Ankara University Faculty of Medicine
Program in English
Year 1; Term 1; 2019-2020

MED109
CELL BIOLOGY

Introduction of the Course

Prof. Alp CAN
Course Coordinator
www.alpcan.com

CELL BIOLOGY

COURSE INTRODUCTION

COURSE PERIOD	: Year 1 – Semester 1
COURSE CODE	: MED 109
COURSE DURATION	: 7 weeks
NATIONAL CREDIT	: 7
ECTS CREDIT	: 10
COURSE COORDINATOR	: Prof. Alp CAN
COORDINATOR ASSISTANT	: Assist. Prof. Nüket YÜRÜR KUTLAY
COURSE SECRETARY	: Buket ADIŞANLI, Bahadır ÇEVRİM
COURSE DATES	: 25.11.2019 – 10.01.2020
TRAINING LOCATIONS	: Pink Hall, Yellow Hall, Rıdvan Ege Laboratory, Medical Skills Laboratory

COORDINATING DEPARTMENTS

Biophysics
Histology & Embryology
Medical Biochemistry
Medical Biology
Medical Genetics
Physiology

CONTRIBUTING DEPARTMENTS

Anesthesiology & Reanimation
Hematology
Medical Education & Informatics
Plastic, Reconstructive & Aesthetic Surgery

TEACHING STAFF

Prof. Meral BEKSAÇ
Prof. Alp CAN
Prof. Özgür ÇINAR
Prof. Erdinç DEVRİM
Prof. İlker DURAK
Prof. Aslıhan GÜRBÜZ
Prof. Hatice ILGIN RUHİ
Prof. Hasan Serdar ÖZTÜRK
Prof. Asuman SUNGUROĞLU
Prof. Ayşe Fulya TEKŞEN
Prof. Mehmet UĞUR
Assoc. Prof. Oya Sena AYDOS
Assoc. Prof. Özlem Selvi CAN
Assoc. Prof. Burak KAYA
Assoc. Prof. Başak Ceyda MEÇO
Assist. Prof. İpek GÖNÜLLÜ
Assist. Prof. Halil Gürhan KARABULUT
Assist. Prof. Timur TUNCALI
Assist. Prof. Nüket YÜRÜR KUTLAY
Lecturer Simge AYKAN ZERGEROĞLU

AIM OF THE COURSE

To gain knowledge about the structure, function and mechanisms of human organism at the molecular and cellular level. Also, to gain skills for basic medical practices.

Overview

Origin of life and the universal properties of cells

Macromolecules of the living organisms

Evolution

Structure and function;

- Genome
- Cell membrane
- Cytoplasm and organelles
- Cell nucleus
- RNA molecules

Mechanisms of;

- Cellular transport
- Signaling mechanisms
- DNA repair
- Protein synthesis
- Cell division
- Cell ageing, cell death

SUMMARY OF THE COURSE

	Lecture	Panel	Lab Practice	Medical Skills	Total
Biophysics	4				4
Hematology		2			2
Histology & Embryology	5	2	2		9
Medical Biochemistry	10		3		13
Medical Biology	21	2	14		37
Medical Genetics	26		4		30
Physiology	4				4
Plastic Surgery		2			2
Anesthesiology & Reanimation				20	20
Medical Education & Informatics				20	20
TOTAL	**70**	**2**	**23**	**20**	**115**

“What have we learned so far?” Session (20 December 2019 - 13:30-15:30)

- Each student will shortly prepare a slide presentation about “what they have/have not learned up to that date”.
- Only 10 students (will be determined by lottery) will present max 5-min slide presentation.

