



Diploma of Expert Practice in Immunocytochemistry

Examination 2025

Paper 1

Short-answer questions

120 minutes

1. Attempt **6 out of 9** questions – **choose 2 from each section**
2. Each question is worth 20 marks
3. You must transfer your answers directly into the answer booklet

Pre-Analysis

1. Discuss the process of selecting appropriate tissue for control purposes.
2. Discuss the advantages and disadvantages of cell blocks versus cytological smears for immunocytochemistry staining.
3. Discuss the procedures for the optimal fixation of tissue for immunocytochemistry investigations.

Analysis

4. Define what is meant by the term “antigen retrieval”. Discuss the requirement for antigen retrieval and provide an overview of the techniques which can be used to retrieve tissue antigens.
5. Discuss the various types of automated immunohistochemistry platforms and what factors you would take into consideration when introducing a new immunohistochemistry auto-stainer into your laboratory.
6. Discuss the Health and safety considerations required within a modern day immunocytochemistry laboratory.

Post- Analysis

7. Discuss the importance of automated or manual run logs in auditing immunocytochemical staining procedures
8. Discuss the steps you would take to investigate and rectify an unusual and unexpected poor staining results with any given antibody.
9. Discuss the impact of over or under retrieval of an antigen on interpretation of immunocytochemistry. How are these identified and what are the corrective actions?



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Paper 2

Interpretive Questions

120 minutes

1. Attempt **3 out of 5** questions
2. Each question is worth 100 marks
3. You must transfer your answers directly into the answer booklet
4. Begin each new answer on a new page

1.

A 55-year-old man presented with a large scaly crusty nodular lesion 15x 10x 8 cm on his left calf. The lesion was excised for histological examination.

a. Describe the optimal fixation requirements for an excised specimen of this size?

(10 marks)

The subsequent paraffin blocks were then cut and stained with H&E (image (1a) low power and 1(b) high power), demonstrating features of a small round cell tumour with features of a trabecular pattern. Further immunohistochemical stains were requested.

