquire critical scientific thinking, ability of independent text analysis and fundamental information selection.

### **Learning outcomes**

Student will be able:

- to describe all physiological functions in human body and eventual consequences of their failure.

### **Syllabus**

- Skeletal, smooth and heart muscle. Respiratory functions. Pulmonary mechanics. Gas transport. Respiration under various physiological conditions. Regulation of respiration. Functional morphology of the kidney. Clearance. Counter-current system. Regulation of kidney functions. Metabolism of saccharides, lipids and proteins. Energy metabolism. Vitamins, minerals and water in nutrition. GIT - mechanical functions. GIT – secretory functions. GIT - resorption and other functions. Coordination in GIT. Regulation of food intake. Physiology of the heart. Conduction system. Cardiac electrophysiology. Electromechanical coupling. Electrocardiography. Arrhythmias. Cardiac mechanics. Heart cycle. Heart failure. Regulation of blood circulation, blood pressure. Variability of circulatory parameters. Rheology of the blood. Microcirculation. Circulatory failure. Regulation of blood flow. Coronary circulation. Regional circulation (pulmonary, skin, muscle, cerebral, splanchnic, renal, fetal). Circulatory reactions. Thermoregulation. Physiology of exercise. Physiology of adaptation. Kidney in regulation of homeostasis. Physiology of childhood and adolescence, aging.

### **Literature**

#### *required literature*

- BORON, Walter F. and Emile L. BOULPAEP. *Medical physiology*. Third edition. Philadelphia: Elsevier, 2017. xii, 1297. ISBN 9781455743773.

#### *recommended literature*

- HALL, John E. and Arthur C. GUYTON. *Guyton and Hall textbook of medical physiology*. 12th ed. Philadelphia, Pa.: Saunders/Elsevier, 2011. xix, 1091. ISBN 9781416045748.
- SILBERNAGL, Stefan and Agamemnon DESPOPOULOS. *Color atlas of physiology*. 6th ed., completely rev. and. New York: Thieme, 2009. xiii, 441. ISBN 9783135450063.
- BARRETT, Kim E. *Ganong's review of medical physiology*. 23rd ed. Maidenhead: McGraw-Hill, 2010. ix, 714. ISBN 9780071270663.

### **Teaching methods**

Lessons are led in the form of lectures.

### **Assessment methods**

Final examination in Physiology consists of three parts:

- written multiple-choice test which consist of 20 questions evaluated by 20 points - students successfully pass the test if they reach at least 15 points;
- practical examination - students randomly choose one of the methods and practically demonstrate and explain the measured parameters;
- oral examination - students randomly choose 2 questions and answer them after 15 minutes of

preparation.

Written test represents 10%, practical exam 20% and oral exam 70% of final grade. Students pass the examination at Physiology on condition that they succeed in all three abovementioned parts.

### **Language of instruction**

English

## **aVLFY0422s Physiology II - seminar**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/1.5/0. 1 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Marie Nováková, Ph.D.

Department of Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: MUDr. Zuzana Nováková, Ph.D.

### **Course objectives**

After finishing the course, students will be able to understand the terms used in general and systemic physiology of man. Students will acquire knowledge necessary for analysis and subsequent interpretation of phenomena taking place on cell, tissue and organ levels as well as on the level of whole human organism.

### **Learning outcomes**

Student will be able:

- to understand and interpret various functions of human body.

### **Syllabus**

- I. Ventilation of the lungs. Gas transport. Regulation of respiration. Assessment of respiratory functions. II. Body fluids. Renal blood flow. Renal functions. Glomerular filtration. Tubular processes. Countercurrent system. pH and its regulation by kidneys. III. Mechanical functions of GIT. GIT secretions. Co-ordination of GIT segments. IV. Cardiac conduction system and myocardial cellular electrophysiology. Action potential spreading through myocardium and its registration. ECG leads. ECG curve. ECG curve interpretation, arrhythmias. V. Heart as a muscle. Cardiac cycle. Polygraphy. Autoregulation of the heart. Coronary circulation. VI. Regulation and adaptation. Regulation and adaptation to exercise. Thermoregulation - the principles. Adaptation to heat or cold. Reactions to body posture changes. Reactions to bleeding.

### **Literature**

#### *required literature*

- BORON, Walter F. and Emile L. BOULPAEP. *Medical physiology : a cellular and molecular approach*. 1st ed. Philadelphia: Saunders, 2003. xiii, 1319. ISBN 0721632564.

