Book reviews

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Chimeras in Developmental Biology

Edited by Nicole Le Douarin and Anne McLaren. (Pp 456; figures + tables. £56.00.) Florida: Academic Press. 1984.

This book gives a detailed account of recent work involving chimeras, that is, composite animals consisting of cell populations derived from more than one zygote. Although there is some mention of invertebrates and amphibia, the main topics covered are in relation to avian and mammalian chimeras, both of which have made exciting contributions to developmental biology in recent years. I found this a fascinating book, although in some places rather hard going for a non-embryologist. There are two excellent chapters on technical aspects, covering the methods of making chimeras and the range of markers available for tracing cell lineage. Studies in early development are reviewed both in quail/chick and in mouse/mouse chimeras. Here the mammalian chimeras have some advantages, since single cells transferred between preimplantation stages can contribute substantially to offspring. The ways in which such experiments have increased our understanding of sexual differentiation and of the relationship between chromosomal and phenotypic sex in germ cells are clearly explained. Other interesting chapters on mouse chimeras include the elucidation of the underlying basis of self recognition in the immune system, and the analysis of the cells involved in the primary site of action of some cerebellar mutants. There is also a good section on the rapidly expanding field of the study of gene expression using teratocarcinoma cell chimeras.

A major part of the book is devoted to work on normal differentiation and organogenesis, much of it in the chick/quail chimeras, where the later stages of development are more open to surgical manipulation than in mammals. The other advantage of this cross is the existence of a nucleolar marker in the interphase nuclei of the quail, allowing a fine-grained analysis of the tissue make-up of the composite embryo. Separate chapters deal with the development of the blood, the lymphoid system, the skeletal musculature and the peripheral nervous system. Although it is not clear how far the conclusions could be extrapolated to man, some of the results presented, for example in the chapter on craniofacial development, must surely be of interest to those concerned in the epidemiology of dysmorphologies.

The book includes a comprehensive account of naturally occurring twin and dispermic human chimeras. Although they have contributed to our understanding of some of the blood groups, and the determination of secretor status, the exact way in which dispermic chimeras arise is still something of a mystery.

In summary, well written and full of factual detail, and conveying both the excitement and the current technical limitation in this field, this is a book to own if possible, rather than borrow from the library. It is clearly illustrated with a memorable photograph of an apparently quite happy chick/quail chimera as frontispiece. Essential for anyone seriously interested in developmental biology, it would also provide plenty of food for thought both for clinical geneticists and for those working on the control of gene expression at the molecular level.

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Mutation, Cancer and Malformation

Edited by E H Y Chu and W M Generoso. (Pp 855; figures + tables. \$97.50.) New York: Plenum Press. 1984.

This volume is based on presentations at the International Workshop on Principles of Environmental Mutagenesis, Carcinogenesis and Teratogenesis held in Shanghai in May 1983, which had the dual aim of describing international and, in addition, Chinese progress in these fields. It consists of 37 articles by different authors, many well known, with four articles and abstracts of selected posters representing the latter aim. The contents reflect the broad range of the title, covering mechanisms of mutagenesis, carcinogenesis, and teratogenesis, the role of environmental agents, human monitoring, descriptions of test systems and public strategy.

Unlike many conference reports this is much more than a series of research papers. Many of the articles are very thorough reviews of the subject, using specific examples to illustrate general points, and are supported by extensive references. This volume could well form a background source work for this field. The articles are generally well introduced and are understandable by the non-specialist though some descriptions of test systems are of more specialist interest.

The early chapters on the role of mutation in carcinogenesis suffer from the multi-author nature