

Book reviews

Magnien, E.; Nettancourt, D. de (eds.): Genetic Engineering of Plants and Microorganisms Important for Agriculture. Dordrecht: M. Nijhoff/Dr. W. Junk 1985. 197 pp.

The seminar held within the framework of the Biomolecular Engineering Programme of the European communities at the Carlsberg Laboratory in Copenhagen in 1984, under the scientific organization of D. von Wettstein, was in fact a general assembly of the contractants – an ideal situation in biotechnology: a melting pot of intermingling disciplines. The topic was: the improvement of agricultural species by genetic engineering. The meeting of the 45 project leaders with their co-workers was divided into poster sessions, workshops and plenary sessions, with highlights on nitrogen fixation, Ti/Ri plasmid- and virus-derived vectors, plant-microbe interactions, plant nuclear genes and organelle DNA, protoplast fusion, cell culture (regeneration), biochemical mutants and selection procedures. Separate workshops were devoted to cytoplasmic male sterility and symbiotic genes. From these sessions and posters, 2-page abstracts are included in the report, so that one gets an idea as to which topics are in the cadre of the European genetical engineers. The most instructive is the (anonymous) introduction, which gives an overview on important results in such fields as nitrogen fixing symbiosis, and the *Agrobacterium* and other transformation systems. Characteristic of the meeting is the intensive trans-national cooperation which goes along with the intention of the EC, so building up European strength in agricultural biotechnology.

H. F. Linskens, Nijmegen

Johri, B. M. (ed.): Embryology of Angiosperms. Berlin, Heidelberg, New York, Tokyo: Springer 1984. XXVI + 830 pp., 278 figs. Hard bound DM 290,-.

This timely volume could best be subtitled “the present state of the art”. It offers a series of well-illustrated chapters, each by an authority in their special field. Here we have an up-to-date account of the various facets of angiosperm reproduction, giving us a text essential to all those who teach and research in the fields of plant embryology and plant breeding.

The sixteen chapters by nineteen contributors are each supported by comprehensive bibliographies. While each aspect of embryology is placed in historical perspective, the main thrust is to present data from recent research especially the last 20 years.

This publication builds on the earlier classical descriptions of angiosperm embryology. The more recent studies have been made possible by the tremendous advances in optics (light and electron microscopy), cytochemistry and biochemistry as well as the continued accumulation of information on the basic processes of cell behaviour at time of reproduction.

It is clear from a number of the chapters that experimental modifications of the system at its various stages is only just beginning and that ingenious developments are already leading to a better understanding of the cellular events which take place. It may well be that this book will become “the precursor” for those who will be involved in the next phase in research on angiosperm embryology. Already with experimental manipulation, hybrids have been produced in culture which have successfully avoided the incompatibility barriers.

There is little doubt that we are at the very beginning of previously undreamt of manipulations of plant genomes which will lead to biological engineering of crop plants. Such studies, unlike the present work, will pose ethical as well as biological questions.

This is an excellent publication. The typography is of high quality with the drawings and excellent half-tone plates all closely integrated with the text. It is a volume that all serious botanical libraries will require on their shelves.

T. C. Chambers, Melbourne

Kennett, R. H.; Bechtol, K. B., McKearn, T. J. (eds.): Monoclonal Antibodies and Functional Cell Lines. Progress and Applications. New York, London: Plenum Press 1984. 426 pp.

In the first section of their second volume on monoclonal antibodies (first volume: Monoclonal Antibodies—Hybridomas: A New Dimension in Biological Analyses) the editors comment on their attempt to present an up-to-date overview on this rapidly expanding field of biotechnology. Following the introduction, 12 reviews are arranged in four sections. The second section, for example, discusses progress achieved in the characterization of structures and functions of macromolecules with antigenic determinant sites. Included in this unit are the receptor for the neurotransmitter nicotinic acetylcholine, enzymes from several tissues, and various types of cell surface carbohydrates. The third section concentrates on the use of monoclonal antibodies directed against membrane glycoproteins, cytoskeletal proteins and components of neuronal cells, for the detection and isolation of the corresponding antigens. This is followed by a discussion of topical or prospective applications of monoclonal antibodies in the diagnosis and therapy of certain cancers and a number of immunoparasitological diseases. The final section is dedicated to the promising combination of monoclonal antibody technology and molecular genetics. (This subject will be deepened in a third volume.) A large appendix, containing more than 60 pages concludes the present volume. It offers an abundant, yet compact compilation of relevant methods.

This clearly written book may be useful and interesting to a broad public, including senior and junior scientists, biology, biochemistry and medical students, technicians, and also industrials in biotechnology. The examples presented in the different chapters are illustrative of the important progress made – up to 1983 but not later – in the application of monoclonal antibodies in medical sciences and biochemistry. Surely, an – integrated – extension of the content to advances in microbiology, zoology and botany would have been welcome to a large group of readers; but I feel that the editors have succeeded in their attempt to provide a satisfying complement to the first volume.

