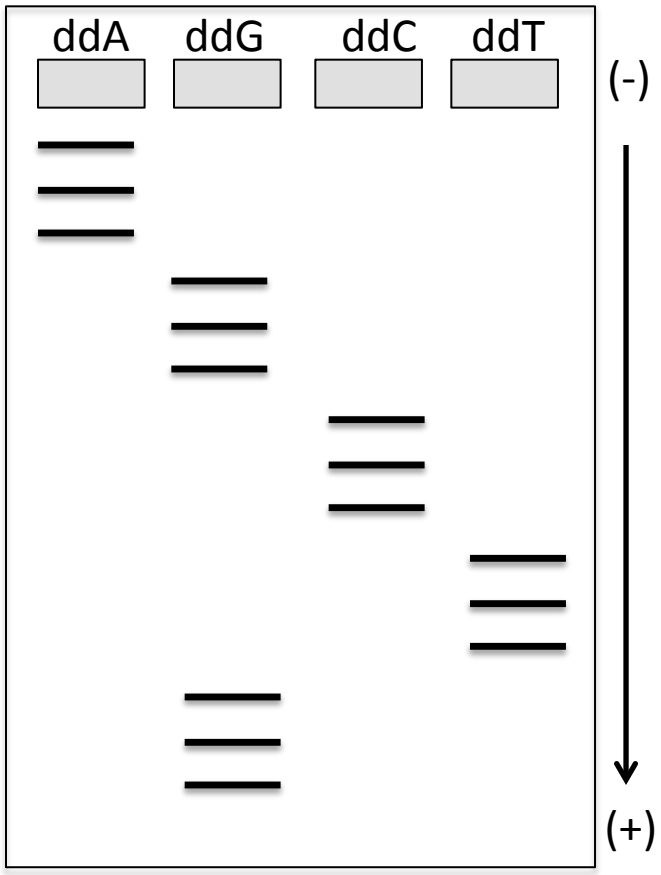
Read the sequencing gel and give the sequence of DNA duplex



-DNA is negatively charged

-DNA strand made 5'->3' and template strand read 3'->5'

-Smaller fragments migrate faster

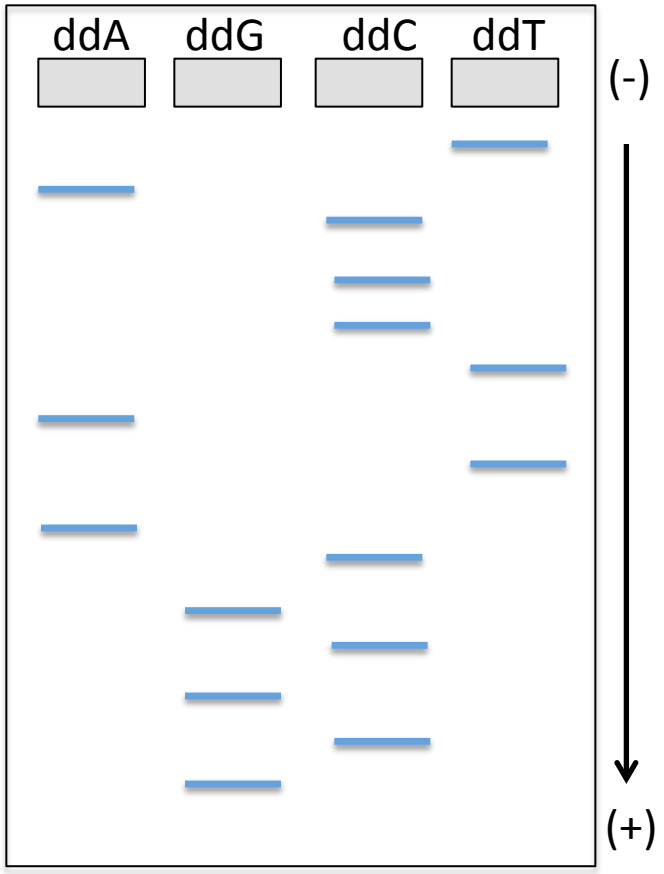
-ddNTPs when added terminate the strand synthesis.

-Addition is to the 3'OH end

5'GGGTTTCCCGGGAAA3' NEW STRAND
3'CCCAAAGGGCCCTTT5' TEMPLATE

Draw the sequencing gel if the Bottom strand was used as template and 5’ATGC3’ is the primer

