

Preface

This book presents the complex subject of meiosis and mitosis in the most comprehensible and easy to understand language. It elucidates the various methods and theories of these processes. Meiosis and mitosis are the processes of cell division that occur in cells. It is an important part of the cell cycle. The topics included in the text are of utmost significance and bound to provide incredible insights to readers. Coherent flow of topics, student-friendly language and extensive use of examples make this an invaluable source of knowledge. The book is appropriate for those seeking detailed information in this area.

A detailed account of the significant topics covered in this book is provided below:

Chapter 1- This chapter will provide an integrated understanding of meiosis and mitosis. Meiosis is a specialized cell division, which reduces the chromosome number by half. Mitosis is the process of division of chromosomes into two new nuclei. This chapter is an overview of the subject matter incorporating all the major aspects of meiosis and mitosis.

Chapter 2- Cytokinesis, DNA replication, synapsis, mitotic index are some of the processes of meiosis and mitosis. These perform a variety of functions in a living organism. The processes elucidated in the following content are of vital importance, and provide a better understanding of meiosis and mitosis.

Chapter 3- An organism whose cells contain a nucleus within its membrane is a eukaryote. Reproduction in eukaryotes can occur both sexually and asexually. While it happens asexually in mitosis, it occurs sexually in meiosis. This chapter on meiosis seeks to explain the development of sexual reproduction and the specific evolutionary characteristics that were propagated because of the same.

Chapter 4- The errors and variations discussed in this chapter are aneuploidy, anaphase lag and endoreduplication. Aneuploidy is when a cell contains an incorrect number of chromosomes. An extra or a missing chromosome can cause a number of genetic disorders. The topics discussed in the chapter are of great importance to broaden the existing knowledge on mitosis.

Chapter 5- The series of events that take place when a cell gets divided is known as cell division. The cell cycle is also divided into three periods: interphase, the mitotic phase, and cytokinesis. During interphase, the cell grows and accumulates nutrients, preparing itself for cell division, and then during the mitotic phase, the chromosomes separate leading the cell to its final stage, the cytokinesis. This section provides a study of cell division and cell cycle.

Chapter 6- The period between mitotic divisions, known as G₁ phase, S phase and G₂ phase, is an interphase. Mitosis is a continuous process, which is divided into five stages which are prophase, prometaphase, metaphase, anaphase and telophase. The major categories of mitosis and cell cycle are dealt with great details in the chapter.

Chapter 7- Cells can be divided based on the function and genetic variation they display. This chapter explores the various types of cells like germ cells, somatic cells, zygote, gamete and phragmoplast. The content provides information on the differences between the various types.

Chapter 8- Homologous chromosomes are chromosomes that align perfectly with one another as they share the same genes and loci. This chapter provides the reader with an overview on homologous chromosomes, sister chromatids, the process of cohesin etc.

Chapter 9- Microtubules are an essential part of the cytoskeleton in eukaryotic cells and certain types of bacteria. This chapter studies microtubules, their functions and their intracellular organization. Also included are topics about the various types of microtubules like preprophase band, astral microtubules and phycoplast.

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Editor