Two-Step Evaluation of the Course

1. Midterm Exam (30%)
   - 16 December 2019
   - 20 multiple choice, fill in the blanks or Right/Wrong type questions
     - Distribution of Questions = Total Question 20

       Biochemistry (5), Biophysics (2), Histology and Embryology (2), Medical Biology (2), Medical Genetics (7), Physiology (2)

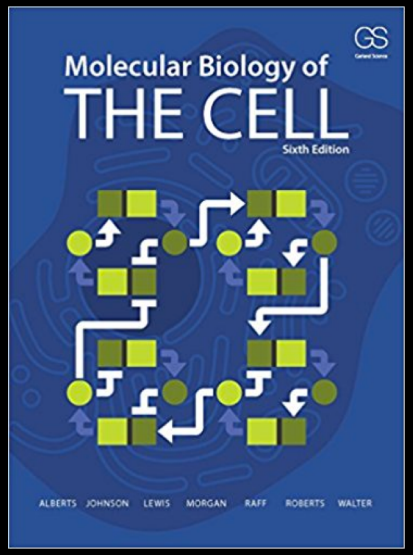
Two-Step Evaluation of the Course

2. Final Exam (80%)
   - Practical Exam (10 January 2020)
     - Medical Skills Session (10%)
     - Laboratory Session (20%)
       - Station-based lab practice exam (10 stations)
       - Question numbers (5 Medical Biology, 2 Genetics, 2 Biochemistry, 1 Histology-Embryology)
   - Written Exam (50%) (10 January 2020)
     - 50 multiple choice questions
       - Distribution of Questions = Total Question 50

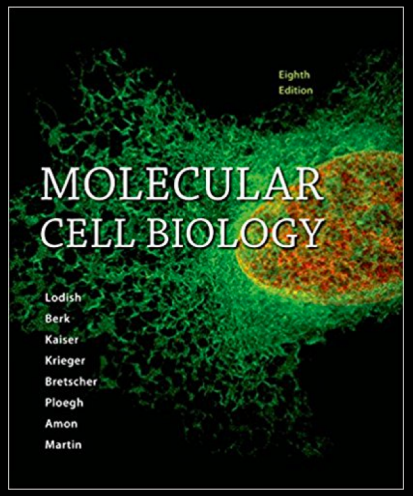
         Biochemistry (7), Biophysics (3), Histology and Embryology (4), Medical Biology (15), Medical Genetics (18), Physiology (3)

A Feedback Session will be held at the and of the course (10 January 2020)

Further Reading – Cell Biology

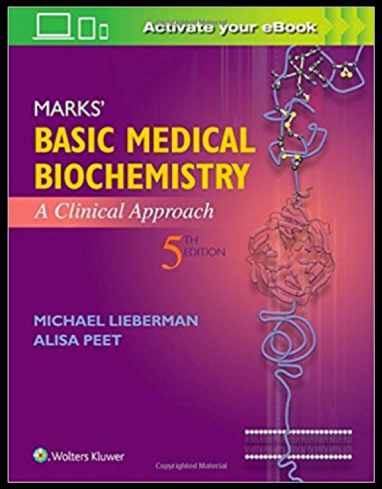


Molecular Biology of the Cell (6th Edition); Bruce Alberts; Garland Science, New York, 2015.

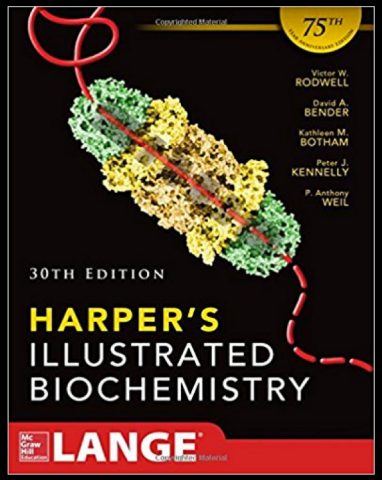


Molecular Cell Biology. (8th Edition); Harvey Lodish; W H Freeman & Co; 2016

Further Reading - Biochemistry

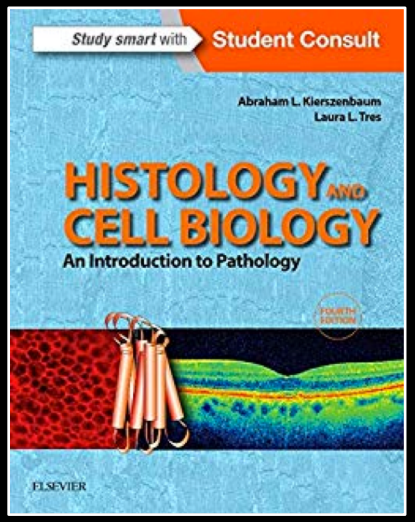


Marks' Basic Medical Biochemistry A Clinical Approach (5th Edition); Michael Lieberman, Alisa Peet; Wolters Kluwer, Philadelphia, 2018.

