

Defence against disease Pathogen	Defence against disease Which group of organisms is not known to cause disease in humans?
Defence against disease How is skin a physical and a chemical barrier?	Defence against disease How do mucous membranes defend the body?
Defence against disease Blood clotting, in order	Defence against disease Innate vs adaptive immune system
Defence against disease How do phagocytes control infection?	Defence against disease Where are lymphocytes found?

Archaea.

A disease-causing organism; the term is typically reserved for viruses, bacteria, fungi and protists.

Sticky mucus traps pathogens; in airways, cilia sweep it away; lysozyme in mucus digests bacterial cell walls.

Physical: tough outer layer of dead keratinized cells. Chemical: acidic secretions with antimicrobial chemicals that inhibit bacteria and fungi.

Innate: broad categories of pathogen, unchanged through life. Adaptive: specific to particular pathogens, builds memory so responses improve.

Platelets release clotting factors → cascade → thrombin → fibrinogen converted to fibrin → fibrin mesh traps erythrocytes → clot.

Circulating in the blood and contained in lymph nodes.

Amoeboid movement from blood to infection site, recognize pathogens, engulf them by endocytosis, digest them with lysosome enzymes.

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Antigen

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Why can a blood transfusion trigger antibody production?

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What two things activate a B-cell?

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Plasma cells

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Immunity

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What do vaccines contain?

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Herd immunity

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Four ways HIV is transmitted

Antigens on donated erythrocytes from a different blood group are recognized as foreign and stimulate antibody production.

A recognition molecule that triggers antibody production; usually a glycoprotein or other protein on the outer surface of a pathogen.

Antibody-secreting cells formed when activated B-cells divide by mitosis; a clone all making the same antibody.

Direct interaction with its specific antigen, and contact with a helper T-cell activated by the same antigen.

Antigens, or nucleic acids (DNA or RNA) with sequences coding for antigens. They stimulate immunity without causing the disease.

The ability to eliminate an infectious disease from the body, due to long-term survival of memory cells that make the specific antibodies.

Unprotected sex; sharing needles; unscreened blood transfusions; mother to baby via placenta, childbirth or breast milk.

When a sufficient percentage of a population is immune, transmission is greatly impeded, preventing epidemics and protecting non-immune people.

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Why does HIV infection lead to AIDS?

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Why do antibiotics not harm human cells?

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How does antibiotic resistance spread?

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How can careful use slow multiresistant bacteria?

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Zoonosis (with IB examples)

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How are rabies and Japanese encephalitis transmitted?

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Percentage change vs percentage difference

They block processes found in bacteria but not eukaryotic cells, eg cell wall synthesis or protein synthesis by 70S ribosomes.

HIV kills helper T-cells, so fewer B-cells are activated and fewer antibodies made; opportunistic infections cannot be fought.

Prescribe only for bacterial infections, complete the course, limit use in livestock, and maintain hospital hygiene.

Mutation or plasmid gives resistance; antibiotic kills susceptible bacteria; resistant ones survive and reproduce: natural selection.

Rabies: bite from an infected mammal (virus in saliva). Japanese encephalitis: bite of a mosquito that fed on infected pigs or birds.

An infectious disease that can transfer from other species to humans, eg tuberculosis, rabies, Japanese encephalitis, COVID-19.

Change: $(\text{final} - \text{initial}) \div \text{initial} \times 100$, one quantity over time, with a sign. Difference: $|A - B| \div \text{mean of A and B} \times 100$, two values with no starting point.