model in laboratories which are not equipped with a sophisticated FAC Star Plus flowcytometer, since very high purity T cells are required.

The T lymphocyte being a prominent cell in most of the inflammatory diseases, the editors have aptly included animal models solely of T cell-mediated diseases. The diseases are well chosen. Experimental allergic encephalomyelitis resembles multiple sclerosis and insulin-dependent diabetes mellitus (IDDM) is an autoimmune disease resulting from destruction of pancreatic islet cells by both cell-mediated and humoral mechanisms. Spontaneous systemic autoimmune disease models for systemic lupus erythematosus are also described.

Angiogenesis, defined as the growth of new blood vessels, is one of the components of chronic inflammation. James D. Winkler and his colleagues give a brief account of the various animal models that are available to study the effects of various angiogenic factors and also inhibitors of angiogenesis.

Though organ transplantation is common place today, rejection continues to be a stumbling block in many cases. The success of organ transplantation has relied on studies in animal models to understand the basic mechanism of rejection. Orosz *et al.* have given detailed methods for evaluation of transplantation rejection in skin, cardiac, renal and pancreatic tissues. They also propose a model for acute rejection produced with transfer of allogenic leukocytes into immunocompromised mice. This, they say is a simple and often overlooked model for studies on drugs that influence mechanisms of allosensitization, tissue inflammation and leukocyte migration. There is also an interesting section on allograft tissue remodelling.

Recent development of special technologies to alter or block gene functions in organisms has led to the development of animal models to define gene function and understand altered gene function in a disease. Creating an animal model in which a particular adhesion molecule, a cytokine, a receptor, a major histocompatible molecule or an enzyme is absent or overexpressed will provide valuable information regarding basic pathological process in inflammation. In addition to a lucid description of the principle and technical features of gene transfer, Anderson *et al.* and David S. Grass have brought us up to date on the various vectors in use today in gene transfer, their advantages and disadvantages, steps required to generate these vectors and transfer genes.

Kenneth N. Litwak and Howard C. Hughes pack the concluding short chapter with updated guidelines and regulations for animal experimentation. The reader is also referred to the relevant internet sites for more information.

The editors Douglas W. Morgan and Lisa A. Marshall have provided the state of the art on animal models in use for study of inflammatory diseases. A newcomer to this field would find the detailed descriptions of methods with explicit black and white as well as colour histological pictures and comparative descriptions of animal models and disease in humans extremely useful. An introductory chapter on inflammation *per se* is missing. Future models and suggestions for new directions are found in the book. The vast amount of work being done on animal models across the globe is reflected in the large number of references at the end of each chapter. Publications up to 1998 have been included in the reference sections.

The book is adequately indexed. It would be an asset to institutions indulging in any type of medical research. It is valuable to immunologists, pathologists, pharmacologists, clinicians and veterinary scientists interested in research on inflammatory diseases.

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A History of Molecular Biology. Michel Morange (Translated by Matthew Cobb). Oxford University Press, YMCA Library Building, Jai Singh Road, New Delhi 110 001. 1999. 336 pp. Price: Rs 495.00

The past 5–6 decades have been very exciting for biologists, thanks to the birth of a new synthetic approach to the study of life processes and an unprecedented rate of growth of this new subdiscipline. This synthetic approach, which resulted from a synergy between specialists in very different branches of science, has generally been designated as 'Molecular Biology'. Although without a clear and generally agreed upon definition, molecular biology has remained the most talked- and written-about subject which most students of biology desire to pursue. Thus, though very young, molecular biology already has a lengthy and complicated history. Several historical accounts have attempted to record the torrents of discoveries in biology that resulted from the molecular biological approaches. Michel Morange's book is one of the latest in such endeavours.

Histories are written post-facto and are essentially personalized interpretations of events in which the writer is generally not directly involved. However, in the case of molecular biology, the situation is different: this field was born and has grown in recent times and the historians of this relatively young but mature field have themselves often participated to varying extents in making the history. Morange is no exception.

The book is arranged into three major sections: the birth, development and expansion of molecular biology. As may be expected from the fact that very diverse areas of scientific enquiries contributed to the birth and development of molecular biology, its history cannot be a simple narration of temporal events where one event leads to the next. The historical narration, therefore, has to follow a criss-cross path. This may make it difficult to read and follow, but Morange has done a good job in tracing some of the more important events and discoveries that gave birth to molecular biology and fostered its rapid growth.

