

TD n°4

Bacteria can be categorized based on their oxygen requirement or tolerance levels. Bacteria that can not survive without oxygen are known as obligate aerobes. These microbes are dependent upon oxygen, as they convert oxygen to energy during cellular respiration. Unlike bacteria that require oxygen, other bacteria can not live in its presence. These microbes are called obligate anaerobes and their metabolic processes for energy production are halted in the presence of oxygen.

Other bacteria are facultative anaerobes and can grow with or without oxygen. In the absence of oxygen, they utilize either fermentation or anaerobic respiration for energy production. Aerotolerant anaerobes utilize anaerobic respiration but are not harmed in the presence of oxygen. Microaerophilic bacteria require oxygen but only grow where oxygen concentration levels are low. *Campylobacter jejuni* is an example of a microaerophilic bacterium that lives in the digestive tract of animals and is a major cause of foodborne illness in humans.

Helicobacter pylori are microaerophilic bacteria found in the stomach. They are neutrophiles that secrete an enzyme that neutralizes stomach acid.

Another important factor for bacterial growth is pH. Acidic environments have pH values that are less than 7, neutral environments have values at or near 7, and basic environments have pH values greater than 7. Bacteria that are acidophiles thrive in areas where the pH is less than 5, with an optimal growth value close to a pH of 3.

The majority of bacteria are neutrophiles and grow best in sites with pH values close to 7. *Helicobacter pylori* is an example of a neutrophile that lives in the acidic environment of the stomach. This bacterium survives by secreting an enzyme that neutralizes stomach acid in the surrounding area.

Exercise 1

a) Classify the main types of bacteria according to their oxygen requirements

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b) Give a definition to each class of bacteria mentioned above.

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c) Find from the text an example of microaerophilic bacteria

Exercise 2

1. Give the singular of these nouns

Fungus, bacterium, médium, protozoon, phylum

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2. Translate what follow into French

Antibiotic resistance is now reaching dangerously high levels in all regions of the world. New resistance mechanisms are emerging and spreading around the world, compromising our ability to treat common infectious diseases.

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3. Translate what follow into English

Les antibiotiques sont des médicaments utilisés pour traiter et prévenir les infections bactériennes. La résistance survient lorsque les bactéries évoluent en réponse à l'utilisation de ces médicaments.

4. Fill in the missing words: Keywords: synthesise, complex, depend, simple

Though the bacterial structure is very-----, they are very----- in behaviour.

Compared to many other organisms, bacteria as a group show the most extensive metabolic diversity. Some of the bacteria are autotrophic: they -----their own food from inorganic substrates.

They may be photosynthetic autotrophic or chemosynthetic autotrophic. The vast majority of bacteria are heterotrophs, they -----on other organisms or on dead organic matter for food