1. How can complement be activated before any antibody has been made?

   ☐ Only through T cells

   ☐ It cannot; complement always needs antibody

   ☐ Only after vaccination

   ☐ Through the alternative and lectin pathways, which recognise microbial surfaces directly

2. A virus is making proteins inside a liver cell. How do T cells find out?

   ☐ T cells bind the free virus in the blood

   ☐ Viral peptides are shown on MHC class I to CD8 T cells

   ☐ Antibodies carry the virus to the T cells

   ☐ Viral peptides are shown on MHC class II to CD4 T cells

3. A naive T cell binds its peptide on MHC, but the presenting cell shows no B7. What happens?

   ☐ The T cell becomes a plasma cell

   ☐ The T cell is switched off (anergy)

   ☐ The T cell divides rapidly

   ☐ The T cell kills the presenting cell

4. How does a secondary response differ from a primary one?

   ☐ It is mainly IgM

   ☐ It needs a new set of naive cells

   ☐ It starts within hours to 2 days, is mostly IgG and peaks 10–100 times higher

   ☐ It is slower but longer

5. Why can a first-ever bee sting not cause type I anaphylaxis?

   ☐ Mast cells appear only in adults

   ☐ T cells must first be activated for three days

   ☐ No IgE against the venom exists yet to sit on mast cells

   ☐ Bee venom is harmless the first time

6. If one identical twin has type 1 diabetes, the other always develops it.

   ☐ True ☐ False

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☐ True ☐ False

8. NK cells need antibody before they can kill a virus-infected cell.

   ☐ True ☐ False

9. A T-cell receptor can bind a whole protein floating in the blood.

   ☐ True ☐ False

10. Vaccine adjuvants work by supplying the danger signal that leads to co-stimulation.

    ☐ True ☐ False

1. **Through the alternative and lectin pathways, which recognise microbial surfaces directly**

   Only the classical pathway is triggered by antibody; the other two start on microbial surfaces.

2. **Viral peptides are shown on MHC class I to CD8 T cells**

   MHC class I, on nearly all nucleated cells, shows what the cell is making; CD8 T cells inspect it.

3. **The T cell is switched off (anergy)**

   Signal 1 without co-stimulation tells the T cell to stand down.

4. **It starts within hours to 2 days, is mostly IgG and peaks 10–100 times higher**

   Memory cells are commoner, more sensitive and already switched to IgG.

5. **No IgE against the venom exists yet to sit on mast cells**

   The first exposure sensitises by making IgE; a later exposure cross-links it.

6. **False**

   Concordance is about 30–50%; the environment and chance decide the rest.

7. **False**

   Without T cells, the weakened vaccine microbe can cause serious disease.

8. **False**

   NK cells kill stressed cells and cells that have lost MHC class I directly; antibody can help but is not required.

9. **False**

   T cells see only short peptides held in MHC molecules on a cell surface.

10. **True**

    Adjuvants make dendritic cells express B7, so signal 2 accompanies the vaccine antigen.

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