Vaccination and immune memory

Student activity • observation and reasoning

YEAR 10 / LESSON 62 / BIOLOGY ONLY

The question

Why can a later response to the same antigen be faster?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, paper models, pencil and ruler

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Biology only: 2.63B. Vaccination and memory cells.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Draw a labelled schematic antibody-response graph for first and later exposure; mark it as a model, not measured data.

2. Explain how vaccination presents an antigen or enables its production to stimulate an immune response without requiring the full disease.

3. Identify memory cells as a lasting part of the response.

4. Compare the delay, rise and size of the later antibody response to the same antigen.

5. Explain why protection is specific and why vaccination does not guarantee that every infection is prevented.

6. Distinguish active immunity from receiving ready-made antibodies; discuss evidence and avoid collecting classmates' vaccination histories.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Vaccination can establish immune memory. On later exposure to the matching antigen, memory-cell responses can lead to antibodies being produced sooner and in greater amounts. Vaccine types differ; not every vaccine contains a whole killed or weakened pathogen. This lesson explains a mechanism, not an individual vaccination schedule.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. What persists after the first response?

2. How can the second response differ?

3. Why is matching antigen important?

4. Do all vaccines contain a whole pathogen?

5. Does a schematic graph provide measured clinical evidence?

6. How is ready-made antibody delivery different?