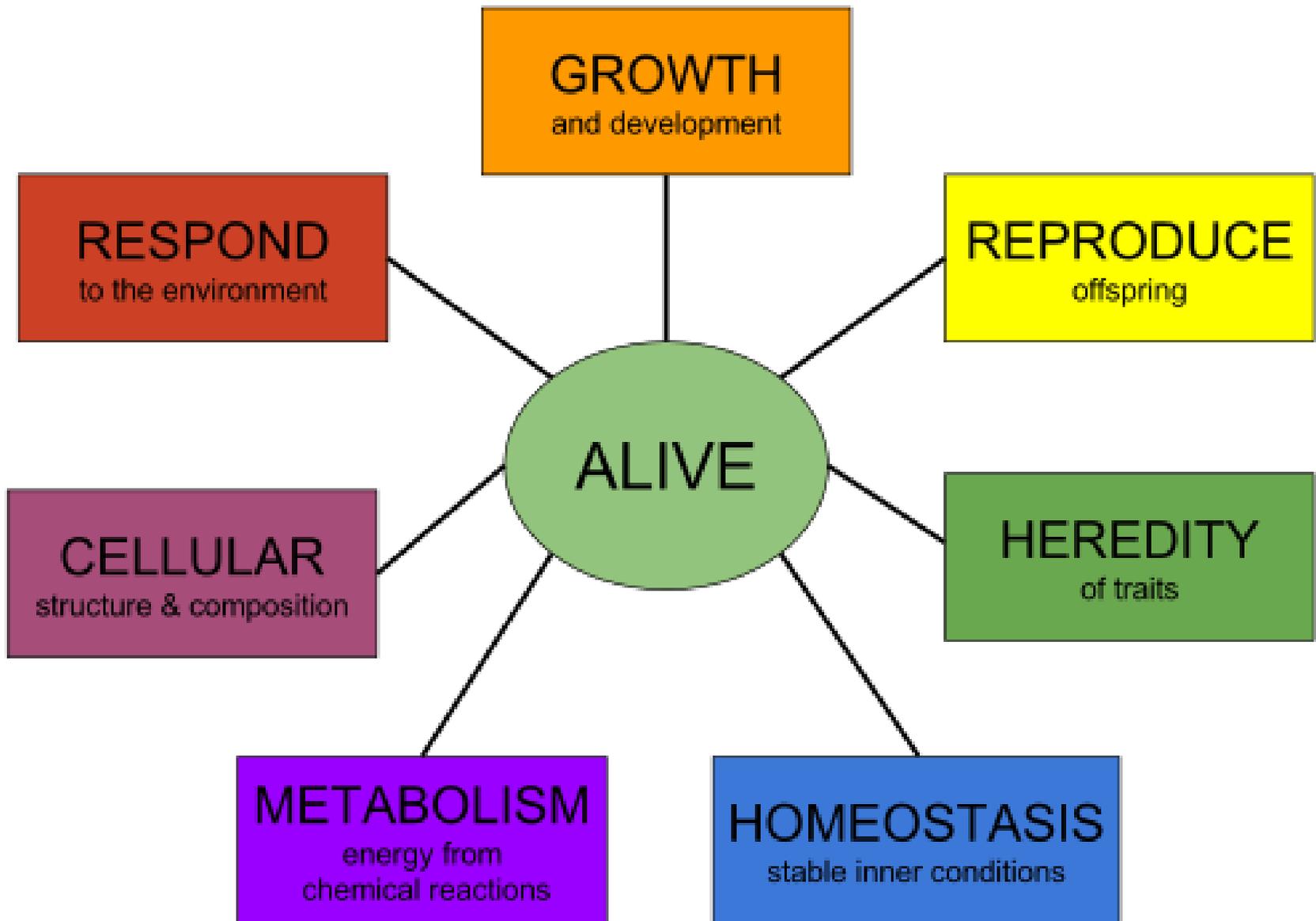


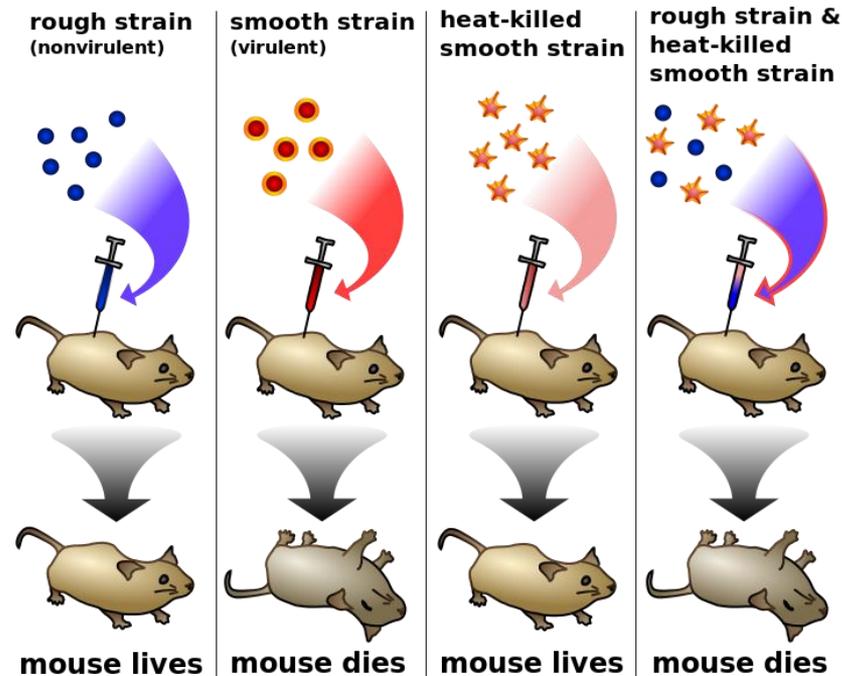
# **Nucleic Acids**



# 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

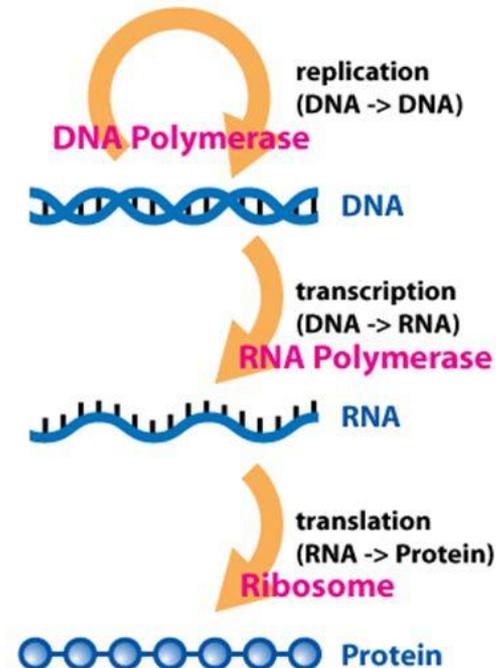
- Storage and propagation of genetic information.
- Transcribing and translating of genetic information into protein sequences.
- Structural and catalytic functions.
- Regulatory functions.