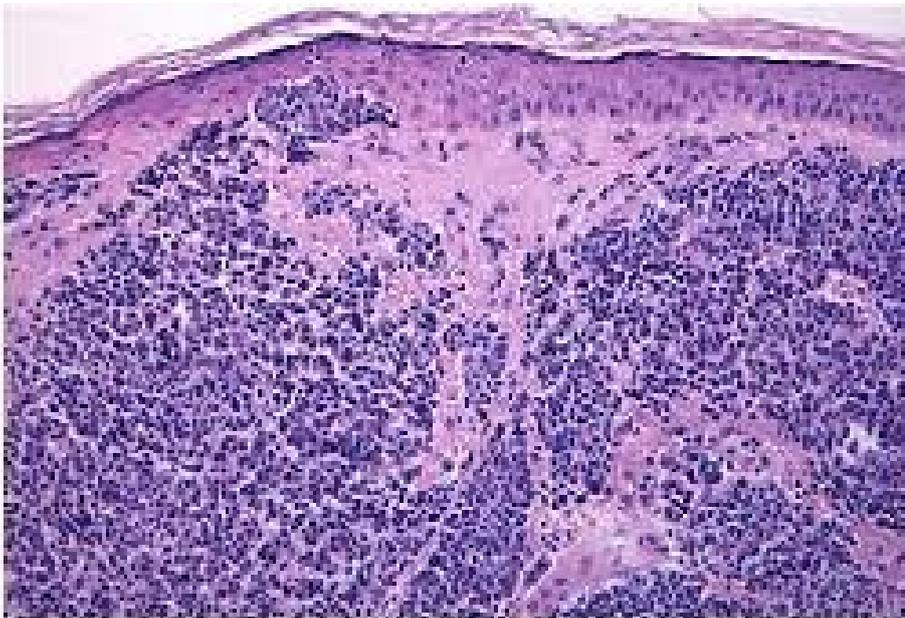


Image 1a

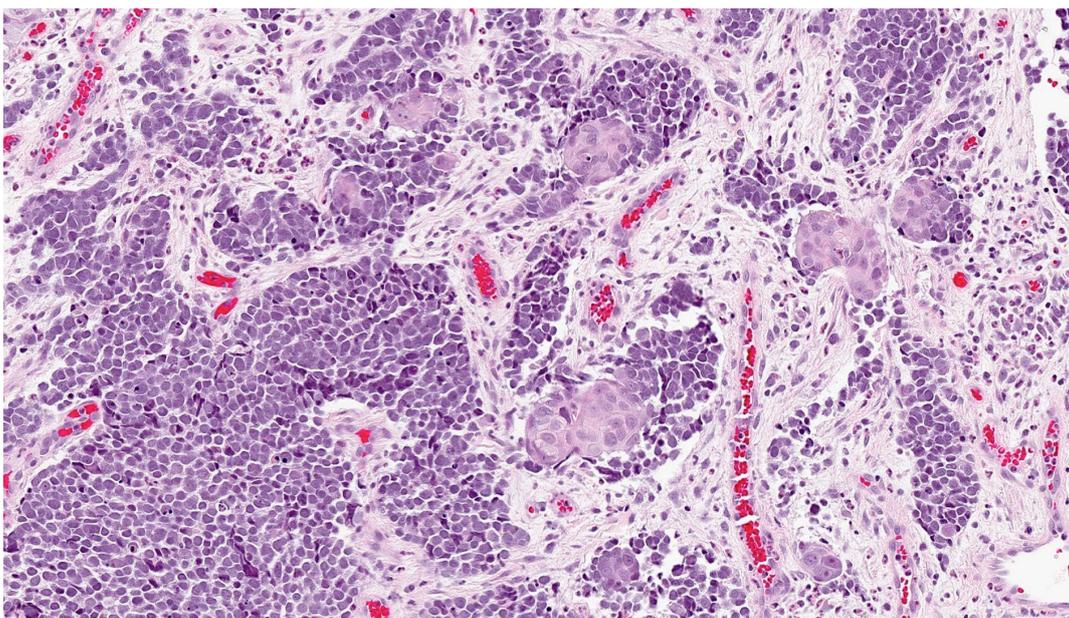
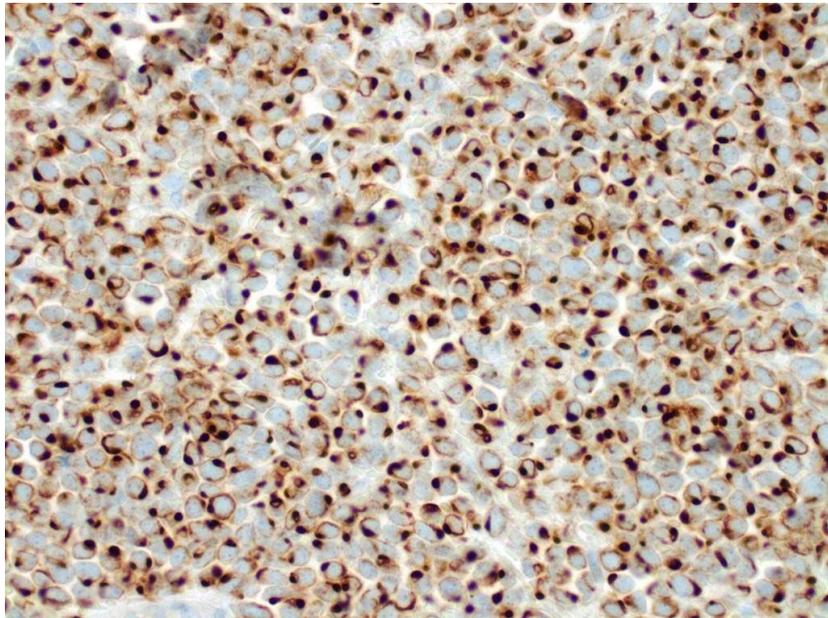


Image 1 b

- b. Discuss which panels of markers you would most appropriately use to define the derivation of this tumour based on the clinical history and HE findings? (30 marks)

Image 2 below shows a characteristic pan cytokeratin staining pattern.



