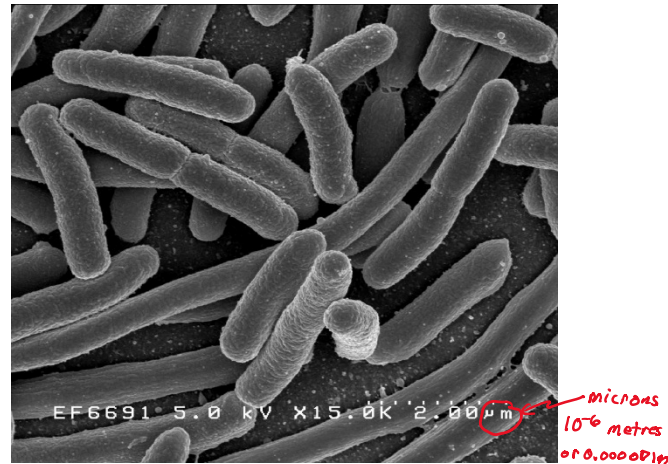


## Introduction to Bacteria

Bacteria is one of three Domains of life. Along with Archea are grouped as <sup>"first" "kernel"</sup> **Prokaryotes**, cells lacking **membrane bound organelles**, such as the nucleus, mitochondria, chloroplasts, Golgi body, vacuoles, endoplasmic reticulum, etc. Bacteria are small (see scale for the picture of the **streptobacilli** at right), and are found where ever we have looked for life.

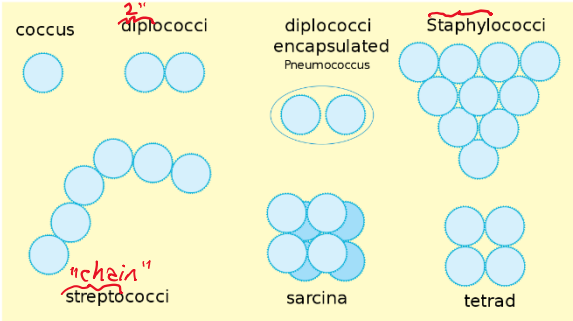
They were the first organisms on Earth and probably about 4 billion ( $10^9$ ) years ago, based on possible fossil finds of microfossils in Quebec recently, dated between 3.5 - 4.5 billion years ago.

Since bacteria are so small, they were initially categorized by their shape and how the group (see below)

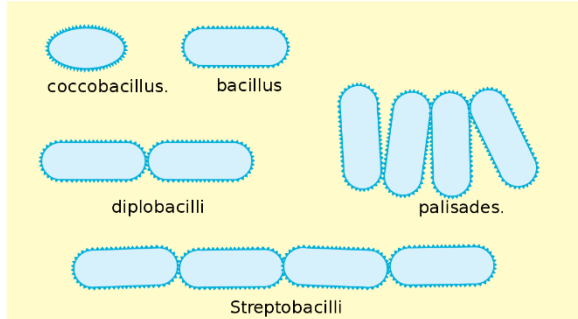


By Credit: Rocky Mountain Laboratories, NIAID, NIH - NIAID: These high-resolution (300 dpi) images may be downloaded directly from this site. All the images, except specified ones from the World Health Organization (WHO), are in the public domain. For the public domain images, there is no copyright, no permission required, and no charge for their use., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=104228>

