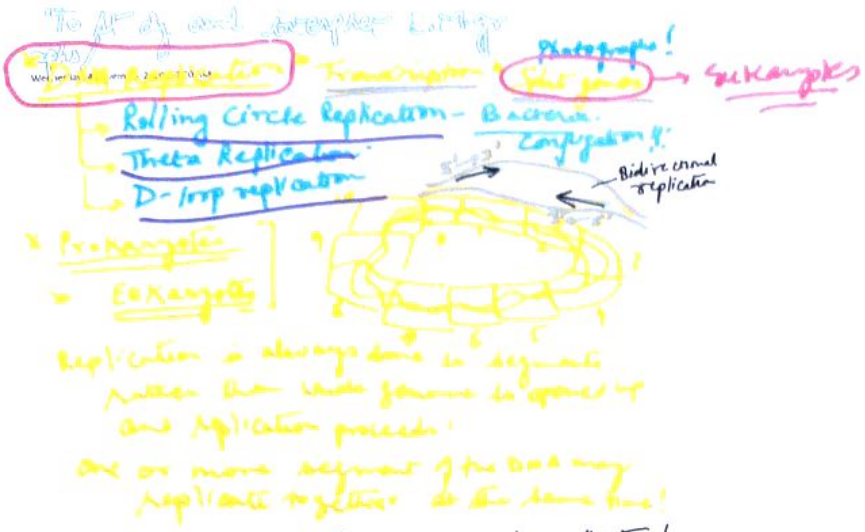


Unidirectional replication!
Nucleic acid rapidly synthesize multiple copies of circular molecules of DNA → such as plasmids

Donor F+, F', Hfr

Recipient F-

* Initiated by an initiator protein which encoded by plasmid or Bacteriophage DNA → Nicks one strand → Ori site [origin of replication site]

Nicking → Cleavage → Synthesis → [5' → 3' Direction]

DNA polymerase → III, II, I + Primer [RNA]

After nick [Two Strands → Nicked Strand, Unnicked strand] → Template for Replication!

Then replication proceeds around the circular DNA simultaneously displacing the nicked strand as a single stranded DNA.

A G C T → Template.
T C G A → new nucleotides being added in the nascent strand

Multiple S.S. linear Copies of DNA → "Concatemers"

Afterwards they are linked up + second strand is synthesized

DNA polymerase I → Ligation
Remove the RNA by (Primer)
A = U
U = A

DNA Sequence.
A = T
T = A

Theta replication → John Cairns (1968)

E. Coli cells.

Autoradiography. ⊖ replication

Thymidine

In order to incorporate radioactivity → Radiolabeled molecule

^{15}N ^{32}P ^{14}C

^{3}H ^{2}H

Thymidine → Nitrogenous base

① Unwinding of two complementary strands

② Bidirection replication – Replication proceeds bidirectionally

Y-shaped replication fork.

Replication fork moving in both but opposite directions

③ Helicase → Unwinding of template strand

Elongation – Replication → Poly III DNA

5' → 3'

④ Leading strand →

Lagging strand → Okazaki fragments

⑤ DNA pol. I → Removal of Primer

→ Nicks – Okazaki fragments sealed / ligated.

D-loop replication

Chloroplast & Mitochondrial DNA

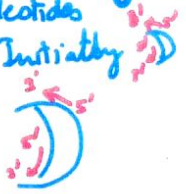
Light L-strand – Comprises of lighter nucleotides

Heavy H-strand – Comprises of heavier nucleotides

} Characterised by

Replication → D-loop → Begins – Initially

D-loop – Expands



1971 –

* Two origin of replication

different – one for light strand

another for heavy strand.

SPLIT GENES → In Eukaryotes !

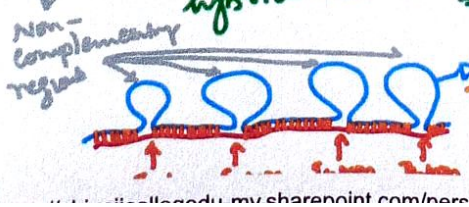
Genes in which information for RNA are found in non-continuous segments i.e. They are interrupted by intervening sequences which are excised at RNA level → Called "Split Genes"

INTRONS → Part of 1° transcript or DNA encoding it i.e. not included in the finished or mature RNA

Shown by

R-looping → Technique in which S.S. RNA is hybridized to d.s. DNA

Result to form a Heteroduplex



Chloroplast & Mitochondria

Light L-strand - Comprises of lighter nucleotides
Heavy H-strand - Comprises of heavier nucleotides
} Characterised by

Replication → D-loop → begins - Initiation

D-loop - Expands

1971 -

* Two origin of replication
  ↓
  different — one for light strand
  another for heavy strand.

