Diploma of Expert Practice in Immunocytochemistry

Examination 2022

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

The question paper is not to be removed from the examination room

Pre-Analysis

1. Discuss procedures for achieving ideal optimal fixation of tissue for immunocytochemistry investigations.

2. Compare and contrast the effects of tissue decalcification solutions used on bone marrow trephine biopsies on subsequent immunocytochemistry investigations.

3. Discuss and explain the appropriate choices of control material for a full repertoire of immunocytochemical antibody tests.

Analytical

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 things would you take into consideration when introducing a new immunohistochemistry autostainer to your laboratory.

6. Discuss automated versus ‘off-board’ antigen retrieval methods. Provide examples and discussion on the various types.

Post- Analytical

7. Discuss the role of external quality assurance schemes within immunohistochemistry.

8. Discuss the health and safety risks associated with the performance of immunocytochemistry protocols.

9. Discuss and debate the importance of information from run logs when performing audits on automated immunocytochemistry equipment.

Diploma of Expert Practice in Immunocytochemistry

Examination 2022

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. 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:

Table 1

	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)

2. A lady aged 50 attended a breast screening appointment for mammography. Initial radiological assessment identified a suspicious lesion and two needle core biopsies were taken from the lesion and sent to the laboratory for investigation. Initial HE staining indicated a differential diagnosis of ductal carcinoma in situ (DCIS) or ductal carcinoma.

a. Evaluate the use of immunocytochemistry (ICC) in the differential diagnosis of in situ and invasive disease in the breast. (50 marks)

b. If an invasive ductal carcinoma is confirmed, suggest a panel of markers which would help inform the patient's management. (35 marks)

c. Discuss how immunocytochemistry is used to differentiate between invasive ductal carcinoma and invasive lobular carcinoma. (15 marks)

3. Sensitivity and specificity of immunocytochemical methods; their importance in the era of companion diagnostics for personalized medicine therapy. Discuss.

4. 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.

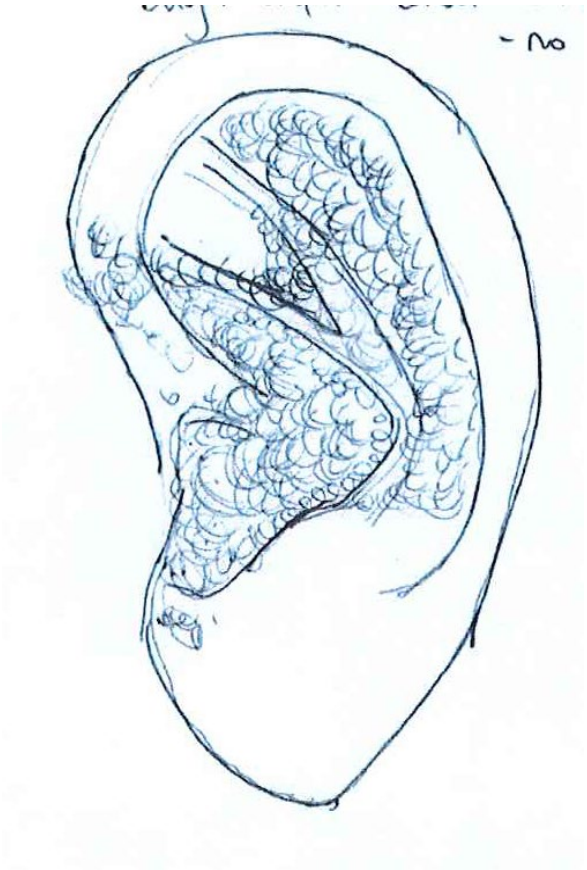
a. Evaluate the use of ICC to determine if this tumour is a squamous cell carcinoma (SCC), an adenocarcinoma or a pulmonary neuroendocrine tumour. (50 marks)

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)

5. A 48 year old man presented at a dermatology clinic with a melanocytic lesion in his left conchal bowl (ear)

Figure 1.



Estimated maximum dimension 25 mm wide (macroscopic) and Breslow thickness 3 mm. Mitoses are sparse (1 per mm2). There was no vascular or perineural invasion identified. Tumour does not penetrate cartilage on the deep aspect. Tissue blocks extensively sampled and HE preparations made Figure 2a and b (x20, x40 Mag)

