



Introduction

Advances in the identification of variants, genes and pathways involved in particular diseases promise routes to new therapies, improved diagnosis and better disease prevention. In 2003, the British government published a White Paper¹ which mapped out how the National Health Service (NHS) in the UK should respond to these advances in genetic research and applications so that the benefits of genetics and improved healthcare it will bring are available to all. These advances in techniques for analysing genetic variants related to disease diagnosis and treatment, although allowing more sophisticated and rapid analysis of patient samples in clinical laboratories, mean that many classical clinical disciplines have to embrace the new technology. Furthermore, although clinical genetics services in the UK NHS traditionally have focussed on rare, single gene conditions, and how these affect individuals and families, rapid advances of our understanding of the role of genetics in common diseases such as cancers, heart disease and diabetes² is likely to expand the remit of NHS genetics services.

In the UK, we have identified training needs that need to be addressed to help clinicians understand emerging and perhaps unfamiliar, genetic technologies.

Course Development

The North West Genetics Knowledge Park (Nowgen) is developing a programme of courses for health professionals in response to the expressed need for training in practical molecular genetics laboratory techniques. The first of these training courses – a national, recurrent two-day course for clinical cytogeneticists – ran in January 2007; course evaluation has provided useful insights for further development.

Firstly, the training need was identified through an exercise to canvas opinion within the cytogenetics profession. A questionnaire was sent to the leads of UK clinical cytogenetics laboratories via the Association of Clinical Cytogeneticists, to assess the need for a laboratory-based training course. Questions were asked about the key laboratory techniques they would want included, and the optimum length of a course. The initial course content was based on this consultation.

Course Content and Delivery

The two-day course developed was designed for clinical cytogeneticists who wanted a theoretical and practical introduction to key molecular biology techniques. The course includes laboratory practicals, computer-based practicals and example patient sample analysis sessions.

On the first day, delegates look at the principles, practice and applications of PCR (Polymerase Chain Reaction), with particular emphasis on data analysis and troubleshooting. The afternoon is dedicated to a bioinformatics session relevant to cytogeneticists, including navigating, accessing and using databases, for example, the DECIPHER database of chromosomal imbalance and phenotype in humans.

On the second day, we examine further techniques including quantitative PCR, quantitative fluorescence (QF) PCR, multiplex ligation-dependent probe amplification (MLPA) and microarray CGH, emphasising their applications in NHS diagnostic laboratories in the UK.

The courses are delivered by research and clinical scientists working at the cutting edge of genetic research and technology development and clinical application. Although each technique is described in theoretical and practical terms, there is major emphasis on troubleshooting and the analysis of anonymised patient data generated from each of the techniques considered in the course.

Course Evaluation and Future Prospectives

Each course is evaluated in order to inform modifications to subsequent courses. A summary of the evaluation of the two courses to date is shown in **Table 1**.

The courses are becoming recognised in the UK clinical cytogenetics community as an important contribution to national training programmes to help cytogeneticists keep abreast of new and emerging genetic technologies.

We are currently using the successful protocol used for these courses to develop further courses for professionals working in other clinical disciplines, including genetic nurses and counsellors, and general pathology laboratory staff.

Table 1. Course evaluation

	Strongly Agree	Agree	Disagree	Strongly Disagree
The presentations were pitched at the right level	11	16	-	-
You would recommend this course to your colleagues	20	7	-	-
The course was relevant to my specific learning needs	13	14	-	-
Adequate time was given for discussion	9	13	-	-
The course was worth the time invested in it	17	10	-	-
The course fully met my expectations	12	16	2	-

¹ Our Inheritance, Our Future: realising the potential of genetics in the NHS. Department of Health White Paper, 2003

² The Wellcome Trust Case control Consortium [2007] Nature, 447, 661 - 678

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