As Morange states 'Molecular biology is a result of the encounter between genetics and biochemistry, two branches of biology that developed at the beginning of the twentieth century'. This encounter was not only catalysed by non-biologists, especially physicists, but they actually actively participated in its subsequent growth. To acknowledge this, Morange has devoted one chapter exclusively to 'The role of the physicists' and another to 'The role of physics'. These 'aliens' to biology contributed substantially in shaping 'modern biology'.

The coming together of biochemists, geneticists, physicists, etc., made it possible for the young field of molecular biology to develop very rapidly, illustrating the well-known biological phenomenon of hybrid vigour. Morange has traced the roots of such interactions and their consequences.

History is created not by people alone but also by the places where men work. Molecular biology also had institutions that programmed themselves to positively promote this field. Morange has selected two institutions, the Rockfeller Foundation and the Pasteur Institute, in particular to emphasize the roles of institutional policies in providing support and promoting freedom of work and thoughts.

This book (and others on the history of molecular biology) should be read by all those who teach some aspects of molecular biology and those who practice it since the historical perspective is always helpful in understanding the processes, phenomena, etc. This is particularly relevant in today's fashion of 'mini-reviews' and the editorial restrictions on the number of references that may be cited in a paper or review. Consequently, new entrants to a field often get away with the impression that research in the given field was only a few years old (remember the editorial pressure on space which does not allow references to original papers but favours only 'recent reviews', which also tend to become 'mini' and 'minier'!). A reading of history helps one to not only learn things in proper perspective but also draws home the point that the 'old' science was not 'crude' because of lack of the so-called modern sophisticated and automated high throughput equipments etc., but the scientists of those days had to be much more innovative and adventurous! For example, not many users of the polymerase chain reaction (PCR) know that long before Mullis and colleagues 'discovered' PCR in the mid-80s, Lederberg and Kornberg in the 1960s and Khorana and colleagues in 1971 had already proposed the basic principles of PCR! There are many finer details that one can learn from reading history.

An important aspect that Morange has highlighted is the role of well-funded individuals and well-managed institutions in promoting 'good' science. 'Democratization' of the fund-distributing and facility-creating process does not promote and nurture excellence. Another lesson that the history of molecular biology clearly teaches us is the need for trans-disciplinary training and interactions. As the history testifies, all the 'great discoveries' were due to interactions between brains that were trained in different disciplines. Unfortunately, in our country both these are often missing. It is hoped that the science-planners and managers in developing countries like India will soon learn from the recent and contemporary history.

The cover of the book features polytene chromosomes of *Drosophila*. Strangely, however, a consideration of the significant contributions made through studies on polytene chromosomes to the development of molecular biology, particularly in the area of gene expression and regulation, is singularly missing. It is tempting for me to record here the prophetic statement by T. S. Painter in his 1934 paper (published in *Journal of Heredity*) describing the nature and structure of polytene chromosomes. For 1934, this paper was provocatively entitled 'Salivary chromosomes and the attack on gene' and in this paper Painter stated 'With these four discoveries with us (i.e. constant and distinctive patterns, somatic synapsis, the behaviour of active and inactive regions and the separation of arms of large autosomes) it was clear that we had within our grasp the material of which everyone had been dreaming. We found ourselves out of woods and upon a plainly marked highway with by-paths stretching in every direction. *It was clear that the highway led to the lair of the gene*' (emphasis added). These prophetic statements, made much before molecular biology was born, have indeed been vindicated by later studies on gene expression utilizing polytene chromosomes. Two important experimental paradigms that contributed substantially to gene regulation relate to heat shock response and steroid hormone-regulated gene expression. In both cases, the initial foundations were laid through studies utilizing polytene chromosomes. Therefore, it would have been appropriate if these contributions were also included in the historical record.

The annotations and references are listed at the end of book in a rather unusual manner which makes searching for them a little frustrating. At places, reading of the book is also not smooth: perhaps translation from French to English could have introduced some 'stiffness'. Nevertheless, I have benefited much from reading this book and I recommend this, not very expensive book, for all libraries and also personal collections. Science policy planners and managers also need to read this book and take some lessons.

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