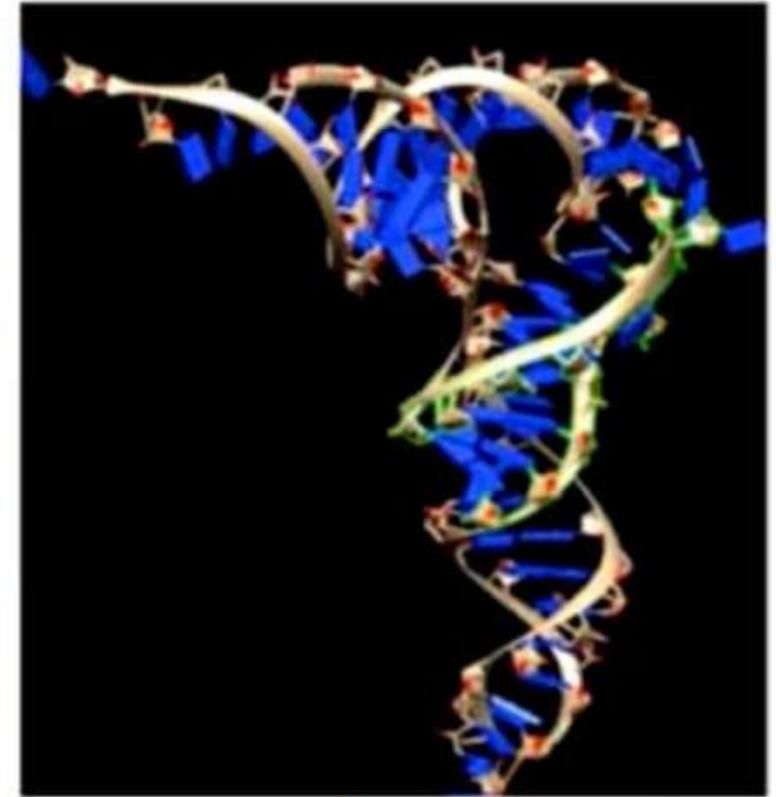
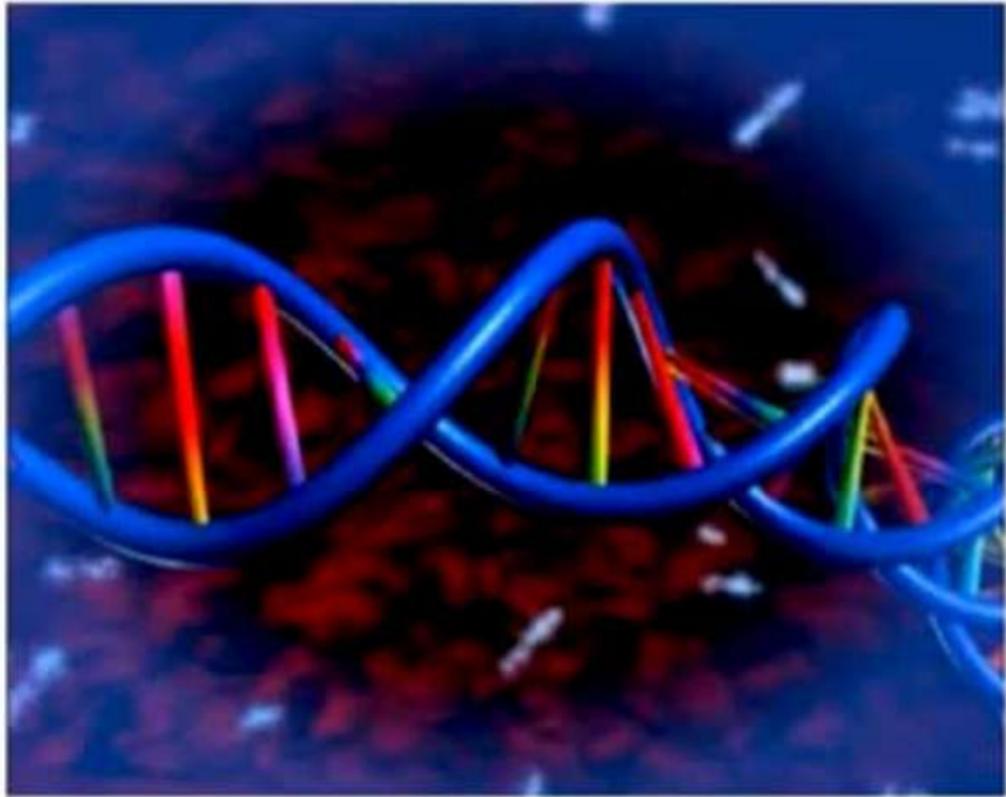


MOLECULAR BASIS OF INHERITANCE





- **Nucleic acids (DNA and RNA)** are the ^(monomer) building blocks of genetic material. ^(polymeric)
- **DNA** is the **genetic material** in most of the organisms. / higher organisms
- **RNA** is the genetic material in some viruses.
- **RNA** mostly functions as **messengers**,

