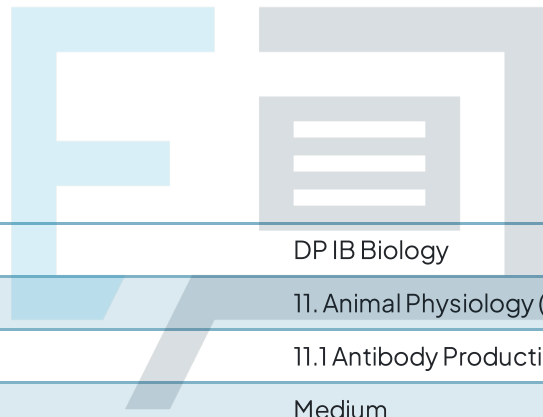




11.1 Antibody Production & Vaccination

Mark Schemes



Course	DP IB Biology
Section	11. Animal Physiology (HL Only)
Topic	11.1 Antibody Production & Vaccination
Difficulty	Medium

Exam Papers Practice

To be used by all students preparing for DP IB Biology HL
Students of other boards may also find this useful

1

The correct answer is **C**

II. is not true because the symptoms of allergies are caused as a result of histamines, the antigens trigger a response which results in histamine release so the symptoms are not DIRECTLY attributable to antigens.

2

The correct answer is **C**

All other options would lead to coagulation as the patient receiving the blood has different antigens to the donor. The donor in part A, B and C all have A antigens which would coagulate the blood in the recipients who don't have A antigens.

3

The correct answer is **B**, activation of T-helper cells initiates the start of the immune response.

Option A is incorrect because phagocytosis alone would not trigger an immune response. Sometimes a specific immune response may be initiated when a T-helper cell binds to antigens presented by a phagocyte. In this scenario, the phagocyte has engulfed the pathogen as the first stage of the process, but the specific immune response is not triggered until the T-helper cell is activated. Option C is incorrect because B-cells mature in the bone marrow prior to initiation of a specific immune response. Part D occurs once the immune response has already started.



4

The correct answer is **C**, plasma cells do not produce memory cells, memory cells differentiate from B-cells (as do plasma cells).

Option A is a feature of plasma cells as they need the RER to produce antibodies. Option B is also true because plasma and memory cells both originate from B-cells. Plasma cells produce antibodies specific to an antigen and so option D is another true feature.

5

The correct answer is **D**

All statements here describe how **antibodies** destroy pathogens. Option A talks about antigens instead of antibodies but describes **complement activation**. Option B and option C describe **reducing activity** and **agglutination** respectively.

6

The correct answer is **D**

Jenner carried out his investigations first on a small child, this is now considered a substantially unethical method of research. It has since been ruled that children should not be used in medical investigations like this. There was **no Research Ethics Committee** at the time, so Jenner couldn't have had his methods officially approved. Additionally, whilst variolation would also not be approved ethically in modern science, it was not a process that Edward Jenner instigated himself. This question tackles the NOS element of the IB course which considers the ethical considerations of scientific research.

7

The correct answer is **C**

The second dose of the vaccine triggers a secondary immune response which results in options A, B and D. Option C would not occur as histamines are a response to allergens and do not provide immunity.

8

The correct answer is **B**.

Allergens initiate the start of an allergic response. These allergens trigger B-cell production of specific antibodies called IgE antibodies, which in turn activate mast cells and basophils to release histamine. Histamine is then responsible for the symptoms associated with allergies, such as inflammation caused by blood vessel dilation.

Note that you don't need to know specific details about IgE antibodies, but should be able to link the release of antibodies to activation of B-cells as with a specific immune response.

9

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The correct answer is **D**.

Myeloma cells are combined with B-lymphocytes to make hybridoma cells. Tumour cell is another name for myeloma cells. T-lymphocytes are not involved in the process (they do not produce antibodies).

10

The correct answer is **A**.

Zoonotic diseases are diseases that cross the species barrier to humans and are therefore of concern. It is thought that the COVID 19 pandemic originated from a virus that crossed the species barrier. Vaccination programs are used to try and control the spread of disease by using epidemiological data to direct efforts. Species-specific diseases are unable to cross the species barrier and are therefore less of a challenge to contain, this makes them less of a risk to humans and therefore less of a concern



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