

Molecular Biology and Biotechnology

Second Edition

Edited by
J. M. Walker
E. B. Gingold

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Preface

Had one been asked twenty years ago to select the most theoretical and least applied area of the biological sciences, there is no doubt that molecular biology would have been near the top of most people's list. Yet today this same area is at the centre of an unparalleled expansion of industrial biology, for out of those earlier theoretical studies has come genetic engineering, and with it the ability to manipulate organisms to produce large quantities of products previously only obtainable by expensive and difficult routes. So dramatic has been the increase in possibilities that a new term, 'biotechnology', has been introduced.

It should never be forgotten, however, that although biotechnology may be a new term, there is a long history of the use of biological processes in the manufacture of products, ranging from the ancient process of alcohol fermentation to the somewhat more recent production of antibiotics. Biotechnology could thus be thought of as the traditional fields such as industrial microbiology and process biochemistry united under a new name. But it is undoubtedly the vast increase in potential arising from the developments of molecular biology that has been responsible for the public recognition that biotechnology now enjoys. Scientific workers from fields well outside the traditional fields of biology have seen the importance of these developments and the need to become involved in the area. It is in this context that the Royal Society of Chemistry organized the residential courses at Hatfield Polytechnic in July 1985 and July 1987 which form the basis of this book.

It is very much our belief that the importance of the long-standing fields of industrial biology should not be lost in the excitement of the recent developments. It is one thing to manipulate a micro-organism into producing an exotic product, and quite another thing to produce it commercially. For this reason we have included in this volume subjects such as fermentation technology, enzyme technology, and downstream processing as well as the methodology of genetic engineering, and in discussions of the new genetics we have concentrated on those aspects relevant to industrial processes. Since the publication of the first edition of this book, there has been a rapid increase in interest in moving beyond bacteria as hosts for industrial

processes, and the increased coverage of cloning in yeasts, animal cells, and plant genetic engineering is a reflection of this.

Many of the chapters in this book relate directly to applications of the new technology. These include discussions on its impact on medical care and on the pharmaceutical industry, on production of chemicals, on monoclonal antibodies, and on the food industry. The exciting field of biosensors is reviewed as is the development of enzyme engineering with its promise of genuinely new protein products.

The RSC course was aimed not at expert biotechnologists but at scientific workers whose experience was in entirely different fields. The contributions in this book should thus be seen as primarily having a teaching function. The book should prove of interest both to undergraduates studying for biological or chemical qualifications and to scientific workers from other fields who need a basic introduction to this rapidly expanding area.

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