



List of required and recommended literature

1. year - General Medicine and Dental Medicine

Medical Chemistry	Mareková M. et al.	Medical Chemistry – Lectures https://portal.lf.upjs.sk/articles.php?aid=250	2021
	Stupák M et al.	Medical Chemistry – “Hand book” for students of General and Dental Medicine https://portal.lf.upjs.sk/articles.php?aid=69	2021
	Smolko L. et al.	Practical exercises from Medical Chemistry https://portal.lf.upjs.sk/articles.php?aid=80	2023
	Stupák M et al.	Medical Chemistry – Calculation https://portal.lf.upjs.sk/articles.php?aid=232	2017
	Urban P. et al.	Chemistry – Repetitorium https://portal.lf.upjs.sk/articles.php?aid=236	2017
	Tomečková V.	Elementary organic molecules in biochemistry, Academic Textbook, Košice	2023
	Országová Z., Žitňanová I. et al.	Medical Chemistry	2008

Required study literature is written by **bold font**

Medical Chemistry – Lectures for General Medicine and Dental Medicine students

prof. Ing. Mária Mareková, CSc., doc. Ing. Katarína Dubayová, PhD., doc. RNDr. Marek Stupák, PhD., doc. RNDr. Vladimíra Tomečková, PhD., doc. Mgr. Peter Urban, PhD.:



The subject Medical Chemistry includes selected chapters from general, inorganic, physical and organic chemistry. Teaching focuses mainly on bioorganic chemistry, which is a static part and an introduction to the study of medical biochemistry. Knowledge of the structure and function of chemical substances and compounds, as well as their interaction and factors which can influence these interactions is very important for students of General Medicine. Medical Chemistry represent the basis especially for the study of Medical Biochemistry, Pathobiochemistry and Clinical Biochemistry.

<https://portal.lf.upjs.sk/articles.php?aid=250>

Medical Chemistry – “Hand book” for students of General and Dental Medicine

doc. RNDr. Marek Stupák, PhD., RNDr. Lukáš Smolko, PhD., doc. Mgr. Peter Urban, PhD., RNDr. Jana Mašlanková, PhD., Ing. Beáta Hubková, PhD., RNDr. Beáta Čižmárová (Veliká), PhD., MUDr. Anna Birková, PhD., doc. RNDr. Vladimíra Tomečková, doc. RNDr. Miroslava Rabajdová, PhD., PhD., doc. Ing. Katarína Dubayová, PhD., prof. Ing. Mária Mareková, CSc.:

This publication is intended mainly for students of medicine studying at the Faculty of Medicine, Pavol Jozef Šafárik University in Košice. The textbook covers the basic knowledge of selected topics of general, physical, inorganic, organic and bioorganic chemistry required for successful completion of the course of Medical Chemistry. Knowledge of the structures and functions of chemical substances and compounds, as well as their interactions and factors of surroundings influencing those interactions is very important for next study medical biochemistry incoming physicians. For better and easier understanding is the text appropriately supplemented with figures, tables, and numerous of chemical schemes. The separate part of this publication presents the chemistry of the most





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Department of Medical and Clinical Biochemistry



important dental materials used in clinical practise of future dentists, including the properties of metals, polymers and impression materials.

<https://portal.lf.upjs.sk/articles.php?aid=69>

Practical exercises from Medical Chemistry

RNDr. Lukáš Smolko, PhD., RNDr. Ivana Špaková, PhD., Ing. Beáta Hubková, PhD., doc. RNDr. Marek Stupák, PhD:



Practical exercises from Medical Chemistry is a set of experimental exercises designed for a better understanding of the subject. Laboratory manuals for the practical exercises are arranged into weeks according to the syllabus and contain theoretical introduction as well as experimental procedures for each exercise. Published material represents an effective instrument for understanding of the basic principles of Medical Chemistry.

<https://portal.lf.upjs.sk/articles.php?aid=80>

Revised and supplemented first published version “Practical exercises from Medical Chemistry”.

Authors: Stupák M., Rabajdová M., Mašlanková J., Urban P., Tomečková V., Mareková M.

Medical Chemistry – Calculations

doc. RNDr. Marek Stupák, PhD., MUDr. Anna Birková, PhD., Ing. Beáta Hubková, PhD., doc. RNDr. Miroslava Rabajdová, PhD., doc. Mgr. Peter Urban, PhD., RNDr. Beáta Čižmárová (Veliká), PhD., prof. Ing. Mária Mareková, CSc.:



Proper administration of individual medications and reagents is of the upmost importance in the clinical practice of future doctors. It can be affected by age, body weight, kidney and liver health, and other health conditions. Subject Medical Chemistry is therefore an essential part of the theoretical education at medical faculties. The basics for the successful completion of the course are also basic chemistry calculations that are listed in the following study material.

