

PHARMACIST BOOSTER - 19

BIOTECHNOLOGY

ENZYMES AND HOSTS USED IN rDNA TECHNOLOGY



Important for RRB, AIIMS, ESIC,
SEPOY, CISF, GSSSB, DSSSB,
SSC, CGHS etc.



Concept + Revision
काँसेप्ट + रिविजन

हिंदी + English में



Priyanka Ma'am

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ALKALINE PHOSPHATASE



USED IN
rDNA technology.

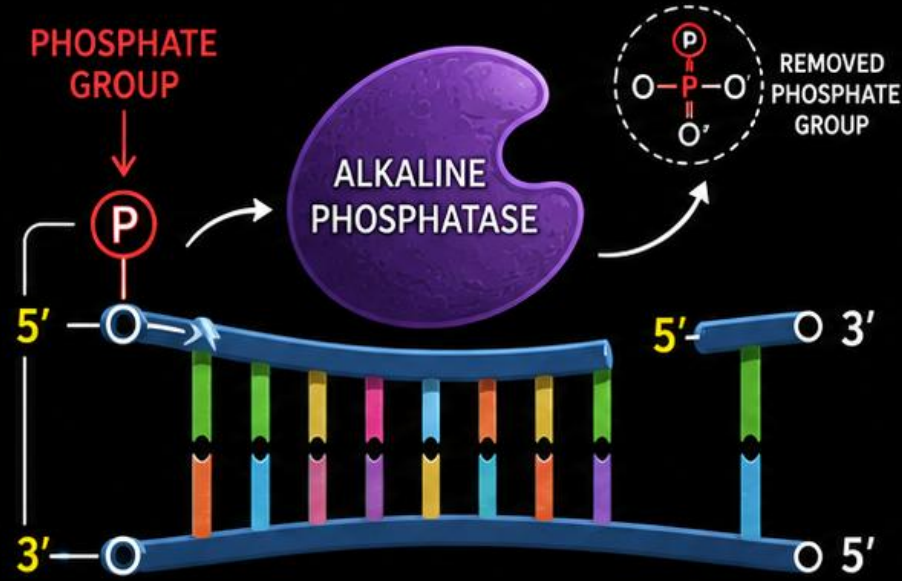


FUNCTION
Removes **phosphate groups** from the **5'** ends of double-stranded or single-stranded DNA or RNA.



KEY USE
Dephosphorylation of DNA ends.

ALKALINE PHOSPHATASE (Dephosphorylation of 5' end)



P = Phosphate group
5' end = End of strand with 5 prime carbon



Year in source: Not mentioned

ALKALINE PHOSPHATASE / अल्कलाइन फॉस्फेटेज



उपयोग:
rDNA technology में प्रयुक्त.



कार्य:
double-stranded या single-stranded DNA/RNA के **5'** end से **phosphate group** हटाता है.



मुख्य उपयोग:
DNA ends का **dephosphorylation**.

DNA LIGASE



FUNCTION:

Joins DNA molecules by forming **phosphodiester linkages** between DNA segments.