Catalytic Molecules, ADAPTER

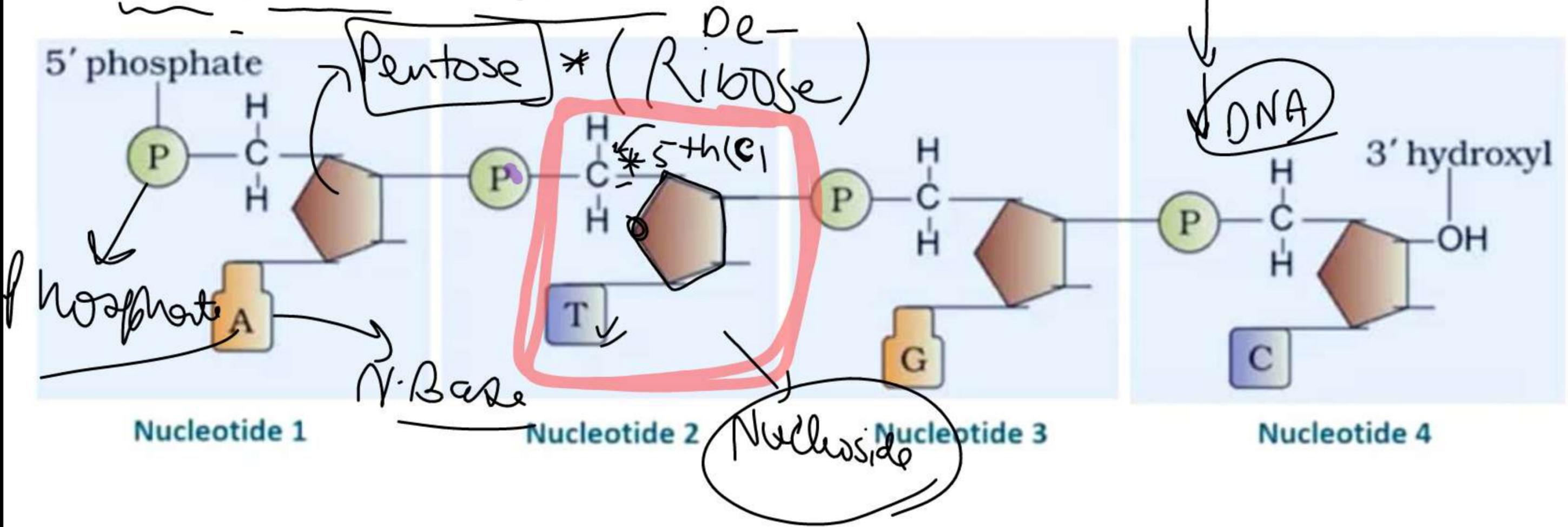
eg: Bacteriophage,
HIV virus.

THE DNA

STRUCTURE OF POLYNUCLEOTIDE CHAIN

- Polynucleotides are the polymer of nucleotides.
- DNA and RNA are Polynucleotides.

