DNA-REPAIR

Repair is done by Replication.
It is known as Repair Replication.
It takes place as follows.

1. Incision :- Endonuclease or incision enzyme recognise the damage or distorted site and breaks one of the strand near damaged site. Coprendonucleases incise close to the damage part of DNA strand.

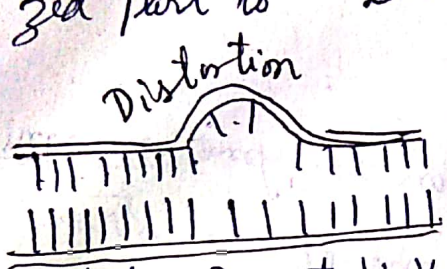
2. Excision :- Exonuclease or excision enzyme removed the damaged part of the strand.
In E.coli DNA polymerase I show such activity in 3' → 5' direction.
It acts as a proofreading and editing incorrectly added nucleotides.
DNA polymerase I also has 5' → 3' exonuclease activity by which thymine dimers can be excised.

3. Re-insertion :- DNA polymerases now add new nucleotides complementary to intact (template) strand.
Short patch repair may be done by Polymerase I enzyme where as for long patch repair ~~DNA~~ Polymerase II and/or Polymerase III are needed. (U-V induced repair)
Repair is generally short patched.

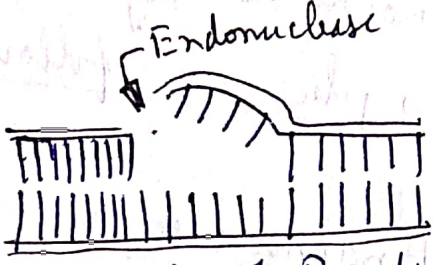
Scanned with CamScanner

4). Joining of Newly formed Strand Segment.

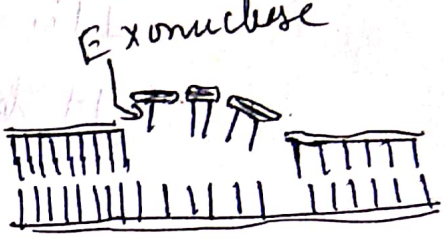
Polynucleotide ligase linked / joined the newly synthesized part to the main strand.



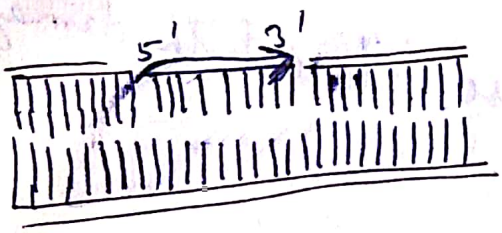
Distortion Due to U-V



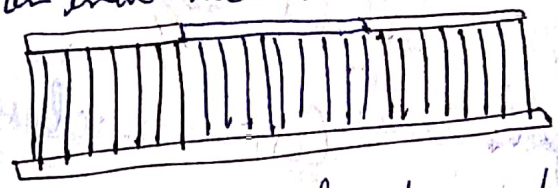
Incision of Break by an endonuclease



Excission by an Exonuc



Synthesis of new strand 5'-3' direction.



Newly formed segment joined by Ligase.

Repair Replication of DNA.

Scanned with CamScanner

RIBOSE NUCLEIC ACID [RNA]

The nucleic acid with ribose sugar is known as Ribose nucleic acid (RNA). The common nitrogenous bases present in RNA are Adenine and Guanine as Purine, whereas Uracil and Cytosine are pyrimidines. Adenine pairs with Uracil and Guanine with Cytosine and vice-versa. Thus pyrimidine uracil is a substitute of thymine.

RNA has some more unusual bases in addition to the usual ones (adenine, guanine, uracil and cytosine) (Unusual bases) These are more in comparison to DNA.

Almost all normal RNA chains have either adenine purines as their first nucleotides i.e. either adenine or guanine.

There are three (3) types of cellular RNAs.

(i) messenger RNA (mRNA) or template RNA,
(ii) ribosomal RNA (rRNA)
(iii) transfer RNA (t-RNA) or soluble RNA (sRNA)

They are synthesized on DNA template.
m RNA and t RNA on chromosome and r RNA on nucleolus DNA.

Scanned with CamScanner

Chart: Showing Comparison of ~~diffent~~ RNAs.

S.No	Characters	Messenger RNA (mRNA) or Template RNA	Ribosomal RNA (rRNA)	Transfer RNA (tRNA) or Soluble RNA (sRNA)
1.	% of total RNA of Cell	3 - 5	80	10 - 20
2.	Sedimentation Co-efficient	8S	28S; 18S; 5·8S; 5S 23S; 16S; 5S	3·8S
3.	Number of nucleotides.	300 - 12000. In E.coli 900 - 1500	5S → 120 16S - 18S → 1,600-2,500 23S - 28S → 3,200 - 5,500	73 - 93.
4.	Molecular Weight	500, 000	23S : $1{\cdot}1 \times 10^6$ 30S : $0{\cdot}55 \times 10^6$	25,000 - 30,000
5.	Unusual Bases	Small amount	Small amount of methylated bases (E. coli 1 per 100-150 nucleotides.	High content of unusual bases (E. coli 1 per 30-40 nucleotides)
6.	Site of Synthesis	On ~~In~~ nucleus ~~on~~ ~~in~~ on DNA template	Derived from nucleolar DNA	In nucleus on DNA template
7.	Beginning of Synthesis	New mRNA is synthesized during early cleavage whereas some mRNA is found in the ovum.	At gastrulation and increases as development proceeds	At the end of cleavage stage
8.	Base of relationship DNA	Shows base relationship to DNA. It is formed from all sections of DNA The bases are complementary to DNA.	No obvious base relationship to DNA r-RNA is formed from only small sections of DNA.	Shows base relationship to DNA as formed from all sections of DNA. Its bases are complementary to DNA.
9.	Functions.	Carry genetic information from DNA of chromosome to the ribosomes	Unpaired bases may bind mRNA and tRNA to ribosomes	Adapter for attaching amino acids to mRNA template

Scanned with CamScanner