

BOOK REVIEWS

has come out in recent years. The article 'Molecular mechanisms of transcriptional regulation in yeast' elegantly analyses all the data with up-to-date coverage.

It is evident that this volume like any other volume of *Annual Review of Biochemistry* covers a wide variety of topics of current interest. Almost all reviews are presented in a very lucid style ending with extensive bibliography. Again, the whole volume is a blend of various aspects of biochemistry and molecular biology.

Personally, I would urge any student/scientists of biology to read the first chapter which sets the trend for the whole book and gives hope for the scientists. This book is a must for the reference section of any library.

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Photobiology and plants

Light and Plant Growth. J. W. Hart.
Unwin Hyman, London, 1988.

I read the book with great interest from cover to cover. It is rare these days to find single-authored books which have coherence and continuity in writing and expression. Although it is a little late to review this book, yet I find that it is still up-to-date with respect to the basic information on photomorphogenesis. The author has deliberately kept the photosynthesis out of context in this book. This to me seems a good decision as there are a number of books on that subject and moreover its inclusion would divert the flow of the theme in the book.

There are eight chapters in the book. The first three chapters describe the nature of light, quality and quantity, reaching the surface of the earth and how it interacts with plants and affects its development. In chapter four the pigments involved in light perception

are discussed and in the following chapter mechanism of action of light is illustrated. The chapters on phototropism and photoperiodism have been well described in the title itself as the orientation of plants in space and in time respectively.

The book is excellent reading material for the graduate and post-graduate students and also for those who wish to get information on the photobiology of plants. One interesting aspect of the book is the special topic 'boxes' in each chapter which give additional information like historical perspectives or explanation of certain important points.

The glossary at the end of the book would be also very helpful to newcomers.

Overall, for the students it is worth keeping a personal copy. However, it is advised that for latest and recent information, especially those that have come in the area of light regulation of gene expression, other literature should be referred.

I recommend all the 'students' of photobiology to read this book.

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Overview of radiobiology

Recent Trends in Radiobiological Research, P. Uma Devi, ed. Scientific Publishers, Jodhpur, 1990. 254 pp. Rs. 350.

'Recent Trends in Radiobiological Research' is Proceedings of invited papers presented at a symposium organized by P. Uma Devi at the Kasturba Medical College, Manipal in November 1987. Radiobiology is a large branch of Science; so with as few as 15 papers the net cannot be cast in depth and sometimes the connection may be lost. Nevertheless, the effort appears worthwhile.

If at all there is any accent, it appears to be on the modification of radiation effects. P. N. Srivastava describes his experiences with sulfhydryl compounds in radiation protection. It is known that because of slow rates of reaction, SH compounds generally offer only anoxic protection. However, working with microsomal system, Srivastava and his coworkers were unable to pinpoint 2-Mercaptopropionylglycine (MPPG) radioprotective mechanisms.

Quintilliani *et al.*, on the other hand, interpret their glutathione and oxygen effects in terms of the Biaglow model. According to this model, GSH is not only able to prevent the radiation damage fixation by oxygen but can also detoxify peroxy radicals. They draw the conclusion that not only oxygen and glutathione can modify the same group of potentially lethal lesions but it is unnecessary to postulate an alternate target for the oxygen-dependent damage.

Maisin's paper is concerned with normal tissue response to radiation and chemical protection. He draws attention to the two great difficulties encountered in tumour therapy with radio-protecting compounds which is their toxicity and the short period during which they are active. The range between the active and the toxic dose is narrow. Protective compounds also have deleterious effects and this is the suggestion of Maisin—to combine a very active low dose radio-protector such as WR 2721 in combination with a suitable biological response modifier like glucan F.

Weiss *et al.* suggest that vitamins E&A can have protective effects post-irradiation. This effect probably arises from the stimulation of the immune system. B. B. Singh argues that phenothiazines, in particular can cause radiosensitization, chemosensitization and sensitization of hyperthermia effect on tumours. P. C. Kesavan notes modification of oxygen-dependent and -independent components of radiation mutagenesis by caffeine probably acting through inhibition of DNA repair. Viney Jain considers Hpd-PDT (Hemato-porphyrin derivative-Photodynamic Therapy) an effective treatment for localized tumours.

Paper by Frankenberg-Schwager *et al.* discusses the repair of double-strand breaks (DSB) in the DNA of eukaryotic cells. Working with yeast, which has several mutant strains and which are

deficient in joining DS breaks they conclude that DSB is a lesion for cell survival by ionizing radiation. They find this as a sufficient explanation for cell killing without invoking sub-lethal damage. A. T. Natarajan *et al* reach the related conclusion that X-ray-induced DSB's lead to chromosomal aberrations.

Kiefer *et al*'s paper has some intriguing observations. When they plot mutant frequencies versus dose-rate, there is a decrease in effects with 50 mGy/h which is followed by an increase in CHO cell system. However, TK6 (human) cells show no dose-rate dependence effects. Apparently, a type repair system present in CHO cells is lacking in human cells. S. B. Bhattacharjee reported an inducible

repair activity in CH-V79 cells which could be blocked with cycloheximide.

B. S. Rao in his review article on late effects of low level radiation exposure in mammals points out, for example, that very large populations would need to be examined, of the order of 10 million, to establish statistically significant carcinogenic effects of average doses of 10 mSv. Further, no increased genetic effects have been measurable even in populations exposed to higher doses of radiation. It should be added here that even the Chinese High Background Radiation Area (HBRA) study has now attributed their increased prevalence of Down Syndrome (reported earlier) to the presence of a larger number of older

women giving birth in HBRA, than in Control Areas, a fact ignored in earlier reports.

This is a kind of a 'variety' book in which several areas in radiobiology are touched upon, without developing any of the themes in depth. Nevertheless, it is of value in providing a cross-sectional overview of the subject. To that extent Uma Devi deserves credit for having organized the Symposium and bringing out the Proceedings.

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