DIPLOMA OF EXPERT PRACTICE IN IMMUNOCYTOCHEMISTRY

Study Guide and Indicative Syllabus

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Diploma of Expert Practice in Immunocytochemistry

The Institute’s Diploma of Expert Practice in Immunocytochemistry provides evidence of the attainment of both the necessary theoretical knowledge underpinning the practice of immunocytochemistry and the practical competence required to perform the techniques. Possession of this Diploma of Expert Practice does not imply an automatic progression to a higher grade of employment or a particular level of remuneration. This is a matter for individual employers according to job content and responsibility. The Institute’s professional qualification structure (below) indicates the position of the diploma in respect of level.

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Undertaking immunocytochemistry requires a level of particular expertise within biomedical science. As such, preparation and training for the Diploma requires the support of a named trainer with an interest in immunocytochemistry (this may be a biomedical scientist or a pathologist).

The examination for the Diploma of Expert Practice in Immunocytochemistry is the final stage of the assessment to obtain this qualification. The following requirements MUST be completed BEFORE entry to the examination is permitted:

- Member of the Institute of Biomedical Science (MIBMS)
- HPC registration
- MSc
• A minimum of three years’ post-registration experience, of which two years should be in immunocytochemistry.
• Submission of a portfolio for assessment
• Submission of the signed training logbook
• A named trainer

AIMS

1. To develop the professional knowledge and skills of a candidate beyond that of an MSc.

2. To provide successful candidates with the opportunity to undertake a role that involves the interpretation and evaluation of the use of antibodies and antibody techniques.

3. To enable suitably experienced holders of the qualification to participate in the training of biomedical scientists wishing to sit the Diploma of Expert Practice in Immunocytochemistry.

LEARNING OUTCOMES

Individuals awarded the Diploma of Expert Practice in Immunocytochemistry will be able to:

1. Demonstrate professional skills and knowledge routinely required of biomedical scientists working in immunocytochemistry.

2. Independently, critically evaluate the use of antibodies and visualisation methods.

3. Show an understanding of how immunocytochemistry findings have an effect on the diagnosis, treatment and management of disease.

TRAINER

The profile of a trainer is to:

• be responsible for the delivery of a service or specialist part of a service appropriate to the diploma being undertaken.
• have skills in advising, assessing and counselling.
• understand the difficulty in undertaking self-directed study at post-graduate level.

A trainer for a biomedical scientist preparing for the Diploma of Expert Practice in Immunocytochemistry must be actively involved with the interpretive aspects of immunocytochemistry. He/she must be aware of the requirements of the diploma and must ask candidates to show them the following documents that will aid them in understanding the preparation and assessment components of the diploma:

• The generic requirements that contain further details on the assessment processes as specified in the generic guidance to candidates
• The appropriate diploma specific requirements that contain the indicative curriculum and the indicative reading list
• The application form, to be signed by trainer and candidate.

Role of a trainer
The principal role of the trainer is to facilitate academic and professional support for candidates during self-directed study for a diploma and particularly during the preparation of an examination portfolio. He/she must guide and direct the training process and ensure that the portfolio meets the requirements specified in the guidance to candidates prior to its submission. He/she must also enable candidates to receive training in the appropriate aspects of immunocytochemistry to facilitate completion of the training logbook.

He/she must also provide confirmation that the candidate has completed a structured training programme and in his/her opinion is ready to sit the examination.

TRAINING FACILITIES
The training laboratory must be an Institute approved training laboratory and must be accredited with CPA (Clinical Pathology Accreditation (UK) Ltd)

PORTFOLIO
The compilation of a portfolio is a means of clearly organising and recording achievements and should demonstrate a range of competencies, skills, experience and an overall reflective approach.

Case Studies
Four case studies should be included as detailed in the generic guidance that demonstrate an understanding of the importance of immunocytochemistry in the diagnosis, treatment and management of patients as described below.

Pre-analysis
Details of presenting symptoms and any additional relevant clinical history should be used to introduce the case. The clinical symptoms may be expanded upon and further clinical tests and options for treatment, including biopsy or surgery, should be critically discussed.

Analysis
The way the specimen is handled when it arrives in the cellular pathology laboratory should be discussed, e.g. whether fresh or formalin fixed, to include accurate details of the macroscopic description and dissection process, if relevant. The main histological features of the pathological processes should be described and details of the stains and antibodies used on the case should be explained to show evidence of slide review. Where a panel of markers have contributed to the final diagnosis these should be discussed, together with possible options of other specialised tests.
Post Analysis
The possible or probable outcomes for the patient should be discussed to include options for follow-up treatment. Discussion should include what could have happened if an error in diagnosis had been made.