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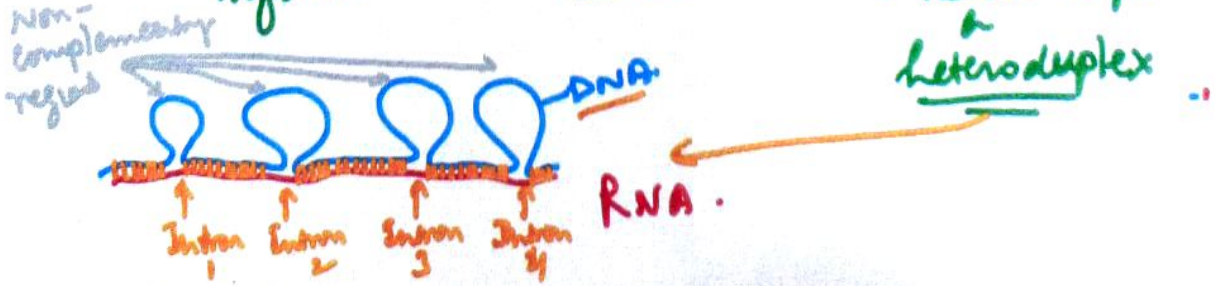


Looped DNA represents the Introns!

No. of loops = No. of Introns

Looped DNA represents the Introns!

No. of loops = No. of Introns

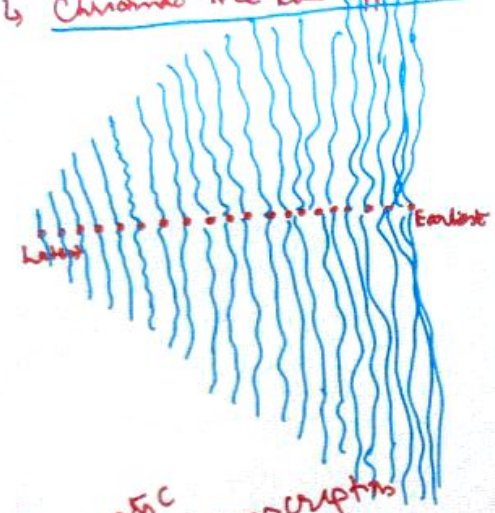
Transcription < Prokaryote -
Eukaryote - Split genes Concept!

Prokaryotic transcription

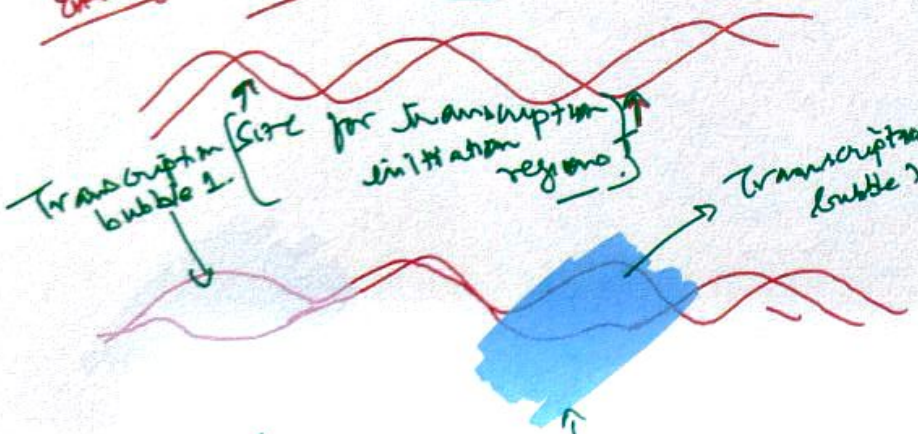
↳ Transcription is coupled with translation — Before the transcription of a gene ends, the translation of mRNA formed by that particular gene starts.

↳ Christmas Tree like appearance

Half-life of mRNA is very less.



Eukaryotic transcription → The site for transcription and translation are different → Nucleus → Ribosome outside the nucleus. (or ER in cytoplasm)



Transcriptionally active regions in Eukaryotes