E. S. Pierson, Nijmegen

Aaronson, S. A.; Frati, L.; Verna, R. (eds.): Genetic and Phenotypic Markers of Tumors. New York, London: Plenum Press 1984. xi + 379 pp., several figs. and tabs. Hard bound \$ 62.50.

Aaronson, Frati and Verna announce in their short preface that in this book “different approaches to the identification of

tumor markers, from the points of view of biochemistry, immunology, and molecular biology, are compared in order to explore possible interrelationships and to simulate scientific collaboration among scientists active in these fields, both in basic research and in clinical applications". The subsequent proceedings of the meeting held in October 1984 in Rome represents a mixed bag of totally different and unrelated studies on tumor markers, under the chapters: (1) phenotypic markers and (2) genomic markers. The phenotypic marker chapter includes studies on biochemical markers (pseudouridine; serum lipid sialic acid; antiestrogens; steroid hormones; phosphatidic acid; protein inhibitors and some mitochondrial enzymes), on antigenic markers (epithelial antigens on breast and colon cancer), on cellular recognition of various markers by lymphoid cells such as NK cells, on modulation of antigenic expression (interferons, Ia antigenic expression; prostaglandins). The genomic marker chapter has some chapters on a few oncogenes and concludes with some human leukemia virus work.

The individual papers are short, review-like papers, generally of dubious quality, occasionally of good quality and informative. Since each paper is an isolated piece of work in a sea of totally unrelated papers, the book is hardly an authoritative work on anything. It is totally impractical for the general reader and it will probably soon be forgotten by the specialists, except those contributing to this work themselves. And the contributors may, after many years, remember certain aspects of Rome even better, than their own contribution to the proceedings of this meeting. This book represents a clear example of how not to organize a scientific meeting and this reviewer fails to see why Plenum Press choose to publish the proceedings of this meeting.

J. H. M. Hilgers, Amsterdam

Selection in Mutation Breeding. Proceedings of a Consultants Meeting, Vienna, 21–25 June 1982, Organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development. Vienna: International Atomic Energy Agency 1984. 180 pp., several figs. and tabs.

Success in plant breeding depends on the genetic variation present in unselected populations and an effective selection screen to identify superior genotypes. This book addresses both of these issues relative to the context of mutation breeding. Twelve chapters are included, but the information is related to two major topics: breeding strategies for identifying and isolating useful mutants; and the successes and failures that have been experienced with mutation breeding for specific traits in different plant species. There are three chapters summarizing the results and the problems and experiences encountered in mutation breeding. This is followed by eight chapters discussing the research conducted for specific traits and methods for enhancing the effectiveness of mutation breeding. A final chapter compares the genetic variation generated via crosses and mutation on how each may contribute to the improvement of specific traits. In most instances,

a frank, objective appraisal of mutation breeding is presented. Use of mutation breeding for increasing photosynthetic efficiency, plant tolerance, and nitrogen fixation was not effective and does not seem too promising because of the complexity of the traits, technical difficulties in measuring the traits, and a lack of understanding of the phenomena, which also are the same problems faced with the more traditional methods of breeding. The problems encountered in mutation breeding are the same as those that are universally encountered in plant improvement: effective screens to identify genotypes with desired traits, numbers of individuals to sample from populations, and the logistics of evaluating progenies. Generally, mutation breeding has not been successful except for a few major genes (e.g., plant height and maturity) in seed propagated species and some modifications in vegetatively propagated crop species. Mutation breeding, as for other methods of plant breeding, is restricted because the underlying mechanisms for the expression of the traits are either unknown or have a very complex inheritance (e.g., photosynthetic rate, nitrogen fixation, tolerance to environmental stress, pest resistance, etc.). Although the book presents a sober assessment of mutation breeding, it is interesting reading and presented in a manner that can be understood by those not directly involved in mutation breeding. The book is recommended reading for those that are interested in maintaining a broad knowledge of the science of plant breeding.

A. R. Hallauer, Ames

Oliver, S.G.; Ward, J.M.: A Dictionary of Genetic Engineering. London, New York, Sydney, New Rochelle, Melbourne: Cambridge University Press 1985. 153 pp., several figs. and tabs. Hard bound \$ 19.95.

In our time not only do scientists in different fields become more and more interested in gene techniques but also other people. The present dictionary will be a real help for all those who are trying to find an explanation of the new terms used in genetic engineering. The book is a very useful collection of these important terms which are, in most cases, clearly and exactly explained (some somewhat too concisely explained). Drawings which illustrate some methods facilitate the reading of the text. The book is more than only a dictionary – it is interesting reading for those who want to obtain an insight into this topic within a short time.

The following critical comments are intended as a help for the preparation of the 2nd edition. In the preface it should be mentioned that most terms are only explained with regard to gene technique (for example clone, chimera, incompatibility). The crossing-over scheme should be corrected. Although genetic engineering is a recombination process, the book does not contain good descriptions of the different possibilities of recombination. It is questionable whether this dictionary has to contain a line drawing of the DNA-Watson-Crick model or tRNA structure. They should be replaced by a scheme of at least one complete experimental essay to construct recombinant DNA. A short index (although not usual for dictionaries) may enable the reader to find all the information included in the text.

E. Günther, Greifswald