

# BIOINFORMATICS: GENOMES AND ALGORITHMS

Computer analysis of genetic information

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# GENOMES AND ALGORITHMS

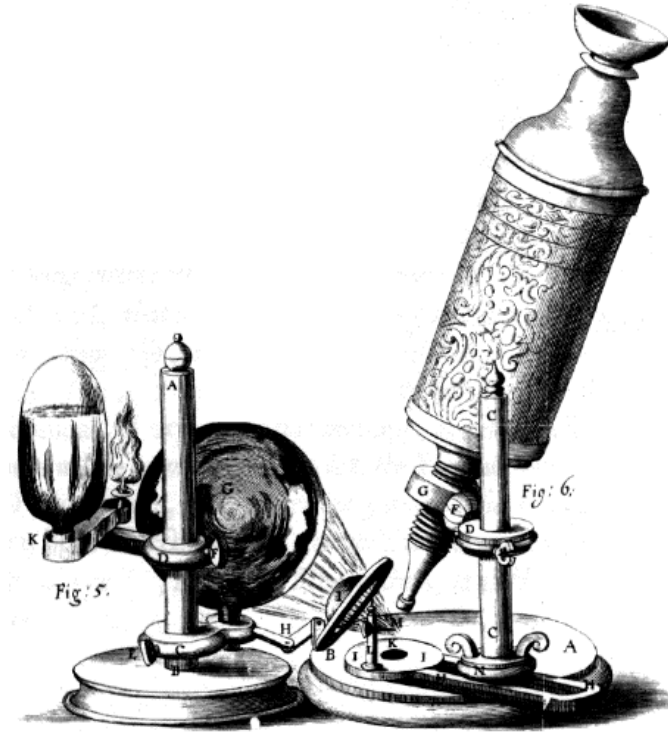
1. Genomic texts
2. Genes and proteins
3. Gene prediction
4. Sequence comparison
5. Phylogenetic trees

# 1. Genomic texts

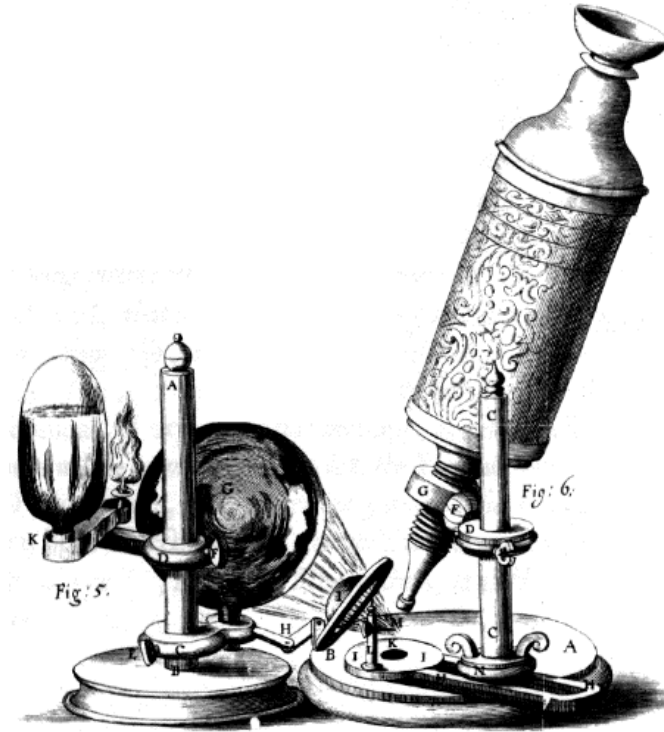
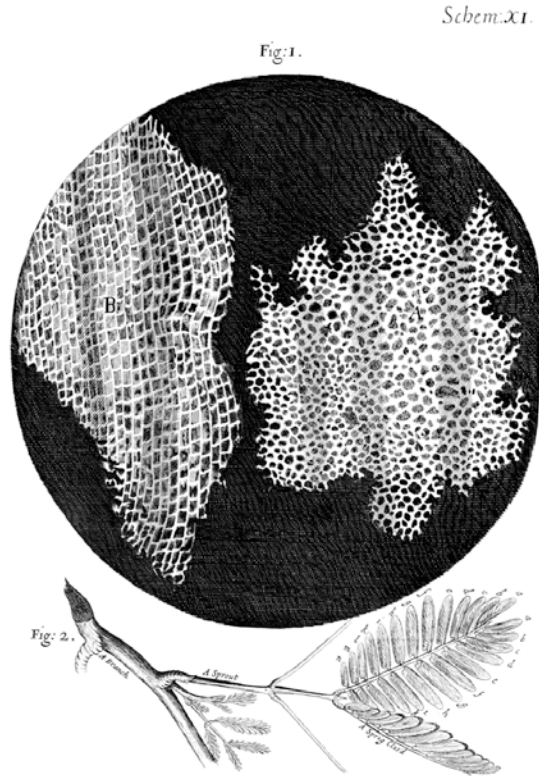
- **The cell, atom of the living world**
- At the heart of the cell: the DNA macromolecule
- DNA codes for genetic information
- What is an algorithm?
- Counting nucleotides
- GC and AT contents of DNA sequence
- DNA walk
- Compressing the DNA walk
- Predicting the origin of DNA replication?
- Overlapping sliding window

