

## II. Observing bacteria : gram staining and wet mount

### What is a bacterium?

- ▶ A bacterium is a microorganism. Its average size is approximately 1 to 5  $\mu\text{m}$ .
- ▶ A bacterium is also unicellular (single-celled), which means it's a whole living being made up of only one cell. It is composed of the three constant elements of cells:
  - Plasma membrane surrounding it
  - A cytoplasm, which is simpler and without many organelles (except ribosomes)
  - Genetic material (DNA)
- ▶ A bacterium is a prokaryote, which means its genetic material is not contained inside a proper nucleus, but free in the cytoplasm.

To observe and describe bacteria, you must use a microscope, because they are too small to be seen with bare eyes. The two main techniques to observe bacteria under a microscope are the Gram staining and the wet mount.

### A. The Gram staining:



### **Hans Christian Joachim Gram** (1850–1938)

H.C.J. Gram was a Danish physician, who traveled throughout Europe during his post-doctoral studies. When he was in Berlin in 1884, he developed a method to distinguish between two major classes of bacteria: this technique is known as the Gram Stain or the Gram's method. He did not entirely invent it, but rather modified and improved a method already used to stain bacteria but which did not allow to clearly differentiate them. He is also famous for his study of human red blood cells and some pathologies related to them, for which he was awarded a Gold Medal in 1878.

Activity n°3: Let's recap the steps of the Gram staining!

Activity n°4: Let's figure out what will happen if.....

### B. The wet mount:

Activity n°5: Let's make a wet mount!

Activity n°6: Let's compare the two techniques!

Activity n°7: Let's see other techniques!