

# MEDICAL CHEMISTRY AND BIOCHEMISTRY II

2<sup>nd</sup> year - GENERAL MEDICINE - winter semester 2024/2025

## Practical exercises

Week	Dates	Topic	
1	1.10. – 4.10.	<i>Seminar: Introduction to clinical biochemistry</i>	
2	7.10. – 11.10.	<i>Lab 1</i>	Examination of blood I
3	14.10. – 18.10.	<i>Lab 2</i>	Examination of blood II
4	21.10. – 25.10.	<i>Lab 3</i>	Examination of blood III
5	28.10. – 1.11.	<i>Seminar: Renal functions, urine</i>	
6	4.11. – 8.11.	<i>Lab 4</i>	Examination of urine I
7	11.11. – 15.11.	<i>Lab 5</i>	Examination of urine II
8	18.11. – 22.11.	<i>Lab 6</i>	Clinical enzymology
9	25.11. – 29.11.	<i>Lab 7</i>	Molecular biology I
10	2.12. – 6.12.	<i>Lab 8</i>	Molecular biology II
11	9.12. – 13.12.	<i>Lab 9</i>	Molecular biology III
<b>12</b>	<b>18.12.</b>	<b>Credit test</b>	
13	6.1. – 10.1.	CREDIT	

Study groups 1, 3, 6

– Students' laboratory 3 (UCH3.20 – 3<sup>rd</sup> floor, building 1)

Study groups 2, 4, 5

– Students' laboratory 2 (UCH3.22 – 3<sup>rd</sup> floor, building 1)

### Conditions for the awarding of course credit:

1. Full attendance at the laboratories.

Absences from laboratory exercises 1–6 can be substituted during January after reservation in the Moodle course. The reservation system will be available from 16.12.2024.

Absences from laboratory exercises 7–9 (molecular biology) can be compensated by preparing a seminar paper.

2. Completed lab reports from all laboratory exercises (completed worksheets).

3. Completion of all evaluated activities in the Moodle course [Medical Chemistry and Biochemistry II](#).

4. 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: topics of practical exercises (clinical biochemistry, molecular biology)

Regular date: **Wednesday 18.12.2024 9:00 – 9:30**

Resit date: Wednesday 8.1.2025 9:00 – 10:00

Other dates: Monday 13.1.2025 10:00 – 11:00

Monday 20.1.2025 10:00 – 11:00

Monday 27.1.2025 10:00 – 11:00

Regular date: remotely (from anywhere) on the Socrative platform (details will be announced on 25.11.2024)

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

Web pages of the Department of Medical Chemistry and Biochemistry: [www.lfp.cuni.cz/biochemie](http://www.lfp.cuni.cz/biochemie)

E-learning support on the Moodle platform: <https://moodle.lfp.cuni.cz/course/view.php?id=290>

## LIST OF EXERCISES

### **Lab 1: Examination of blood I (proteins)**

- a) Estimation of total protein by biuret reaction
- b) Estimation of albumin
- c) Estimation of C-reactive protein (CRP) in blood serum

### **Lab 2: Examination of blood II (glucose, lipids)**

- a) Estimation of glucose in blood serum
- b) Estimation of glucose in capillary blood using glucometer
- c) Estimation of total cholesterol
- d) Estimation of triglycerides

### **Lab 3: Examination of blood III (nitrogen compounds)**

- a) Estimation of urea
- b) Estimation of uric acid
- c) Estimation of the total and conjugated bilirubin

### **Lab 4: Examination of urine I**

- a) Physical examination of urine
- b) Basic chemical examination of urine

### **Lab 5: Examination of urine II**

- a) Estimation of glomerular filtration rate as a creatinine clearance
- b) Amino acids and their metabolites in urine (phenylketonuria, cystinuria, tyrosinosis)
- c) Microscopic examination of urinary sediment

### **Lab 6: Clinical enzymology**

- a) Alanine aminotransferase and aspartate aminotransferase in liver
- b) Estimation of alkaline phosphatase in blood serum
- c) Estimation of lactate dehydrogenase activity in blood serum

### **Lab 7: Molecular biology I**

- a) DNA isolation
- b) Measurement of DNA concentration, purity control

### **Lab 8: Molecular biology II**

- a) Polymerase chain reaction

### **Lab 9: Molecular biology III**

- a) Restriction cleavage analysis
- b) Electrophoresis, interpretation of the results