# The cell, atom of the living world

In 1667, Robert Hooke saw the “walls” of a cell



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# The cellular theory

- All living organisms are composed of cells
  - Every cell comes from another cell
  - Cells are functionally autonomous
  - Cells are separated, but not isolated, from their environment by a membrane

« What is true for the bacterium  
is also true for the elephant »  
(Jacques Monod)

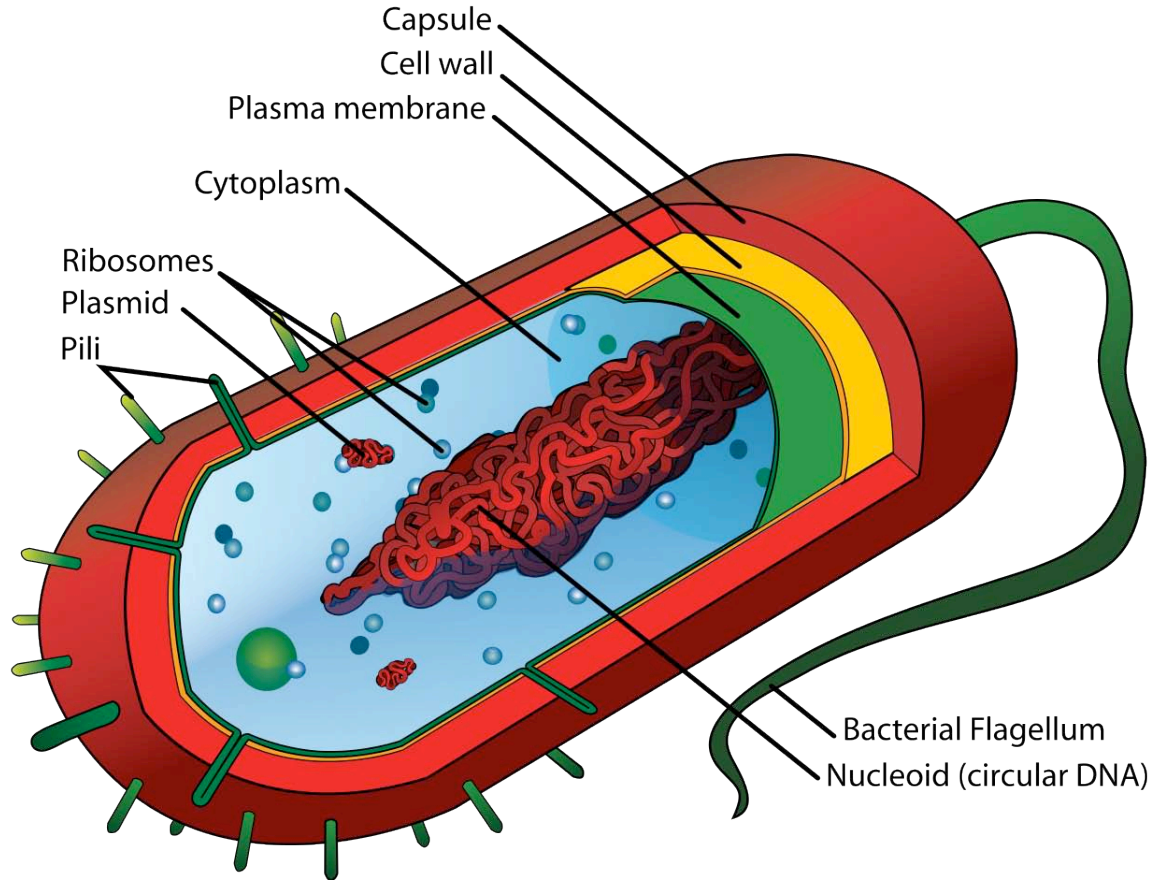
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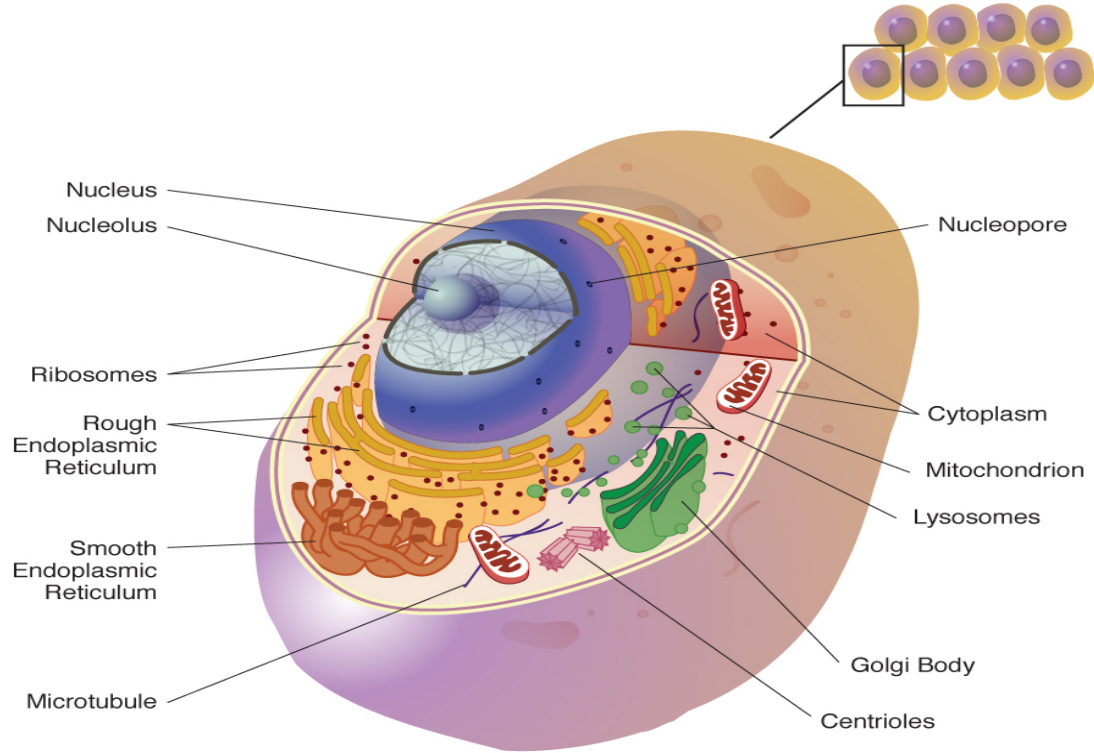
And viruses?



# Bacterial (prokaryotic) cell



# Eukaryotic cell



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