Transgenic Techniques in Mice: a Video Guide. By ROGER A. PEDERSEN and JANET ROSSANT. New York: Cold Spring Harbor Laboratory. 1988. Approximately 1 hour long. Available in VHS, BETA, PAL, NTSC and SECAN Formats. Price $170.00.

Gene transfer into mice is fast becoming a standard technique in many fields of study. Transgenic mice are being used to answer basic questions of the control of gene expression, oncogenesis, immune regulation, development, and the list goes on.

The techniques of embryo manipulation which are required for the production of transgenic mice have until recently been solely in the domain of reproductive and developmental biologists. The power of transgenic mice is encouraging workers with no experience of embryology to embrace these techniques. It is to such people that this video will be of greatest appeal. While there have been many detailed protocols published, including the excellent manual by Hogan, Costantini and Lacy, seeing the techniques being performed will be of great help to many. The video is intended to complement the Hogan, Costantini and Lacy manual, and is in no way intended to be used on its own.

In the video, eleven procedures are demonstrated, as follows. (1) Dissection of oviducts. Recovery of fertilized eggs. Removal of cumulus cells. (2) Recovery of 8-cell embryos. Removal of the zona pellucida. Construction of aggregation chimaeras. (3) Dissection of uteri. Recovery of blastocysts. (4) DNA injection into pronuclei to produce transgenic embryos. (5) Nuclear transfer. (6) Blastocyst injection of embryonic stem cells. (7) Vasectomizing male mice. (8) Oviduct transfer of manipulated embryos. (9) Uterine transfer of manipulated embryos. (10) Recovery of $6\frac{1}{2}$ and $7\frac{1}{2}$ day embryos. (11) Dissection of midgestation $12\frac{1}{2}$ day embryos and foetal membranes.

Of these procedures, four are used for the generation of transgenic mice by microinjection of DNA, and another three for gene transfer via embryonic stem cells. The remainder of the video covers other techniques for the recovery and manipulation of embryos. The format of the video is that each technique is introduced briefly, with a description of the technique and where it fits in to the overall scheme. The technique is then demonstrated with a voice-over commentary.

The quality of the filming was generally good, although many of the demonstrations suffered from reflections from the lights which made important detail difficult to see in places, and the colour of our copy was not at all life-like. In places there was some background noise.

Several of the techniques cover dissection for the recovery of embryos. The methods for recovery of preimplantation embryos are reasonably clearly demonstrated, recovery of postimplantation embryos are beautifully clear. Included in the demonstration of recovery of 8-cell embryos is the removal of the zona pellucida and construction of aggregation chimaeras. All of these demonstrations would be of help to anyone attempting these procedures for the first time.

Injection of DNA into pronuclei of 1-cell eggs is central to the most widely used method for production of transgenic mice. It is surprising how brief the demonstration of this technique is; a single successful injection and one problematic injection are shown. It would have been easy and instructive to demonstrate a typical series of injections, and this need not have taken too much of the available time. Following microinjection, nuclear transfer is shown. While this was well demonstrated, the optics used on the microscope were phase contrast, as opposed to the differential interference contrast optics used for the microinjection. Because phase contrast was used, the pronuclei were difficult to see in this demonstration. There was no mention of the change of optics, while the same microscope was apparently used for both procedures. This could be a source of confusion, and makes the nuclear transfer appear more difficult. The final technique of embryo manipulation shown, injection of embryonic stem cells into blastocysts, was well demonstrated.

Three of the techniques are operations. The first, vasectomy of male mice, was very clear. The procedure is demonstrated on each vas deferens, which apart from being essential to sterilize the mouse, served to reinforce the points made. The second operation demonstrated was the transfer of embryos into the oviducts of pseudopregnant female mice. When generating transgenic mice by microinjection of DNA into pronuclei, this is the method of choice for the reintroduction of embryos into mice. This procedure is difficult, and is the commonest stumbling block for those learning the techniques. The most difficult step of oviduct transfer is locating the ostium, through which the eggs are introduced into the oviduct. The procedure was repeated on a second mouse because of the difficulty of demonstrating it well. It was disappointing that neither demonstration was clear, even to experienced eyes. It is difficult to know if this section would be of much help to the viewer. Finally, transfer of embryos into the uterus is demonstrated. This method is suitable for transfer of blastocysts, for example after the introduction of embryonic stem cells. This procedure is relatively easy to perform and is demonstrated clearly.

It is clear that the primary viewers of this video will be newcomers to transgenic mouse work who wish to learn the techniques as quickly and painlessly as possible. The video goes part of the way to this end, but is disappointing in some respects. The demonstrations are generally good, but limited. While there are obvious time constraints on a video, some simple changes could have made a large difference.

There was very little use of still frames which, for example, could have made a dramatic difference to the demonstration of oviduct transfer. The range of techniques demonstrated is quite wide, and it is questionable if this were desirable at the expense of a deeper and more comprehensive coverage of basic transgenic techniques. Perhaps a demonstration of tail biopsy could have been included, an essential but simple technique which could have been demonstrated quickly. There are other omissions, for example no mention of the use of retroviral infection was made; while this is not widely used, it would have been appropriate to mention retroviruses when showing the removal of the zona pellucida from 8-cell eggs. One serious cricism of the video is that there was no demonstration of production of the various pipettes used for embryo manipulation. Production of good pipettes is not trivial, and the use of poor pipettes can make the techniques much more difficult.

Production of such a video is an ambitious undertaking. The same factors which make the techniques difficult are those which make them difficult to demonstrate. The video gives an impression of what is involved in transgenic mouse work, but a visit to an established laboratory would be of far greater benefit

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Computational Molecular Biology Sources and Methods for Sequence Analysis. Edited by ARTHUR M. LESK. Oxford University Press. 1989. 254 pages. £25.00. ISBN 0 19 854218 6.

It is now impossible to do experimental molecular biology without occasional recourse to computers and in many cases, for example a shotgun sequencing project, operating the computer has become a major component of the process.

As most molcular biologists still do not have any formal training in computing there is a real need for books on computation molecular biology. This one, prepared under the auspices of the CODATA Task Group on Protein Sequence Databases and edited by Arthur Lesk, draws together contributions from many of those who are active in the provision of computing resources for molecular biologists.

The book is organized around the four questions: (1) What data are available? (2) What calculations can be done? (3) How does one gain access to the necessary data and to the necessary programs? and (4) How can the results of the calculations be intelligently and cautiously interpreted? The book consists of twenty relatively self-contained contributions in the style of scientific papers from about forty authors; something that is probably essential to cover adequately such a wide-ranging subject. The suitability of the editor as a person to organize such disparate material is attested to by his own contributions, the subjects of which range from computer networks to molecular evolution.

All of the contributions are from workers in the forefront of their fields and many, particularly those at the beginning of the book intended to answer questions (1) and (3), are extremely detailed indeed. For this reason the book will prove of especial value to someone charged with setting up computing resources for any group that has previously been without them.

The later chapters on methods of analysis, perhaps wisely, do not descend to the same level of detail, concentrating instead on how the user should interpret the output of the programs. The reader who is actually interested in details of algorithms and implementations will, however, be well served by the extensive bibliography, complete, I am happy to say, with titles. For a newcomer to the field this alone will be worth the price of the book.

Although this book is expensive for its size, it can be recommended for the very large amount of useful information fitted into so small a space. For my own part I was pleased to see the clearly articulated warnings included in the descriptions of the more speculative types of analysis. Those included in the chapters on assessment of significance of sequence similarities and on protein secondary structure prediction should be put on the syllabus of all undergraduate biochemistry courses.

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