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Molecular Biology of Muscle Development

This book represents the proceedings of a Roche-UCLA symposium held in Park City, Utah, in March 1985. I attended this meeting in person and found this book to be a valuable record of the proceedings. This is the third book over the last five years that records developments in muscle gene expression and its application to neuromuscular disease. This book adopts the same format as the previous volumes, with sections on cellular aspects of myogenesis, membranes and matrix, protein polymorphism, gene organisation and expression, myofibrillar assembly, cardiac muscle, and human muscular dystrophies, a total of 69 chapters in all. The main virtue of the book is that it is current and all of the major groups that are working on cellular or molecular aspects of myogenesis have contributed chapters. The space allocation for each author is not large, so the chapters are more summaries of ongoing work rather than detailed reviews. The book is therefore a good starting point for finding out what is current in myogenesis and for directing additional reading.

Valerie A Cowie

The Neurobiology of Down syndrome

This hardback book is based on the National Down Syndrome Society Conference on the Neurobiology of Down Syndrome held in 1985 in New York. Accordingly it is a miscellany of contributions but the main thrust is towards an understanding of the manifestations of Down’s syndrome in the light of neuropathological and neurochemical findings, and of special considerations, such as the potential of gene dosage at a cellular level during development of the central nervous system.

The contributions are of a consistently high standard. Many are of specialist interest. The neurochemical contributions by Balazs and Brooks- bank and by McCoyt and Ens are outstanding in their erudition and detail. On the other hand, some chapters constitute a purview and may be of more general interest, such as that on the neurology of Down’s syndrome by Ira Lott. Each chapter is followed by its own references and at the end of the book there is a good subject index.

In the preface it is stated that the volume is directed to a spectrum of groups including physicians, human and animal geneticists, neurobiologists with a variety of interests, and behavioural scientists. Undoubtedly, workers in each of these categories will find particular attraction towards at least some parts of the book, but the specialism of a number of contributions preclude its general interest to a wide readership. Also, there is a likelihood that the book may soon become outdated by work that is going apace at the present time.

With these reservations, this is a book with contributions of a high scientific standard that marks the shift of emphasis in the study of Down’s syndrome from general clinical observations to a detailed examination of neurobiological mechanisms often at a cellular level.

P N Goodfellow

Nothwithstanding this minor caveat, this is the best biology book of the year.

Advances in Gene Technology: Molecular Biology of the Endocrine System

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I highly recommend the book as an up to date record of research in a rapidly moving field, and should be required reading for all muscle biologists and also clinicians interested in the workings of skeletal muscle.

F S Walsh

**Methodology in Medical Genetics**

This is, in the best sense of the word, a cook book. It aims to provide the collector of raw data with ways of analysis which will make it more digestible. The purchaser of recipe books rarely has access to a full range of raw materials, and will judge it by those parts of interest. The reviewer has a more difficult problem, and has to read it from beginning to end, and assess each recipe by such criteria as to whether cooking improves the raw material, and, if so, whether the recipe is the best, and, if it is, if the presentation is clear. If, as in this case, the reviewer also reviewed the first edition, a comparison is needed. This at least is easy; it covers new territory, it is more elegantly produced, and it is more expensive.

The raw data cover a range sufficient for the most omnivorous geneticist, and is itself of value for its interest, variety, and reliability. This is to be expected from an author who has been productive both of raw data and of several lucid books, including a recent book on recombinant DNA techniques. The recipes are almost entirely unexplained, and their origin and reliability are a severe test on any reviewer. Such key references as those to Galton, Pearson, Robbins, Fisher before 1930, Muller, Malecot, Crow and Kimura, and Kimura after 1965 are missing. The frequent and necessary references to Cavalli-Sforza and Bodmer lack a page reference.

There are some errors and unnecessary obscurities. In the hope that their documentation will be productive, and of use to the many readers the book deserves, I will mention these in order.

The Hardy-Weinberg equilibrium is introduced with the interesting embellishment that "the mutation rate remains constant". Hardy did not mention this; unless zero it destroys the equilibrium. The treatment is an advance on Hardy for lucidity, though not brevity. Gene frequency estimation starts with non-codominant systems, rather than with simple gene counting.

The next chapter, on population structure, introduces, without explanation, the formula 100/2Ne for the percentage of loci which will become fixed or eliminated in each generation. The sense is clear, but the formula is orphaned, and not helped by the '100'. In fact Ne, the effective population in genetical terms, is also the average life of a neutral allele in generations. Unfortunately the probability of loss is not independent of gene frequency, and, although the next sentence rescues this potential misinterpretation by implying an averaging over all loci, lucidity is hardly achieved.

The effective population size, Ne, is the product of the total population and the proportion which reproduce, weighted by its fecundity. It is not the product of the number and the proportion of their lives for which they are capable of reproduction. The effect of variance (p14), due to Wright (1938), is not explained, although it is conceptually simple, since (V + 2) is a 4 in a stable population with Poissonian fertility, when both the mean and variance are 2, the average number of children.

Under gene flow there is perhaps the only example in the book of a highly implausible explanation—the attribution of blood group B in Western Europe to the Mongolian invasions—which hardly reached Ireland, Wales, Iceland, or indeed anywhere beyond the Rhine. The use of absolute values in the equation on p23 is wrong, or would be if the signs differed: if they do not the ratio is always positive. If they do something impossible has happened.

An ingenious inversion of an equation featuring migration is used to estimate migration: however, this is clearly wrong, since it will estimate migration when applied to an isolate, as, indeed, it appears to have done in the example. Under selection (p27) the retention of 'q', when very small in the divisor (1-q), leads to complications, including a graph with one logarithmic axis, basically showing two numbers to be identical. Tanaka's simple and rarely used method of estimating fitness is clearly described.

Segregation analysis, even if its interest is now mainly historical, is dealt with clearly, with some simple and little known estimators, such as the 'singles method'. The three pages of tables are unlikely to find much use against the personal computer, which makes it simple to use one-off trial-and-error approaches. The variances, on which so much algebraic ingenuity has been exercised, are of limited interest since they do not relate to symmetrical distributions, and exact graphical displays can be produced if needed. The chapter is a fine example of type setting and proof reading, but it would be easier if 'q' had not become promoted from its minority status earlier in the book, as is now usual. Heritability, following Falconer's lucid approximations, is clearly described but regression is not, and there is no help in the way of diagrams of

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