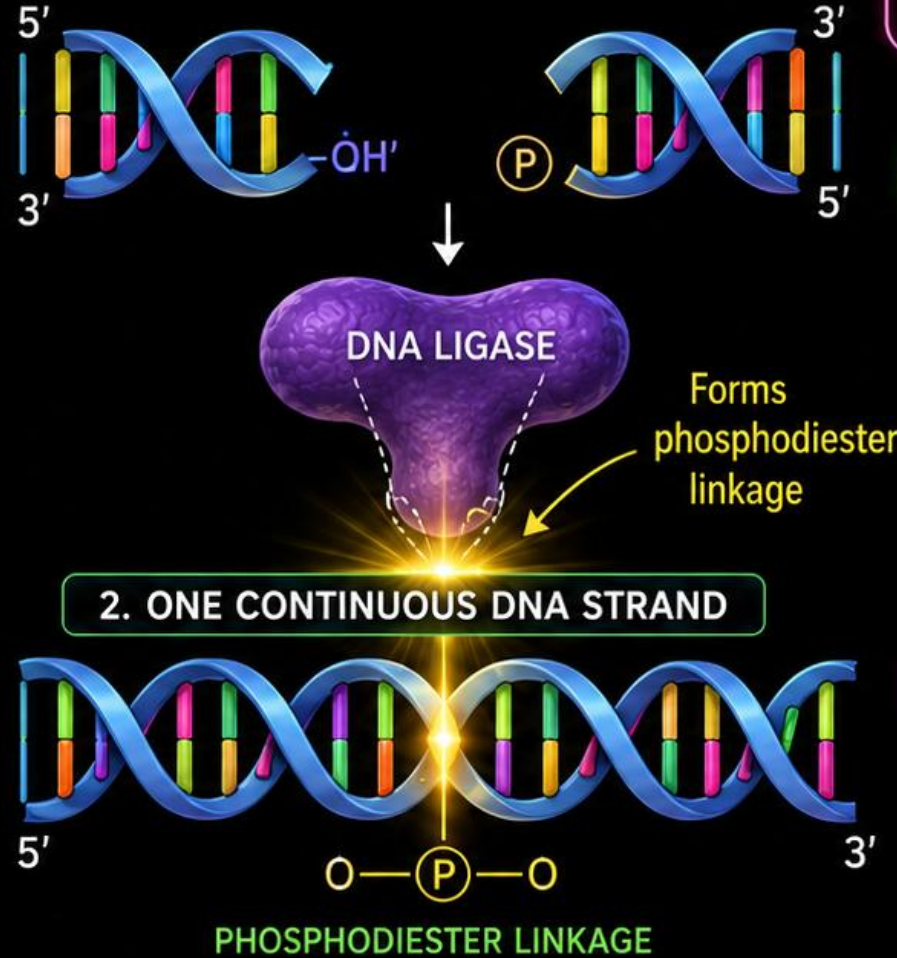


IMPORTANT NOTE:

DNA ligase is associated with the **T4 bacteriophage**.

DNA FRAGMENTS JOINED BY DNA LIGASE

1. TWO DNA FRAGMENTS



DNA Ligase / डीएनए लाइगेज़



कार्य:

DNA segments के बीच **phosphodiester linkage** बनाकर DNA molecules को जोड़ता है।



महत्वपूर्ण तथ्य:

DNA ligase, **T4 bacteriophage** से associated है।



Year asked: **RJ Pharmacist 2012 P-1**

DNA Polymerase I



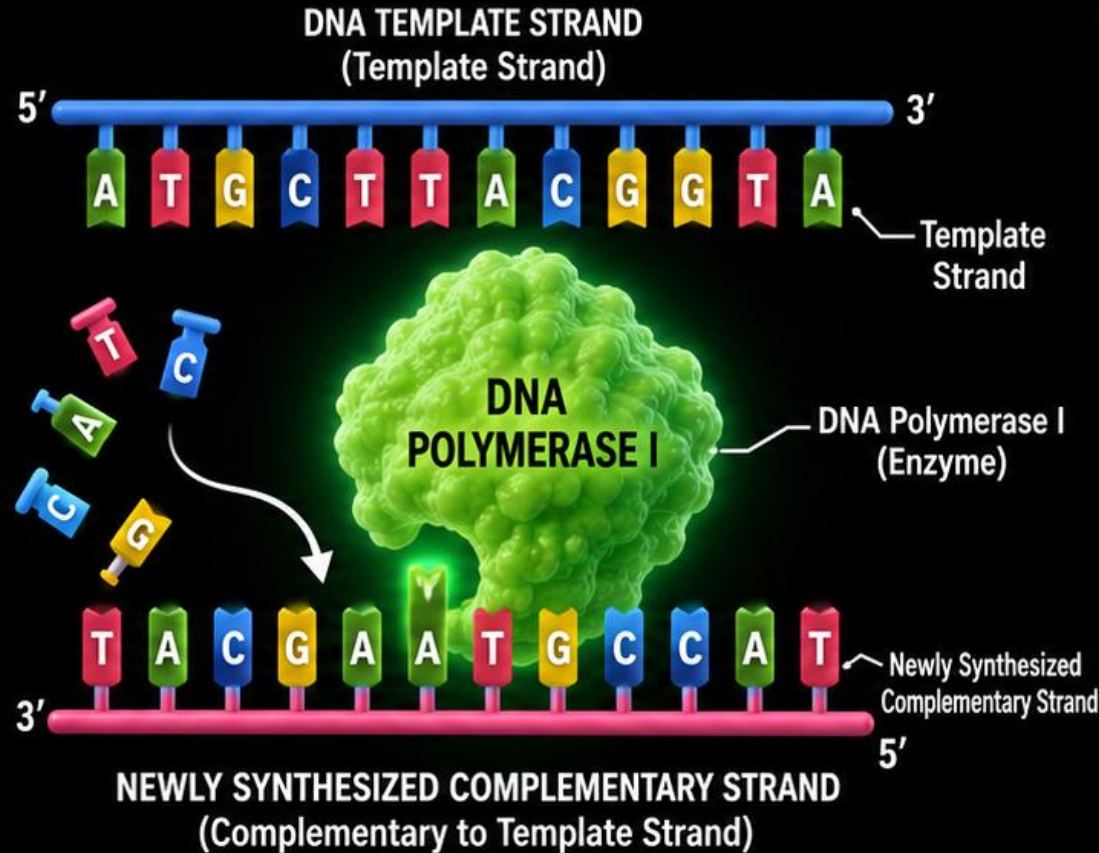
FUNCTION:

Synthesizes **DNA complementary** to a DNA template.