- c. What is this staining pattern called? (10 marks)
- d. What is the cell type and subsequent malignant tumour described here? (10 marks)

A sentinel lymph node was also taken from the left leg near the left groin draining lymph node basin.

- e. Discuss and describe the histological and immunocytochemical investigations you would employ to investigate the SLN for metastatic tumour deposits? (10 marks)
- f. There is an associated virus that is commonly found within this tumour type. Name the virus and discuss its role and frequency of expression in this tumour. (10 marks)
- g. Immunocytochemistry can be used to identify other virus organisms. Explain which antibodies are available for diagnostic use and which tumours are associated with the viruses named. (20 marks)

2.

Table 1 below shows a successive series of results your laboratory has received from the UKNEQAS for ICC and ISH EQA scheme for demonstration of KI67/MIB1:

	Run I	Run II	Run III	Run IV
UKNEQAS	15	12	12	8
In-house	16	12	12	8

- a. Comment on these results. (25 marks)
- b. What actions would you take before the next KI67/MIB1 run? (30 marks)
- c. Summarise the reasons behind the changes you would make. (20 marks)
- d. Discuss the broader implications for your laboratory practice. (25 marks)

3.

A 63-year-old female attended her GP surgery complaining of lower back pain and a history of post-menopausal bleeding (PMB). On examination, distention of the patient's abdomen was noted, and she reported a recent unexplained loss of weight. The patient was referred to gynaecology services for further investigations and a hysteroscopy showed an irregular uterine cavity with a 3cm area of "suspicious polypoid lesions". A MyoSure® procedure was performed and multiple pieces of white tissue measuring 40 x 40 x 21mm were excised and sent to the laboratory for histological investigation.

- a. What key factors should be considered to ensure optimal fixation of MyoSure® samples and why are these factors important in immunohistochemistry? (30 marks)

The photograph in Figure 1 is an HE section taken from the patient's MyoSure® sample. The image contains endometrial fragments showing a solid pattern of glandular proliferation, nuclear atypia, focal necrosis within the luminal spaces and foamy histocytes. The changes seen in the HE-slide are consistent with a diagnosis of an "endometrioid" subtype of endometrial cancer.

- b. Suggest a suitable panel of antibodies which could be used to assist diagnosis in this case, describing the staining patterns of the antibodies you have chosen and the relative merits of the use of these markers. (50 marks)

