

# Preface

This book is a valuable compilation of topics, ranging from the basic to the most complex theories and principles in the field of molecular biology. It provides thorough insights about the varied sub-branches of this field. Molecular biology refers to the study of the cells and the different biological activities happening between biomolecules in different cells. Also included in this text is a detailed explanation of the various concepts and applications of molecular biology. The book is a complete source of knowledge on the present status of this important field. It will be of great help to students in the field of biochemistry, genetics and bioinformation.

Given below is the chapter wise description of the book:

**Chapter 1-** The branch of science that concerns biological activity at the molecular level is regarded as molecular biology. This field overlaps with biology and chemistry. This chapter on molecular biology introduces the reader to the basic concepts of the subject including molecular biology, molecular microbiology and biomolecule. The chapter provides an integrated understanding on molecular biology.

**Chapter 2-** The processes involved in molecular biology are DNA replication, transcription, gene expression and translation. The biological process of producing two identical replicas of DNA from one original DNA molecule is referred to as DNA replication. This chapter serves as a source to understand the major categories related to molecular biology.

**Chapter 3-** Molecular cloning is a method used to assemble recombinant DNA molecules and polymerase chain reaction is the copying of a piece of DNA to generate millions of copies of the same DNA. This chapter discusses the techniques of molecular biology in a critical manner providing key analysis to the subject matter.

**Chapter 4-** The method used to imitate the behavior of molecules is molecular modelling whereas the testing of the properties of molecules in order to assemble better systems and processes is molecular engineering. This chapter is a compilation of fields like molecular modelling, molecular engineering, molecular genetics and molecular microbiology.

**Chapter 5-** This chapter will provide an integrated understanding of the applications of molecular biology, with a brief explanation on molecular medicine, bioinformatics and central dogma of molecular biology. This chapter helps the reader to develop a better understanding on the applications of molecular biology.

**Chapter 6-** Blotting can be divided into three techniques, southern blotting, northern blotting and western blotting. The macromolecule analyzed in southern blot technique is DNA, for northern blot it is the RNA and for western it is protein. The chapter on macromolecule blotting offers an insightful focus, keeping in mind the complex subject matter.