

C22

# DEVELOPMENT OF METHODS FOR TEACHING MOLECULAR BIOLOGY TO PHYSIOLOGISTS: THE MOLECULAR TECHNIQUES WORKSHOP 1999 - 2004

P.T. Harrison

*Physiology, UCC, Cork, Ireland*

The Annual Molecular Techniques Workshop was established in 1996 to provide hands-on training for physiologists in molecular biology. From the early workshops it emerged that students lacked both a theoretical background in molecular biology, not just techniques, and essential skills in accurately pipetting small volumes. Students also struggled to grasp the potential applications of the techniques during the 10 days of the workshop.

To address these issues, several changes were made. The most significant development was a rearrangement of the techniques into a 3-phase project. In phase I, RNA for a specific gene (P2X2) was extracted from a target tissue. Phase II saw the gene cloned into an expression vector. In phase III, the gene was expressed in heterologous cells and functional assays performed. Students were also sent an introductory text (1) in advance and since 2004, a second more detailed book (2) has been made available during the course.

Other changes were the inclusion of a daily debriefing session (2002), provision of a detailed post-course report with the data generated during the course (2003), and introduction of an additional phase which appears to have resolved the issue of pipetting small volumes (2004). Students also leave with a CD con-

taining the lab protocols so that they can customise them in consultation with detailed lab protocol manuals (3, 4).

Funding is in place for two more workshops and demand for the 16 places each year is increasing: 35 applicants in 2002, 47 in 2003 and 51 in 2004. Given that about half the applicants each year are physiology graduates of the post-genomic era from top flight academic institutions, it is a matter of concern that most applicants state that they lack a background in basic molecular biology and that training is not available in their immediate research environment.

The course has changed substantially over the last five years, but the techniques are essentially the same. A feedback survey (5) of past students showed that most were currently using molecular techniques in their research and could now critically assess literature which was previously unintelligible.

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*Molecular Cloning* (2000). ed. Sambrook J & Russell D. Cold Spring Harbor Press.

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I would like to thank Rod Dimaline & Stan White for extensive discussion of course reorganisation, Annemarie Surprenant & Alan North for reagents, and the Physiological Society & the Wellcome Trust for funding the workshops.

*Where applicable, the experiments described here conform with Physiological Society ethical requirements.*