



# The Discovery That Built Biotechnology

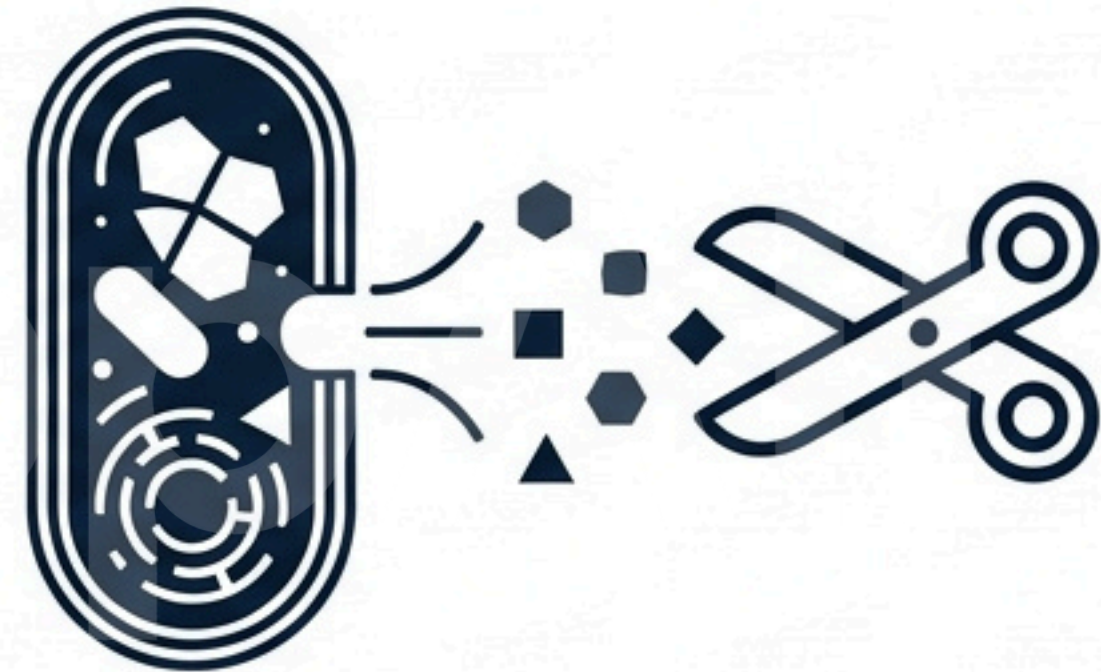


# Herbert Boyer Discovers Molecular Scissors

## The Protagonist: Herbert Boyer

- 1966: Assumes assistant professorship at UCSF.
- 1969: Performs pivotal studies on restriction enzymes within *E. coli* bacteria.

## The Tool: Endonucleases

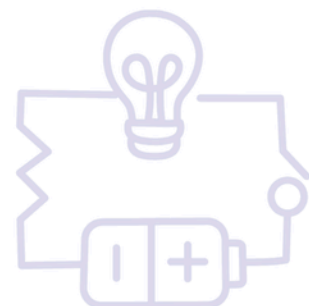


These unique enzymes possess the capability to cut DNA strands in a highly particular, predictable fashion.