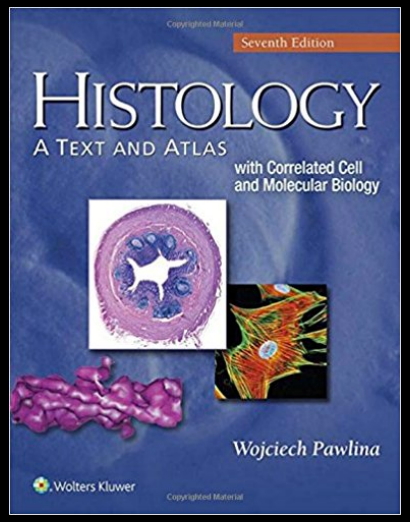


Harper's Illustrated Biochemistry (30th Edition); Victor W. Rodwell, David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil; McGraw-Hill, 2015.

Further Reading - Histology

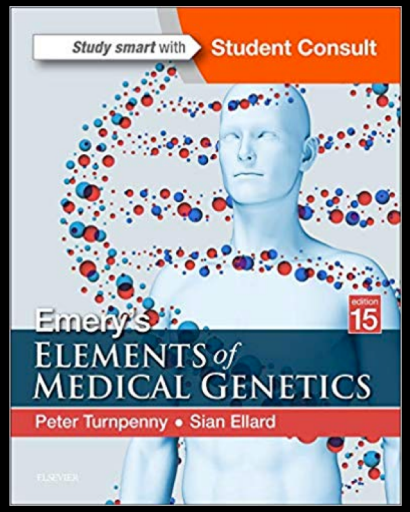


Histology and Cell Biology: An Introduction to Pathology (4th Edition); Abraham L. Kierszenbaum, Laura L. Tres; Elsevier Saunders, Philadelphia, 2015.



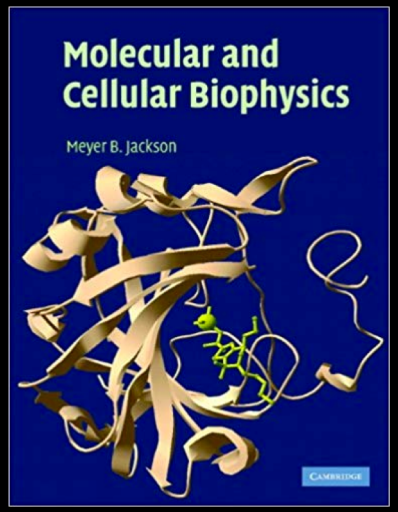
Histology: A Text and Atlas with Correlated Cell and Molecular Biology (7th Edition); Micheal H. Ross, Wojciech Pawlina; Lippincott Williams & Wilkins, 2015.

