

# SINGLE STRAND DNA

There is only one strand. e.g. Bacteriophage  $\phi$ X174

It differs from Double stranded DNA as:

1) It is not resistant to formaldehyde as its reactive sites are exposed.

where as Double strand DNA is resistant due to unexposed sites.

2) It is circular, Double stranded is linear.

3) A:T:G:C :: 1:1.33:0.98:0.75.

4) Ultra-Violet absorption increases rapidly steadily from 20°C - 90°C. in single stranded DNA.

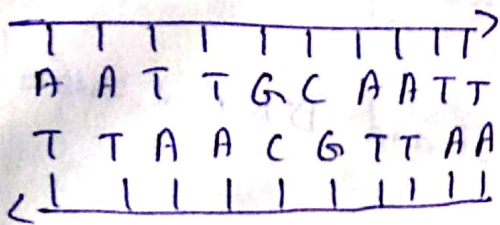
In double stranded U-V absorption remain constant from 0°-80° (critical melting point) then rises rapidly.

## FORMS of DNA : DNA may exist in A, B, C; & D. form

S.No.	Character	A-Form	B Form	C Form	D Form
1.	Abbreviation	A-DNA	B-DNA	C-DNA	D-DNA
2.	Base pairs per turn of the helix	11	10	0.9-33	0.8
3.	Axial rise (in height)	2.5 A	3.37 A	3.32 A	3.03 A
4.	Tilt of Base Pairs ( $\gamma$ )	20.2°	6.3°	-7.8A°	-16.7°
5.	Pitch of the helix	28.15 A	34 A	31 A	---
6.	Sugar Puckering	3'-endo	3'-exo	2'-endo	3'-exo

PALINDROMIC-DNA:

The nucleotides of one strand is going in one direction are the same as the nucleotides of the other strand going in the other direction. e.g.



"Madam I'm Adam"

→ They read same in both direction.

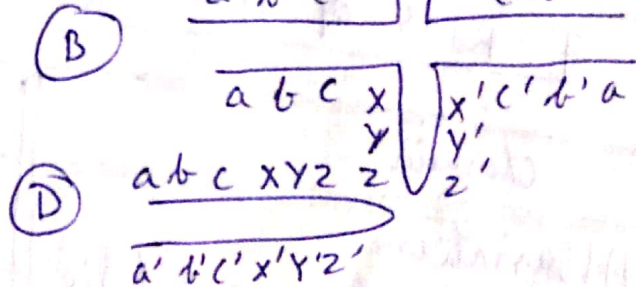
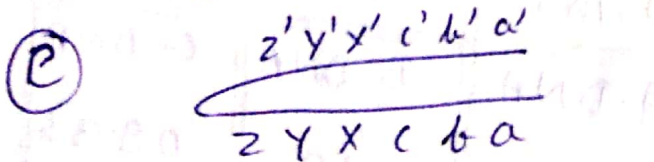
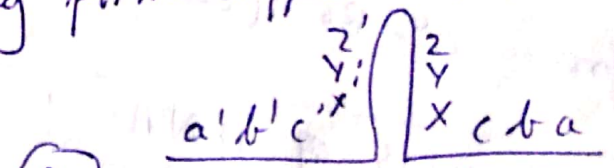
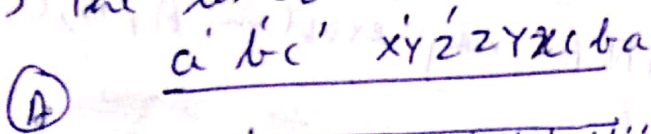
Transcribe some rRNA by both strands if RNA polymerase started from either side.

→ They may be short. (3-10 base pair).

→ Eukaryotes have more than prokaryotes.

→ r-repetitive DNA may resemble a giant palindrome, having two halves which are virtually identical.

→ The linear r-DNA may form different structures.



## Functions of DNAs.

Main → a) Replication  
b) Transcription.

c) Reverse Transcription

d) Recombination

e) Repair

f) Genetic

Others! -

g) Mutations.

h) Autocatalytic function.

i) Heterocatalytic function

j) Control of metabolism

k) Growth & differentiation.

l) DNA - finger printing.

m) Gene-Therapy.

n) Research