

TABLE OF CONTENTS – Cell Biology, 3rd Edition

Section 1: Introduction to Cell Biology

- 1 Introduction to Cells
- 2 Evolution of Life on Earth

Section 2: Chemical and Physical Background

- 3 Molecules: Structures and Dynamics
- 4 Biophysical Principles
- 5 Macromolecular Assembly
- 6 Research Strategies

Section 3: Chromatin, Chromosomes, and the Cell Nucleus

- 7 Chromosome Organization
- 8 DNA Packaging in Chromatin and Chromosomes
- 9 Nuclear Structure and Dynamics

Section 4: Central Dogma: From Gene to Protein

- 10 Gene Expression
- 11 Eukaryotic RNA Processing
- 12 Protein Synthesis and Folding

Section 5: Membrane Structure and Function

- 13 Membrane Structure and Dynamics
- 14 Membrane Pumps
- 15 Membrane Carriers
- 16 Membrane Channels
- 17 Membrane Physiology

Section 6: Cellular Organelles and Membrane Trafficking

18 Posttranslational Targeting of Proteins

19 Mitochondria, Chloroplasts, Peroxisomes

20 Endoplasmic Reticulum

21 Secretory Membrane System and Golgi Apparatus

22 Endocytosis and the Endosomal Membrane

23 Processing and Degradation of Cellular Components

Section 7: Signaling Mechanisms

24 Plasma Membrane Receptors

25 Protein Hardware for Signaling

26 Second Messengers

27 Integration of Signals

Section 8: Cellular Adhesion and the Extracellular Matrix

28 Cells of the Extracellular Matrix and Immune System

29 Extracellular Matrix Molecules

30 Cellular Adhesion

31 Intercellular Junctions

32 Connective Tissues

Section 9: Cytoskeleton and Cellular Motility

33 Actin and Actin-Binding Proteins

34 Microtubules and Centrosomes

35 Intermediate Filaments

36 Motor Proteins

37 Intracellular Motility

38 Cellular Motility

39 Muscles

Section 10: Cell Cycle

40 Introduction to the Cell Cycle

41 G1 Phase and Regulation of Cell Proliferation

42 S Phase and DNA Replication

43 G2 Phase and Control of Entry into Mitosis

44 Mitosis and Cytokinesis

45 Meiosis

46 Programmed Cell Death

Glossary

Appendix.