Further Reading - Genetics



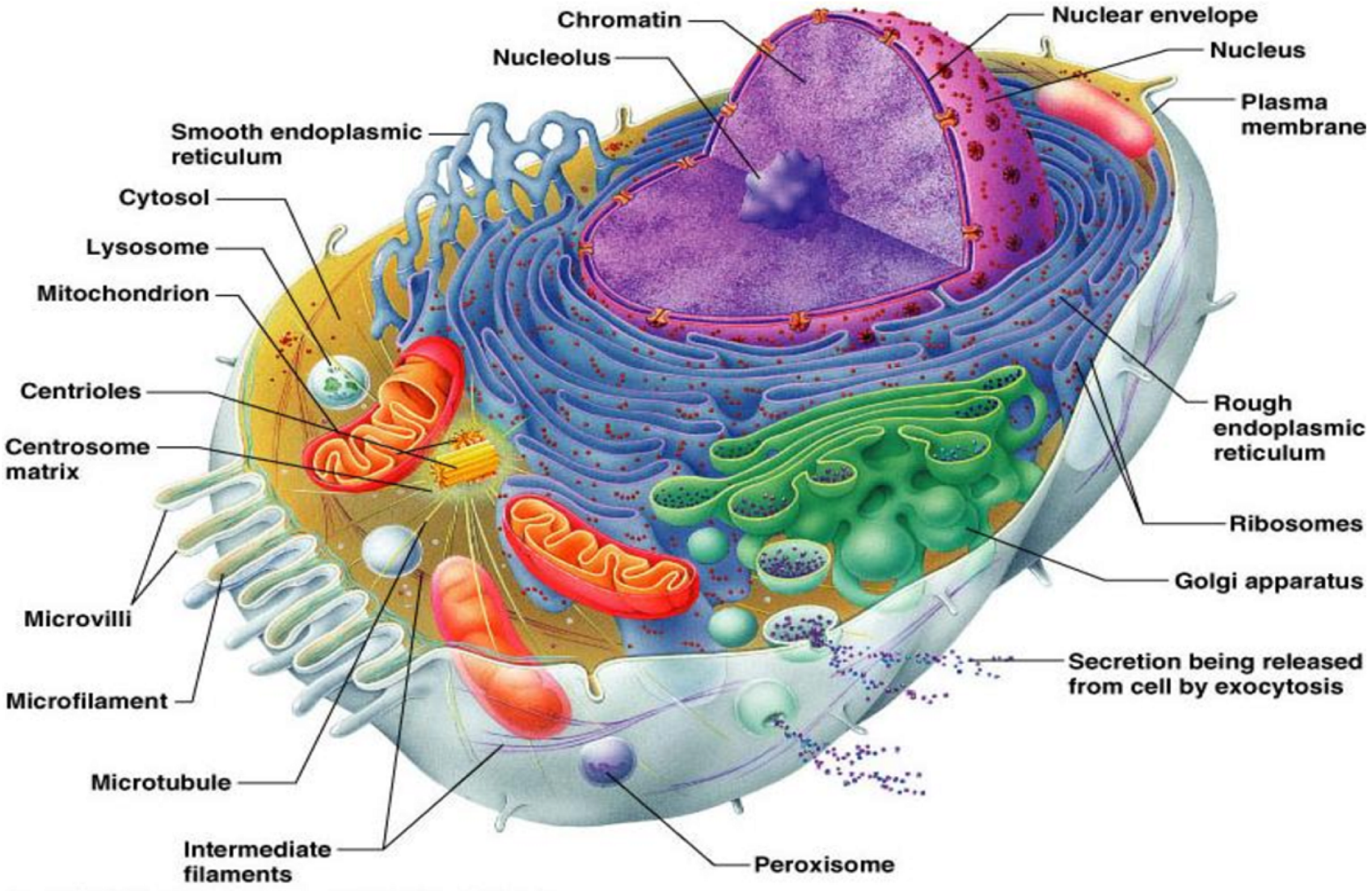
Emery's Elements of Medical Genetics (15th Edition); Peter D. Turnpenny, Sian Ellard; Elsevier, Philadelphia, 2017.