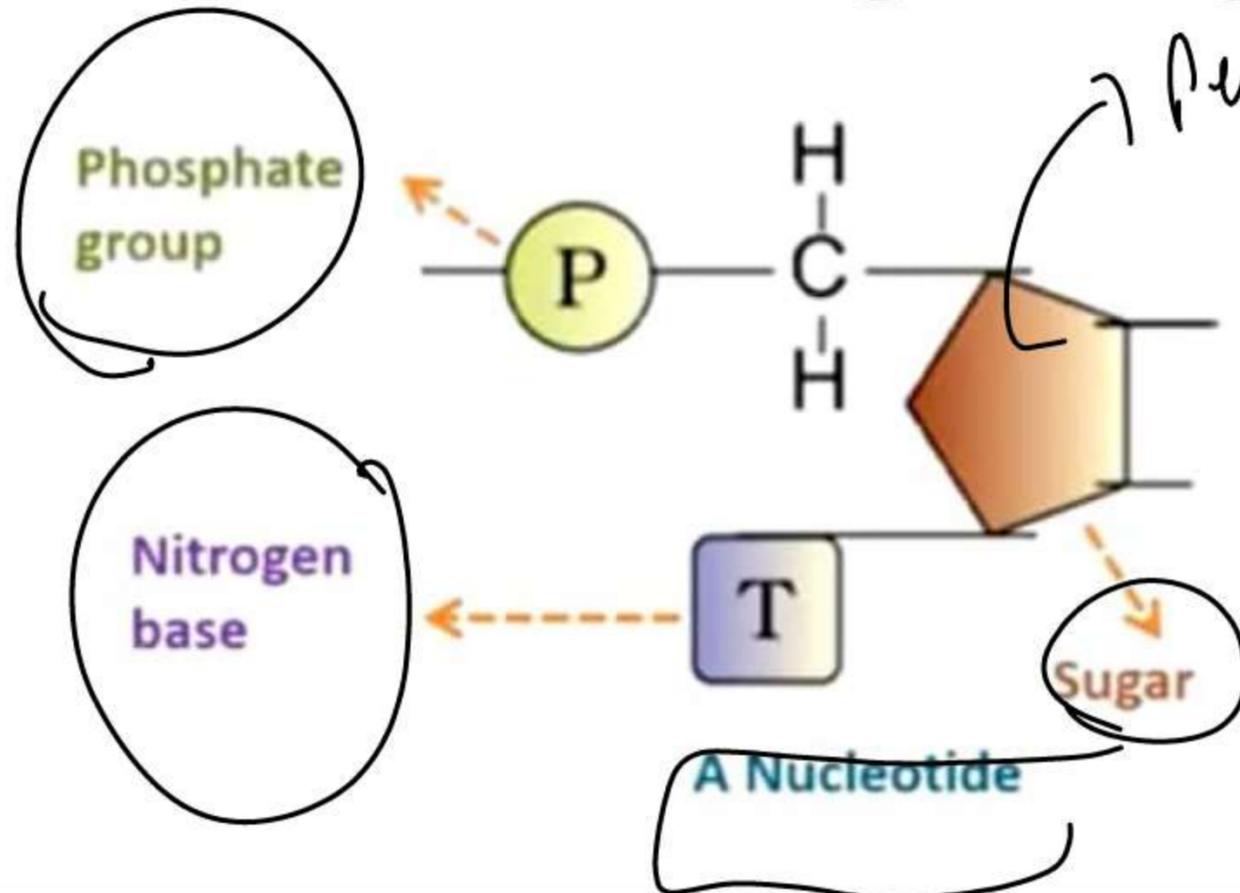
nucleotides
(monomers)



THE DNA

STRUCTURE OF POLYNUCLEOTIDE CHAIN

- **Polynucleotides** are the polymer of **nucleotides**.
- DNA and RNA are Polynucleotides.



A nucleotide has 3 components

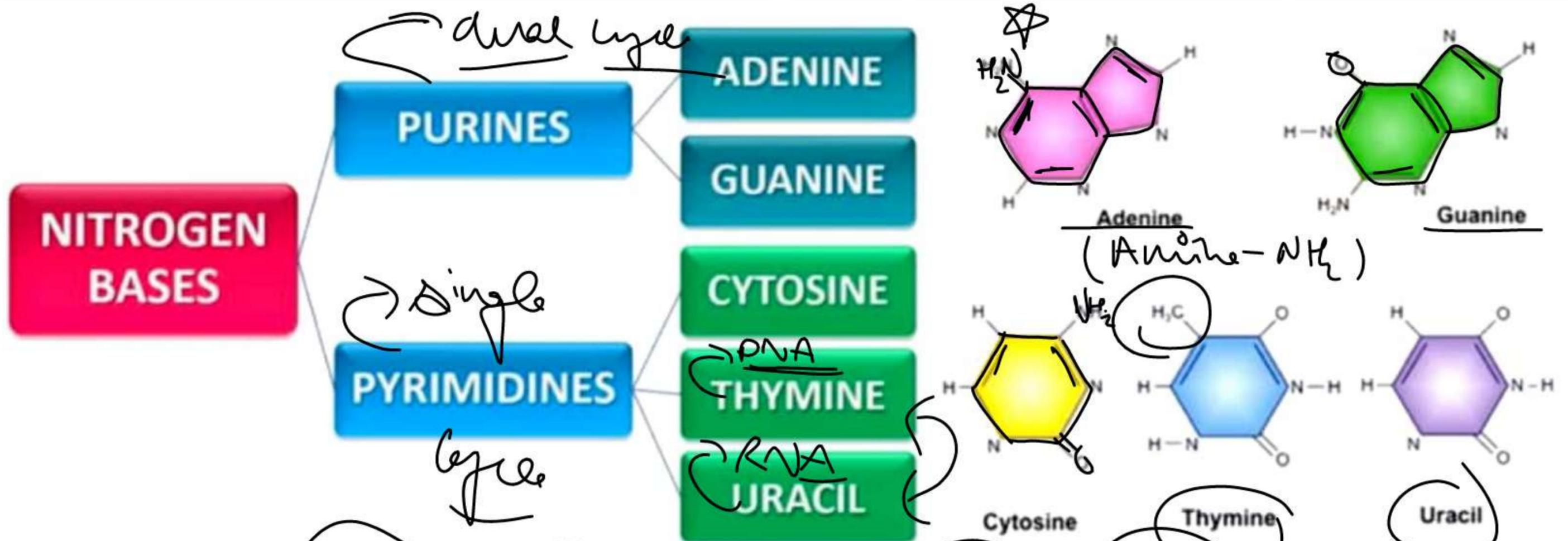
A nitrogenous base

A pentose sugar
(Ribose in RNA & deoxyribose in DNA)

