book would then be useful as a reminder of the things that a good fingerprinter needs to know. All in all, though, I get the feeling that it had been thrown together in a hurry, in order to be the first to appear on a sexy new subject.

Despite these reservations, the book is a noble effort to introduce the world and his wife to a hot subject. Most readers will find chapters that are new to them, and they will learn the need for care and caution when science approaches the courtroom. It is eminently readable, but I don't think it will work as a 'Teach Yourself' guide: it might be wise to await the next one before rushing out to buy.

References

1 Brookfield, J.F.Y. (1989) *IMA J. Math. Appl. Med. Biol.* 6, 111–131
2 Chakraborty, R., Meagher, T.R. and Smouse, P.E. (1988) *Genetics* 118, 527–536
3 Lynch, M. (1988) *Mol. Biol. Evol.* 5, 584–599
4 White, R.M. and Greenwood, J.J.D. (1988) *Mod. Law Rev.* 51, 145–155

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Renaissance of chromosome banding

Chromosome Banding

by A.T. Sumner, Unwin & Hyman, 1990. £60.00 (xiv + 434 pages) ISBN 0 04 445279 9

When mammalian chromosomes are treated with trypsin, and then stained with Giemsa dye, a distinctive, reproducible banding pattern emerges on each chromosome. This example and many others are discussed in *Chromosome Banding* by A.T. Sumner, the originator of one of the most popular chromosome banding methods and a leader in the field virtually for as long as it has existed. In the main part of this book, Sumner extensively reviews the history, standard protocols and variants of banding methods, their applications and in particular the possible banding mechanisms and what may be discerned about chromosome structure. Since *Chromosome Banding* is not meant to be a laboratory manual, most variants of the standard protocol are described in general terms ('by changing the ionic strength'), and the reader is referred to one of the 2000 references for further details.

Chromosome banding flourished in the 1970s as a strikingly empirical science, in which dozens of compounds were tested for whether or not they produce or improve banding patterns. Despite the wealth of information that has since accrued on what does and does not 'work', the biological mechanism behind each banding method remains mostly controversial. Sumner discusses all standard mammalian banding mechanisms in great detail, and mentions other species as well. However, he uses a narrow definition of banding, excluding banding patterns that reflect structural differences that are obvious without staining, which even excludes the banding of *Drosophila* polytene chromosomes. This distinction is somewhat arbitrary, since all banding methods must have some kind of structural basis, whether obvious or not.

Chromosome Banding is published at a time when, with the mapping and sequencing of several genomes underway, the field is experiencing a renaissance, as documented by reviews of the subject in popular journals[1,2]. This interest comes from a different audience, one with a more molecular background. This cross-fertilization should soon provide the molecular link between chromosome bands and interesting biological features. For example, the gene-rich regions of mammalian chromosomes can be stained specifically, using either standard R-banding, Alu repeats, replication banding, or antibodies to Z-DNA, to name just a few. To add to the mystery, some but not all of these methods also produce banding on nonmammalian chromosomes, and it is not known whether there is a correlation between chromosome bands and gene density. The last chapter on genome organization summarizes these exciting issues well.

Because of its very comprehensive coverage, *Chromosome Banding* will undoubtedly be a 'must' for the cytogeneticist studying these methods. It is not meant to help with routine cytogenetics in a clinical setting. But can this book attract outsiders to the field? Unfortunately, the poor index makes it difficult to use as a reference book: for example, if you cannot remember the name of the method that discriminates between rodent and human chromosomes in a somatic cell hybrid line (G-11), you have to search the whole book to find it. Nevertheless, enough readers should find *Chromosome Banding* sufficiently useful that this problem can be overcome in a second edition.

References

1 Manuelidis, L. (1990) *Science* 250, 1533–1540
2 Bickmore, W. and Sumner, A.T. (1989) *Trends Genet.* 5, 144–148

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