KEY POINT:

DNA synthesis using **template strand**.



Year in source: Not mentioned

DNA Polymerase I / डीएनए पॉलीमरेज I



कार्य:

DNA template के **complementary DNA** का **synthesis** करता है.



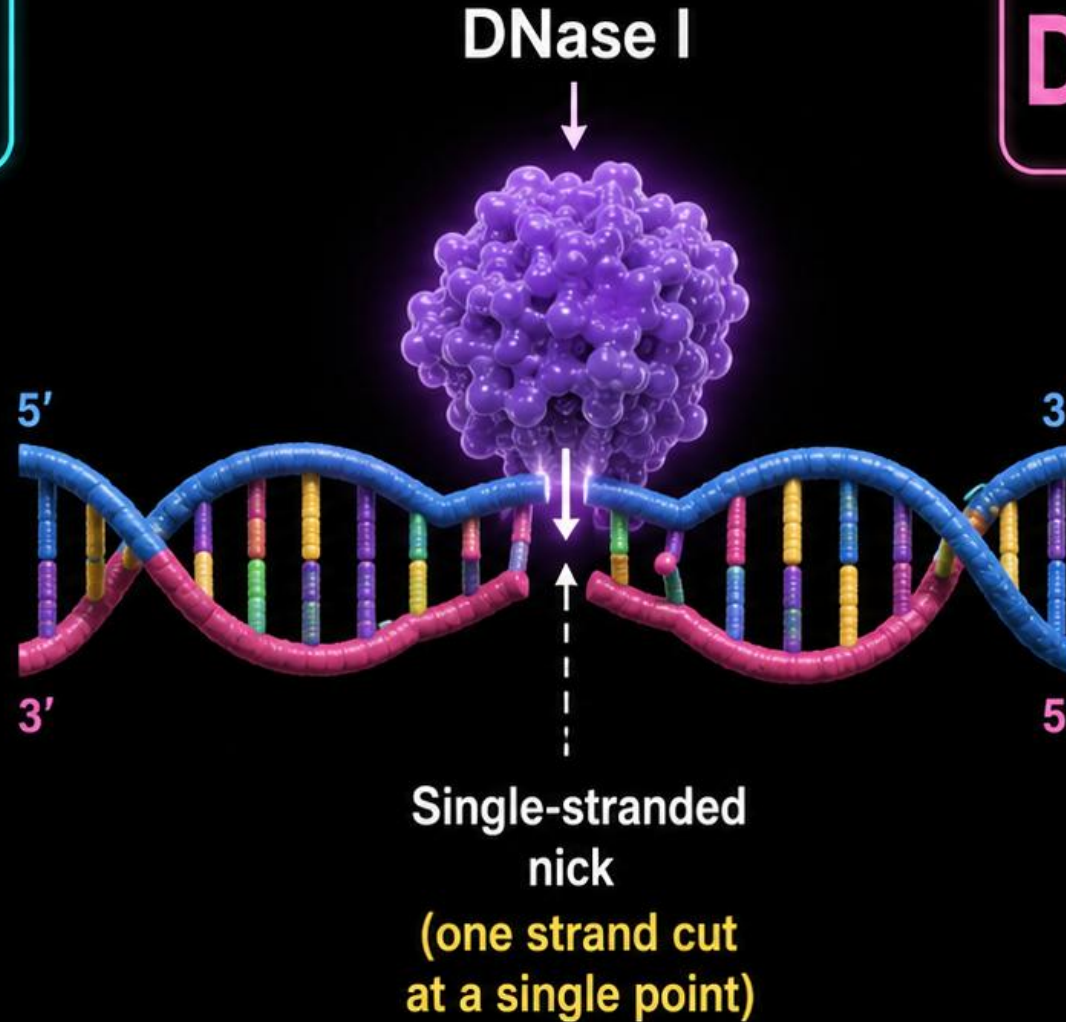
मुख्य बिंदु:

template strand की सहायता से **DNA** बनाता है.