Figure 2a HE x20

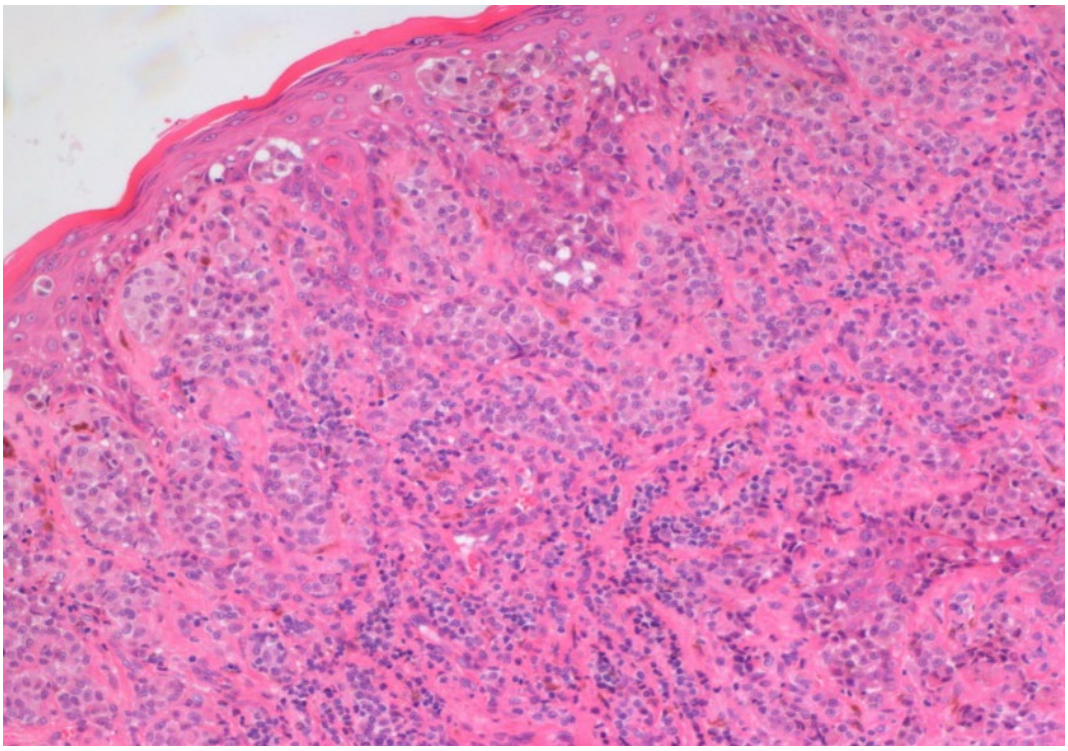
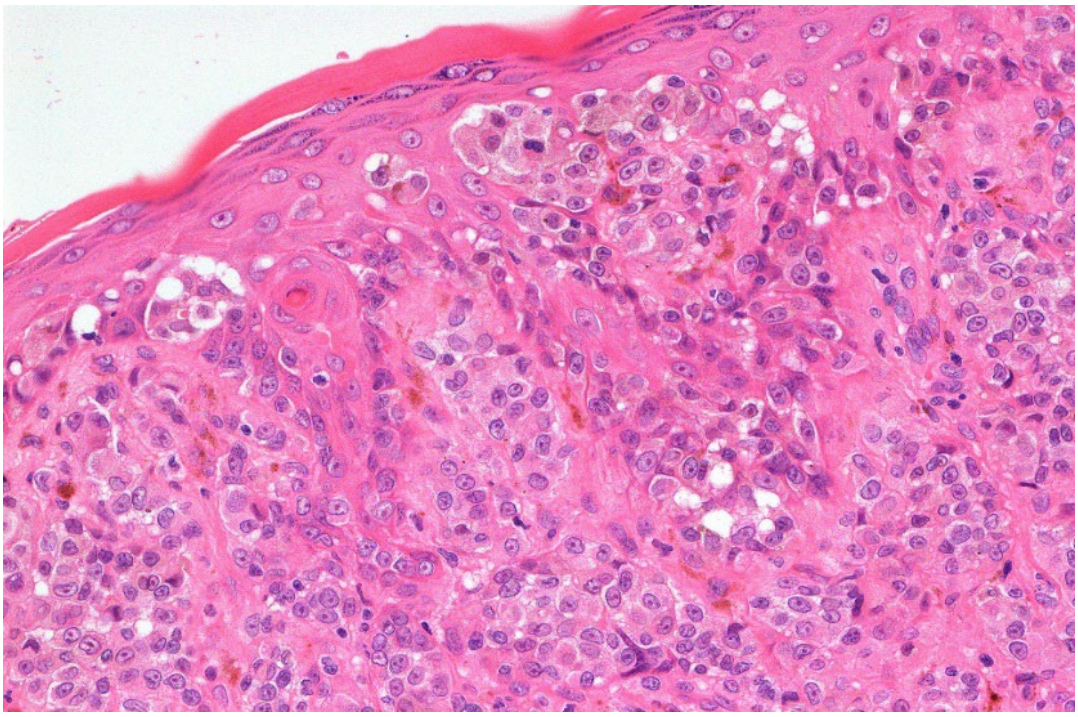


Figure 2b HE x40



a. Describe the features seen within the lesion (20 marks)

b. Describe the panel markers you would use to delineate the atypical cellular population seen. (20 marks)

The pathologists requests additional dual label antibody staining for Ki67 and Melan A.

c. What information will this provide? (10 marks)

Molecular PCR NGS screening was requested on paraffin curls from two of the blocks. The result came back with the following comments 'unable to extract DNA from samples from tumour - need to repeat on any residual tissue left at next surgical procedure'.

d. Bearing in mind the nature of the tissue what could the reason for the NGS to fail? (10 marks)

e. Since NGS molecular screening failed which antibody test could be requested in this instance? Which mutation does this test detect? (20 marks)

f. Which new antibody is currently used to help delineate between benign and malignant melanocytic lesions. Provide the full name and not just the abbreviation. What does this antibody recognize? (20 marks)