# 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



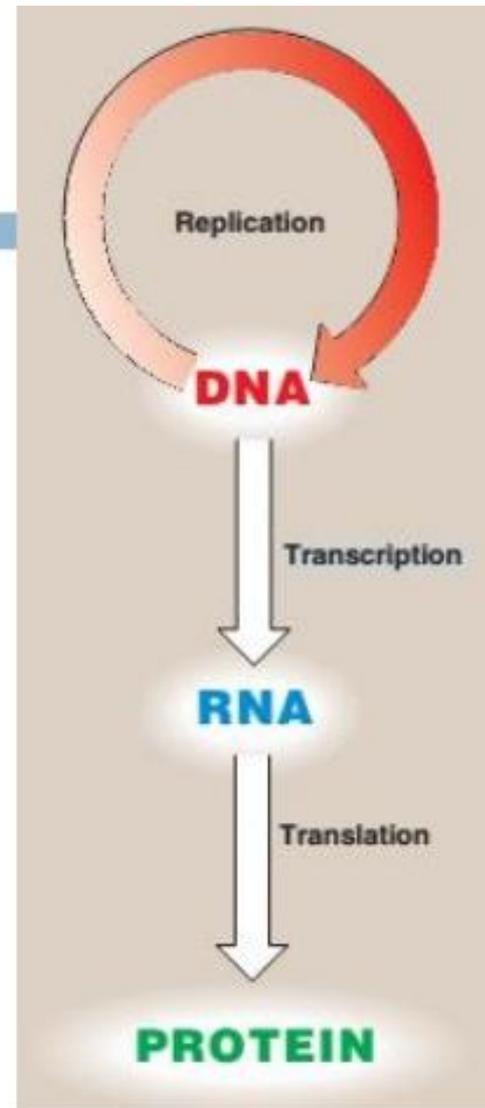
# Nucleic acids

3

## □ Information flow

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

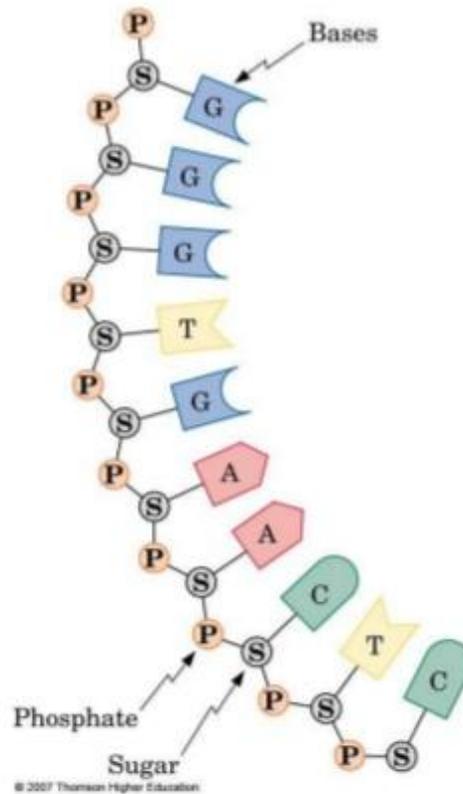
Rajesh Chaudhary



# Chemical structure of nucleic acids

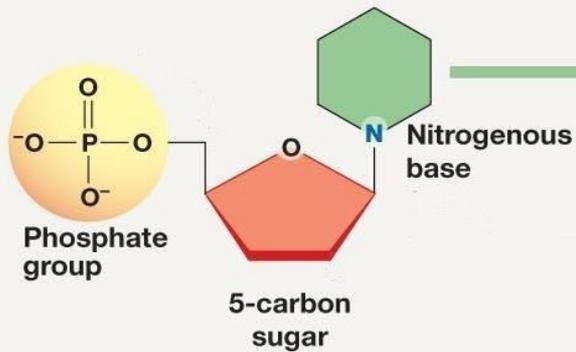
- Nucleic acids are biopolymers. They are chains consisting of monomers called nucleotides joined together by phosphodiester bonds

