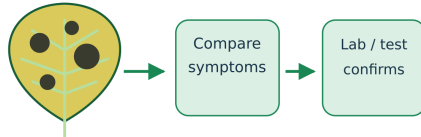


Higher Tier Biology extras

AQA Separate Biology 8461 | Paper 1 extras | Higher Tier only

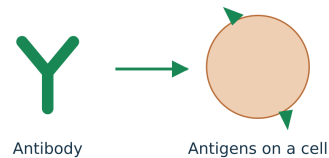
1 Investigate plant disease



A symptom alone may have several causes.

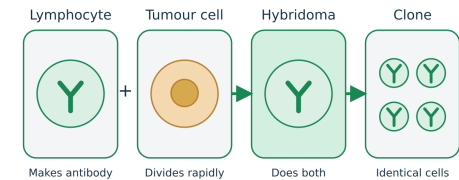
Clues: stunting, spots, rot, growths, malformed parts, discolouration or pests. Compare a reliable reference; send a sample to a lab or use a suitable specific test. Symptoms alone may not identify one cause.

2 One clone, one antibody



Monoclonal antibodies come from **one clone** of cells. They have identical binding sites specific to a particular **antigen**. A test using them can detect its matching target.

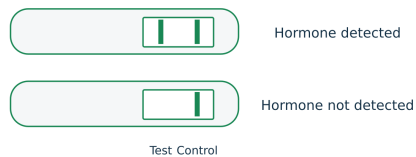
3 Make and clone a hybridoma



Stimulate mouse lymphocytes to make the antibody wanted. Fuse a selected lymphocyte with a dividing tumour cell. **Hybridoma: divides + makes antibody.** Clone a selected single cell; grow the clone, collect and purify its antibodies.

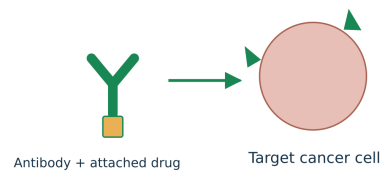
4 Detection and research

Pregnancy test: an example



Uses include detecting hormones or pathogens and measuring chemicals in blood. Fluorescent labels locate targets in tissues. Pregnancy test example: antibodies bind **hCG**. Learn specific binding; test details may be given.

5 Targeting and evaluation



An antibody can deliver a toxic drug or radioactive substance to cancer cells with the matching antigen. **Benefit:** more targeted delivery. **Limits:** side effects; testing needed; animal use can raise ethical issues.

6 Standard form

Standard form

$$32\,000 = 3.2 \times 10^4$$

3.2 is at least 1 and less than 10.

10^4 means $\times 10 \times 10 \times 10 \times 10$

After finding the population, write it as **$a \times 10^n$** , with $1 \leq a < 10$.
1,000 cells, five divisions:
 $1,000 \times 2^5 = 32,000 = 3.2 \times 10^4$.
 32×10^3 has the same value, but is not standard form.