### *recommended literature*

- HALL, John E. and Arthur C. GUYTON. *Guyton and Hall textbook of medical physiology*. 12th ed. Philadelphia, Pa.: Saunders/Elsevier, 2011. xix, 1091. ISBN 9781416045748.
- BARRETT, Kim E. *Ganong's review of medical physiology*. 23rd ed. Maidenhead: McGraw-Hill, 2010. ix, 714. ISBN 9780071270663.
- SILBERNAGL, Stefan and Agamemnon DESPOPOULOS. *Color atlas of physiology*. 6th ed., completely rev. and. New York: Thieme, 2009. xiii, 441. ISBN 9783135450063.

### **Teaching methods**

Tuition is done in the form of seminar. Students should read the literature of particular area of physiology and eventually prepare their own presentation of the topic. During the seminars, students present the topics and intensify their knowledge in discussion with the teacher.

### **Assessment methods**

The course-unit credit is conditioned by full attendance and 60% control of preparedness in the seminars (control test at the beginning of seminar - 6 and more points).

### **Language of instruction**

English

## **aVLLP0431c Clinical Introduction I - practice**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/1.3/0. 3 credit(s). Type of Completion: z (credit).

### **Supervisor**

MUDr. Jan Konečný, Ph.D.

First Department of Surgery - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

### **Course objectives** (in Czech)

The course combines theoretical biochemistry knowledge with clinical applications.

### **Syllabus**

- Biochemical investigations in clinical medicine and their significance. Biochemical analysers, point of care testing. Factors influencing results of laboratory examinations. Blood collection and processing. Laboratory tests in clinical biochemistry. Sources of error, assessing the significance of a test result. System of quality control. Biological and analytical variations, critical difference. Reference intervals. Interpretation of results. Diabetes mellitus - laboratory diagnosis. Hypoglycaemia, hyperglycaemia, screening and monitoring, oGTT test. Glycosuria, fructosamine, haemoglobin, microalbuminuria, insulin, C-peptide, autoantibodies. Biochemical diagnosis of liver diseases. Tests for the integrity of hepatocytes.

The tests for hepatocellular cholestasis. Tests of the liver's biosynthetic capacity. Laboratory diagnosis of jaundice. Laboratory tests of specific liver diseases. Biochemical markers of myocardial injury - cardiac troponin, myoglobin, CK-MB mass. Laboratory tests in heart failure - natriuretic peptides. Tests for homocysteine, hsCRP, lipid spectrum. Sampling and urine collection for physical, chemical, microbiological and microscopic examination. Physical examination of urine (pH, density, osmolality). Chemical examination of urine. Glomerular filtration rate (creatinine, cystatin). Morphological analysis of urine. Examination of urine sediment. Kidney stones analysis – classification of kidney stones according to the composition, factors affecting their formation, methods of analysis. Cerebrospinal fluid (CSF) analysis. Indications, puncture, basic and special examination, typical findings in some neurological diseases, markers of CSF leakage. Investigation of blood count, hemocoagulation. Immunohematological and isoserological determinations.

## **Literature**

### *required literature*

- Texts available in Information System.

## **Teaching methods (in Czech)**

seminars, active discussions of problems, biochemical case reports.

## **Assessment methods**

Conditions for giving the course-unit credit \* Full (100%) attendance in practice is the principal condition. If any absence, it must be apologized through Department of Study Affairs up to five days. If apology is recorded in Information System (IS), then student is allowed to make up the absence according to teacher's instructions. \* Two revision tests are written during the semester, limit for credit is 21points. \* If the semestral limit is not fulfilled, student must write the Credit test (limit 9/20). All absences must be made up before writing the credit test. \* One repetition of the Credit test is approved.

## **Language of instruction**

English

## **aVLLP0431p Clinical Introduction I - lecture**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

2.3/0/0. 0 credit(s). Type of Completion: z (credit).

### **Supervisor**

MUDr. Jan Konečný, Ph.D.

First Department of Surgery - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

## **Literature**

### *recommended literature*

- CHROBÁK, Ladislav, Thomas GRAL and Jiří KVASNIČKA. *Physical examination in internal medicine*. 1. vyd. Praha: Grada, 2003. 239 s. ISBN 9788024706177.

### **Language of instruction**

English

## **aVLTZ0451 Theoretical Bases of Clinical Medicine I - seminar**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/1.5/0. 2 credit(s). Type of Completion: z (credit).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

### **Course objectives**

This newly introduced subject focuses on overview exercising of substantial problems from the point of view of anatomist, embryologist, physiologist, pathological physiologist, pathologist, microbiologist, immunologist and finally, corresponding clinician. Using this approach we will conceptually approach closer to strategy of USMLE, Step 1.