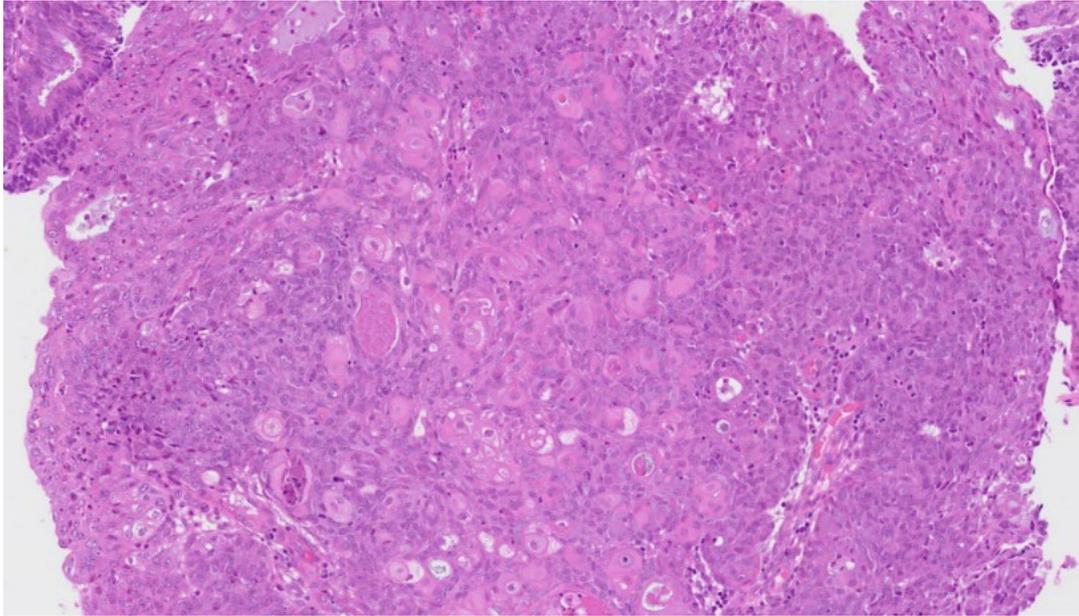


Figure 1: Haematoxylin and Eosin (HE) section from Myosure sample

- c. Figures 2-5 show the IHC staining results for expression of the MLH1, MSH2, MSH6 and PMS2 MMR proteins respectively. Discuss the significance of these results. (20 marks)