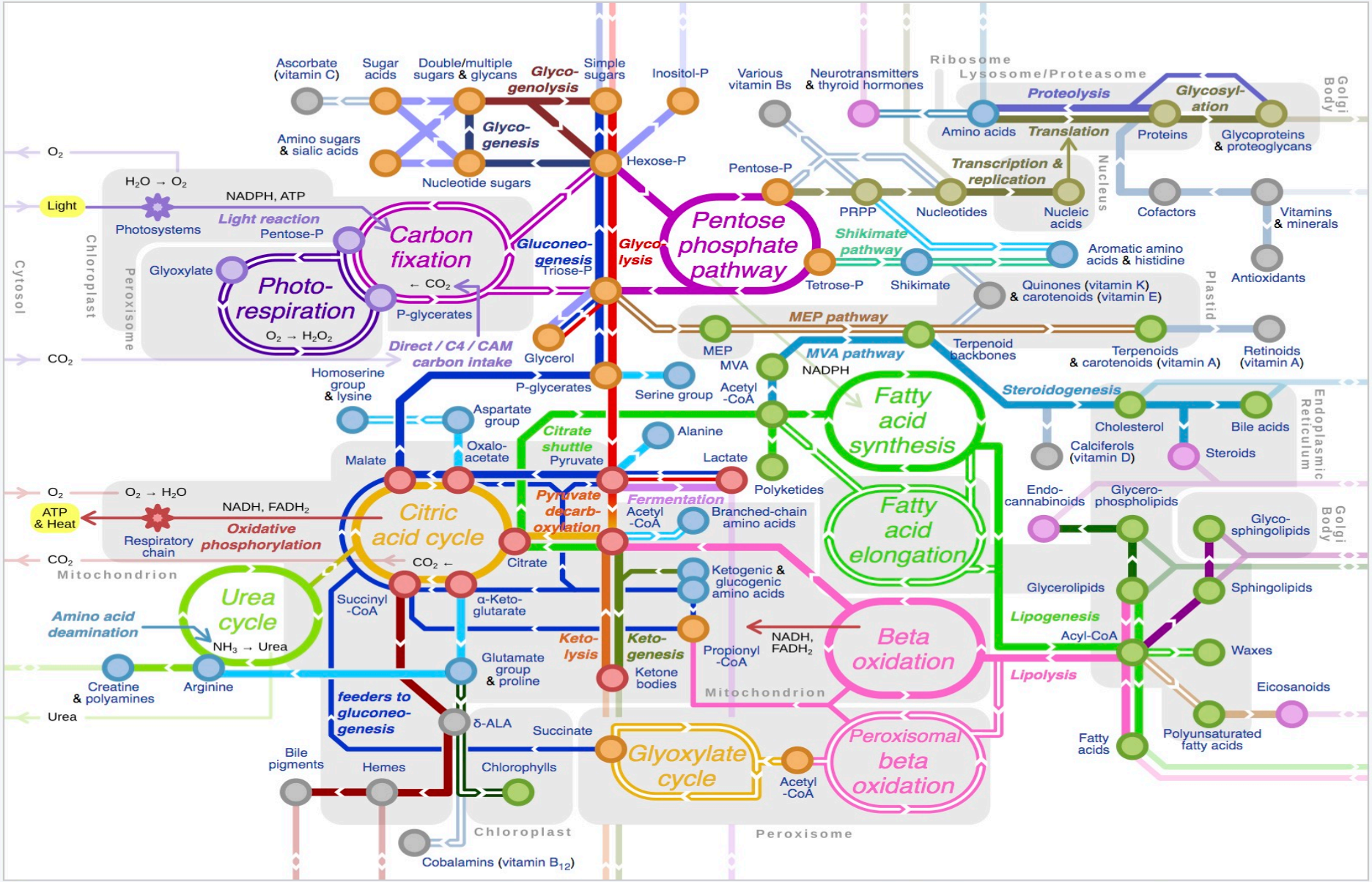
Further Reading - Biophysics



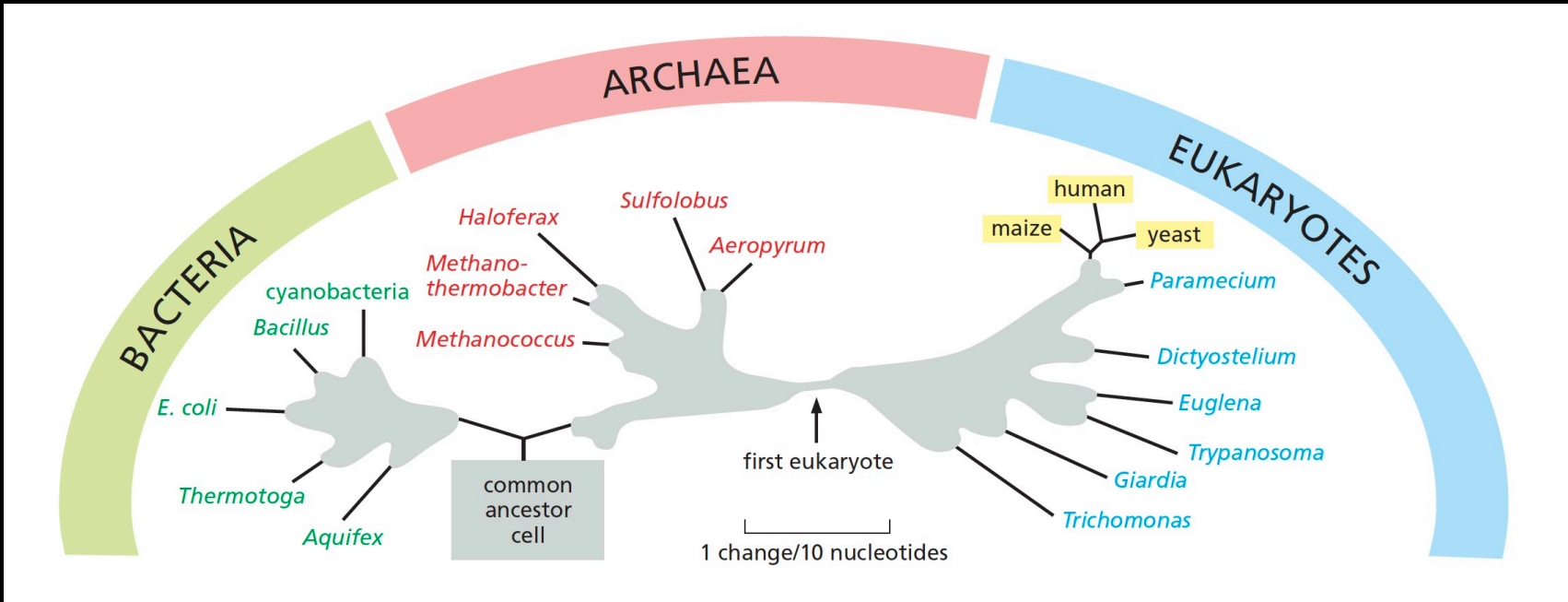
Molecular and Cellular Biophysics; Meyer B. Jackson; Cambridge University Press, Cambridge, 2006.

Cell Biology is More Than the Studying the Structure of a Cell!





Major metabolic pathways in metro-style map. Click any text (name of pathway or metabolites) to link to the corresponding article.
Single lines: pathways common to most lifeforms. Double lines: pathways not in humans (occurs in e.g. plants, fungi, prokaryotes).
Orange nodes: carbohydrate metabolism. Violet nodes: photosynthesis. Red nodes: cellular respiration. Pink nodes: cell signaling.
Blue nodes: amino acid metabolism. Grey nodes: vitamin and cofactor metabolism. Brown nodes: nucleotide and protein metabolism.
Green nodes: lipid metabolism.



The three major divisions (domains) of the living world.

The word "bacteria" was originally used to refer to "prokaryotes" in general, but more recently has been redefined to refer to "eubacteria".

Nucleus of the eukaryotic cell is now thought to have emerged from a sub-branch within the archaea, so that in the beginning the tree of life had only two branches—bacteria and archaea.

Tools for Studying Cell Biology

- Molecular Biological Techniques
  - Cytogenetic Techniques
  - DNA, RNA sequencing
  - PCR
- Biochemical Techniques
  - Enzyme and protein chemistry
- Histological and Microscopy Techniques
  - Cell & Tissue Culture, Organoids
  - Tissue Sectioning and Cytochemistry
  - Microscopic Investigations

Model Organisms in Biology & Medicine