

MEDICAL CHEMISTRY AND BIOCHEMISTRY I

1st year - GENERAL MEDICINE - *summer semester 2023/2024*

Practical exercises

Week	Dates	Topic	
1	19.2. – 23.2.	<i>Introduction, safety rules</i>	
2	26.2. – 1.3.	<i>Lab 1</i>	Essential skills
3	4.3. – 8.3.	<i>Lab 2</i>	Solutions
4	11.3. – 15.3.	<i>Lab 3</i>	Osmosis, osmolality
5	18.3. – 22.3.	<i>Lab 4</i>	Chromatography
6	25.3. – 29.3.	<i>Lab 5</i>	pH, buffers * Public holiday 29.3.
7	1.4. – 5.4.	<i>Lab 6</i>	Volumetric analysis * Public holiday 1.4.
8	8.4. – 12.4.	<i>Lab 7</i>	Optical methods
9	15.4. – 19.4.	<i>Lab 8</i>	Enzymology I
10	22.4. – 26.4.	<i>Lab 9</i>	Enzymology II
11	29.4. – 3.5.	<i>Lab 10</i>	Enzymology III * Public holiday 1.5.
12	6.5. – 10.5.	<i>Substitutions (*)</i>	
13	20.5.	Credit test	
14	20.5. – 24.5.	CREDIT	

Study groups with odd number (1, 3, 5) – Students' laboratory 3 (UCH3.20 – 3rd floor, building 1)

Study groups with even number (2, 4, 6) – Students' laboratory 2 (UCH3.22 – 3rd floor, building 1)

Conditions for the awarding of course credit:

1. Full attendance at the laboratories.
Absences from laboratory exercises can be substituted during examination period of the summer semester after reservation in the Moodle course. The reservation system will be available from 29.4.2024.
2. Completed lab reports from laboratory exercises (completed worksheets).
3. Successfully completed Moodle course [E-seminar to the subject 'Medical Chemistry and Biochemistry I'](#).
4. Completion of evaluated activities in the Moodle course [Medical Chemistry and Biochemistry I](#).
5. Credit test successfully passed. The number of attempts is limited to three. If the student does not use these three options within the announced dates, there is no right to ask for an extra date.

Credit test:

Test contents: 1. topics of the lectures up to enzymology
2. topics of practical exercises and e-seminar

Regular date: Monday 20.5.2024 9:00 – 10:00

Other dates: Monday 27.5.2024 10:00 – 11:30

Monday 3.6.2024 10:00 – 11:30

Monday 24.6.2024 10:00 – 11:30

Monday 9.9.2024 10:00 – 11:30

The term reserved for the regular date at the end of the semester is at the time of the lecture.

Regular date: remotely (from anywhere) on the *Socratic* platform (details will be announced on 29.4.2024)

All other dates: a classic in person test "on paper"

LIST OF EXERCISES

Lab 1: Essential laboratory skills

- a) Laboratory glassware and equipment
- b) Training of volume measurement (pipetting) and weighing

Lab 2: Preparation of solutions, reactions of inorganic compounds

- a) Preparation of a solution of known concentration
- b) Filtration, centrifugation
- c) Selected reactions of inorganic compounds

Lab 3: Osmosis, osmotic pressure, osmolality

- a) Demonstration of osmosis
- b) Preparation of isotonic infusion solutions
- c) Determination of osmolality using cryoscopy

Lab 4: Chromatography

- a) Paper chromatography of amino acids
- b) Separation of plant pigments by thin-layer chromatography
- c) Separation of dye mixture by gel chromatography

Lab 5: pH, buffers

- a) Measurement of pH
- b) Demonstration of buffer functioning

Lab 6: Volumetric analysis

- a) Alkalimetry
- b) Chelatometry

Lab 7: Optical methods

- a) Identification of acid-base indicator by absorption spectra
- b) Spectrophotometric estimation of Cu^{2+} concentration (calibration curve)
- c) Spectrophotometric estimation of Cl^- concentration (single standard)

Lab 8: Enzymology I

- a) Specificity of enzymes (sucrase, α -amylase)
- b) Dependence of enzyme activity on pH (α -amylase)

Lab 9: Enzymology II

- a) Estimation of Michaelis' constant of acid phosphatase
- b) Estimation of catalase activity

Lab 10: Enzymology III

- a) Competitive inhibition of succinate dehydrogenase with malonate
- b) Monitoring of milk xanthine oxidoreductase activity