(PO_4^{3-})
A phosphate group

THE DNA

STRUCTURE OF POLYNUCLEOTIDE CHAIN

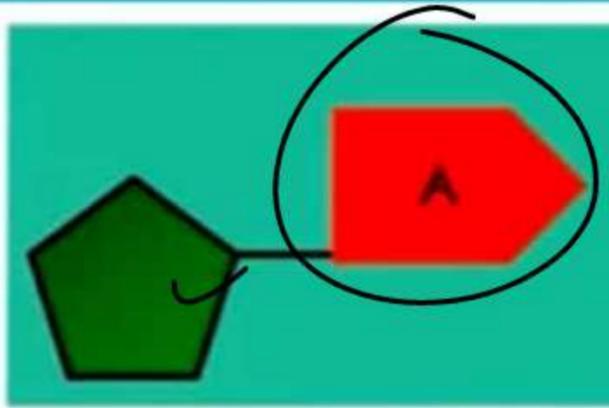


Thymine (5-methyl Uracil) present only in DNA and Uracil only in RNA.

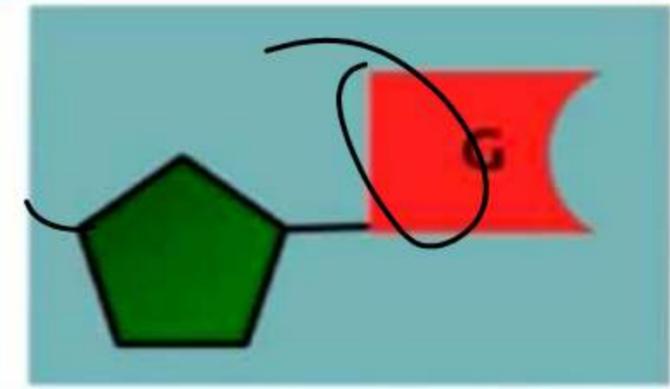
THE DNA

STRUCTURE OF POLYNUCLEOTIDE CHAIN

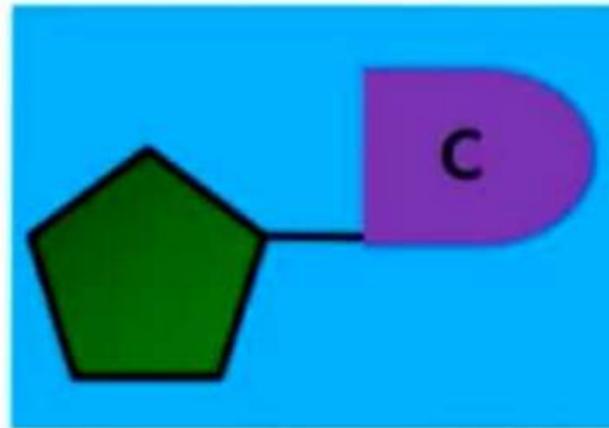
Nucleosides in RNA	Nucleosides in DNA
<u>Adenosine</u> - Adenine	Deoxyadenosine
<u>Guanosine</u> - Guanine	Deoxyguanosine
<u>Cytidine</u> - Cytosine	Deoxycytidine
<u>Uridine</u> - Uracil	Deoxythymidine



