

AS Level Biology B
H022/01 Foundations of biology

Question Set 14

- 1 *Aspergillus fumigatus* is a fungus normally found in soil humus. It is an opportunistic pathogen known to cause a variety of diseases in mammals and birds called aspergillosis.

Aspergillosis can occur in any area of the body, but the respiratory system is most commonly affected.

- (a) (i) Using *A. fumigatus* as an example, explain what is meant by the term opportunistic. [1]
- (ii) Outline **one** mechanism used by pathogenic fungi such as *A. fumigatus* to infect body tissues. [2]
- (b) One method of diagnosing aspergillosis in the human respiratory system is to use a light microscope to observe sputum samples.

Fig. 1 is a photomicrograph showing the presence of *A. fumigatus* in a human sputum sample.

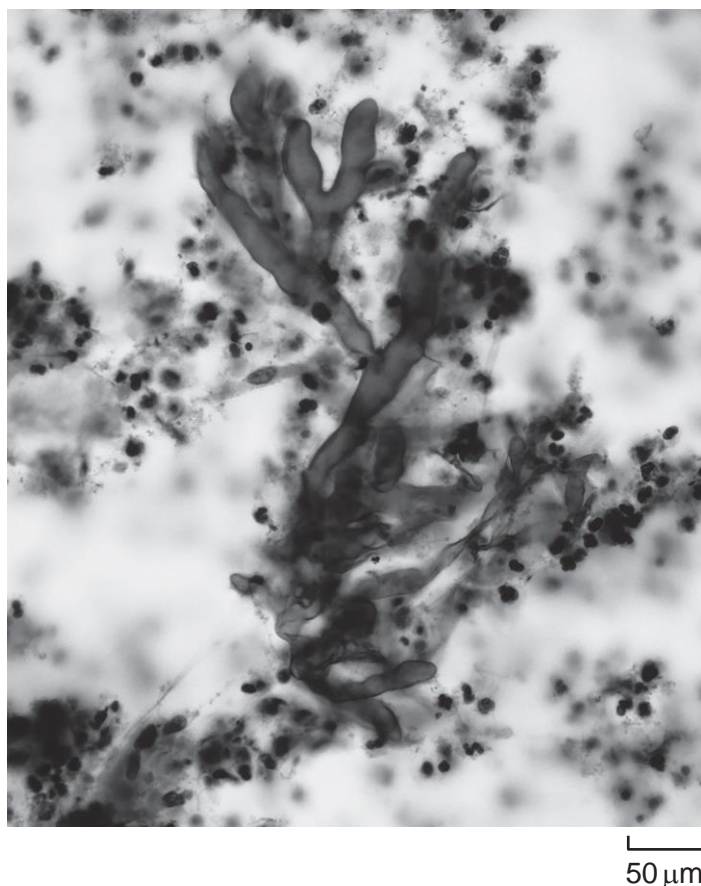


Fig. 1

- (i) Describe how the sputum sample in Fig. 1 could have been prepared for viewing the cells of *A. fumigatus* using a light microscope. [2]
- (ii) Calculate the magnification of the photomicrograph shown in Fig. 1.
magnification = [2]

- (c) *A. fumigatus* can also be observed using other types of microscope such as scanning electron microscopes and transmission electron microscopes.

The table below lists a number of features that could apply to **either or both** of these types of electron microscope.

Complete the table by indicating with a tick (✓) which of the features apply to each type of electron microscope.

| Feature | Scanning electron microscope | Transmission electron microscope |
|--|------------------------------|----------------------------------|
| The electron beam reflects off the surface of the specimen | | |
| A 3-D image is produced | | |
| Heavy metals are used to stain or coat the specimen | | |
| Specimens must be extremely thin | | |

[4]

Total Marks for Question Set 14: 11



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