

Book reviews

Obe, G.; Basler, A. (eds.). **Cytogenetics. Basic and Applied Aspects.** Berlin Heidelberg New York: Springer-Verlag 1987. 128 figs., IX, 401 pp., 990 g. Hard cover DM 198.-.

Although this book can not be considered to be fully up-to-date when this review appears, it is still full of interesting information. With this positive statement, it is now necessary to make a series of critical remarks. The first criticism, perhaps not of primary importance for many readers, is that the title is misleading; the text revolves around a consideration of the human somatic chromosome. There is almost nothing on transmission cytogenetics; mitosis and meiosis. This probably is the reason why important developments in gene localization using chromosome rearrangements in hybrid cells, and chromosome sorting and chromosome manipulation are not considered. Only 1 chapter (Ch. 5) out of the total 19 discusses anything other than human chromosomes (chromosome evolution of *Cervidae*), and it falls outside the general context of the book. In its place, a chapter on primate chromosome evolution would have been more appropriate: this subject is only very superficially covered, in fact, only in chapter 4 (The chromosomes of man). The necessity of the long chapter 11 on restriction enzymes is similarly unclear, even though it is interesting in itself. Very little of it fits in with the context, not even with chapter 12 on restriction enzyme banding and chapter 13 on restriction enzyme-induced chromosome aberrations. Nor are all the remaining chapters satisfactory. Some disappoint because they merely describe the author's experience and scarcely touch the much more advanced and broader developments occurring in other centers throughout the world (Ch. 3 on automated microscopy). Others deal with very specialized subjects where a general review lacks (Ch. 18 on cytogenetic effects of spider toxins and related *p*-benzoquinones). Yet other chapters, although as well-written as previous ones, and this time fitting in with the context, are too modest in their coverage and leave too much unsaid (Ch. 15 on DNA damage, especially as regards chromosome aberrations; Ch. 16 on sister chromatid exchanges).

As a consequence, the book is too heterogeneous in quality and coverage. This is a general shortcoming of all multi-author books, and this type is apparently very popular these days, but it must be regretted nevertheless. Few of the chapters are really poor, but the book would have profited from a more systematic set-up and more emphasis on the really relevant major subjects (and a better fitting title). By leaving out unnecessary topics, others could have been treated in more detail, and more attention could have been given to supplying fundamental information. As the book now stands, the first chapter on chromosome structure, for instance, is very brief on molecular aspects; chapter 2, on techniques, hardly considers *in situ* hybridization (nor do other chapters), nor late replication banding, etc. . . . As regards the chapters not yet mentioned: chapter 6 is on neoplasia; chapters 7, 17, and 19 on (environmental) mutagens and populations; chapter 8 on A-bomb survivors; chapter 9 on *in vitro* fertilization; chapter 10 on sperm karyotype; chapter 14 on DNase effects.

Many chapters can be recommended to the human cytogeneticist, as well as to others in the field of cytogenetics because in several respects, human chromosome science is well ahead of other areas of chromosome research.

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Austin, R. B.; Flavell, R. B.; Henson, I. E.; Lowe, H. J. B.: **Molecular Biology and Crop Improvement: A Case Study of Wheat, Oilseed Rape and Faba Beans.** Cambridge: Cambridge University Press 1986. V + 114 pp., 2 figs., 9 tabs. Hard bound.

The present book reports on opportunities for applying molecular biology to improve wheat, oilseed rape and faba beans, these three being representatives of a long list of economically important crops in European agriculture. The study was carried out by scientists at Plant Breeding Institute, Cambridge, U.K., under contract to the Commission of the European communities.

Three general conclusions emerge from this study:

- 1) The biochemical study of genes and their direct products will continue to be of great value for research in plant biology to gain a better understanding of the molecular basis of growth and differentiation, of responses to environmental factors, and of host-pathogen and host-pest interactions.
- 2) The ability to introduce foreign and modified genes into plants will lead to the production of plant genotypes with defined and restricted changes.
- 3) Molecular biological techniques will thus complement the existing plant breeding methods.

These conclusions are based on a thorough and comparative analysis of the four main areas recognizable as being particularly amenable for study at the molecular biological level: photosynthesis, plant/water relations, seed composition, and pest and disease resistance. All these have an important impact on the determination of crop yield and quality.

The introductory chapter describes the existing biological, economical, and political problems concerning the production of new varieties for increasing yield, improvement of quality, and modification in the use of crops in general. The second chapter treats currently practised plant breeding technologies and discusses some of its limitations. The third chapter surveys molecular and some cellular techniques which can be presently used for crop improvement. The next three chapters, each on a different crop, focus attention on the specific research areas where genetic engineering is considered to be of great use. The last chapter summarizes in a surveyable way the need for applying molecular biological methods for improving the three crops.

Some limitations of the book are the short reference list, and the absence of a subject index and illustrations. Nevertheless, the problems are posed in a very comprehensible way, which makes this book worth reading, not only by plant molecular biologists and plant breeders, but also by politicians having agronomical interests.

A final remark is directed towards the initiators of this publication: there are also other crops of importance in European agriculture, like potato, grape, ornamentals, etc., which deserve a similar case study.

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