DNase I

☆ FUNCTION:

- ▶ Produces **single-stranded nicks** in DNA.



DNase I / डीएनएज़ I

☆ कार्य:

- ▶ DNA में **single-stranded nicks** बनाता है.



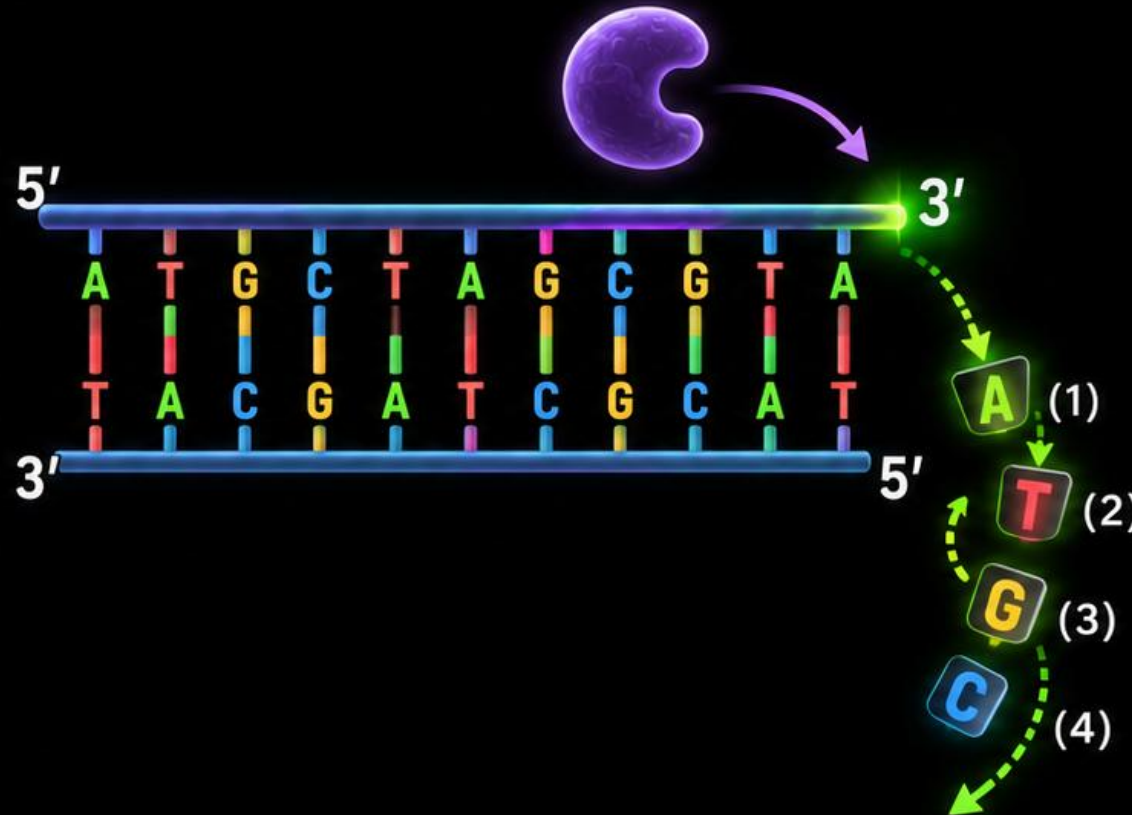
Year in source: Not mentioned

EXONUCLEASE III

FUNCTION:

Removes nucleotides from the **3' ends** of DNA.

Exonuclease III



Year in source: Not mentioned

Exonuclease III /
एक्सोन्यूक्लिएज़ III

कार्य:

DNA के **3' ends** से nucleotides को हटाता है.

