

PREFACE

'Biotechnology' is neither a new concept nor a new application. Ancient fermented food processes, such as making bread, wine, cheese, curds, etc., some of which are over 6,000 year old and developed long before man had any knowledge of the existence of the micro-organisms, also genuinely constitute biotechnology. Conventional agriculture is a well-developed biotechnological industry in its own right. However, for the sake of convenience, the traditional processes are excluded from the realm of 'modern biotechnology'. In simpler words, biotechnology is the industry-scale use of organisms and/or their products.

Plant biotechnology employs a range of biological, chemical, and engineering disciplines to develop the use of plant organisms in agricultural and industrial processes. The most obvious use of plant products in traditional biotechnology was for food. Over the centuries, farmers have learned to select edible crops for yield and quality. New and even better varieties were produced when early humans learned to cross-pollinate plants and became plant breeders.

Although biotechnology has been with us for a long time, it is only now receiving the interest of the general public. This new interest in biotechnology is due to the revolution in molecular biology that has occurred over the last 30 to 40 years. Advances in DNA technology have made it possible to move genes between widely divergent organisms, creating new combinations of traits never before possible in nature. These advances were originally developed for use in the laboratory where they revolutionised our ability to ask questions and obtain meaningful answers about the fundamental biological problems. However, this new technology is now being exploited by industry, where the economic potential is immense.

The hope, the hype and the vehement opposition modern biotechnology has generated in a short-time are immense and unprecedented. Both the technical and non-technical literature on biotechnology is vast and diverse, often frustrating even the biologists. The students and teachers of biological sciences are also at a serious disadvantage in accessing and understanding the full measure of the implications and complications of the new technology. The diverse and often conflicting views that appear in the media leave the general public in a state of confusion. There is a clear need to disseminate factual science-based information that facilitates informed decisions on the acceptance or rejection of the products and services biotechnology endlessly offers.

Against this background, this textbook is conceived as a perfect resource to serve the needs of a wide range of audience. It provides an overview of the production of GM plants, highlighting the key scientific and technical advances that underpin their development. Each chapter is well-structured, containing tables and drawings that clearly illustrate concepts in the text. The book is designed for advanced undergraduates with a serious interest in this attractive topic and graduate students wishing to pursue a career in the field.

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