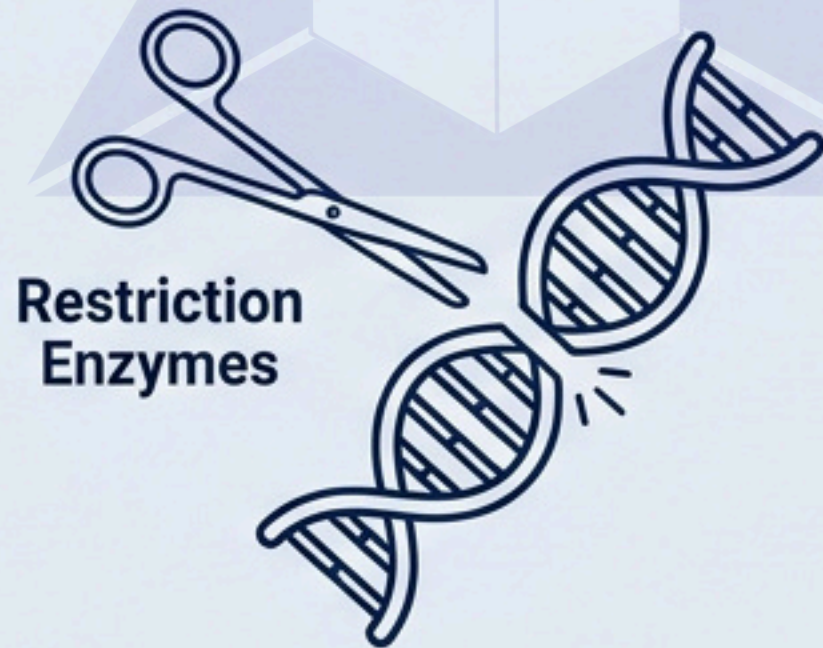


Isolation of Genetic Material

The essential first step in Recombinant DNA Technology

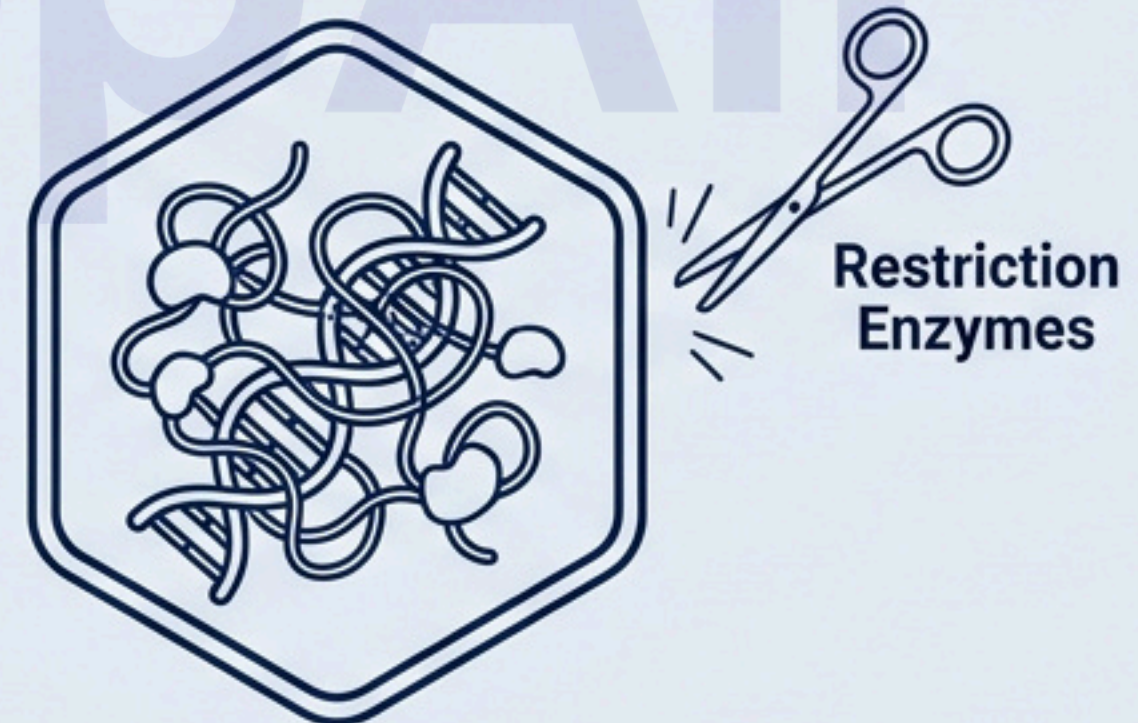
The Goal

- **Target:** Pure, intact DNA.
- **Why?** Restriction enzymes ('molecular scissors') require DNA to be entirely free from other macromolecules to cut at specific locations.