BEST PHARMACIST COURSE

RECOMMENDED FOR YOUR PREPARATION





RRB PHARMACIST

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ADMISSION OPEN







6395596959, 8006781759



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FEATURES

- LIVE CLASSES
- RECORDED CLASSES
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- SUBJECT-WISE E-NOTES



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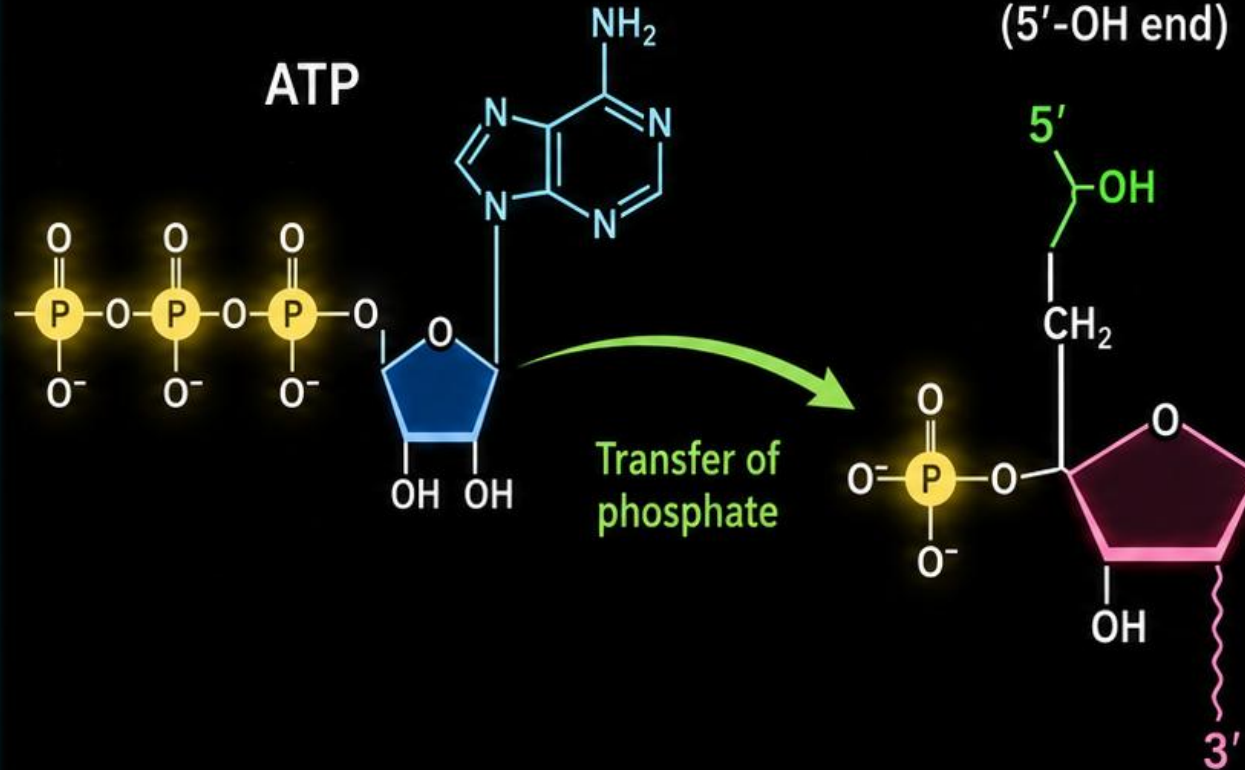
CONTACT FOR ADMISSION RELATED QUERIES- 6395596959, 9259827802

ENGLISH

🎯 FUNCTION:

- Transfers **phosphate** from **ATP** to the **5'-OH** ends of **DNA** or **RNA**.

POLYNUCLEOTIDE KINASE



Year in source: **Not mentioned**

हिंदी

⚙️ कार्य:

- ATP** से **phosphate** को **DNA** या **RNA** के **5'-OH** ends पर **transfer** करता है।

RESTRICTION ENZYMES (ENDONUCLEASES)



FUNCTION:

Enzymes produced by **bacteria** that cleave DNA at **specific sites** along the molecule.



