

Preface

Cytogenetics is now a more important subject in this era of biotechnology and bioinformatics. Biologists are trying to understand the function of cell at molecular level using systems biology approach. Findings from molecular analysis regarding mapping of genes, variation in chromosome number, structural variations (duplication, deficiency, inversion, translocation), chromosome organization, etc can be corroborated with cytological observations. Interphase cytogenetics and molecular cytogenetics will help in the studies of single loci or chromosomal regions in interphase nuclei. Thus the knowledge of cytological and cytogenetic techniques is more relevant today. This book on cytogenetics is the first in the series of books, the second and the third being biotechnology and bioinformatics, respectively. This book deals with structure and function of a cell, study of organization, function, transmission and recombination of genetic material using chromosome during mitosis and meiosis. Mendel's laws of heredity, the deviations from the laws and genetic recombination provide understanding of the transmission of traits from parents to offspring. It is essential to understand the applications of chromosome engineering for improvement of crop plants and the uses of manipulation of cytoplasm and $2n$ gametes. Cytological techniques described will help in conducting practical and the cytogenetics and genetics problems provided will enhance the analytical skill.

The source for inspiration for writing this book is the superb teaching that the author received from Dr. G. H. Jones at the University of Birmingham, England, while doing Ph.D. during 1980-83.

I would like to express my gratitude to Mr. N. K. Mehra, M/s Narosa Publishing House for proposing to publish manuscript in a series and for his sincere interest and attention. I would like to thank Mrs. Anupama Jauhry, Assistant General Manager (Production), Narosa for her attention to my manuscript.

I would like to thank Dr. S.N. Tiwari, and Dr. V.S. Pundhir, for using their facilities for scanning some figures.

Finally, I would like to thank my wife Veena, daughter Cynthia and son Shishir for their encouragement during the course of writing this series of books.

DARBESHWAR ROY