The Challenge

- DNA is enclosed within membranes and tangled with RNA, proteins, polysaccharides, and lipids.
- **Solution:** A 4-step chemical and physical isolation protocol.



Step 1: Lysis (Breaching the Barriers)

Different cell walls require specific enzymatic keys to release the genetic material.

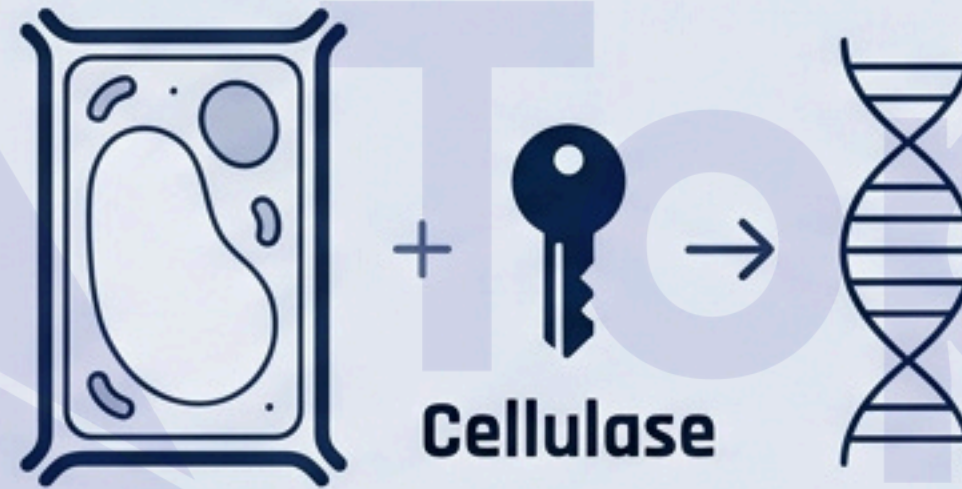
Bacterial Cells



Barrier: Peptidoglycan

Bacteria require Lysozyme to degrade the peptidoglycan cell wall.

Plant Cells



Barrier: Cellulose

Plant cells require Cellulase to break down the rigid cellulose wall.