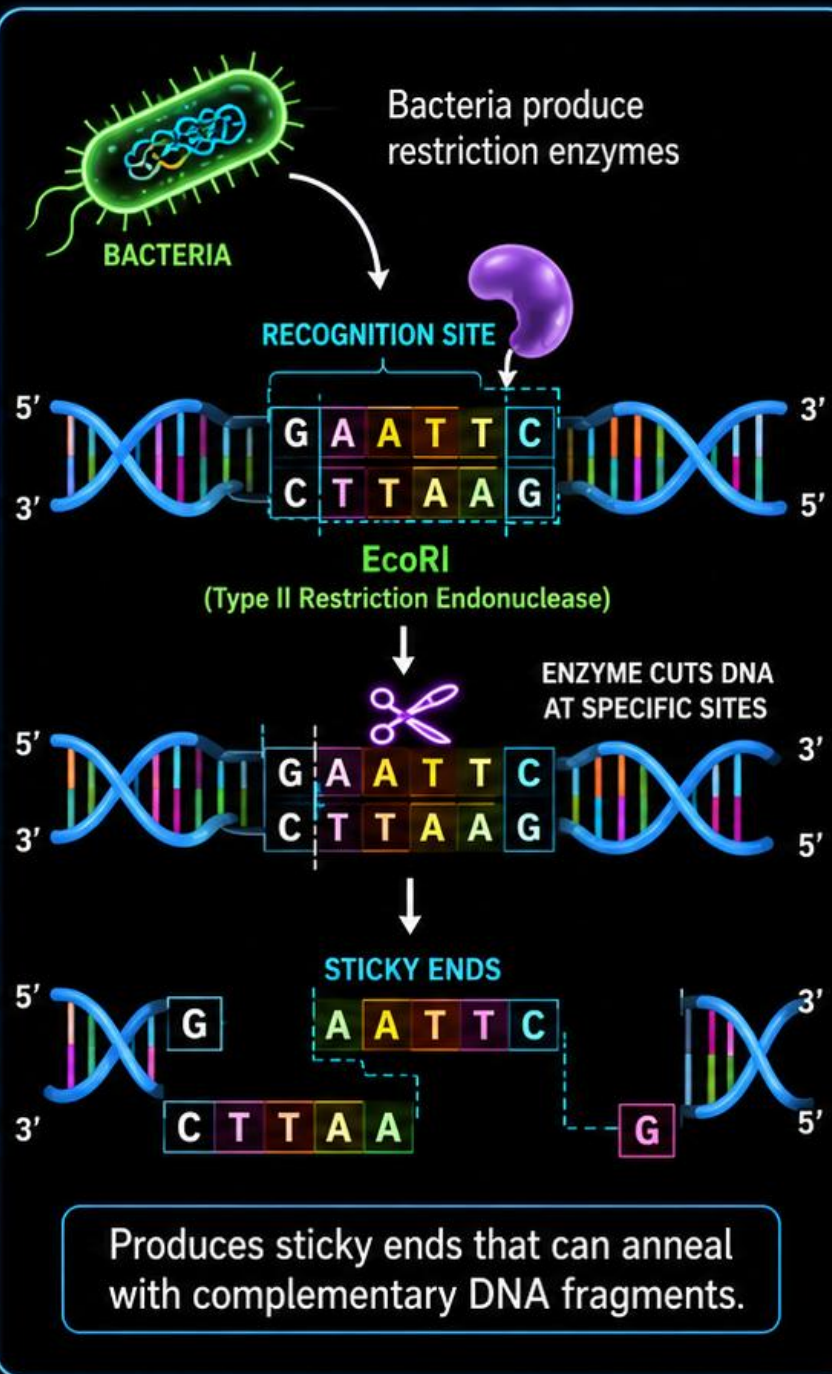
KEY POINT:

Type II restriction endonucleases are used in **recombinant DNA technology reactions**.



Year asked:

RJ Pharmacist 2012 P-1



RESTRICTION ENZYMES (ENDONUCLEASES)

रेस्ट्रिक्शन एंजाइम्स
(एंडोन्यूक्लिएज़)



कार्य:

बैक्टीरिया द्वारा उत्पादित एंजाइम जो DNA को **specific sites** पर काटते हैं।



मुख्य बिंदु:

Type II restriction endonucleases **recombinant DNA technology** में उपयोग किए जाते हैं।

REVERSE TRANSCRIPTASE / रिवर्स ट्रांसक्रिप्टेस



FUNCTION:

Synthesizes DNA from an RNA template.



KEY POINT:

Converts RNA information into complementary DNA (cDNA).



USE:

Important in rDNA technology and cDNA synthesis.

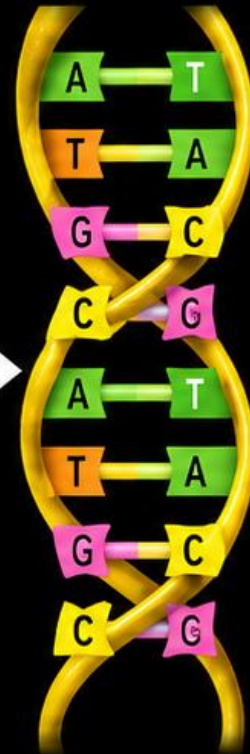
RNA
TEMPLATE



(RNA)

REVERSE
TRANSCRIPTASE

cDNA /
DNA



(cDNA / DNA)



कार्य:

RNA template से DNA का synthesis करता है।



मुख्य बिंदु:

RNA की जानकारी को complementary DNA (cDNA) में बदलता है।



उपयोग:

rDNA technology और cDNA synthesis में महत्वपूर्ण।

Taq DNA Polymerase



FUNCTION:

