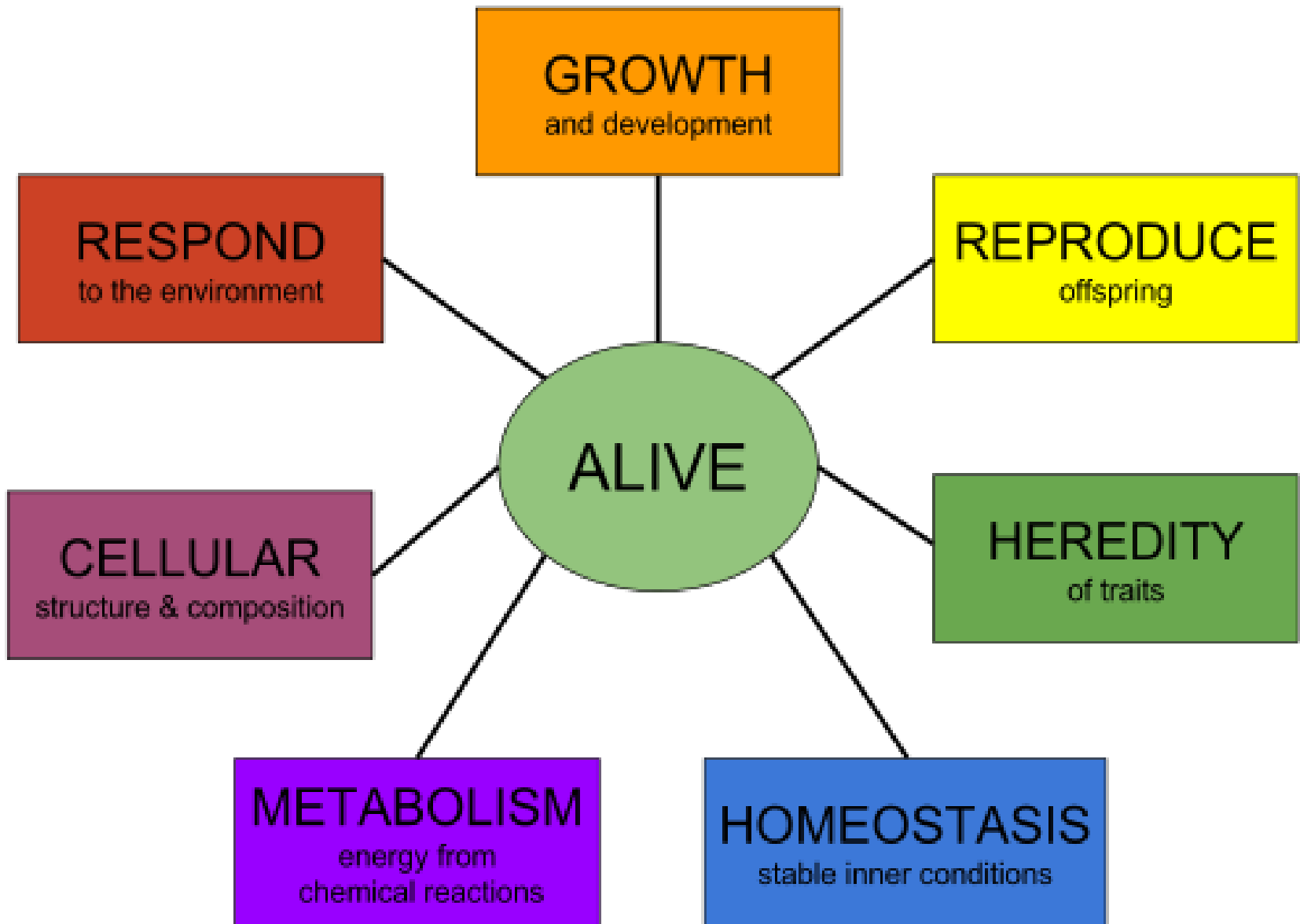


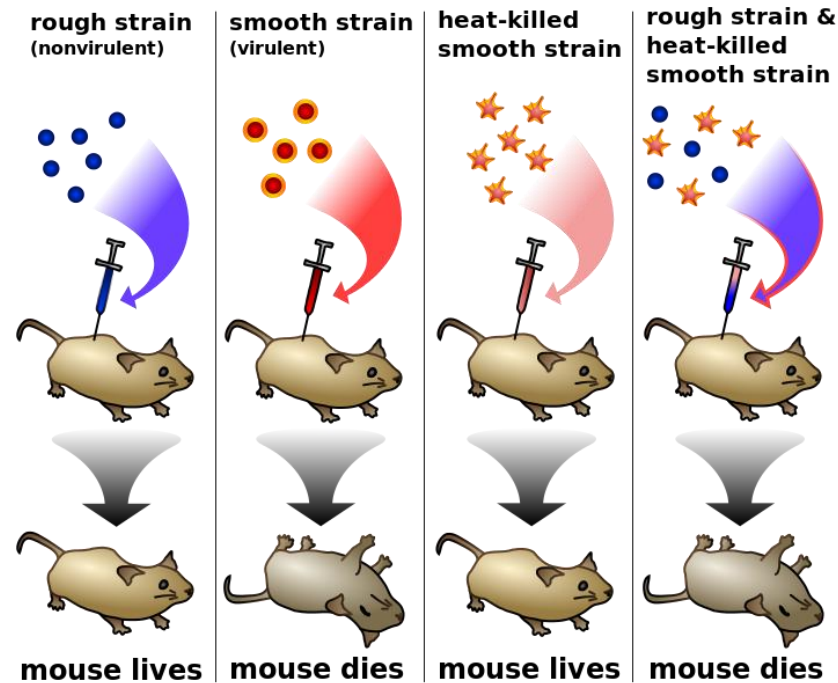
Nucleic Acids



Nucleic acids carry genetic information

- For long time scientists assumed that genetic information is carried by proteins
- In 1928 Griffith reported an experiment suggesting that bacteria are capable of transferring genetic information through a process known as transformation.
- In 1944 Avery, MacLeod and McCarty reported experiment showing that DNA was transforming factor in bacteria.

Griffith experiment



- Griffith experiment indicated that non-pathogenic strain of bacteria could be "transformed" into the lethal strain by a "transforming principle" that was somehow part of the dead pathogenic bacteria.