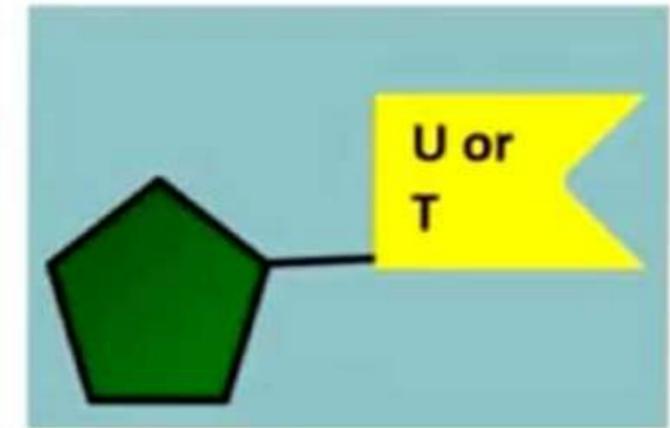
Adenosine / Deoxyadenosine



Guanosine / Deoxyguanosine



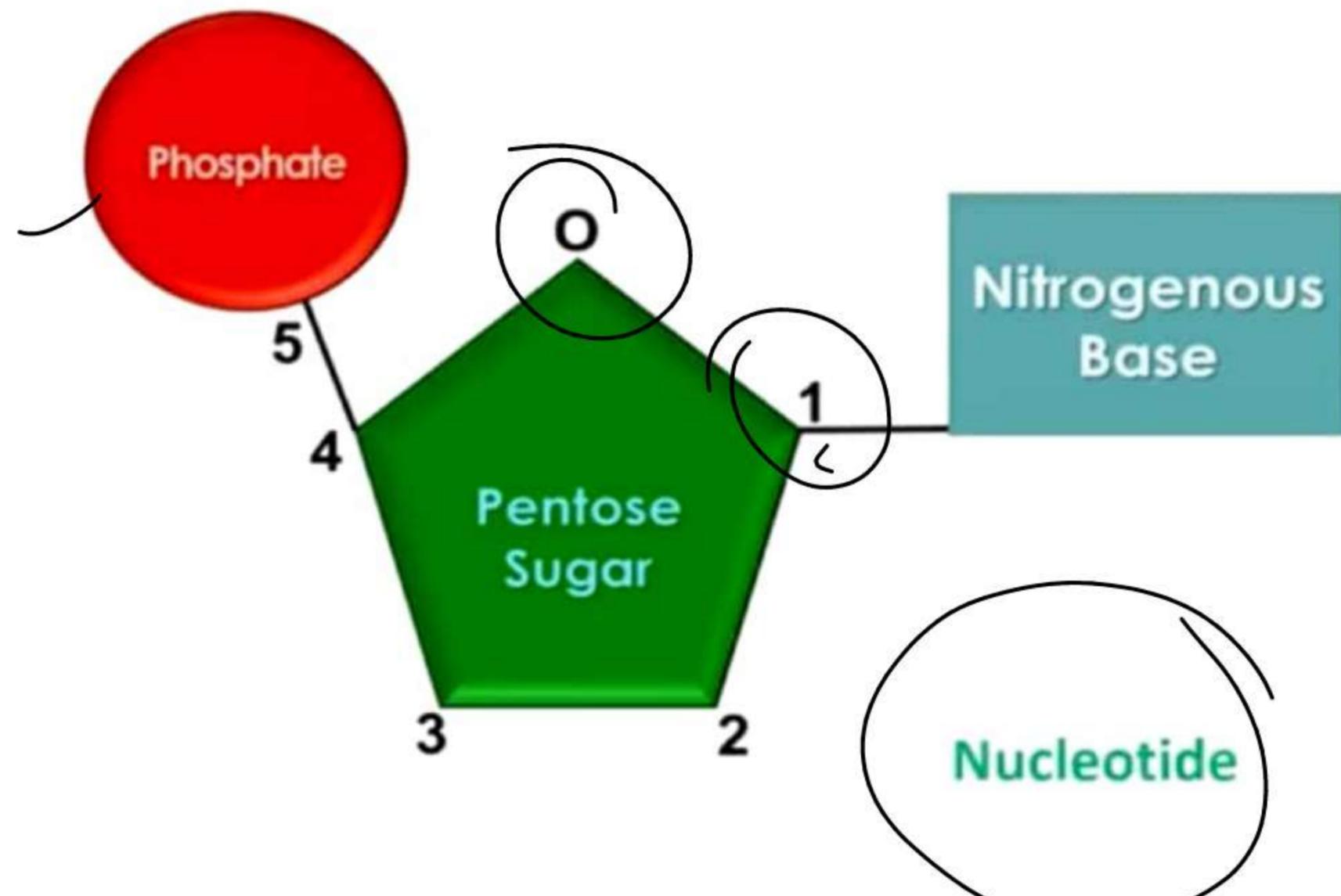
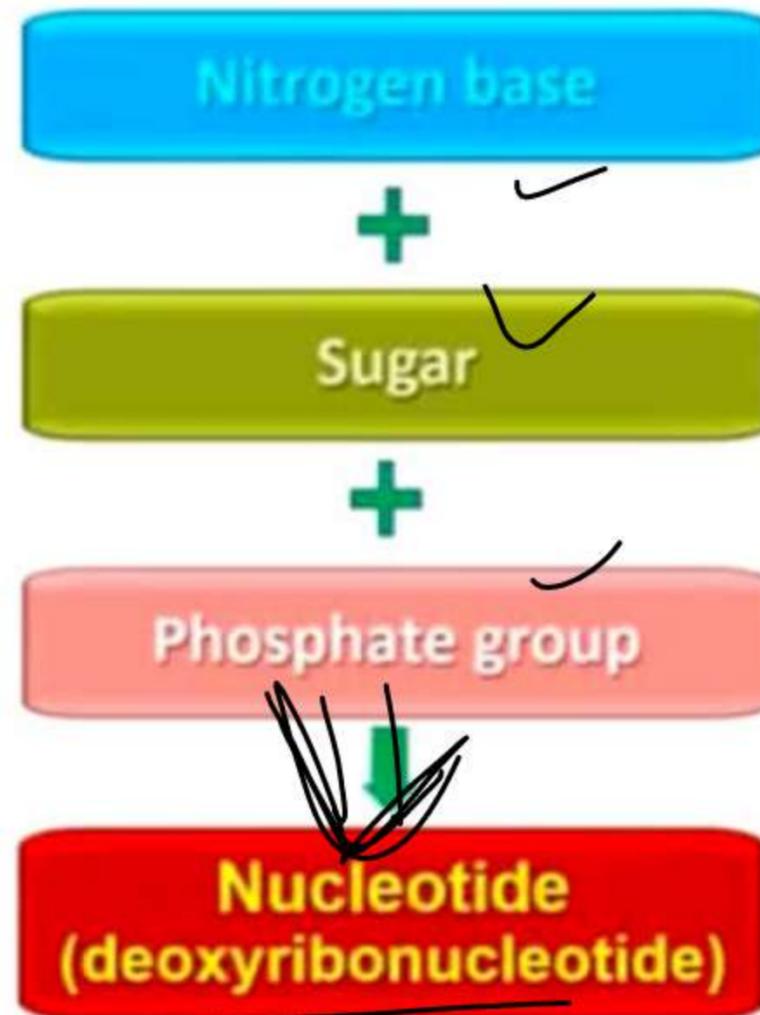
Cytidine / Deoxycytidine



