

PREFACE

In the beginning of this century, Haberlandt performed his pioneering experiments on the culture of plant cells. Simultaneously he had visualized the potential applications of this technique, and thus was born plant cell biotechnology. In the intervening period, the technique of plant cell culture has been perfected, but plant cell biotechnology remains in its infancy. The reason for the slow progress is inadequate information about physiology and genetics of higher plant cells. In this series a synthesis of the concepts of cell physiology and genetics, the basic disciplines for cell biotechnology and genetic engineering, is presented. A broad and informative view of these disciplines will be appealing to plant physiologists, geneticists, cell biologists, plant breeders, and biotechnologists.

Volume I comprises four chapters. Initial chapters devoted to fundamental aspects (Cell Multiplication and Cell Differentiation) concerning cell physiology are basic to the theme of biotechnology of higher plants. Included in the chapter on Cell Differentiation is an account of biosynthetic potential of higher plant cells. The next chapter, Cell Totipotency, highlights the regeneration potential of higher plant cells, for micropropagation of plants. Following this is the chapter entitled Induction of Haploid Plant/Cell. Developments in this field have led to the beginning of a new era in crop improvement.

Volume II comprises five chapters. Of these, four chapters are devoted to cell genetics: Protoplast — Isolation and Cell Regeneration, Cell Modification, Cell Fusion, and Cell Transformation. These chapters concern genetic engineering of plants. The final chapter, Cell Preservation, for germplasm storage, concludes the series.

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