

BIOINFORMATICS: GENOMES AND ALGORITHMS

Computer analysis of genetic information

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GENOMES AND ALGORITHMS

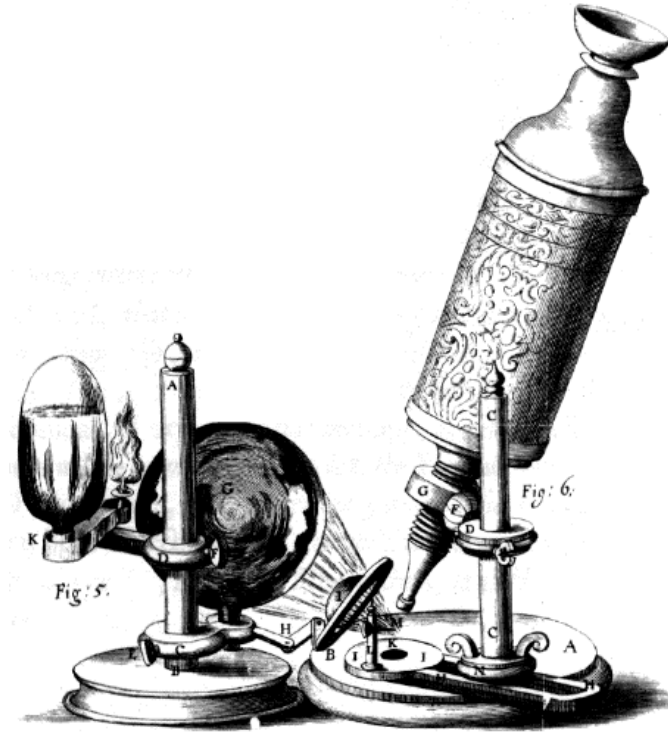
1. Genomic texts
2. Genes and proteins
3. Gene prediction
4. Sequence comparison
5. Phylogenetic trees

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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Schem. XI.

Fig: 1.

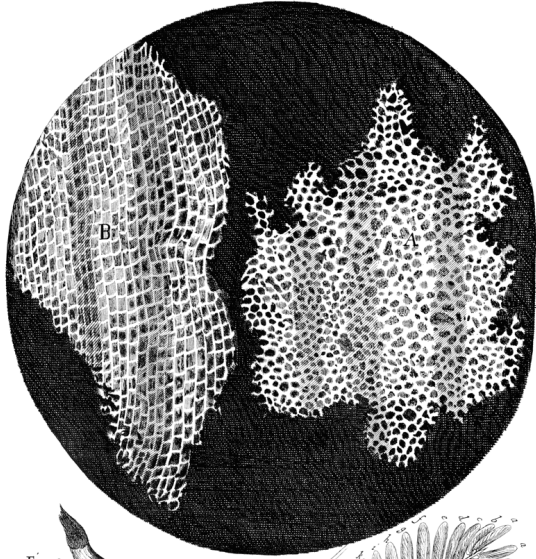
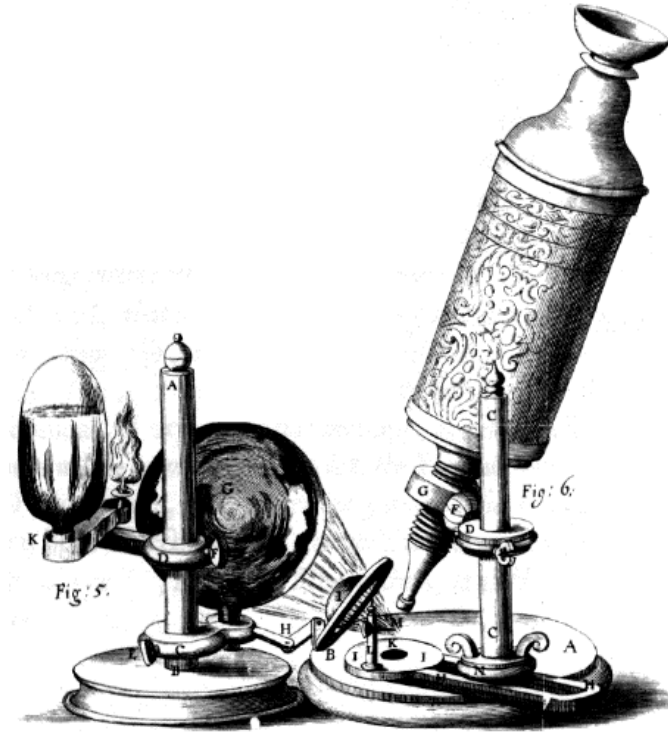
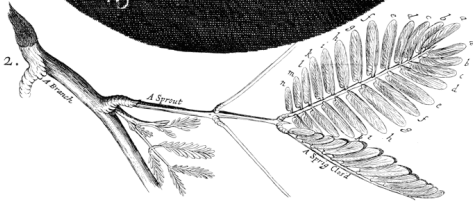


Fig: 2.