**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.**

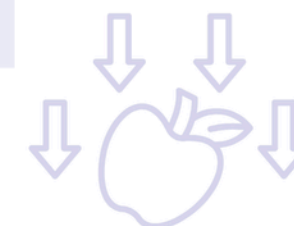
**Practice Now**



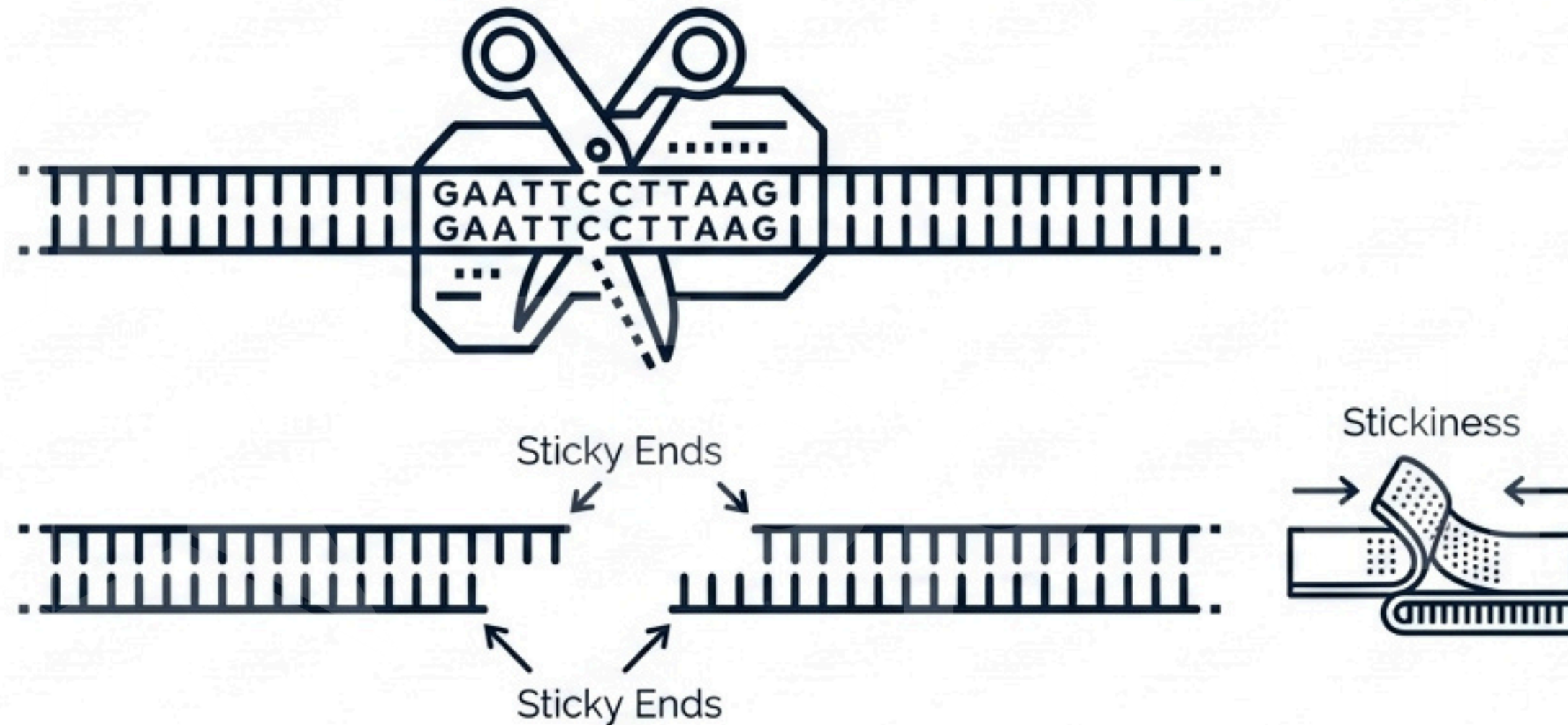
At [prep.topall.app](https://prep.topall.app)

### 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



# Precision Cutting and Sticky Ends



These clipped ends transformed the cutting of DNA into a precise exercise, ready to be pasted to a complementary sequence.

# Stanley Cohen and the Delivery Vehicle

## The Protagonist: Stanley Cohen

- A Stanford scientist studying small ringlets of extra-chromosomal DNA called plasmids.