- Avery, MacLeod and McCarty showed that the "transforming principle" was DNA from the dead bacteria.

Functions of nucleic acids in the cell

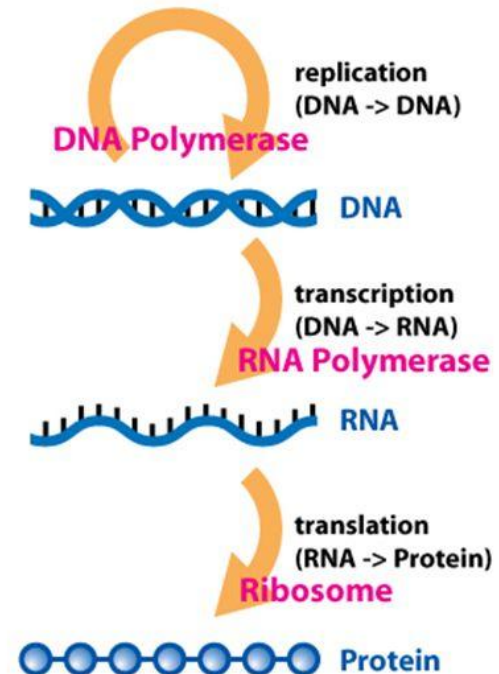
- Storage and propagation of genetic information.
- Transcribing and translating of genetic information into protein sequences.
- Structural and catalytic functions.
- Regulatory functions.

The Central Dogma of Molecular Biology

- Information is transferred from DNA to RNA to protein

DNA -> RNA -> Protein

- Proteins create traits
- This is called **gene expression**
- This process is found in all organisms