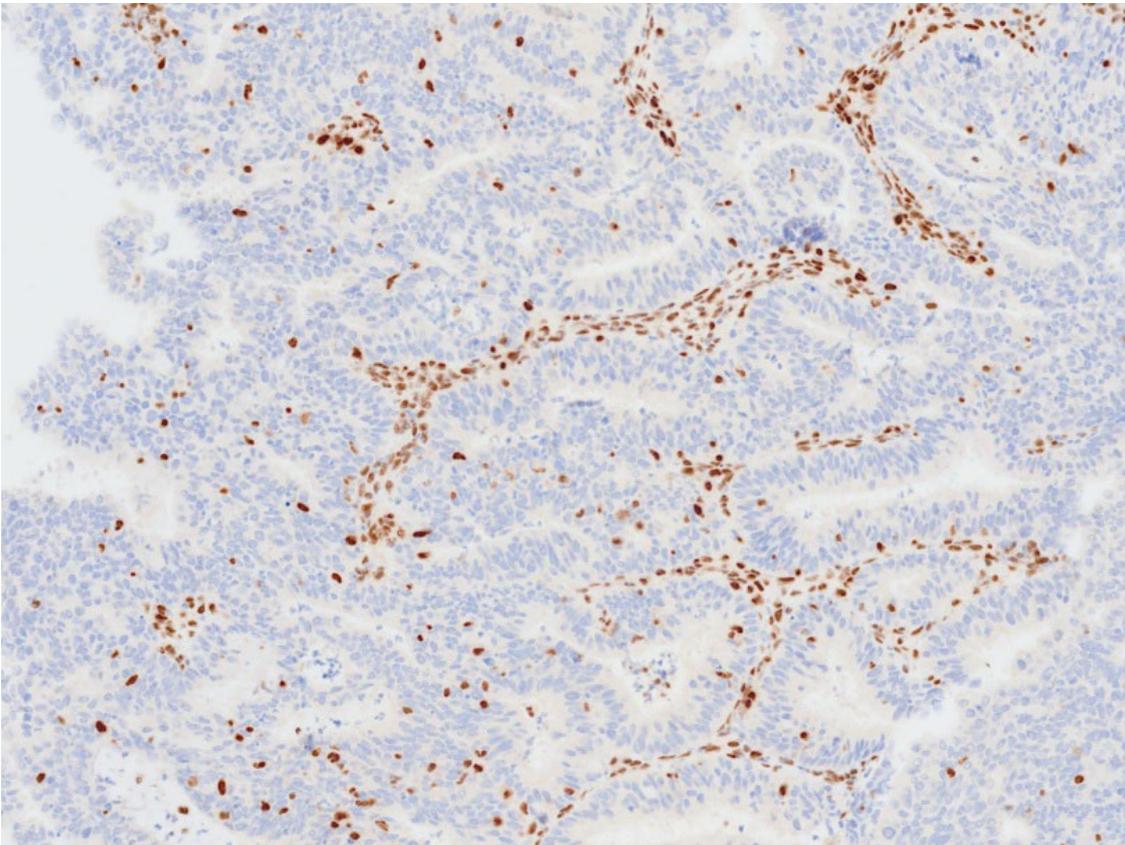


Figure 2: MLH1 staining Results

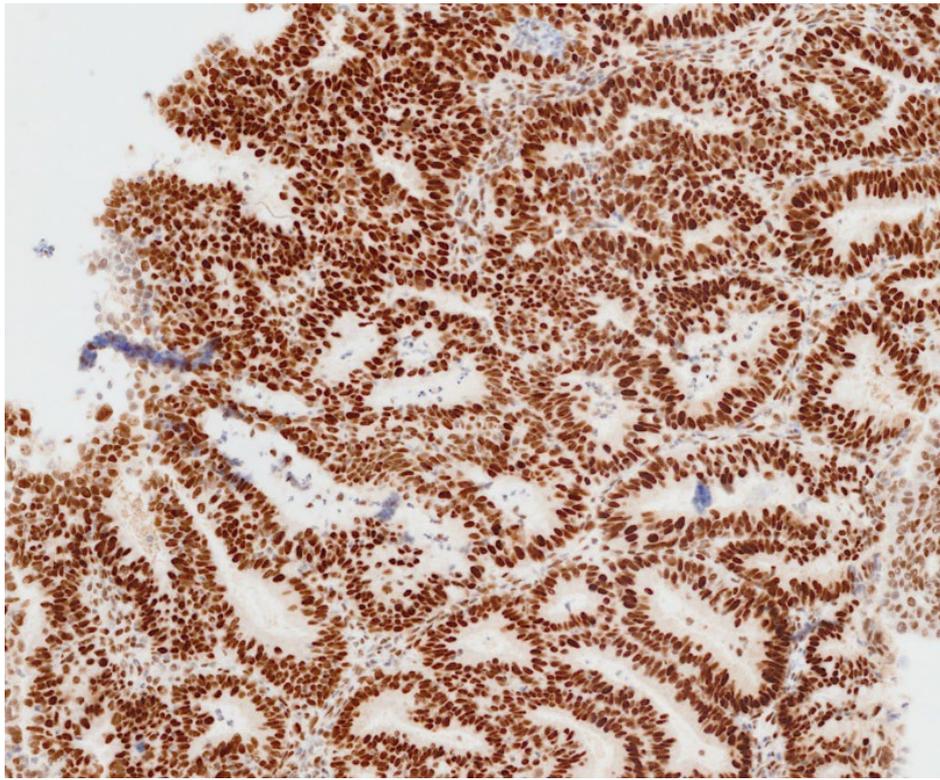


Figure 3: MSH2 staining Results

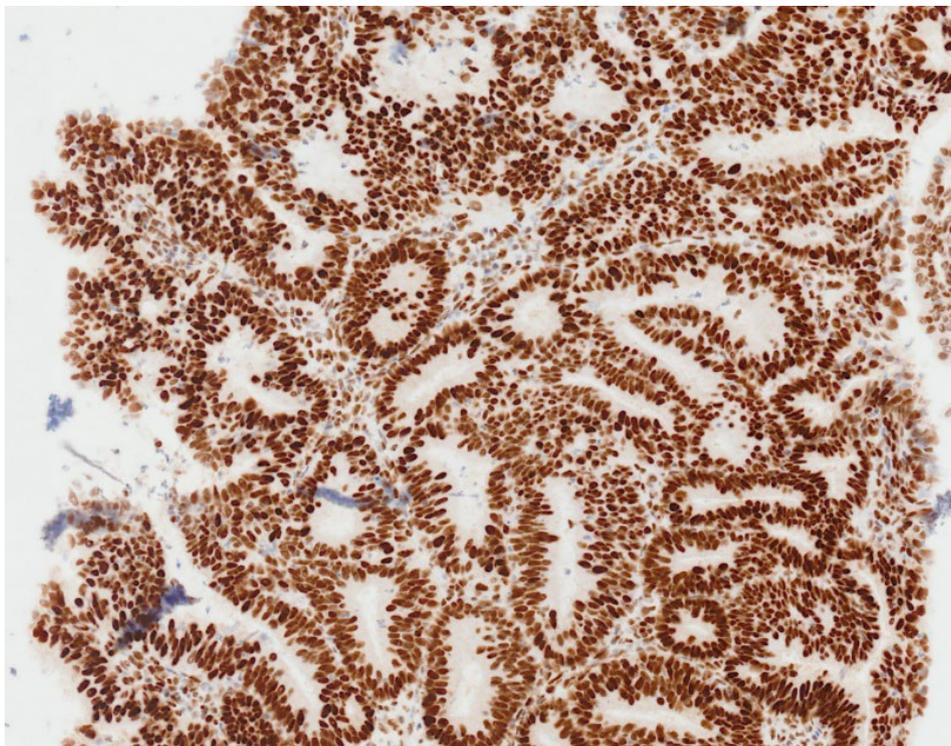


Figure 4: MSH6 staining Results

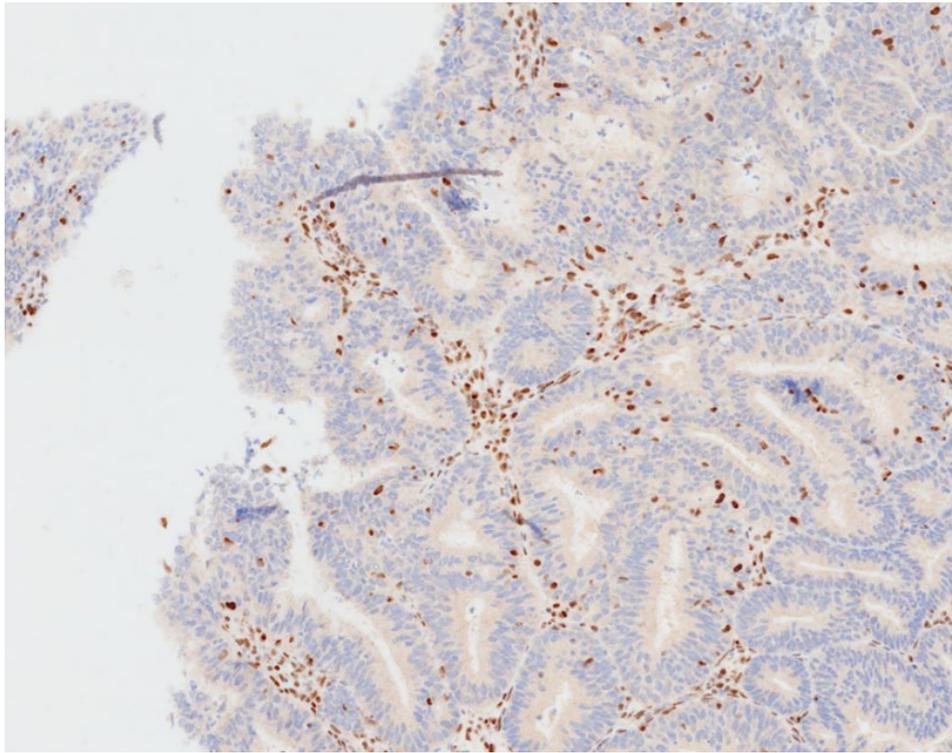


Figure 5: PMS2 staining Results

4. Evaluate the use of immunocytochemistry in order to differentiate in-situ disease from early invasive disease in the following sites:
- a. Breast (50 marks)
 - b. Prostate (50 marks)
5. A 64 year old female smoker attends her GP surgery with symptoms of a persistent cough, breathlessness and unexplained fatigue and weight loss. The patient is referred to her local hospital for a chest x-ray which reveals a grey-white mass in the thoracic cavity. Biopsies are taken from the mass and histological examination of the biopsies reveals this to be an undifferentiated carcinoma.
- a. Evaluate the use of ICC to determine if this tumour is a squamous cell carcinoma (SCC), an adenocarcinoma or a pulmonary neuroendocrine tumour. (50 marks)
 - b. If the tumour was confirmed as a lung adenocarcinoma, which additional tests would be required and why? (30 marks)
 - c. If the tumour was confirmed as a SCC, which additional markers could be required and why? (20 marks)