Uridine / Deoxythymidine

THE DNA

STRUCTURE OF POLYNUCLEOTIDE CHAIN

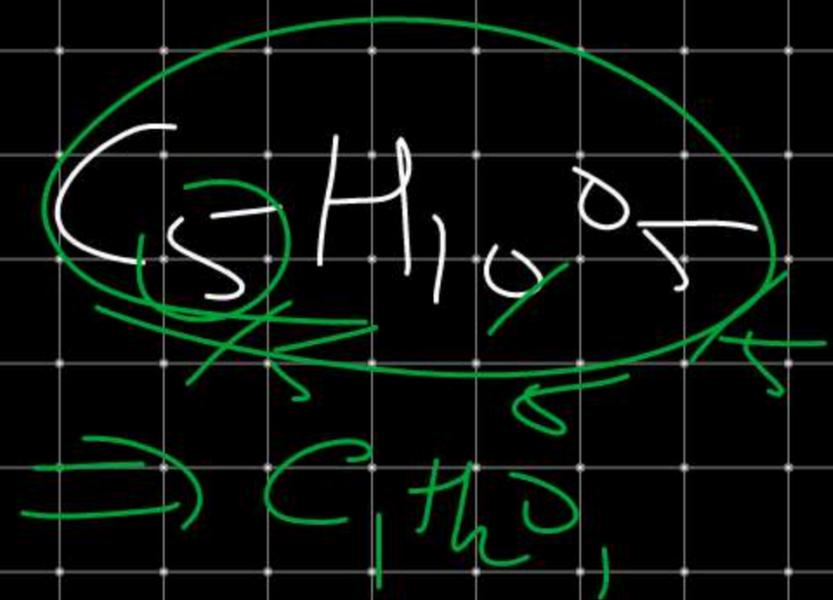
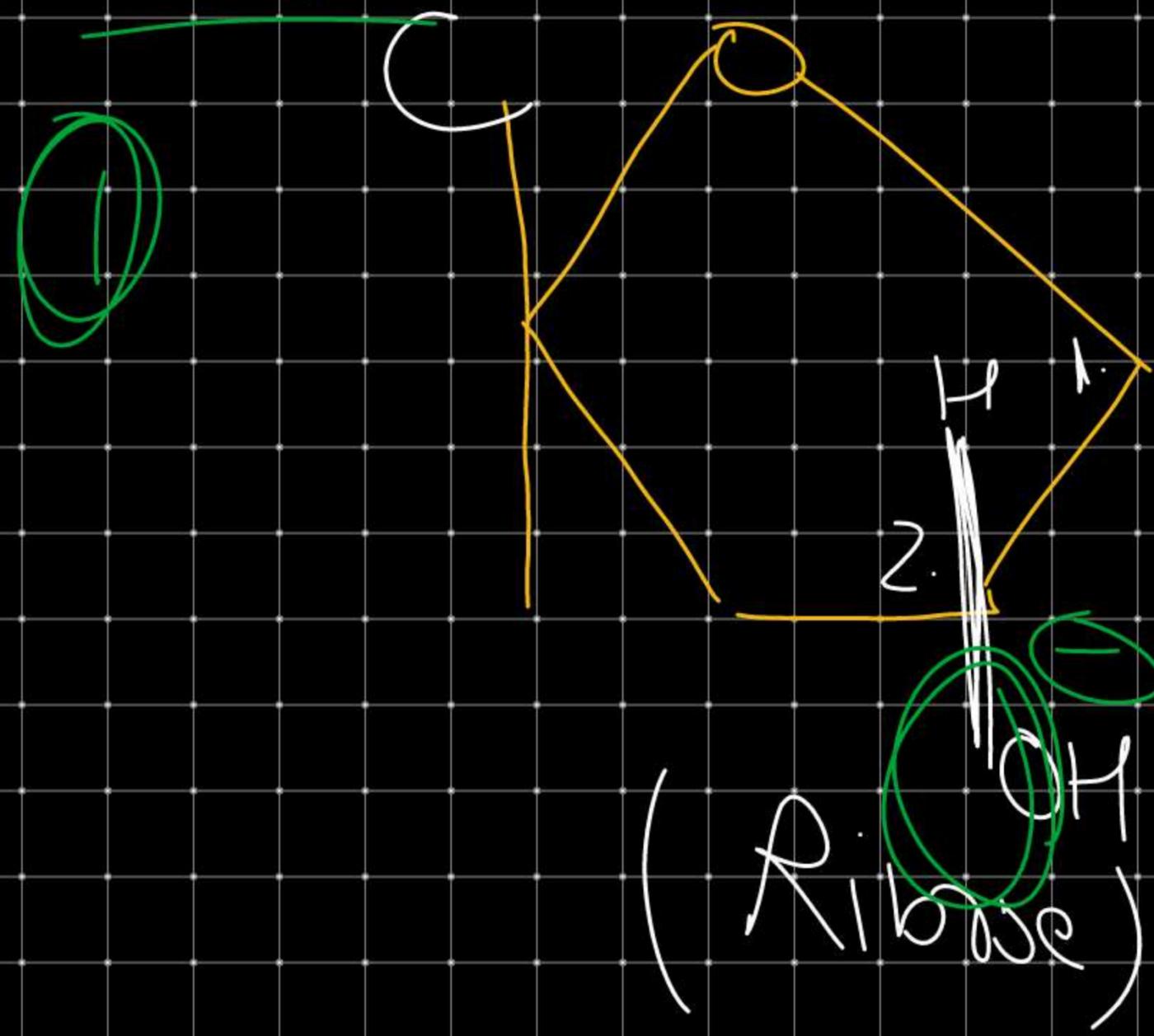


