

## The Integrated Teaching of General Chemistry to Students of Medicine and Stomatology in Medical Schools

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The primary goal of this programme is to present the chemical foundation necessary to students of medicine and stomatology. More specifically, the aim is to introduce the reader to the basic aspects of normal metabolism that are required for an understanding of the causes and consequences of various disorders.

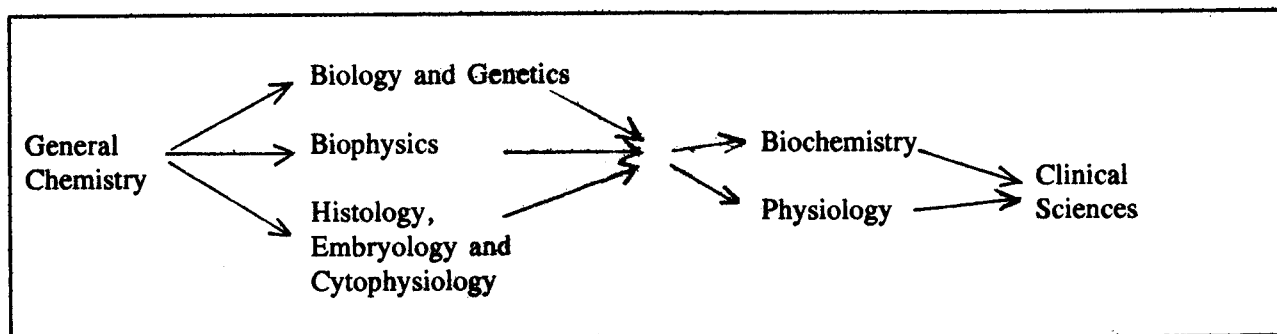


Figure 1. General Chemistry for Medical Sciences

Teaching General Chemistry to students of medicine and stomatology in medical schools is discussed in Poland. At the Faculty of Medicine and Stomatology I proposed 30 hours of lectures and 75 hours of exercises for students of medicine, and 30 hours of lectures and 60 hours of exercises for students of stomatology.

**Table 1.** The Teaching of General Chemistry in the Faculty of Medicine and Stomatology, Medical School, Szczecin (Proposition)

	Lectures h	Exercises h	Total h
Medicine	30	75	105
Stomatology	30	60	90

I have integrated the teaching of General Chemistry with biology and biophysics (the first year):

**1 Metabolism of Nucleotides**

**1.1 Biosynthesis of Purine Ribonucleotides**

- 1.2 Control Mechanism in Purine Nucleotide Biosynthesis
- 1.3 Biosynthesis of Pyrimidine Ribonucleotides
- 1.4 Control Mechanism in Pyrimidin Nucleotide Biosynthesis
- 1.5 Biosynthesis of Deoxyribonucleotides
- 1.6 Salvage Pathways
- 1.7 Inhibitors of Nucleotide Synthesis
- 1.8 Digestion and Absorption of Nucleotides
- 1.9 Catabolism of Purines
- 1.10 Catabolism of Pyrimidines
- 1.11 Uric Acid and Hyperuricemic Disorders

**2 Biosynthesis of Nucleic Acids**

- 2.1 Structure of DNA and its Replication
- 2.2 Mechanism of DNA Replication
- 2.3 Reactions Involved in Replication and their Probable Sequence
- 2.4 Enzymes Involved in DNA Replication
- 2.5 Transcription
- 2.6 Differentiation of RNA
- 2.7 Messenger RNA
- 2.8 Transfer RNA
- 2.9 Ribosomal RNA

- 2.10 Translation and the Genetic Code/and with histology, embryology and cytophysiology (the first ÷ the second year):
- 3 **Biosynthesis of Proteins**
  - 3.1 Synthesis and Properties of Aminoacyl-tRNA
  - 3.2 Base-Pairing between tRNA and mRNA
  - 3.3 Initiator of Protein Synthesis
  - 3.4 Elongation of the Polypeptide Chain
  - 3.5 Termination in Protein Synthesis
  - 3.6 Post-translational Modification of Synthesis
  - 3.7 Primary, Secondary, Tertiary and Quaternary Structures of Proteins
  - 3.8 Inhibitors of Transcription and Translation
  - 3.9 DNA and Nuclear Proteins
  - 3.10 Control of Gene Expression
  - 3.11 Mutations
  - 3.12 Recombinant DNA and Genetic Engineering/and with biochemistry (the second year of the teaching of students):
- 4 **Saccharides**
  - 4.1 Classifying Saccharides
  - 4.2 The Three-Dimensional Structure of Monosaccharides
  - 4.3 The Cyclic Structure of Monosaccharides
  - 4.4 Mutarotation
  - 4.5 Reactions of Monosaccharides
  - 4.6 Hexosamines
  - 4.7 Disaccharides (Sucrose, Lactose, Maltose, Isomaltose, Cellobiose, Trehalose)
  - 4.8 Polysaccharides (Starch, Glycogen, Cellulose, Inuline)
- 5 **Lipids**
  - 5.1 Classifying lipids
  - 5.2 Fatty Acids
  - 5.3 Unsaturated Fatty Acids
  - 5.4 Waxes
  - 5.5 Triacylglycerols (Triglycerides)
  - 5.6 Phosphoglycerides (Phospholipids)
  - 5.7 Sphingolipids
  - 5.8 Biological Membranes
  - 5.9 Soaps and Detergents
  - 5.10 Prostaglandins and Prostacyclins

Exercises and questions are placed at appropriate places in the lectures and at the end of each chapter in my textbook. In writing this program I have benefitted greatly from the comments and suggestions of many of my colleagues and students. I wish to express my appreciation to Professor Mirosława Humiczewski-Rajski, Professor Jerzy Kawiak, and Professor Zygmunt Machoy for detailed and thoughtful reviews of various sections of this program.

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