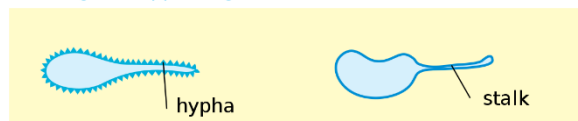
### Cocci - spheres



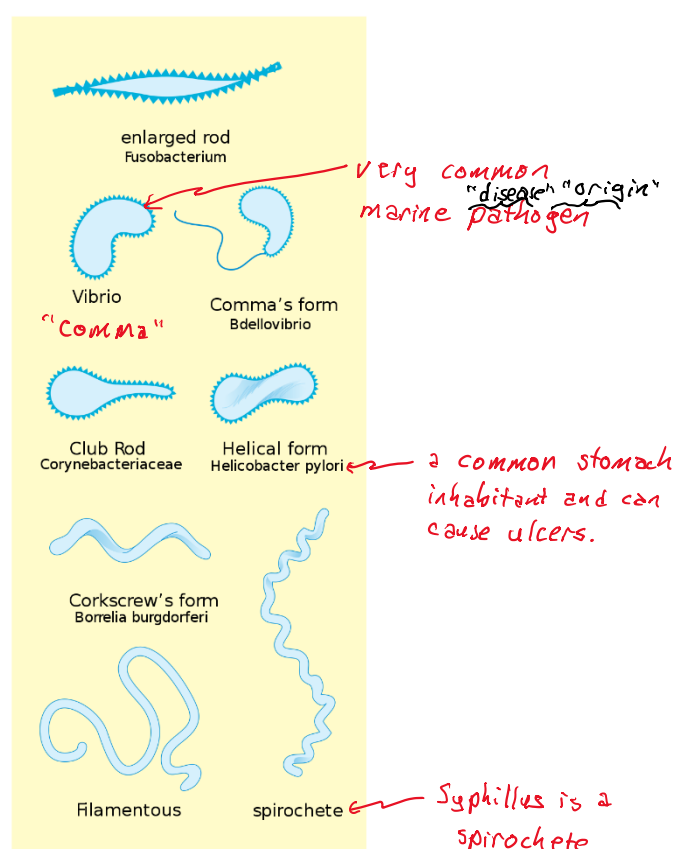
### Bacilli - rods



### Budding and appendaged bacteria

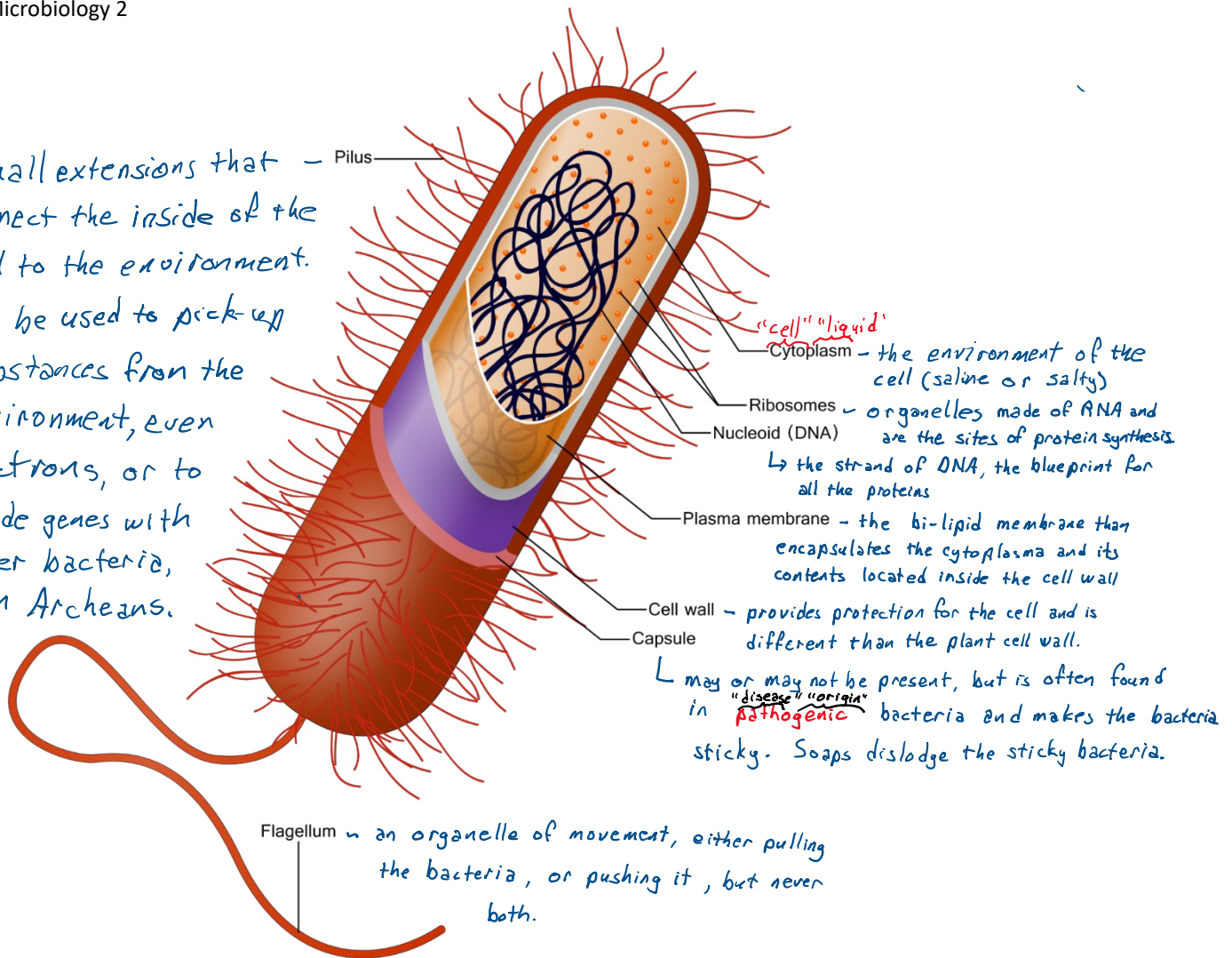


### Others



By Mariana Ruiz LadyofHats - the image i did myself using adobe illustrator, using the information found on [1], [2], [3], [4], [5], [6], [7] and the book "medizinische mikrobiologie" from ernst wiesmann ED. Thieme (1986), Public Domain, <https://commons.wikimedia.org/w/index.php?curid=738916>

Small extensions that connect the inside of the cell to the environment. Can be used to pick up substances from the environment, even electrons, or to trade genes with other bacteria, even Archeans.



By This vector image is completely made by Ali Zifan - Own work; used information from Biology 10e Textbook (chapter 4, Pg: 63) by: Peter Raven, Kenneth Mason, Jonathan Losos, Susan Singer · McGraw-Hill Education., CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=44194140>

Bacteria reproduce by **binary fission**, splitting in two. Some, like Escherizia coli or E. coli, poop bacteria, double their population every twenty minutes. One cell becomes  $4,7 \times 10^{21}$  bacteria. Bacteria do not die. They get eaten and can be killed, but do not have a life span. They also do not have sexual reproduction.