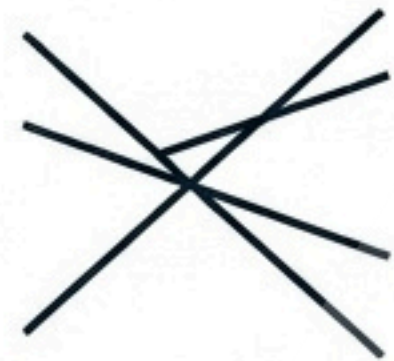
## The Tool: Plasmids



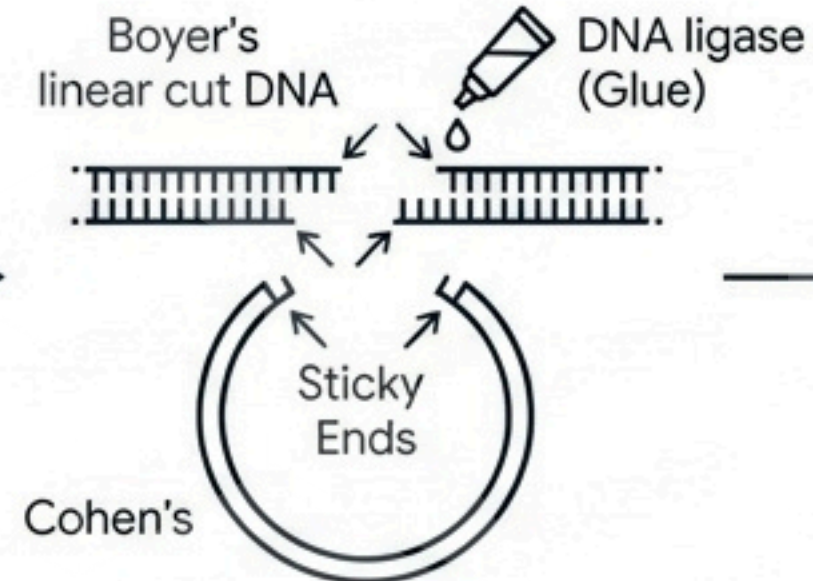
**Because plasmids replicate entirely independently from the main coding strand, they are the perfect mobile delivery system.**

# The Hawaiian Synthesis Creates a Protein Factory

## 1972: The Hawaii Meeting



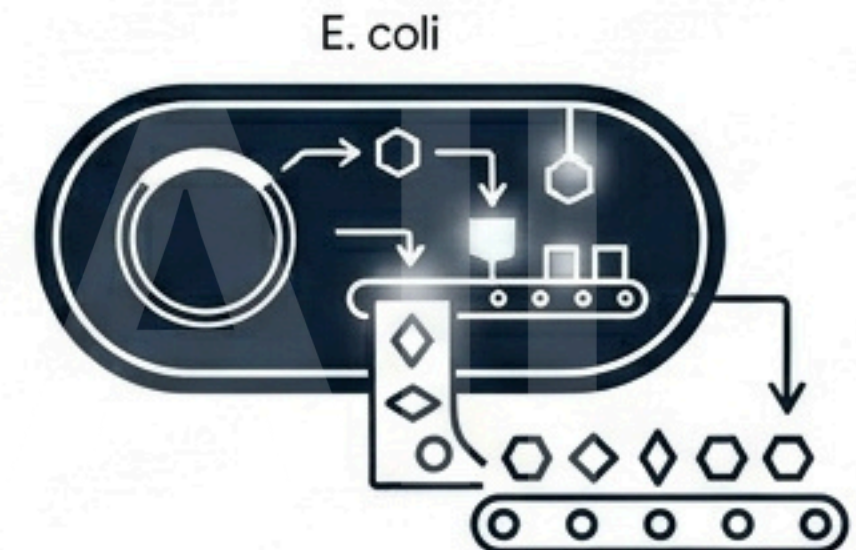
## The Splice



## The Recombinant



## The Factory



By combining DNA splicing with plasmid transfer, Boyer and Cohen birthed the discipline of biotechnology—turning bacteria into programmable manufacturing plants.



# 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