✓
Genetic Material: which control over
Genetics (gene constitution)

- DNA (Deoxyribonucleic acid)
- RNA (Ribonucleic Acid)

Ribose → Pentose sugar
→ 5-C-Molecule

DNA vs RNA



Deoxyribose

Nucleic Acid : Acid which is present

in the nucleus.

DNA: (Deoxyribo nucleic Acid)

Highly coiled molecule.

RNA

① Messenger:

Translation

(mRNA → Protein)

Transcription

(DNA → rRNA)

(m^r-RNA)

→ Nucleus

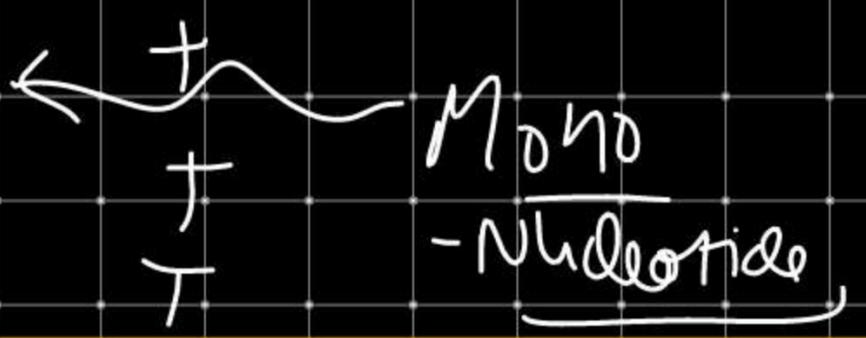
② Catalytic Mol.:

Ribo-~~zyme~~

— to break bonds in a genetic material.
eg: Varkud satellite RNA.

ADAPTER [t-RNA]

Polynucleotide (Polymer)



Nucleotides:

Nitrogen Base + P. Sugar
Phosphate group, (P³⁻)

DNA is a (-)vely charged, Acidic Mol.

N. Base:

Purine: A, G
Adenine, Guanine



Pyrimidine: C, U, T (Thymine)
Cytosine, Uracil

① (deoxy-Ribose + N Base) = Nucleoside

② Nucleoside + PO_4^{3-} = Nucleotide

eg: Adenine + Pentose Sugar = Adenosine
(deoxyribose)
cytosine

eg. (deoxy) Adenosine + PO_4^{3-} → deoxyadenylic Acid

Q. 1) ^(DNA) Cytosine + P.S → Nucleoside?

Nucleoside?