### **Syllabus**

- 1/4 Stem cells, wound healing, regeneration in medicine
- 
- Guarantor of topic: doc. MVDr. Aleš Hampl, CSc.
- A22/116 Campus 11:00-12:40
- Importance and perspectives of stem cells application in medicine I (2 hrs, dr. Pešl, dr. Rotrekl)
- A22/116 Campus 11:00-12:40
- Autologous and allogenic hematopoietic stem cells transplantation: introduction, contemporary indications and trends (2 hrs, prof. M. Krejčí)
- A22/116 Campus 11:00-12:40
- Possibilities of using of cardiomyocytes produced by induced pluripotent stem cells of individual patient in medicine (1 hr, doc. Bébarová)
- Wound healing in surgery (1 hr, doc. Veverková)



- A22/116 Campus 11:00-12:40
- Importance and perspectives of stem cells application in medicine II (2 hrs, doc. Hampl)
- A22/116 Campus 11:00-12:40
- Wound healing in dermatology (2 hrs, dr. Slonková)
- 
- 2/4 Metabolic bone diseases
- 
- Guarantor of topic: prof. MUDr. Anna Vašků, CSc.
- A22/116 Campus 11:00-12:40
- Metabolism of calcium and phosphates (1 hr, doc. Babula)
- Laboratory diagnostics (Ca, phosphates, PTH, PTHrP, vitamin D, paraproteins) – 1 hr, doc. Babula)
- A22/116 Campus 11:00-12:40
- Osteoporosis, osteodystrophy, and osteomalacia: Bone state in patients with chronic renal failure: pathophysiological point of view (2 hrs, prof. A. Vašků)
- A22/116 Campus 11:00-12:40
- Clinical example (woman aged 85, living alone with pathophysiological fracture history)- (1 hr, prof. A. Vašků)

## Literature

### *recommended literature*

- SILBERNAGL, Stefan and Florian LANG. *Color atlas of pathophysiology / Stefan Silbernagl, Florian Lang*. 3rd edition. Stuttgart: Thieme, 2016. x, 438. ISBN 9783131165534.
- DAMJANOV, Ivan. *Pathophysiology*. Illustrated by Matt Chansky. 1st ed. Philadelphia: Saunders/Elsevier, 2009. vii, 464. ISBN 9781416002291.

## Teaching methods

Education will be realised by interactive seminars, practicals and lectures.

## Assessment methods

Written test at the end of each semester.

## Language of instruction

English

# **aVLIL021 Information Literacy**

## **Faculty of Medicine**

autumn / spring

## **Extent and Intensity**

0/0/0. 3 credit(s). Type of Completion: z (credit).

## **Supervisor**

Mgr. Jiří Kratochvíl, Ph.D.

Central Library - Specialized Units - Faculty of Medicine

Contact Person: Mgr. Petr Sejk

## **Course objectives**

At the end of this course student should be able to: - search for full texts of journal articles or books concerning concrete topics (search in library catalogues, online databases, on the Internet) - recognise the quality information resources - write texts according to rules for creating scholarly texts - cite correctly according to recommended citation styles

## **Learning outcomes**

At the end of this course student should be able to: - search for full texts of journal articles or books concerning concrete topics (search in library catalogues, online databases, on the Internet) - recognise the quality information resources - write texts according to rules for creating scholarly texts - cite correctly according to recommended citation styles

## **Syllabus**

- 1. Introduction. Information resources.
- 2. Searching.
- 3. Multidisciplinary databases.
- 4. Subject specific databases
- 5. Rules for creating scholarly texts. Publication ethics.
- 6. Citation Ethics. Creating bibliographic references.
- 7. Evaluation of scientific work.

## **Literature**

### *recommended literature*

- LIPSON, Charles. *Doing honest work in college : how to prepare citations, avoid plagiarism, and achieve real academic success*. 2nd ed. Chicago: University of Chicago Press, 2008. 258 p. ISBN 0226484777.
- BADKE, William B. *Research strategies : finding your way through the information fog*. 3rd ed. New York: iUniverse, Inc., 2008. xviii, 213. ISBN 9780595477470.

- MATTHEWS, Janice R. and Robert W. MATTHEWS. *Successful scientific writing : a step-by-step guide for the biological and medical sciences*. 3rd ed. Cambridge: Cambridge University Press, 2008. xii, 240. ISBN 9780521699273.
- BOOTH, Wayne C., Gregory G. COLOMB and Joseph M. WILLIAMS. *The craft of research*. 3rd ed. Chicago: University of Chicago Press, 2008. xvii, 317. ISBN 9780226065663.
- HOCK, Randolph. *The extreme searcher's Internet handbook : a guide for the serious searcher*. 2nd ed. Medford, N.J.: CyberAge Books, 2007. xxvii, 326. ISBN 9780910965767.
- *The researcher's toolkit : the complete guide to practitioner research*. Edited by David Wilkinson. First published. New York: Routledge, 2000. xvi, 135. ISBN 0415215668.

### **Teaching methods**

e-learning, training

### **Assessment methods**

Two mock tests, seven assignments during the semester.

### **Language of instruction**

English