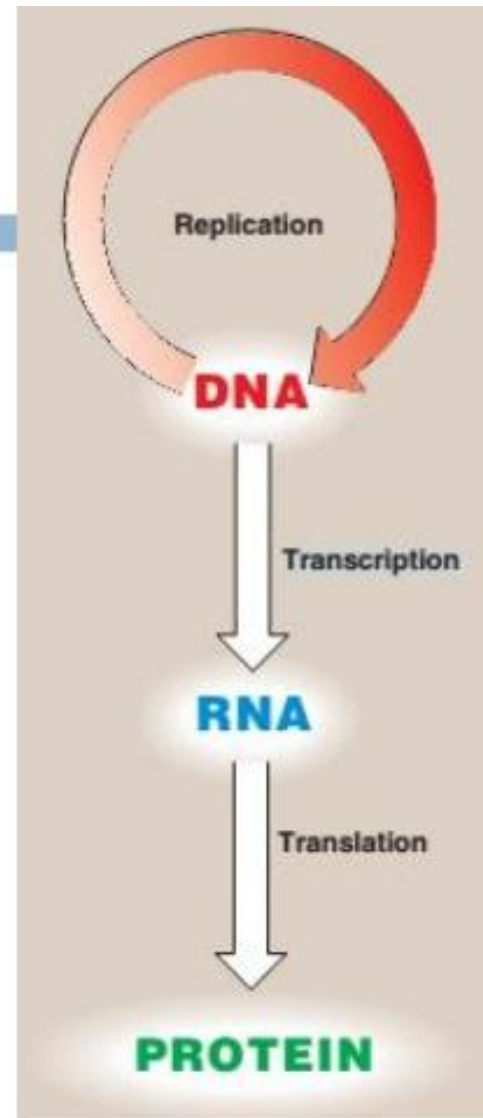
Nucleic acids

3

□ Information flow

- **DNA** → **RNA** → **PROTEIN**
- **DNA:** storage of genetic information
- **RNA:** expression of genetic information
- **PROTEIN:**

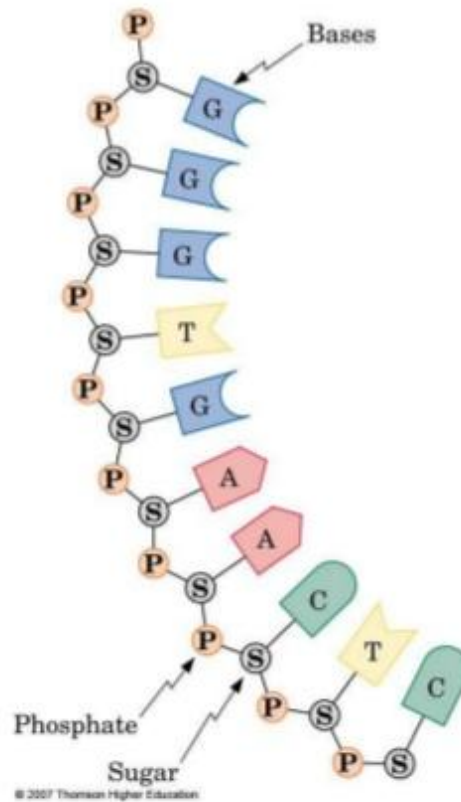
Rajesh Chaudhary



Chemical structure of nucleic acids

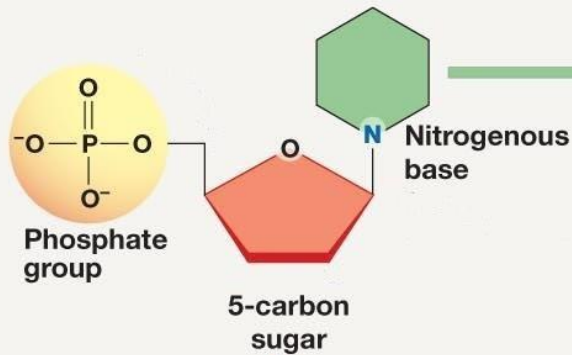
- Nucleic acids are biopolymers. They are chains consisting of monomers called nucleotides joined together by phosphodiester bonds

