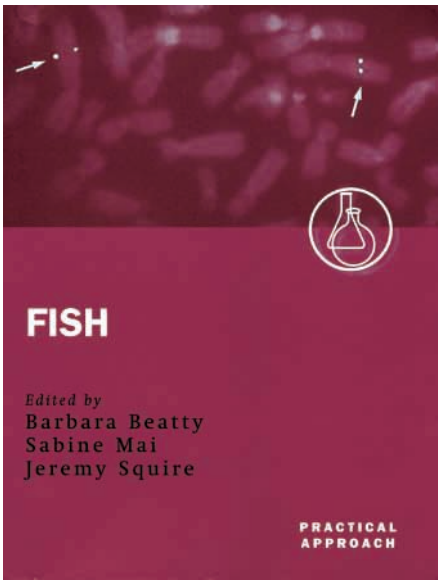
Fanatical about FISH



FISH: A Practical Approach

edited by Barbara Beatty, Sabine Mai and Jeremy Squire

Oxford University Press (2002) 225 pages.
ISBN 0-19-963884-5
£40 (paperback)

The fluorescence in situ hybridisation (FISH) method has been around for a while and has previously been hidden away as a single chapter inside a Practical Approach series book – but no longer. The applications of FISH are now so wide and varied that this technique has managed to break away from its single chapter status to fill an entire book.

The level of technical expertise involved in each of the applications increases as you make your way through *FISH: A Practical Approach*. The essentials of FISH are covered in the first few chapters: these sections should help the novice to get started and include practical information outlining the different types of FISH probe you can use and the protocols used to prepare and label them. They also include some useful information on the principles of fluorescence and the commonly used fluors. The actual FISH procedure is covered in detail, with protocols describing how to prepare your target DNA to obtain really good metaphase chromosomes or interphase nuclei and how to perform high-resolution fibre FISH using chromatin extended to varying degrees. Perhaps most importantly, there is also a section on current web pages you can use to identify and obtain the FISH probes you will need to do these experiments.

The book then starts to get technical, moving on to the more challenging applications for which FISH has been utilised in the past few years. Of these, the ability to visualise the spatial organisation of the nucleus is the most visually arresting, and protocols are presented to allow the researcher to perform FISH on three-dimensionally preserved nuclei combined with detection of nuclear proteins and RNA transcripts. Although the methods are technically demanding, these chapters are well written and include lots of small but important details that should make the difference between getting the experiments to work and getting them to work really well.

The final few chapters emphasise the practical applications of FISH. Genome-wide screening of chromosomal abnormalities can be achieved using techniques such as comparative genomic hybridisation and multicolour FISH, whereas global gene expression levels can be analysed using microarrays. Those readers with an interest in clinical cytogenetics will also appreciate the detailed protocols within the specialised chapter on the current uses of FISH in clinical laboratories.

Its always easy to be critical when writing a review, but pretty much every new FISH application developed in the past few years seems to have been covered in *FISH: A Practical Approach*. The layout of the book is genuinely helpful, with a really handy list of protocols right at the beginning of the book, which is perfect for finding information on a certain topic without trailing through several chapters. The editors have also made an effort to avoid duplication of protocols in each of the chapters, with many chapters referring back to previous sections for the more common methods, although there are still a few different protocols for probe labelling scattered throughout the book. There is also a vast reading list at the end of each chapter for those of you who want to refer back to the primary literature. If forced to come up with one thing that I really didn't like about this book it would have to be the layout of the many wonderful FISH figures that accompany each of the protocols. In the soft cover version of the book, all the original colourful FISH images have been relegated to a central colour section and the actual chapters themselves only contain their poor greyscale counterparts. It's a small comment, but irritating when reading nonetheless. The editors state that the book is "intended to provide essential practical information for clinical, basic and student researchers" and as you would expect for a new title in the *Practical Approach* series, it is essentially a practical book for practical people. It has enough of the basics to be useful for the researcher with no experience in this field, but the more complex applications covered also make it a good choice for the more experienced FISH researcher.

Carol Shiels
Centre for Structural Biology,
Imperial College London, UK

Journal of Cell Science 116, 2375

doi:10.1242/jcs.00593

FISHing for complements

FISH Technology: Lab Manual

edited by B. Rautenstrauß and T. Liehr

Springer-Verlag (2002) 424 pages.
ISBN 3-540-67276-1
£90.50/$139

The powerful technique of fluorescence in situ hybridisation (FISH) has developed rapidly over the past 25 years and has been used to study many aspects of genome behaviour. There are some very clever people working away at the 'filleting edge' to make this method more versatile, more specific, more sensitive, more colouful and more suitable for different materials.

FISH Technology is edited by two

German Scientists, Rautenstrauß and Liehr, and contains 36 chapters full to the gills of modern state-of-the-art FISH techniques. The Editors have netted many of the experts in their particular field to write these chapters.

Surprisingly, there are relatively few books around describing FISH and its associated techniques, and certainly if one is interested in more than the basics it can mean trawling through inadequate method sections of papers. In Rautenstrauß and Liehr's manual most of the cutting edge techniques are here and are well described, and it contains some colour images. It is a book that would complement the library of any lab performing FISH experiments and would bring new technologies to labs already scaling the heights or to labs setting out on their journey.

The first two chapters provide an overview of FISH, microscopy and imaging. These chapters are important and form a good introduction to the method for graduate students or researchers diving into the FISH world. They cover aspects of FISH that would not normally come to light if people were teaching themselves, for example, the historical perspective, other related technologies and the reasons for developing specific techniques. The chapter on imaging will be very helpful to people starting (and continuing) to use microscopy and is written in a way that is rarely seen – advanced physics is not a prerequisite!

I was impressed by the organisation of *FISH Technology*: the basics are covered in chapter 3, and the following chapters describe FISH methods in various cell types (hair root cells, sperm and amniotic fluid cells), different organisms (yeast, viruses and insects), different fixations (archival material, formalin and paraffin) as wells as special techniques such as fibre FISH, peptide–nucleic-acid FISH, chromosome orientation and chromosome orientation and direction FISH, nuclease-digestion FISH, DNA-strand breakage FISH and others.

One of the strengths of this book is the description of FISH techniques that have been developed to answer more specific questions about DNA structure and behaviour. These techniques can be employed by labs that are not used to using FISH applications. Furthermore, the chapters describing FISH in different organisms will be very helpful to yeast geneticists and virologists and demonstrate the power of the improved resolution of FISH. However, it would have been nice to see some discussion of FISH in other organisms, but to be fair these have been discussed in other books, and the authors have concentrated on the simpler organisms, which are more difficult to use this technique on.

There is a comprehensive section on multicolour FISH, with the most exciting chapters for me being the ones describing the combination of this technique with immunohistochemistry to reveal specific antigens. The simultaneous delineation of nuclei acid sequences and protein will make a big difference to tumour cytogenetics research and diagnostic labs.

So, 'mullet' over, there may be a 'ray' of hope – you too could become a 'dab' hand at FISHing using this book.

P.S. My PhD student has recently been using this book and praised it without knowing I was reviewing it – what better endorsement could there be?

Joanna M. Bridger

Cell and Chromosome Biology Group, Brunel University, Middlesex, UK

Journal of Cell Science 116, 2375-2376

doi:10.1242/jcs.00594