Computer genomics

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1 Rembering old topics on DNA

What is DNA made of?

- Pentose sugar (the *sides* of the ladder)
- Phosphate group (the *sides* of the ladder)
- Nitrogenous bases (the rungs of the ladder)

What is a polymer:

Any of a class of natural or synthetic substances composed of very large molecules, called macromolecules.

What is a Nitrogenous base made of?

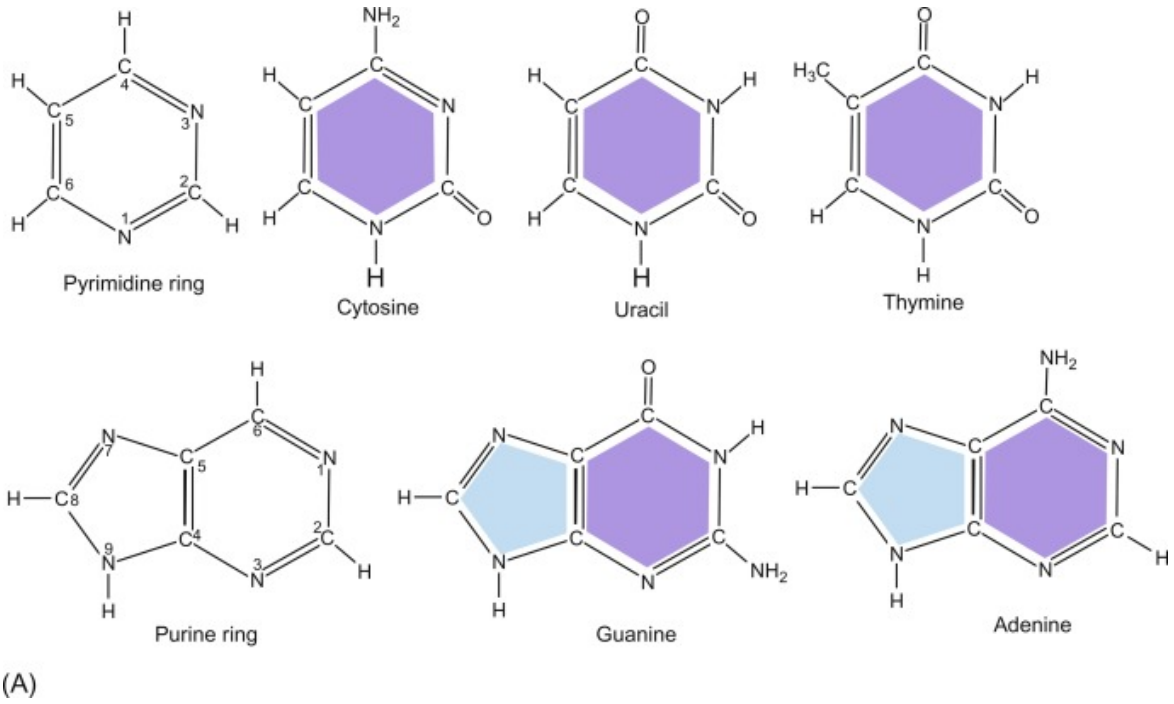

Figure 1: Nitrogenous bases are made of...

What process can you do with DNA?

- Translation (Protein Synthesis)
- Transcription (Synthesizes RNA)
- Central Dogma (Transcription + Translation)

Where on earth can I find DNA?

The nucleus of a cell contains Chromosomes and DNA is contained within the Chromosomes.

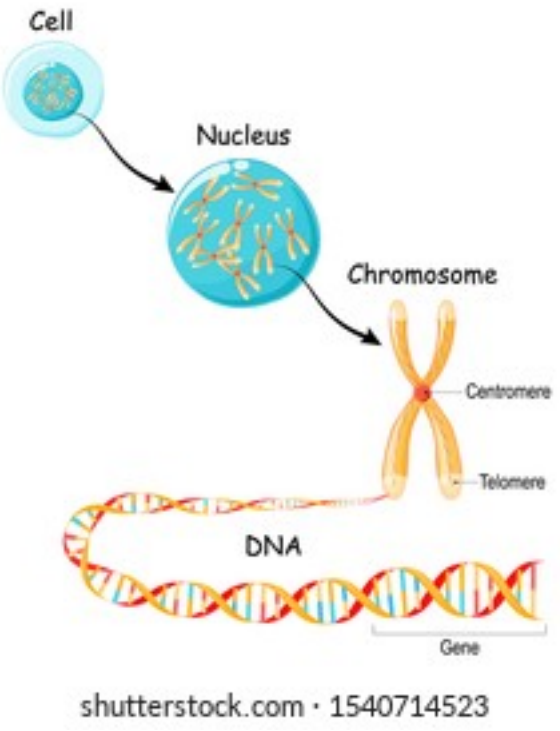

Figure 2: DNA...