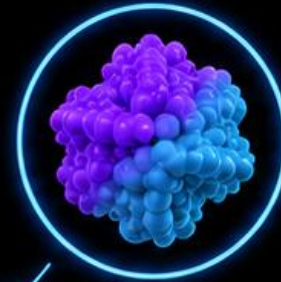
Used in the
**polymerase chain
reaction (PCR).**



KEY POINT:

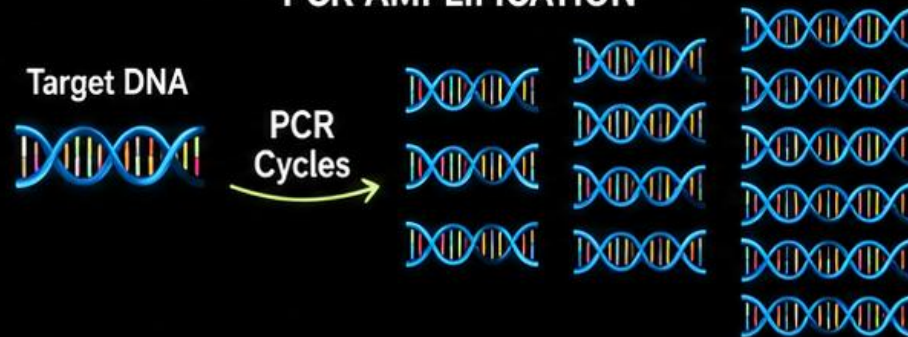
important enzyme
in **PCR amplification.**

PCR MACHINE / THERMOCYCLER



Taq DNA
Polymerase

PCR AMPLIFICATION



Taq DNA Polymerase is a thermostable enzyme
isolated from *Thermus aquaticus*.

Taq DNA Polymerase / टैक डीएनए पॉलीमरेज़



कार्य:

polymerase chain
reaction (**PCR**) में
उपयोग होता है.



मुख्य बिंदु:

PCR amplification
का महत्वपूर्ण एंजाइम.



Year in source: **Not mentioned**



HOST CELLS USED IN GENETIC ENGINEERING – BACTERIA



Bacterial Host Cells



Group:
Prokaryotic



Category:
Bacteria



Role:
living host systems used to propagate recombinant DNA vectors.



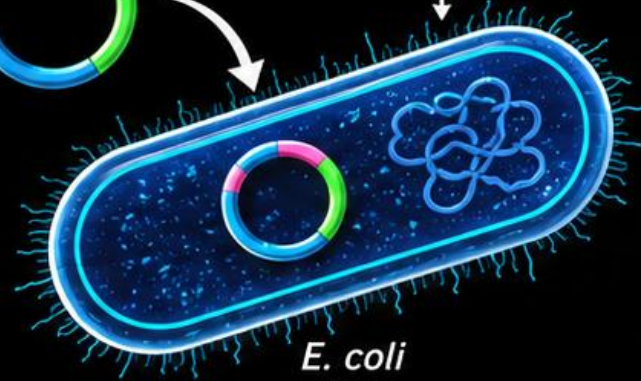
Examples:

- *Escherichia coli*
- *Bacillus subtilis*
- *Streptomyces sp.*

RECOMBINANT
PLASMID (VECTOR)

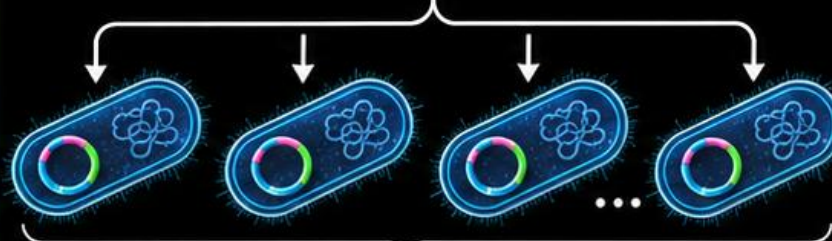


PLASMID ENTERS
BACTERIAL CELL



E. coli

RECOMBINANT DNA
PROPAGATION



MULTIPLE COPIES OF RECOMBINANT DNA VECTOR
MAINTAINED AND PROPAGATED

(CLONING AND AMPLIFICATION IN BACTERIA)

Bacterial Host Cells / बैक्टीरियल होस्ट सेल्स



समूह:
Prokaryotic



श्रेणी:
Bacteria



भूमिका:
recombinant DNA vector को propagate करने के लिए जीवित host system.