Fungal Cells

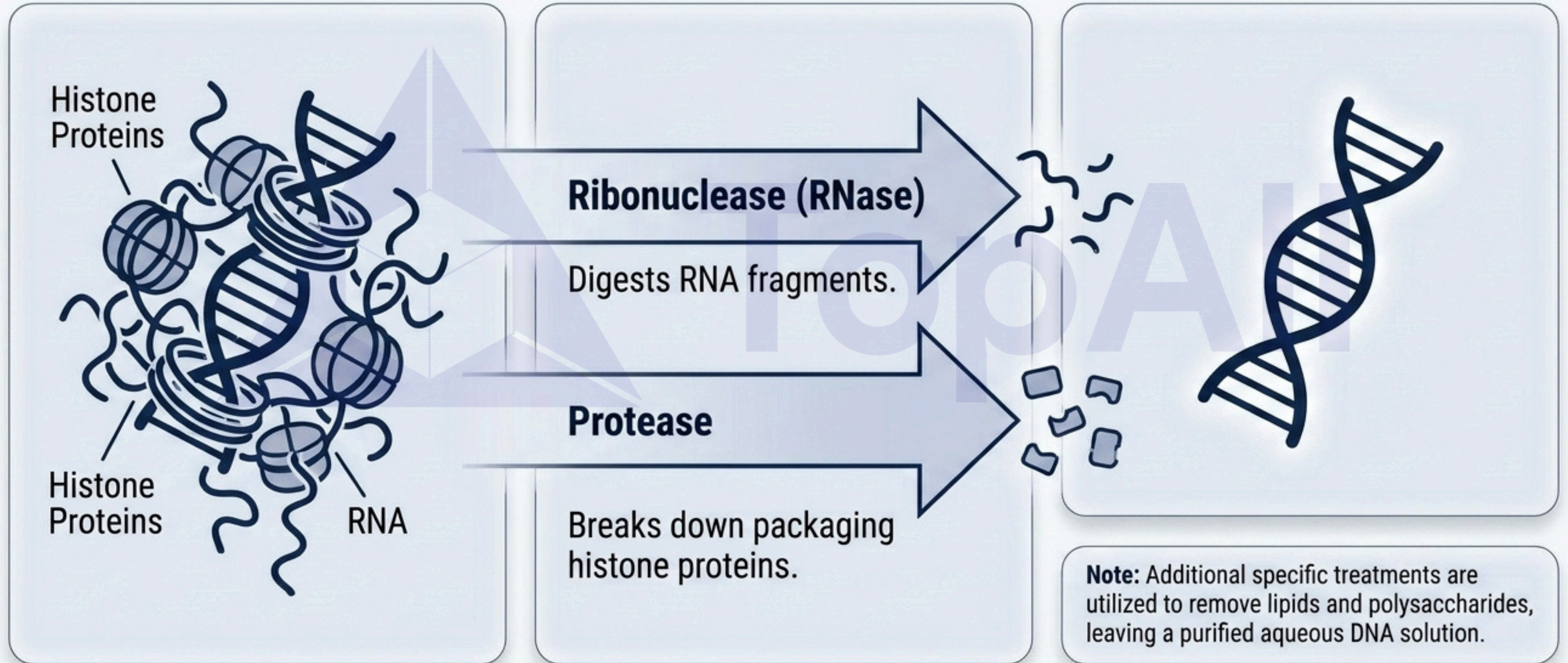


Barrier: Chitin

Fungi require Chitinase to dissolve the chitin-based cell wall.

Step 2: Purification

Stripping away intertwined macromolecules to isolate the DNA.





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

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

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

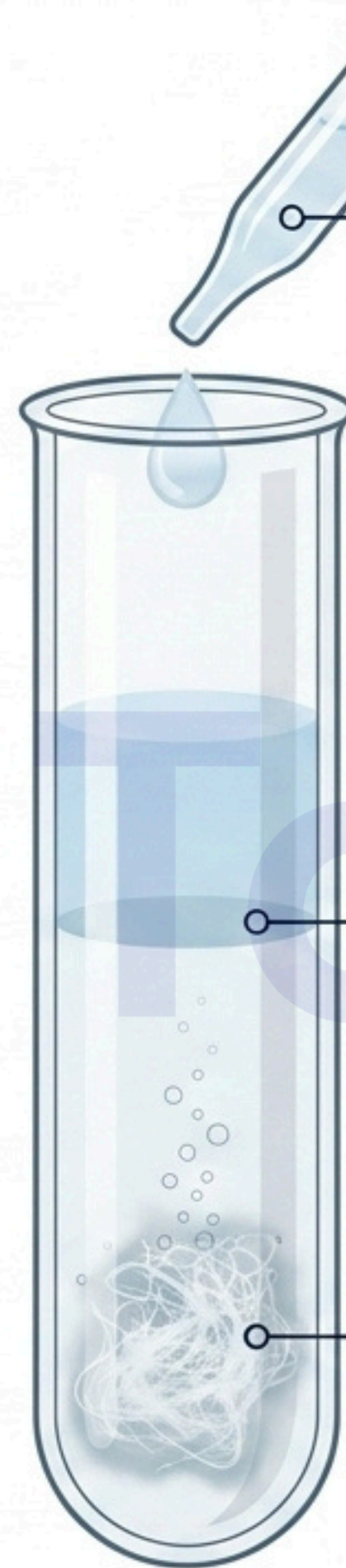


Step 3: Precipitation

Forcing the purified DNA out of the aqueous solution.

Visual Result:

The precipitated DNA appears as a collection of fine, whitish threads suspended within the liquid.