The complete portfolio must be submitted to the Institute, along with the training logbook, as part of the evidence for completion of training in immunocytochemistry prior to the examination. All evidence should be accompanied by a written commentary indicating how and why particular evidence was included and its relationship to the training objectives. It may include digital microscopic images, flow diagrams or PowerPoint presentations to accompany the written work.

FINAL EXAMINATION
The final examination is based upon the syllabus documented in the training logbook and the level of knowledge should be readily obtained working in a routine immunocytochemistry laboratory. It consists of two short-answer written papers each of two hours long. Two examiners mark all papers independently. In the case of a significant difference of opinion the paper is referred to a third examiner.

Candidates must achieve a combined overall average of 50%, with neither of the two papers below 40%.

Appeals against the outcome of the examination must be made in writing to the Institute on Appeals Form A2 within 40 days of the date of receipt of the examination results. Examples of the type of questions are given below with an indication of the level and volume of the required response.

Sample Questions

PAPER 1
Using examples from both cytology and histology outline the methods for conserving and optimising scant material for immunocytochemical analysis.

Answer
- Cytospin / LBC
- Serial sections
- H&E reference section
- Adhesive slides
- Artefacts from surgery or laboratory

PAPER 2
A laboratory is evaluating a new antibody to assess the immunocytochemical over-expression of the human epidermal growth factor receptor-2 (HER2) protein. As part of this process, HER2 testing was carried out on a breast cancer needle core biopsy specimen and repeated on a surgical excision specimen from the same patient. Figure 1 shows 3+ HER2 expression in the core biopsy of grade 3 invasive ductal carcinoma. In subsequent testing of the excision specimen, the same cancer was scored as HER2 2+. 
a) Suggest reasons why these discordant results may have been obtained.

b) How can a laboratory demonstrate that it provides a satisfactory HER2 immunocytochemical testing service?

c) What is the prognostic and predictive significance of a HER2 3+ invasive breast carcinoma?

d) What are the advantages and disadvantages of using cell lines as control material for HER2?

Figure 1. HER2 expression in the grade 3 invasive ductal carcinoma.

Answers:

a) Tumour heterogeneity
   Better tissue fixation in the core biopsy
   Poor tumour fixation in the excision specimen
   Suboptimal immunostaining
   Intra-observer variation

b) Internal QA – validation of test results with FISH tests
   Internal audits – frequency/distribution of 0, 1+, 2+, 3+
c) HER2 3+ breast carcinomas have an overall worse prognosis than non-positive HER2 carcinomas. HER2 3+ immunopositivity predicts resistance to conventional adjuvant chemotherapy and tamoxifen/aromatase inhibitors, regardless of the nodal or hormone receptor status. Patients with breast carcinomas with amplified or overexpressed Her-2/neu may respond to treatment with trastuzumab (Herceptin) and anthracycline-based regimens.

d) Advantages – standardised; reproducible; ease of interpretation
Disadvantages – cost to purchase; turnaround times may be significantly affected if a batch of cell lines is suboptimal
IMMUNOCYTOCHEMISTRY SHORT COURSES

The following course is provided by the University of Westminster. Candidates may find attendance useful in their preparation for the exam. Please contact the organiser for further details.

University of Westminster
Immunocytochemistry Workshops
Department of Biomedical Sciences
115 New Cavendish Street
London
W1W 6UW

Course organiser: Dr A Madgwick
020.7911-5000 ext 3864
madgwia@wmin.ac.uk
INDICATIVE READING LIST

Below is an indicative reading list but candidates are expected to study as widely as possible in preparation for the exam.

BOOKS


WEBSITES

Institute of Biomedical Science [www.ibms.org](http://www.ibms.org)

BioMed Central [www.biomedcentral.com](http://www.biomedcentral.com)

Mayo Clinic [www.mayoclinic.com](http://www.mayoclinic.com)

Royal College of Pathologists [www.rcpath.org](http://www.rcpath.org)

UKNEQAS Immunocytochemistry [www.ukneqasicc.ucl.ac.uk](http://www.ukneqasicc.ucl.ac.uk)

College of American Pathologists [www.cap.org](http://www.cap.org)

JOURNALS

American Journal of Clinical Pathology

American Journal of Surgical Pathology

Applied Immunohistochemistry and Molecular Morphology

British Journal of Biomedical Science

Diagnostic Histopathology

Cytopathology

Diagnostic Cytopathology

Histopathology

Journal of Clinical Pathology

Journal of Histochemistry and Cytochemistry

Journal of Pathology