<https://portal.lf.upjs.sk/articles.php?aid=232>

Chemistry – Repetitorium

doc. Mgr. Peter Urban, PhD., RNDr. Lukáš Smolko, PhD., RNDr. Jana Mašlanková, MUDr. Anna Birková, PhD., RNDr. Beáta Čižmárová (Veliká), PhD., Ing. Beáta Hubková, PhD., doc. RNDr. Marek Stupák, PhD., prof. Ing. Mária Mareková, CSc.:



Knowledge of the structure and function of chemical substances and compounds, as well as their interactions and factors which can influence these interactions are very important for study Medical Chemistry and Biochemistry. The supporting materials are repeating of high school chemistry and represent the summarization of knowledge's from high school. All listed information can help the student to better prepare for exam from Medical Chemistry.

<https://portal.lf.upjs.sk/articles.php?aid=236>



Elementary Organic Molecules in Biochemistry

Oxygen, Sulfur, and Nitrogen Derivatives

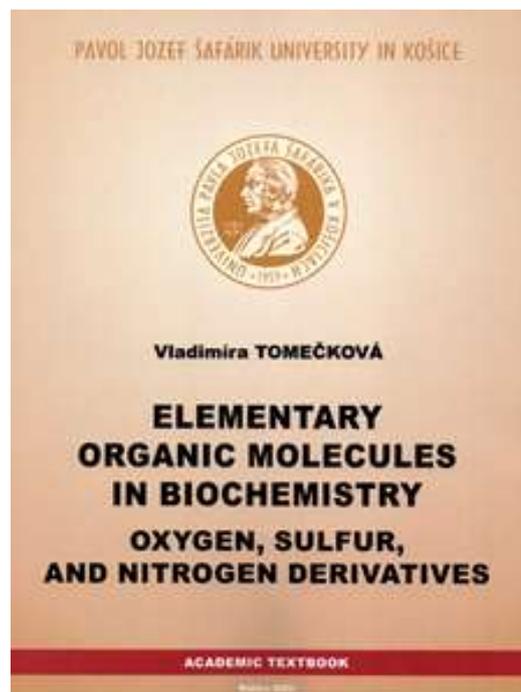
doc. RNDr. Vladimíra Tomečková, PhD. univ. prof.

This book is written for students of general and dental medicine who would like to learn medical organic chemistry in simplicity with application in bioorganic chemistry and biochemistry. This book is devoted to motivated students who would like to practice their knowledge. Improve yourself in this subject not only by reading but by practice the drawing of simplified basic organic reactions with your hand with their future application in biochemistry.

Content

- 1 Oxygen derivatives of hydrocarbons
- 2 Sulfur derivatives of hydrocarbons
- 3 Nitrogen derivatives of hydrocarbons
- 4 Important reactions of unsaturated compounds in medicine, and cooking
- 5 Selected pharmaceutically active compounds
- 6 Heterocyclic compounds
- 7 Isomerism of organic compounds

Nature, as well as the human body, contains an abundant quantity of organic molecules. This textbook describes selected oxygen, sulfur, nitrogen derivatives of hydrocarbons, heterocyclic compounds of their reactions, which are important in the human body or are found in pharmaceutical active substances, poisons, foodstuffs and heat-treated food. The last part of the textbook describes the isomerism of organic compounds, which enables dynamic changes in the structure of molecules that have different properties. Nature is filled with different plants and animals and is the first laboratory to produce bioactive organic natural compounds. These compounds are compatible with human cells and are applicable as therapeutic medicine. There is an effort to reproduce natural molecules in chemical laboratories, but they cannot be as perfect as the natural ones. Synthetic molecules can serve as a model for multiple studies, but there still does not exist a magic panacea pill or a perfect copy of nature, for the treatment of various diseases. Knowledge about the regenerative and toxic effect of medicinal substances in dependence on their structure (type and number of substituents) is very important for the understanding of their role in modulation of health and disease in dependence on their concentration. Compounds can be used daily only in recommended doses (higher doses can be toxic), but still will not replace a healthy diet. People need a varied diet to be healthy, in which are all necessary nutrients, what Hippocrates demonstrated long ago "Let food be the medicine, and let medicine be the food." Learn the simple models mainly through creative simple instruction by using different colours, by repetition, practice by drawing of formulas by hand (at least three times) and memorization of common names of compounds and their reactions which have application in biochemistry. Thus, establishing simple educational methods how to distinguish organic molecules according to the colours of a functional group can promote universal learning for all students who thought that chemistry is a difficult subject, but hopefully they change their opinion after study of this book.



Keywords: organic molecules, oxygen, sulfur, nitrogen derivatives of hydrocarbons, heterocyclic compounds, chemical reactions, isomerism of organic compounds