5’ATGCGCGCGCATATCCCAT3’ TOP STRAND
3TACGCGCGCGTATAGGGTA5’ BOTTOM STRAND



PCR

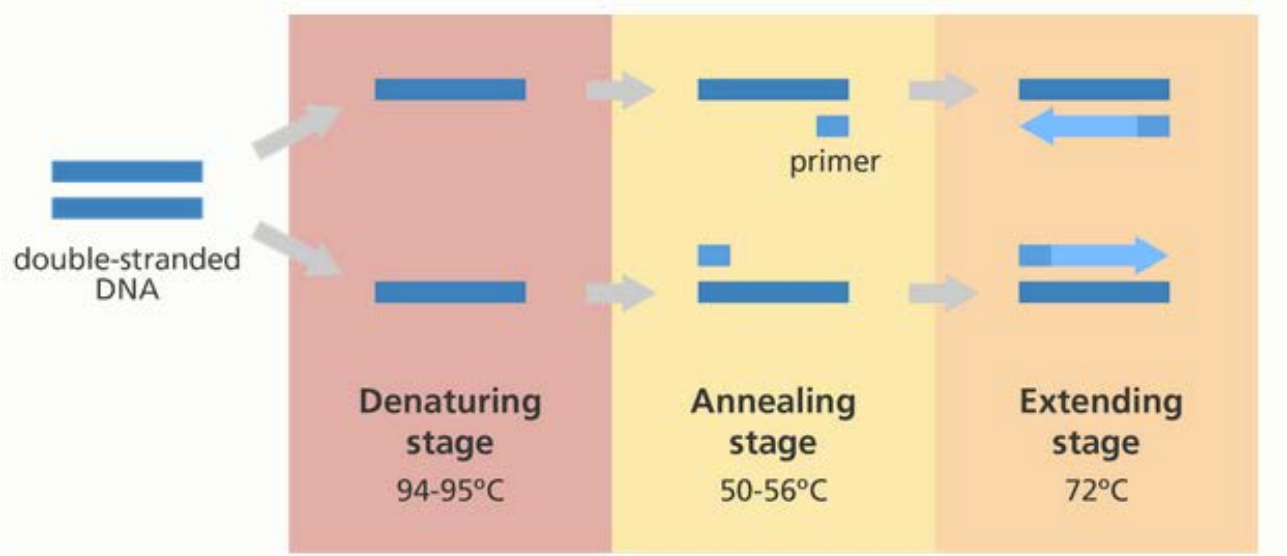


Illustration showing the main steps in the polymerase chain reaction (PCR).

Image credit: Genome Research Limited

-primer are complementary and anti-parallel to template strand
-primer elongation is 5'->3'
-bases added to the 3' end of template strand
-template, primer pairs, dNTPs and DNA polymerase needed
-amplification is $(2)^N$ where N is the number of PCR cycles

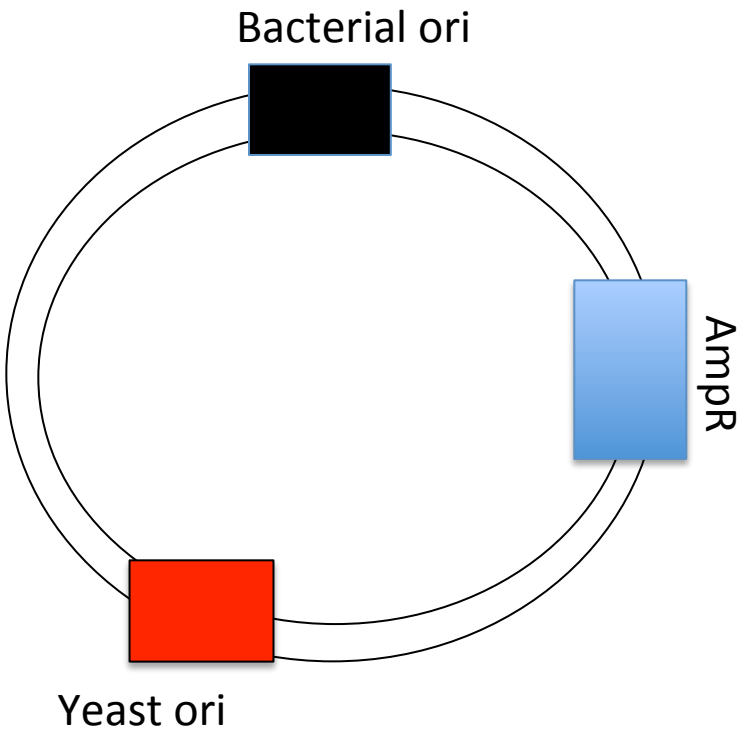
Identify the correct primer pairs (5 bases long) for amplifying Gene A

Pair 1: 5’ATGCG3’ and 5’GGGTA3’

Pair 2: 3’TACGC5’ and 3’TACCC5’

Pair 3: 5’ATGCG3’ and 5’ATGGG3’

Shuttle vector



Can this plasmid vector replicate in…

- Prokaryotes: Yes/ No?

Yes, in bacterial since it has a bacterial ori

- eukaryotic cell: Yes/ No?

Yes, in yeast cell since it has a yeast ori

Which of the following is true?

-SNPs are only found in genes?

They can be anywhere in the genome

-SNPs are more common than mutations

True, they are present at a frequency of >1%

Which region can have a consequential SNP that changes the protein sequence?

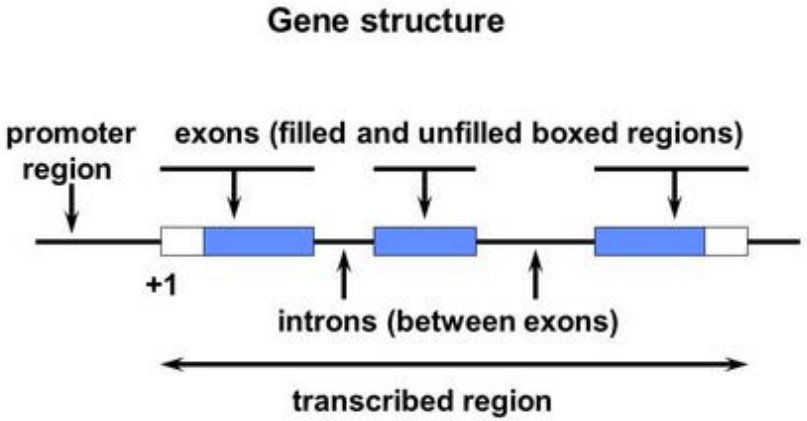
-Promoter

-Exons

-Introns

Can this be mutation be repaired?

Yes, by CRISPR technology



How CRISPR-Cas9 works?

Image removed due to copyright restrictions. Please see: Javier Zarracina/Vox.
https://www.vox.com/2018/7/23/17594864/crispr-cas9-gene-editing