Nucleotide composition

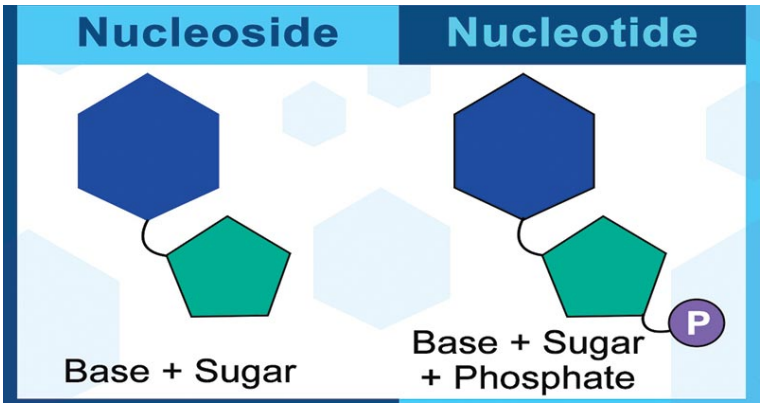

Figure 3: Here we see a nucleotide and a nucleoside

Remember!

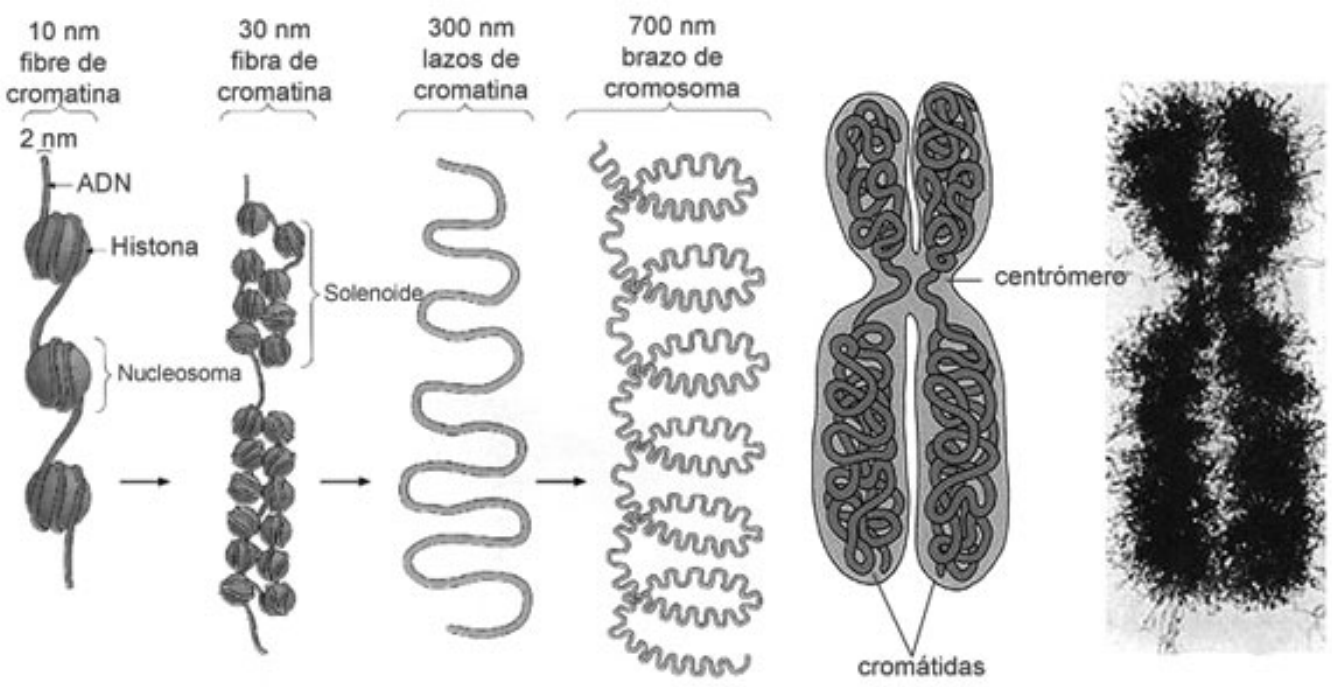

Figure 4: A deeper look into Chromosomes

2 Beggining and struggles in the age of genomics.

Notes about the video:

