

Test n°1

The development of bacterial communities is a very complex process in which bacteria form complex three-dimensional structures.

“We used *Bacillus subtilis* as a model organism. This ubiquitous bacteria is also found in our intestinal flora. We revealed that these bacteria, which live in communities, cooperate and interact with each other across generations,” explains Professor Knut. Drescher, head of the study. *Bacillus subtilis* is a Gram-positive bacillus (family Bacillaceae), ubiquitous, common in soils. It is a mobile, strictly aerobic bacteria capable of forming very resistant spores in the environment. It can, on the other hand, form biofilms. *B. subtilis* is considered to have no pathogenicity for humans, apart from exceptional food poisoning. It is sometimes used to facilitate the reconstitution of the intestinal microbiota. The *B. subtilis* bacteria has several modes of action: it competes with pathogens for nutrients, but also prevents their attachment to the plant while stimulating the natural defenses of plants.

When bacteria build communities, they cooperate and share nutrients between generations. Researchers from the University of Basel were able to demonstrate this for the first time using a newly developed method. This innovative technique makes it possible to monitor gene expression during the development of bacterial communities in space and time. Indeed, *B. subtilis*, whose genome has been completely sequenced, is, moreover, a bacterium used in the laboratory to study certain metabolic pathways, cellular differentiation and genetic regulation. Finally, it constitutes a source of enzymes for the food and pharmaceutical industries.

Questions:

Exercise1

Read the text carefully and do the activities.

1) Propose an appropriate title to the text above.

2) Find in the text words or phrases that are closest in meaning to the following


- a) present anywhere =
- b) obligate aerobes =
- c) able =

3) Find in the text words that are opposites of the following

- a) vulnerable /
- b) simple/

- c) cause/

1. Bacterial morphology & gram stain

Bacillus subtilis	shape	approximate size	Gram
			

2- Describe the bacteria studied in the text

3- Note from the text the different modes of action of these bacteria.

Exercise 2

I- Choose the correct answer from these propositions

- 1-Gram staining allows
- 2-identify immobile bacteria
- 3-distinguish cocci from bacillus
- 4-attach bacteria to the slide
- 5-no previous proposition is correct

II- Fill in the missing words:

a) **Keywords:** Microorganisms, Microbiology

-----is an essential element of our everyday lives. This is not only the consequence of the importance of some pathogenic-----, but also due to their positive and important role in processes related to human health, food production or waste recycling, to cite a few.

b) **Keywords:** yogurt, variety, sugars, temperature, good.

Yogurt is made with a -----of ingredients including milk, proteins, fats, -----, stabilizers, fruits, emulsifiers, flavors and bacterial culture.

The milk used for yogurt production should be -----quality and tested antibiotic free otherwise the antibiotics in the milk can kill the starter cultures.

The process of making -----includes modifying the composition of and pasteurizing the milk at a high -----90°C and holding at that temperatures with the set temperature optimized for the yogurt culture selected; cooling, adding fruit, sugar and other ingredients.

Exercise3

Connect with an arrow each type of bacteria to its color after Gram staining.

- | | |
|----------------------------------|------------------|
| 1. Gram-positive bacteria | A. rose |
| 2. Gram negative bacteria | B. violet |