



Molecular Scissors of DNA

Understanding Restriction Enzymes in
Recombinant DNA Technology

The Nucleases: Two Distinct Approaches



Exonucleases

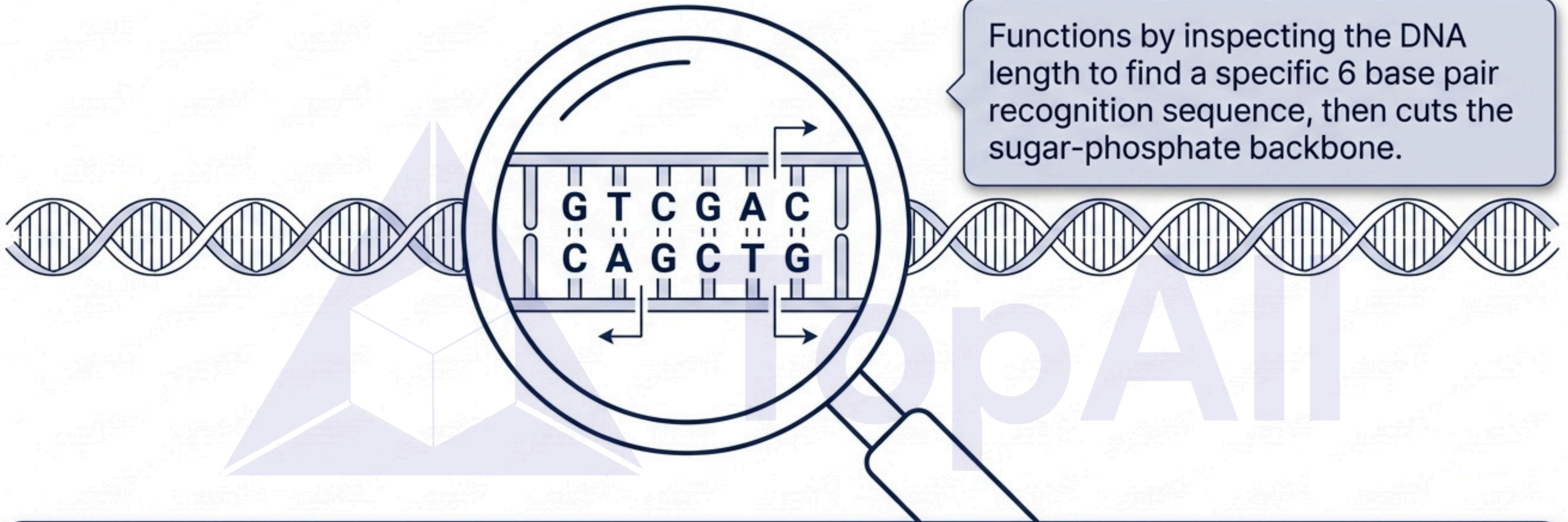
Removes nucleotides sequentially from the ends of the DNA strand.



Endonucleases

Makes precise cuts at specific positions within the DNA. These are the highly specific molecular scissors used in biotechnology.

Hind II: The First Restriction Endonuclease



Today's Arsenal: Over **900** restriction enzymes isolated from **230+** bacterial strains, each recognizing different sequences.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



The Convention of Naming

E → Genus:

Escherichia (First letter of the genus name).

R → Strain:

RY 13 (Derived from the name of the specific strain).

co → Species:

coli (Second two letters from the species of the prokaryotic cell).

I → Order:

Roman Numeral (Indicates the order in which the enzyme was isolated from that strain).

EcoRI

The Target: Palindromic Sequences

M A L A Y A L A M

A sequence of base pairs that reads the same on the two strands when the orientation of reading ($5' \rightarrow 3'$) is kept the same.

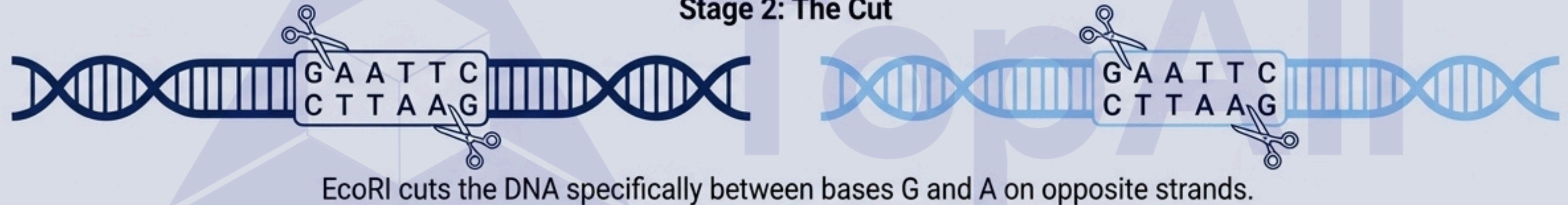
5' — G A A T T C — 3'
3' — C T T A A G — 5'

EcoRI Action: Creating Sticky Ends

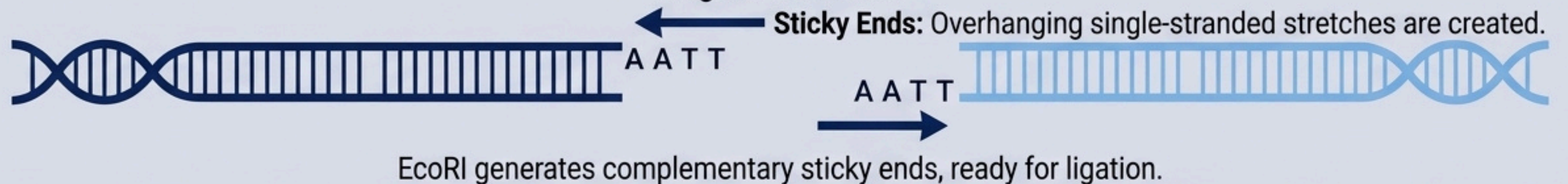
Stage 1: Recognition



Stage 2: The Cut



Stage 3: The Result



NEET KEY TAKEAWAY

Sticky Ends
(Hydrogen bonding)



DNA Ligase
(The Molecular Glue)



**Recombinant
DNA**

The stickiness of the ends facilitates the action of the enzyme DNA ligase, which joins the sugar-phosphate backbones end-to-end to create a seamless recombinant molecule.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

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