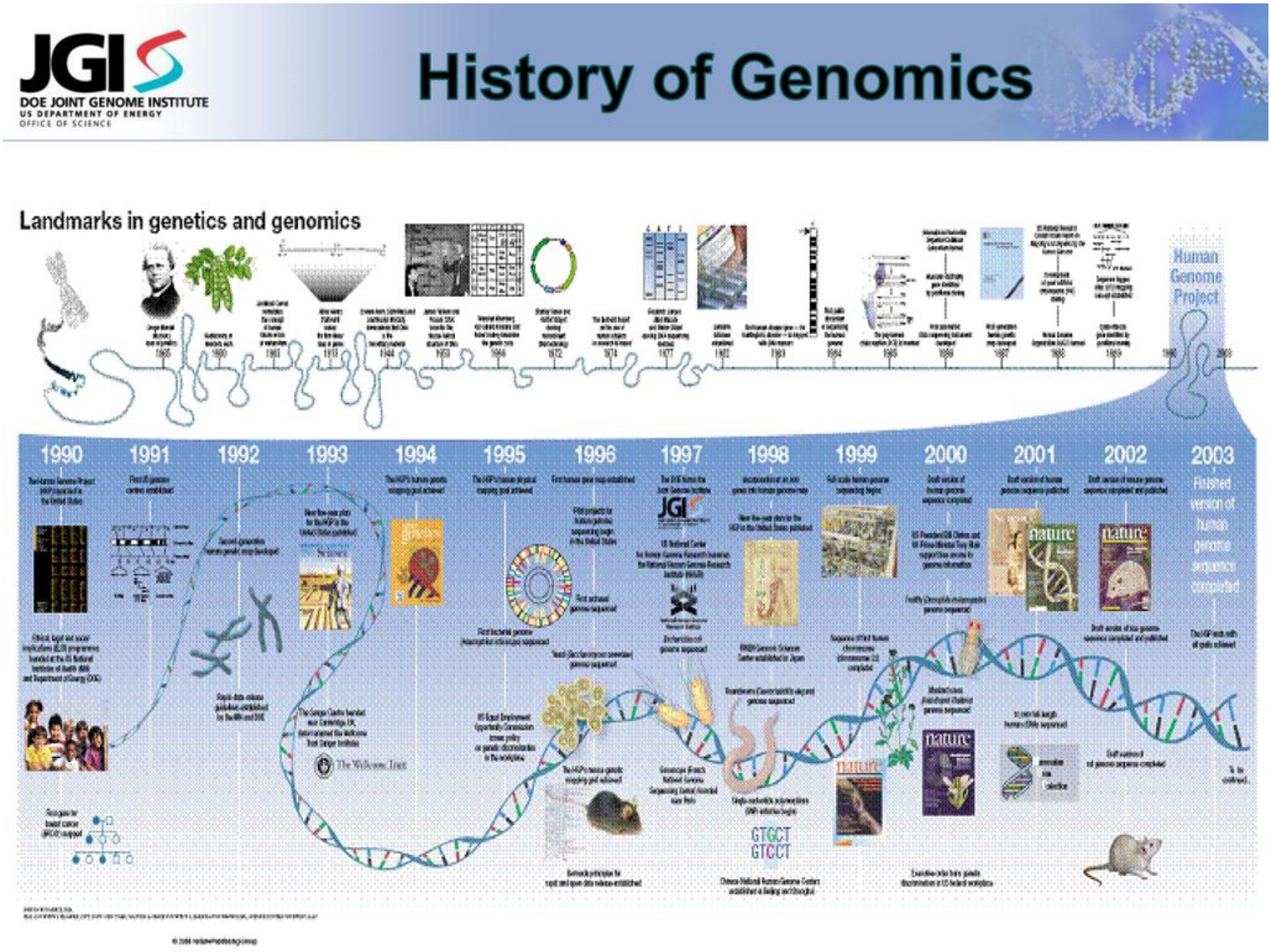

Figure 5: History of Genetics

3 Important years

1865: Laws of genetics (Mendel laws).
1900: Darwin theory + Mendel laws join together
1913: Alfred Henry first linear genetic maps
1953: Watson and Crick discover the structure of DNA

1966: Determination of the genetic code
1977: Creating of the first methods to sequence DNA
1982: GenBank database was established
1985: Discovery of the chain reaction polymerase
1988: They start to talk about the human genome project
1990: The human genome starts and the ELS(Ethical, legal and social implications)
1993: The wellcome Trust Sanger Institute
1997: Joint Genome institue and National Humans Genome Research Institute (JGI and NHGRI)
2003: Finished version of the human genome sequence completed

Challenges Biology: Concrete the structure and function of the genomes.
Health: Find benefits based on the human genome knowledge.
Society: Use genomics to maximize the benefis and minimize dangers in society.

- Humans share 99 of their DNA.
- Thymine gets along with Adenine. (hydrogen bonding)
- Guanine gets along with Cytosine. (hydrogen bonding)
- Model organisms: yeast, bacteria.

The three biggest challenges:

- Indentify the functional and structural components in the HG.
- Understand the organization of the genetic networks and protein routes to see how they corelate to the phenotype in organisms.
- To develop a detailed hereditary variation in the HG.
- To comprehend biggest