

Preface

The possession of plasmids was for a long time recognized only in the bacteria. It is now evident that plasmids, or replicative forms of DNA structurally and experimentally comparable to bacterial plasmids, exist in eukaryotic organisms as well. Such plasmids are in fact common among fungi and higher plants. The present review is undertaken to provide a comprehensive account of the data available on plasmids found in eukaryotic organisms. This review will not consider plasmids of prokaryotic origin, even though certain bacterial plasmids, such as the tumor-inducing (Ti) plasmids of *Agrobacterium tumefaciens*, may be intimately associated with transformation of the eukaryotic host. This book, moreover, does not consider transformation experiments in eukaryotic hosts involving viral DNA as vectors, although indeed such vectors have been developed for use in plant and animal systems.

After a general introduction, providing historical perspective on the nature and role of plasmids, a list of eukaryotic plasmids will be presented according to their origin. This is followed by a detailed discussion of known structure and function. In subsequent chapters the practical implications of eukaryotic plasmids for molecular cloning and biotechnology will be discussed. This latter part traces the development of interest in *biotechnical genetics* and gives special consideration to the use of eukaryotic systems for gene cloning. The terminology *biotechnical genetics* is introduced to the reader and is used in a general sense as equivalent to *genetic engineering*. Biotechnical genetics includes, but is not limited to, gene cloning through *recombinant DNA* technology. Genetic manipulations involving protoplast fusion, embryo transplantation or directed mutagenesis would also represent forms of biotechnical genetics.

Since this booklet is intended as a general reference source, not only for scholars but for industrial scientists and engineers as well as others more generally interested in biotechnology, a concerted effort has been made to compile recently published scientific data along with relevant background information and experimental details. The authors invite constructive criticism from readers of this first edition concerning the selection and presentation of material in the text.

During the preparation of the manuscript, friends and colleagues have assisted with critical advice. We would like to acknowledge also the assistance of Frau Ch. König and Frau D. Lenke in preparing the manuscript and of Herr H. J. Rathke for the excellent art work.