Cytosine + Pentose ^{de-ox} = Cytidine / Uridine
sugar

Nucleotide: De-ox
Cytidyl Acid. ^{de-ox}
Uridyl Acid

①

Adenosine

De-ox
Adenosine

deoxy
adenylic
acid

②

Thymine

De-ox
thymidine

De-ox
thymidylic
acid

③

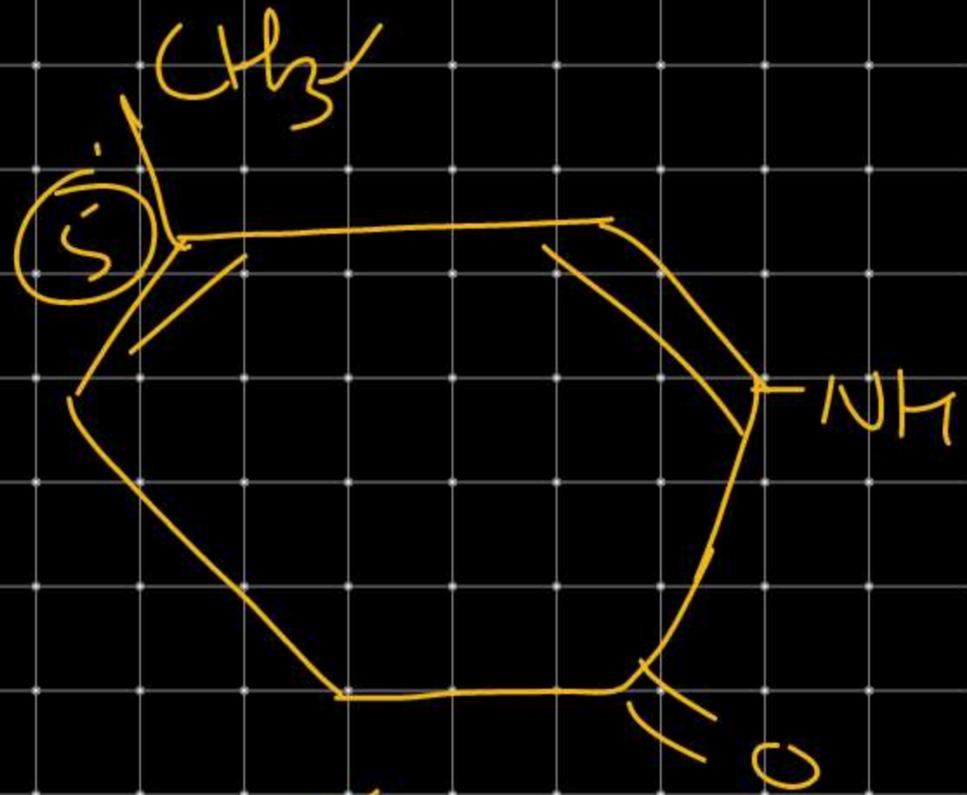
Guanine

de-ox
(Guanosine)

De-ox
Guanylic acid

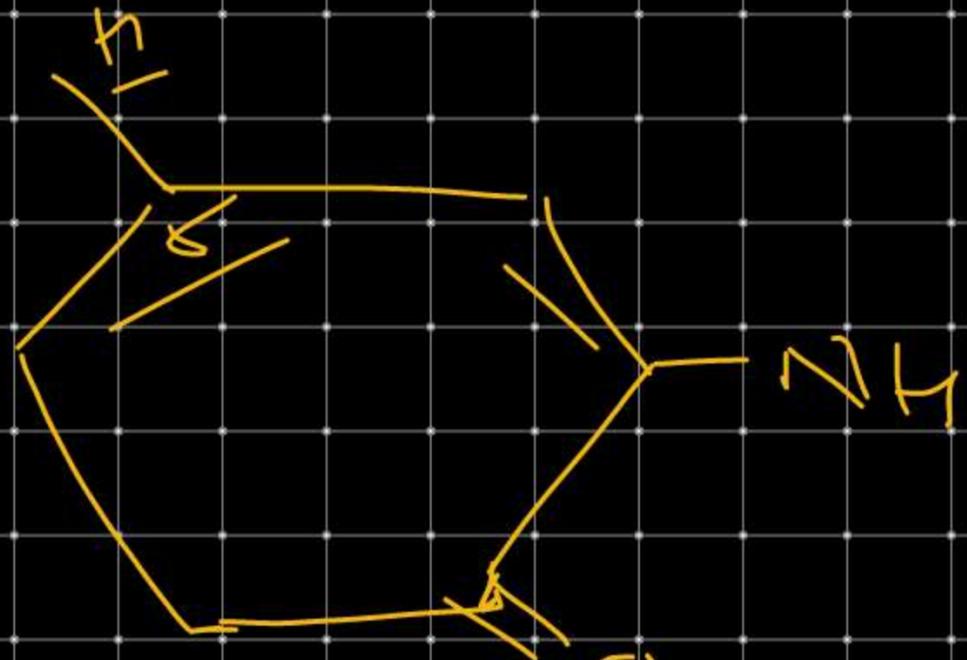
Nucleoside

Nucleoside



Thymine

(5-Methyl
uracil)



uracil