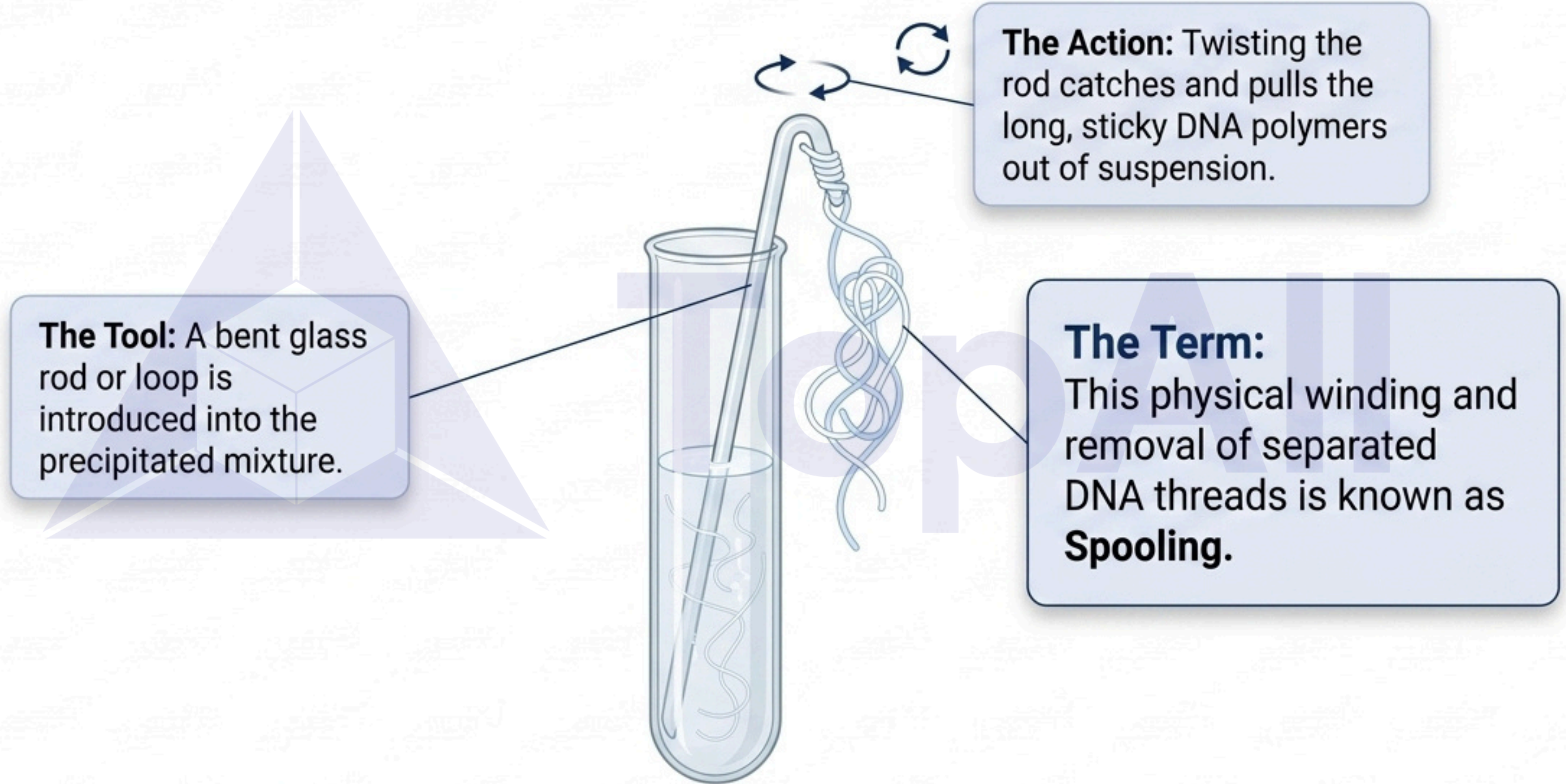
The Catalyst: Chilled Ethanol
(Room temperature is ineffective.)

The Reaction: Purified DNA is completely insoluble in cold ethanol.

The Result: DNA physically precipitates out of the liquid phase.

Step 4: Spooling

The final physical collection of the genetic material.



Protocol Complete: Pure DNA is now ready for fragmentation by restriction endonucleases.

NEET Key Takeaways: DNA Isolation

High-yield concepts for rapid exam revision.

Lysis Matching

- Bacteria → Lysozyme
- Plant → Cellulase
- Fungus → Chitinase

The Purification Trap

Correct: Use Ribonuclease (for RNA) and Protease (for proteins).

Exam Trap: Do NOT use DNase. It will destroy the very genetic material you are attempting to isolate!

Precipitation Condition

Only Chilled Ethanol successfully precipitates purified DNA out of suspension. Room temperature is ineffective.

Visual Identification

Spooling: The specific, highly-tested term for physically winding the precipitated fine threads of DNA onto a glass rod.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis