

Biochemistry I

Self-Introduction

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BS (Wuhan University)

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Joined Tsinghua University in 2004

Taught Biochemistry II since Spring, 2004

Taught Biochemistry I since Spring, 2012

Self-Introduction

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Self-Introduction

Research interest:

Adiponectin-targeted drug development

- Molecular mechanism of adiponectin multimerization and secretion
- Screen for new drugs to treat type 2 diabetes (糖尿病)

Biochemistry is the chemistry of life

- Describe in molecular terms the structures, mechanisms, and chemical processes shared by all organisms
- Provides organizing principles that underlie life in all its diverse forms
- Provides important insights and practical applications in **medicine**, agriculture, nutrition, and industry

Biochemistry is an multidisciplinary science

- **Organic chemistry**: describes the structure and properties of biomolecules
- **Microbiology**: shows that single-celled organisms and viruses are ideally suited for studying many metabolic pathways and regulatory mechanisms
- **Cell biology**: describes biochemical division of labor and life processes within a cell
- **Genetics**: describes the mechanisms that give a cell or organism its biochemical identity

Biochemistry is an multidisciplinary science

- **Biophysics**: applies the techniques of physics to study the structure of biomolecules
- **Physiology**: investigates life processes at the level of tissue or organism
- **Nutrition**: illuminates metabolism by describing the dietary requirements for health maintenance
- **Medical research**: seeks to understand human diseases in molecular terms

Course Introduction

Textbook:

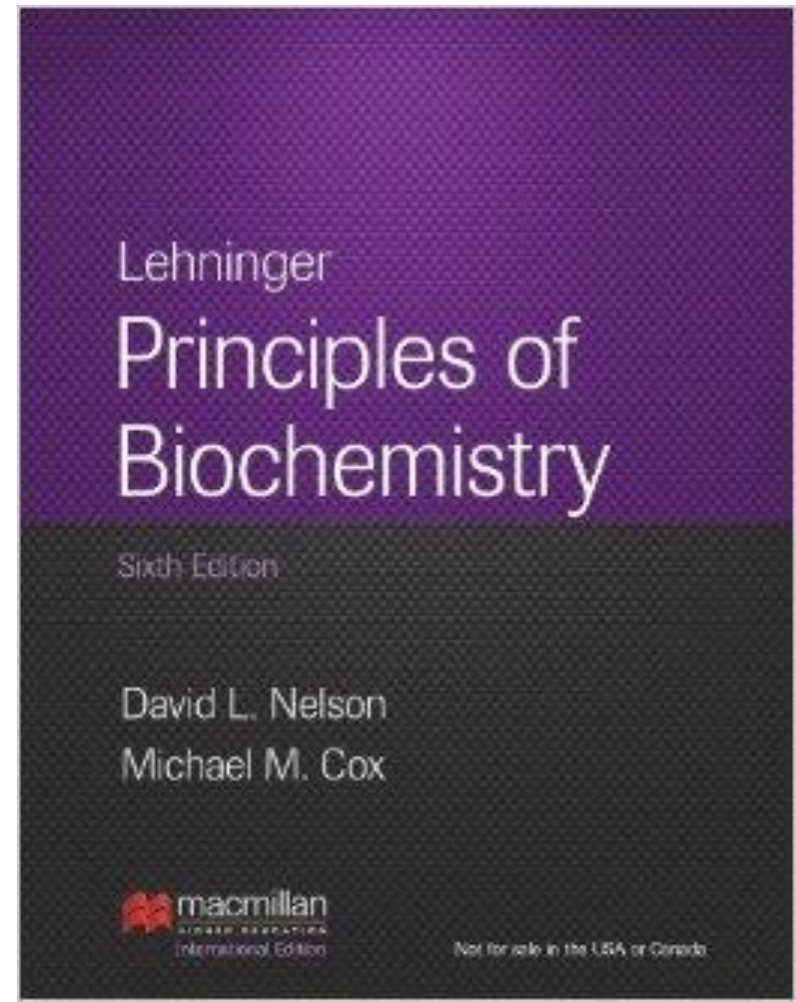
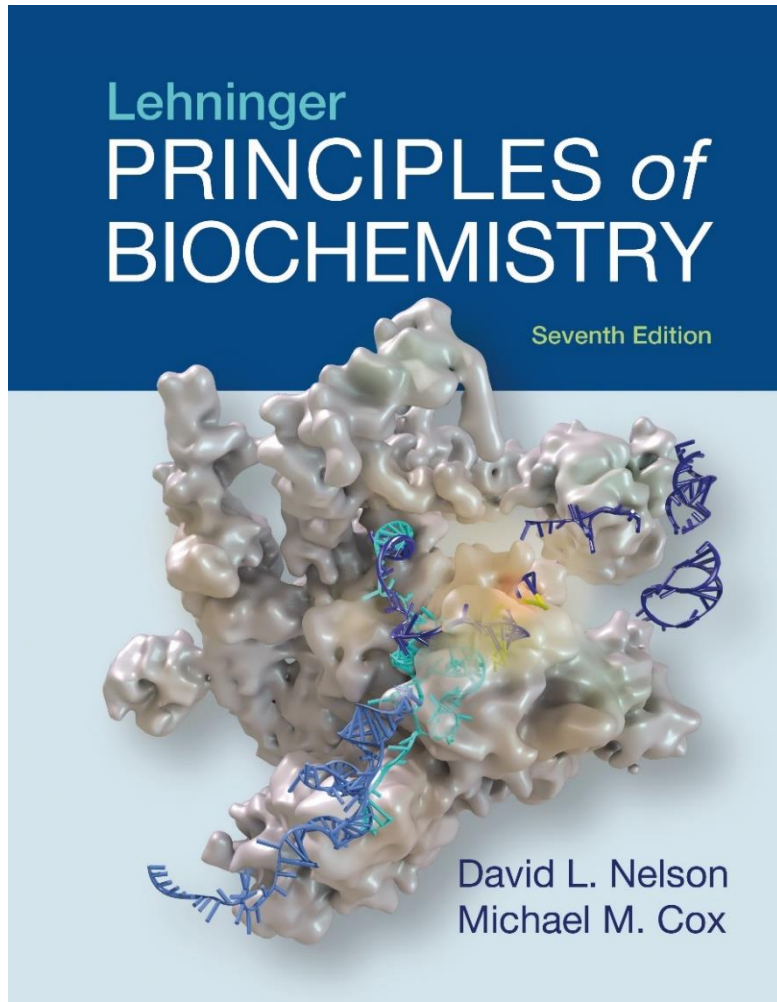
Lehninger Principles of Biochemistry

By D. L. Nelson and M. M. Cox,

Seventh Edition

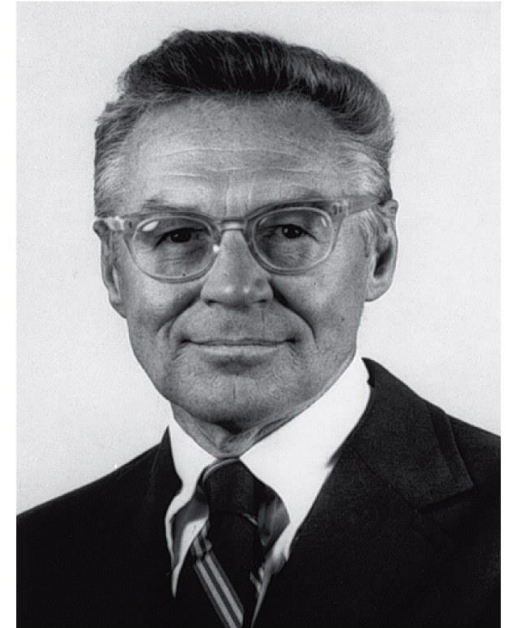
Course Introduction

Textbook



Albert Lehninger

- Citric acid cycle occurs in mitochondria
 - Mechanism of oxidative phosphorylation
 - Mitochondrial structure and function
 - Bioenergetics
-
- Author of classic textbooks:
 - *Biochemistry (1970-1983)*
 - *The Mitochondrion (1964)*
 - *Bioenergetics (1965-1974)*



**Albert L. Lehninger,
1917–1986**

Three parts of Biochemistry

- **The structural chemistry of the components of living organisms and the relationship between chemical structure and biological function --- Part I**
- **Metabolism - the chemical reactions that occur in living organisms --- Part II**
- **The chemistry of molecules and processes that store and transmit biological information --- Part III**

Course Introduction

Biochemistry I (this semester)

Part I: Structure and Catalysis

Chapter 1 - Chapter 6 (Week 1-8)

By Zhen Li

Chapter 7 - Chapter 12 (Week 9-16)

By Prof. Dong Liu

Prof. Geng Wang

Course Introduction

Biochemistry II (next semester)

Part II: Bioenergetics and Metabolism

Chapter 13 - Chapter 23

Part III: Information Pathways

Chapter 24 - Chapter 27

All by Zhen Li

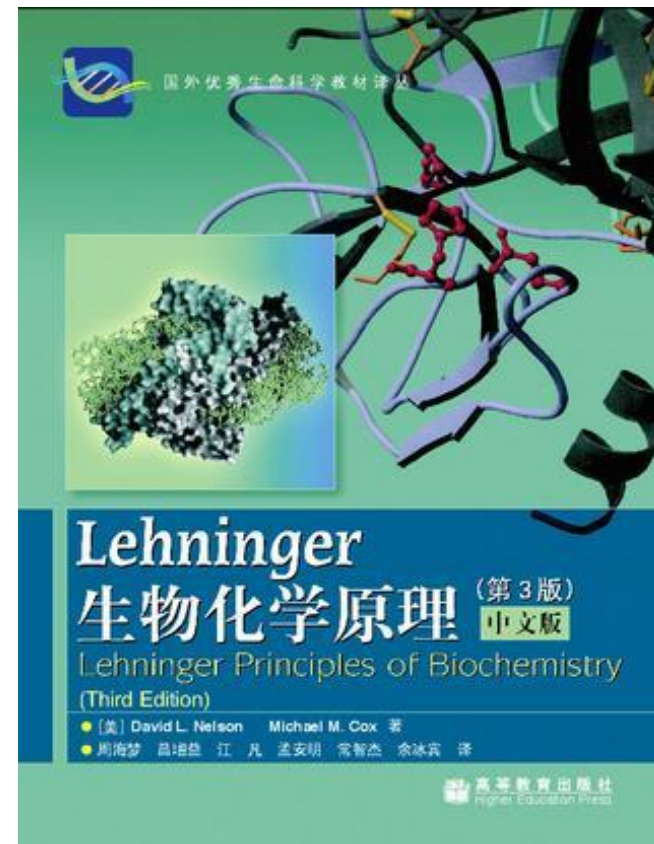
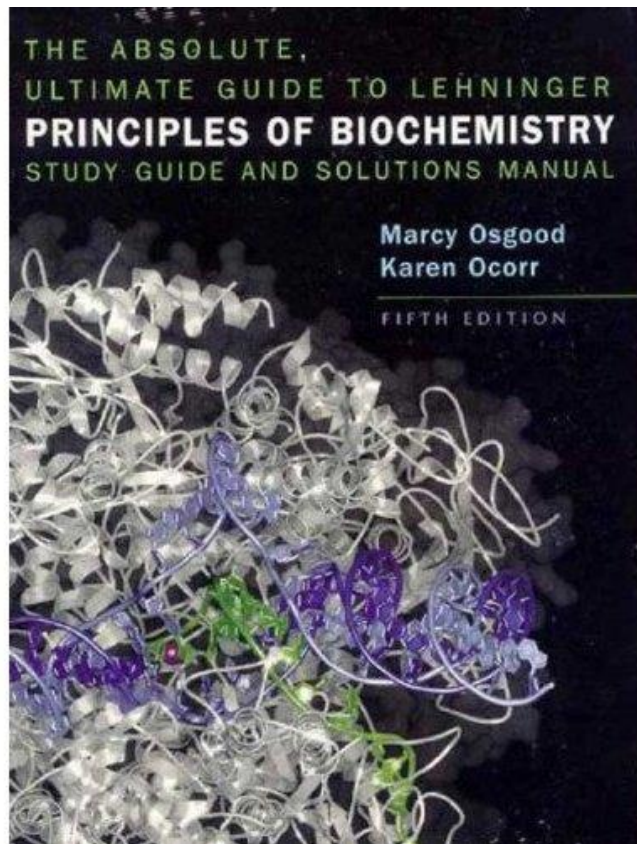
Course Introduction

Reference textbooks:

- * Biochemistry, Fifth Edition
(By Berg, Tymoczko and Stryer)
- * The absolute, ultimate guide to Lehninger Principles of Biochemistry, Fifth Edition
(By Marcy Osgood and Karen Ocorr)
- * Lehninger 生物化学原理, 第三版, 中文版
(周海梦, 昌增益等译)

Course Introduction

Reference textbooks:



Course Calendar

WEEK	CONTENTS
1	Introduction to the course Ch 1 --- The foundations of biochemistry
2	Ch 2 --- Water
3	Ch 3 --- Amino acids, peptides, and proteins (I)
4	Ch 3 --- Amino acids, peptides, and proteins (II)
5	Ch 4 --- The three dimensional structure of proteins
6	Ch 5 --- Protein Function
7	Ch 6 --- Enzymes (I)
8	Ch 6 --- Enzymes (II) Summary of Ch 1 - 6

Course Introduction

Office Hour:

3 - 5 pm, Friday

You are welcome to come to my office to ask questions about the course!

(If you have classes during regular Office Hour, you can send your questions to me via E-mail or make an appointment with me by E-mail)

Grade for the course

Quiz and Test: in class

account for **20%** of the final grade (50 points)

Final exam: at the end of the semester

accounts for **80%** of the final grade (50 points)

Active and volunteering participation in the classroom is encouraged and will be awarded bonus points

Course Introduction

Lecture time and location:

- **Tuesday, 9:50-12:15, 六教6A017**
- **Wednesday, 9:50-12:15, 五教5101**

Course Introduction

Teaching assistant:

Yudian Zhang 张雨点

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Course Introduction

- **First all-English course**
- **Lots of news words and new concepts**
- **Exposed to a large amount of information within a relatively short period of time**
- **Impossible to talk about everything in the textbook**
- **Rely on you to self-study those not discussed in the lectures**

Rules of the classroom

- **Turn off your mobile phone**
- **Keep quiet**
- **Raise your hand if you have questions**
- **Be honest in the quiz and the final exam**

Useful links

- **Website for the course:**

<http://biochem.life.tsinghua.edu.cn>

- **Website for the textbook:**

<https://www.macmillanlearning.com/Catalog/product/lehningerprinciplesofbiochemistry-seventhedition-nelson>

- **清华大学网络学堂:**

<http://learn.tsinghua.edu.cn>

Some useful tips

- Don't worry too much!
- Preview (预习) before each lecture
- Take good notes in class
- Review (复习) and **do homework** after lectures
- Spend at least **3 hours every week** in this course
- Ask for help if you have difficulties or problems in your study
- Have enough sleep the night before the lecture

Some useful tips

- Pay attention to the **Worked examples, Key Convention, Key Terms (Keywords) and Summary** in the textbook and ppt files
- Make use of all kinds of learning resources
- Try to use as much **English** as possible in your reading, writing and thinking

Understanding is more important than memorization!

My goal

For you to learn the principles of biochemistry and to understand its **relevance to medicine and to health issues in general, for a healthier life and a healthier planet**

**Let us work together
to make this
a fun and fruitful
experience!**