उदाहरण:

- *Escherichia coli*
- *Bacillus subtilis*
- *Streptomyces sp.*



Year in source: Not mentioned

HOST CELLS USED IN GENETIC ENGINEERING - FUNGI



TITLE:
Fungal Host Cells



GROUP:
Eukaryotic



CATEGORY:
Fungi



ROLE:
host system for propagation
of recombinant DNA vectors.



EXAMPLES:

- *Saccharomyces cerevisiae*
- *Aspergillus nidulans*



शीर्षक:
Fungal Host Cells / फंगल होस्ट सेल्स



समूह:
Eukaryotic



श्रेणी:
Fungi



भूमिका:
recombinant DNA vector के
propagation के लिए host system.



उदाहरण:

- *Saccharomyces cerevisiae*
- *Aspergillus nidulans*

Year in source: Not mentioned



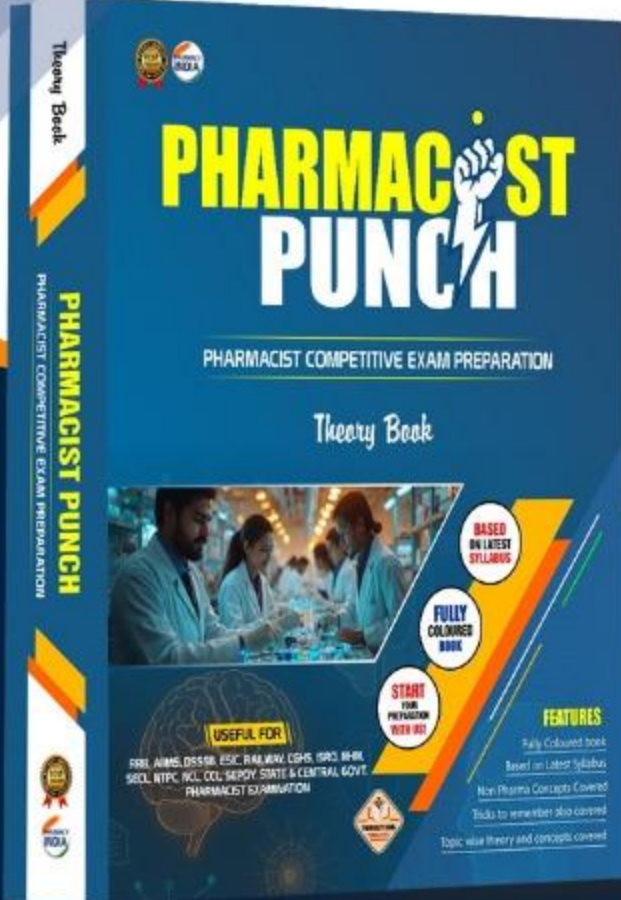
YOUR FINAL

PUNCH



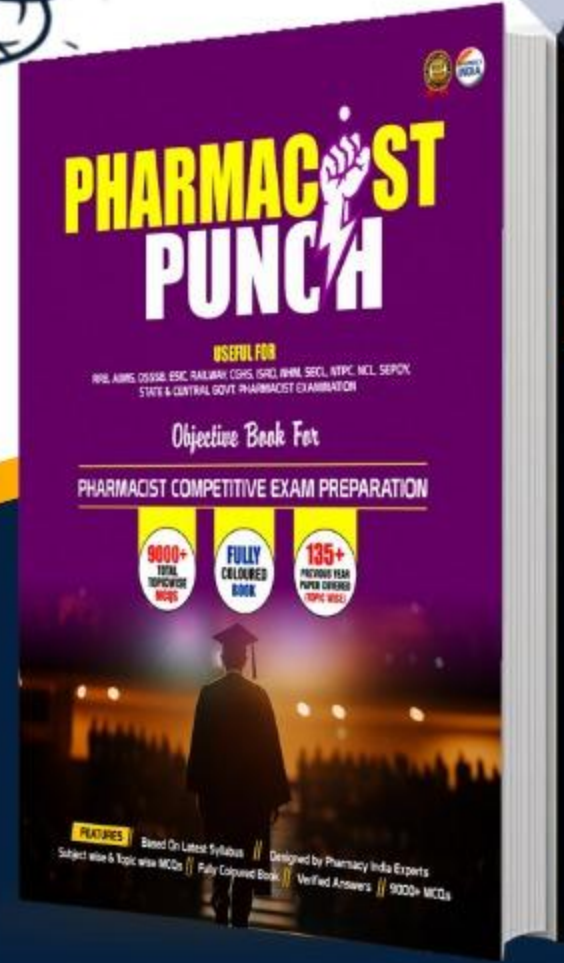
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