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

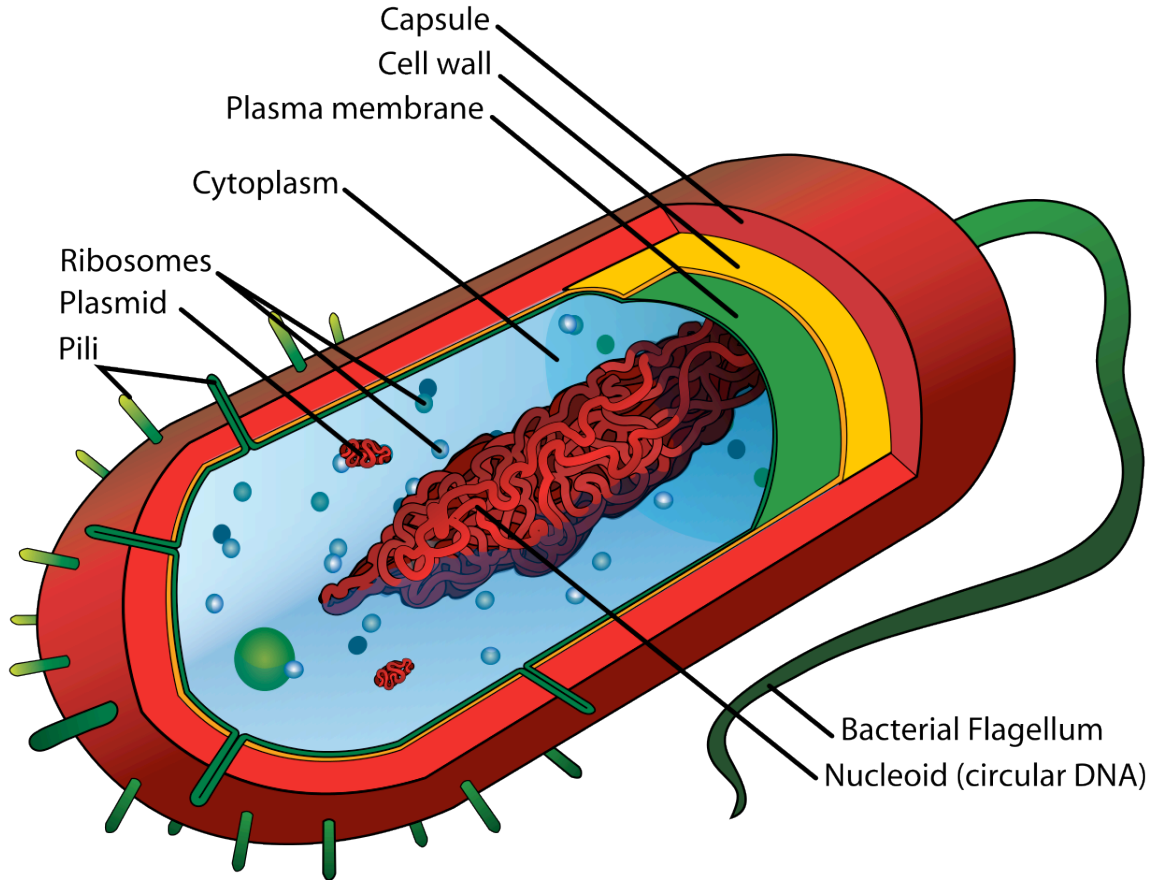
« What is true for the bacterium
is also true for the elephant »
(Jacques Monod)

The cellular theory

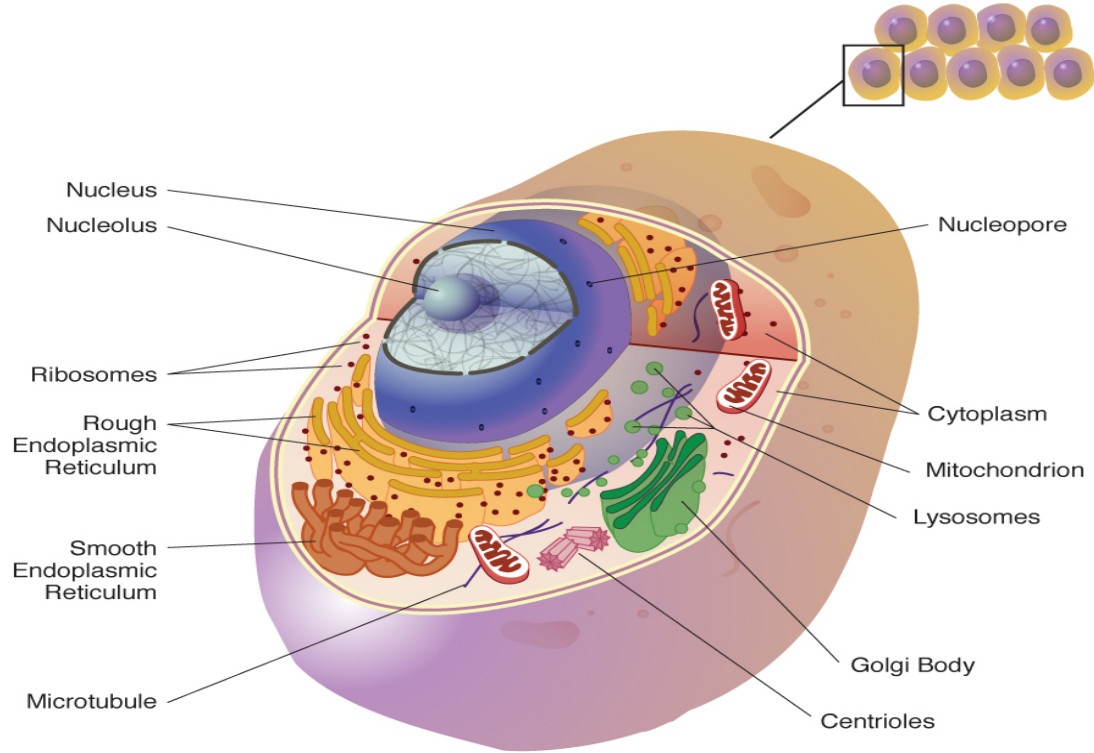
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And viruses?

Bacterial (prokaryotic) cell



Eukaryotic cell



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