International
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162 – Causes of disease IX

Bacteria and viruses

Below is a summary that has been brought together in order to show some of the differences between bacteria and viruses.

	Bacteria	Viruses
Brief description	Single-celled, prokaryotic micro-organisms that can survive in animals or the environment	Acellular (has no cell structure) that require a living host to survive
Status	Living	Non-living
Ribosomes (bind mRNA and tRNA to produce proteins)	Present	Absent
Cell wall	Yes – peptidoglycan/ lipopolysaccharide	No – Just a protein coating
Structure	DNA and RNA floating freely in cytoplasm. Has cell wall and cell membrane	DNA or RNA enclosed inside a coat of protein
Size	Large (1,000nm)	Small (20-400nm)
See under light microscope	Yes	No
Reproduction	Asexual binary fission	Takes over the host cell causing it to make copies of the viral DNA/RNA
Number of cells	One – unicellular	None – not living
Free living growth, for example, in the environment	Yes	No
Laboratory culture	On agar plates	In cell lines, eggs or tissues. Will not grow on agar plates.
Enzymes	Yes	Yes in some
Infections	Often localised	Often systemic
Treatment of disease	Antibiotics	Antivirals (currently too expensive for animals)
Vaccines	Yes	Yes
Killed by disinfectants	Yes	Yes
Benefits	Some bacteria are beneficial, for example, certain bacteria are required in the digestive tract	Viruses are not beneficial although some can be useful in genetic engineering