# Structure of DNA and RNA

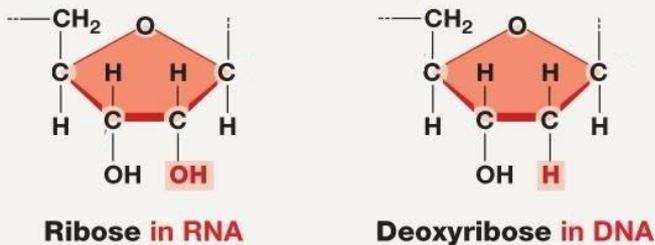


# Nucleotides

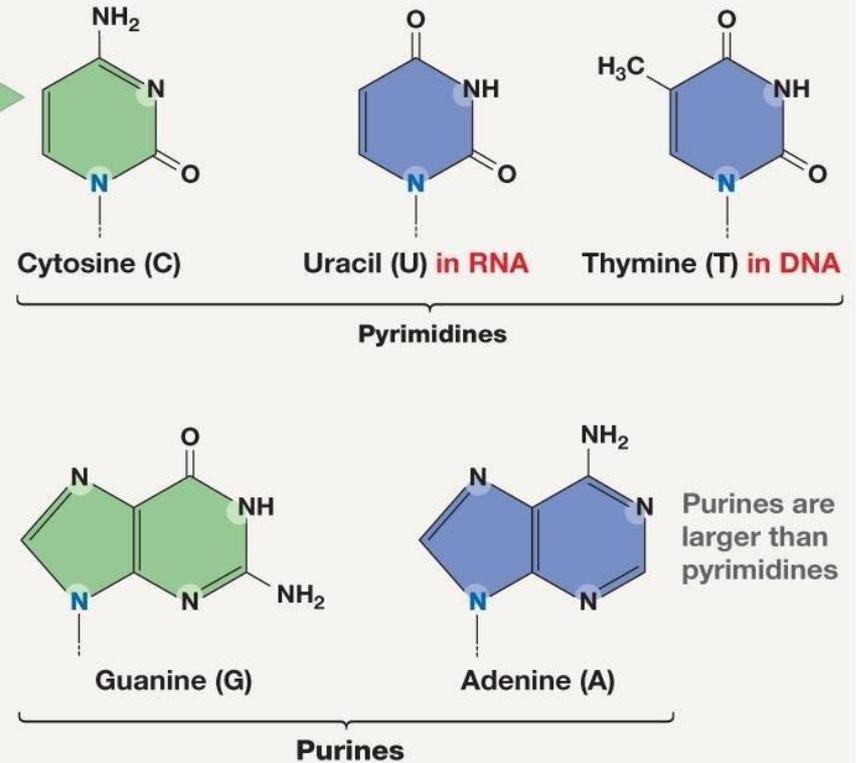
## Basic Nucleotide Structure



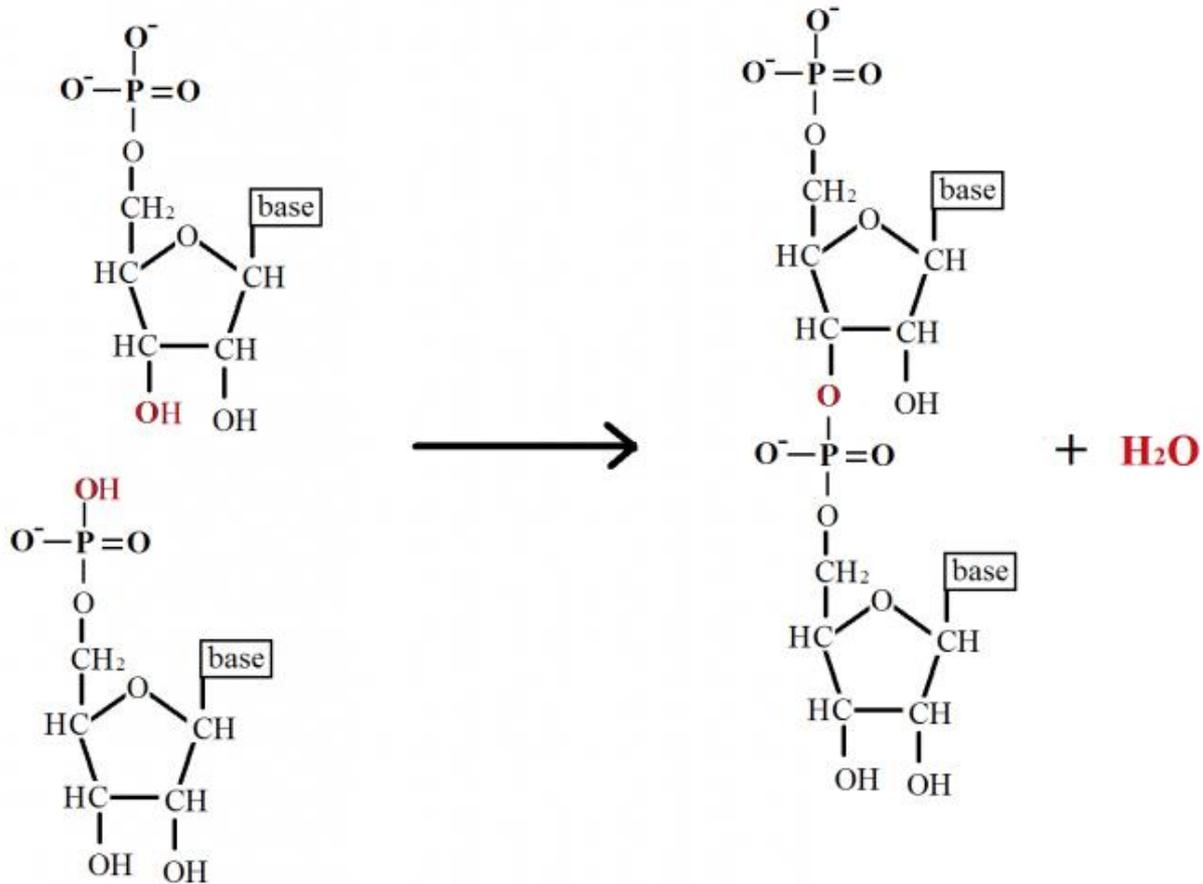
## (b) Sugars



## (c) Nitrogenous bases



# Phosphodiester bond



# Nucleic acid strand has direction

