

*Gene Targeting* is well written, easy to follow, has helpful diagrams, and provided it is used in conjunction with the recent literature, offers an excellent introduction to the topic, particularly with regards to vector design and screening. Newcomers to the ES system will still, as always, need 'hands on' advice regarding ES culture and blastocyst injection.

## References

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*Experiments with Fission Yeast: A Laboratory Course Manual.* By CAROLINE ALFA, PETER FANTES, JEREMY HYAMS, MAUREEN MCLEOD and EMMA WARWICK. Cold Spring Harbor Laboratory Press. 1993. Plastic Comb Binding. 188 pages. Price \$55.00. ISBN 0 87969 424 6.

This book has its origins as the laboratory manual for use by students on the Molecular Genetics of Fission Yeast course that has run annually at Cold Spring Harbor since 1989. That the authors and publishers have sought a wider audience for their work suggests that they believe the book will find a use as a general laboratory manual for day-to-day use in existing fission yeast labs or as a start-up guide for those venturing into fission yeast for the first time. While there is little doubt that a book of this sort is required by the fission community, prospective buyers of *Experiments With Fission Yeast: A Laboratory Course Manual* should be aware of its limitations.

What does the book contain? The Introduction deals succinctly with taxonomy, cell growth and division properties of fission yeast and is clearly written, although the quality of reproduction of the photographs leaves a little to be desired, particularly in the case of the sole colour figure where it is impossible even for the experienced eye to discriminate key details clearly. This chapter is followed by some 22 'experiments', divided into three sections (cell biology, classical genetics and molecular genetics) though several of these actually include more than one

experimental procedure. The strength of the book lies in the clarity of presentation of these sections. Each experiment is laid out in a uniform style: each has a defined Aim, followed by a brief Introduction, outlining the background to the method used, then by details of Strains, Media and Reagents (the latter interspersed with occasional hazard warnings), the experimental Procedure itself, and a section headed Analysis of results. The experimental sections are followed by a series of appendices detailing growth media, reagents, the growth and maintenance of fission yeast strains, as well physical and genetic maps. A list of suppliers (U.S. addresses only) follows.

Section I – Cell Biology – includes protocols for staining cells to identify nuclear material, septa, mitochondria and vacuoles, together with detailed methods for immunofluorescence studies. Also contained in this section is a method for preparation of fission yeast cells for flow cytometry. The results expected from these experiments are described in the text but, surprisingly given the nature of the material, the discussions are not illustrated (except where stained cells are included in figures illustrating the introductory chapter), nor is any advice given to aid trouble-shooting of failed experiments. These are significant omissions that greatly limit the usefulness of the book.

Section II – Classical Genetics – covers tetrad analysis, fine structure mapping, diploid construction and genetic mapping using diploid strains, and the use of ethylmethanesulphonate as a mutagenic agent, while section III – Molecular Genetics – focuses on the introduction of recombinant DNA into fission yeast cells. Two protocols are included for transformation in this section, with a third in the Appendix, along with a method for testing plasmid stability. Also included are methods for the preparation of chromosomal DNA suitable for Southern blot analysis, and for pulsed field gel electrophoresis. The PFGE method is included in a protocol for mapping of a previously cloned gene (by homologous integration of the gene carried on a plasmid containing a single NotI site) which the availability of ordered cosmid libraries has to all extents and purposes rendered obsolete. Procedures for protoplast fusion and nuclear isolation found in this section might better have been located amongst the cell biology protocols of section I.

Section III is in fact the weakest of the three, and the one in which the limitations of the book as a general laboratory guide are seen most clearly. As with section I, there is little if any advice on trouble-shooting unsuccessful experiments. There is no discussion of available selectable marker systems and plasmid vectors, nor of their advantages and disadvantages. The protocol included for one-step gene replacement makes no attempt to discuss what factors should be taken into account in designing constructs for this purpose. In addition, there is no discussion of methods for mapping mutations by gene conversion

or for recovering mutant alleles by homologous recombination, nor do any of the experiments exploit the increasingly widely-used nmt regulatable promoter. In short, as both a general fission yeast lab manual or as a start-up guide, the book falls some way short of expectations. *Caveat emptor*.

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*Microbial Cell–Cell Interactions*. Edited by MARTIN DWORKIN. American Society For Microbiology, Washington D.C. 1991. 374 pages Hardback. Price \$69.00. ISBN 1 55581 037 3.

This book contains a collection of extremely diverse articles on inter-cellular interactions in various microorganisms – bacteria, yeasts, algae, etc. In his introduction the editor, M. Dworkin, points out that microbiologists are usually inclined to restrict their studies to the unicellular features of their chosen organisms, which are conceived as if they were living in an isolated, strictly unicellular, world. In reality, many of them are continuously exposed to signals emanating from other microorganisms, belonging to the same or different species. In particular the vast majority of bacteria live in dense associations, such as biofilms, surface colonies etc. and cannot escape what Dworkin calls ‘horizontal’ control from their neighbouring cells.

There are many examples of this kind of control, whereby signals pass from one cell to another, and influence the behaviour of the recipient cells. One such example is that of the mating pheromones, soluble substances secreted by cells of one mating type, and inducing mating behaviour in another. Mating in bacteria was first discovered, to our great surprise, by J. Lederberg and E. L. Tatum in 1947, and since then an immense amount of detail, far too much to go into a single chapter of a book like this, has been revealed. Similarly in yeast the process of sexual conjugation is

now known to involve an incredibly complicated system of interactions between different cells. These interactions are very different in different groups of microorganism, showing that universal biological phenomena like sexual fusion may be controlled in many different ways.

Apart from mating, microbes may associate in groups for other purposes, such as the formation of colonies, symbiotic combinations or predator–prey interactions. So the book is very heterogeneous in regard to the organisms treated, in the phenomena discussed, and in the amount of detail available for each example. The unsuspecting reader will be surprised to find one chapter devoted to a subject ordinarily discussed only when one visits the dentist, namely the formation of layer upon layer of different species of bacteria in the plaques on our teeth. These bacteria, it seems, must also be subjected to some kind of cell–cell interaction. The last chapter is devoted to a remarkable bacterium called *Bdellovibrio*, which invades other bacteria and passes through various developmental stages there, killing its host. All this involves an exchange of signals between predator and prey, but the nature of these signals, in this case, is largely unknown.

Wide though the range of topics and organisms is, the reviewer was sorry to find so little attention being given to the ciliate protozoa, in which the concept of mating type, in *Paramecium*, was first put forward by T. M. Sonneborn in 1937, and in which so much important work on mating-inducing pheromones, in *Euplotes*, has been discovered recently. Obviously, this is an enormous subject, only the surface of which is scratched by the articles in this book. However, one must applaud the initiative of the author in selecting and publishing these articles, which will undoubtedly arouse interest among a wide circle of biologists.

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