Structure of DNA and RNA

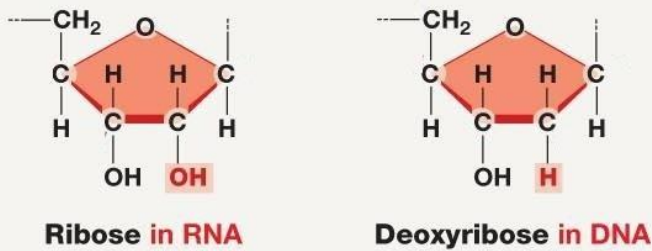


Nucleotides

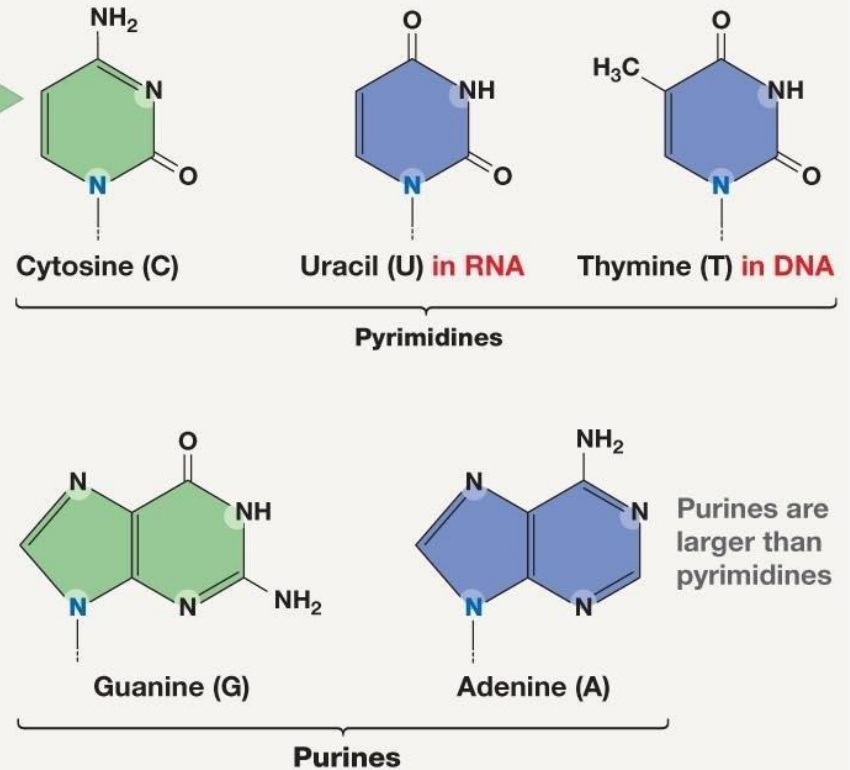
Basic Nucleotide Structure



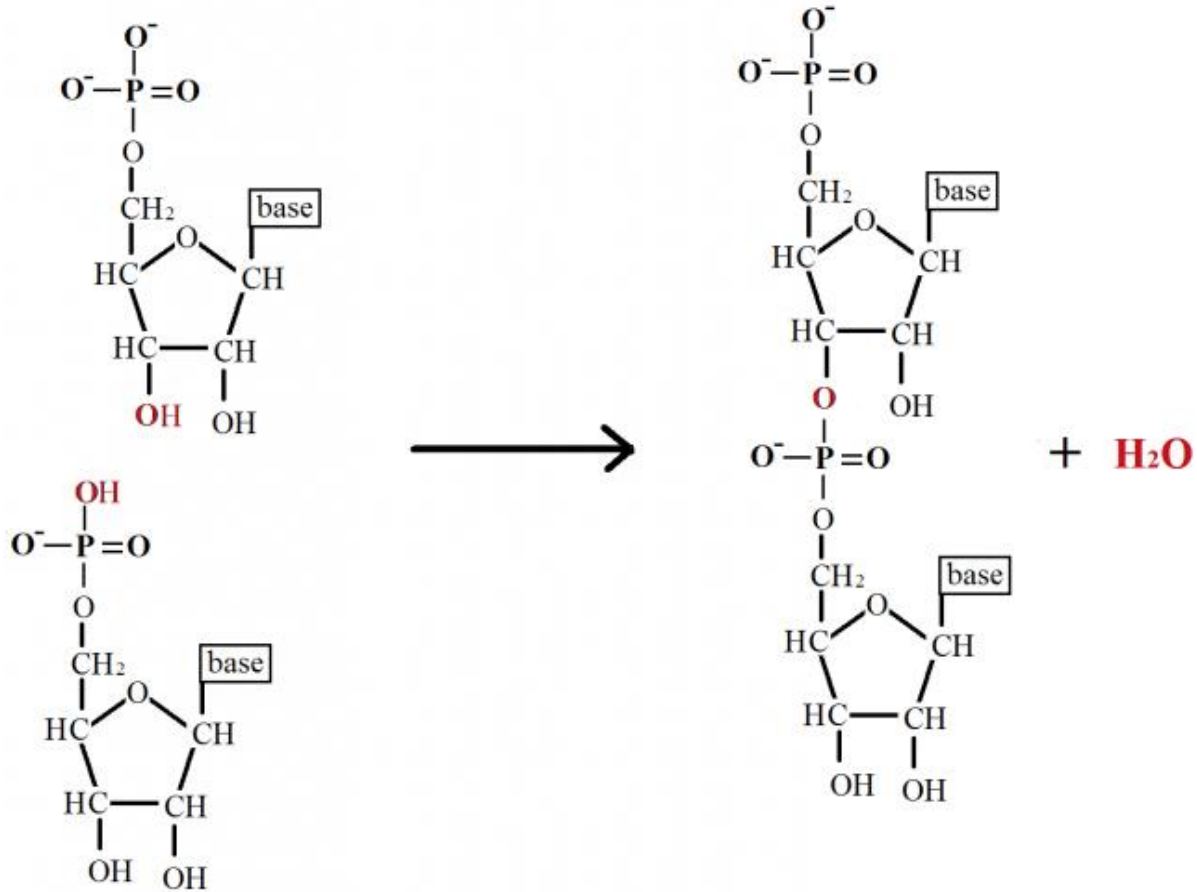
(b) Sugars



(c) Nitrogenous bases



Phosphodiester bond



Nucleic acid strand has direction

