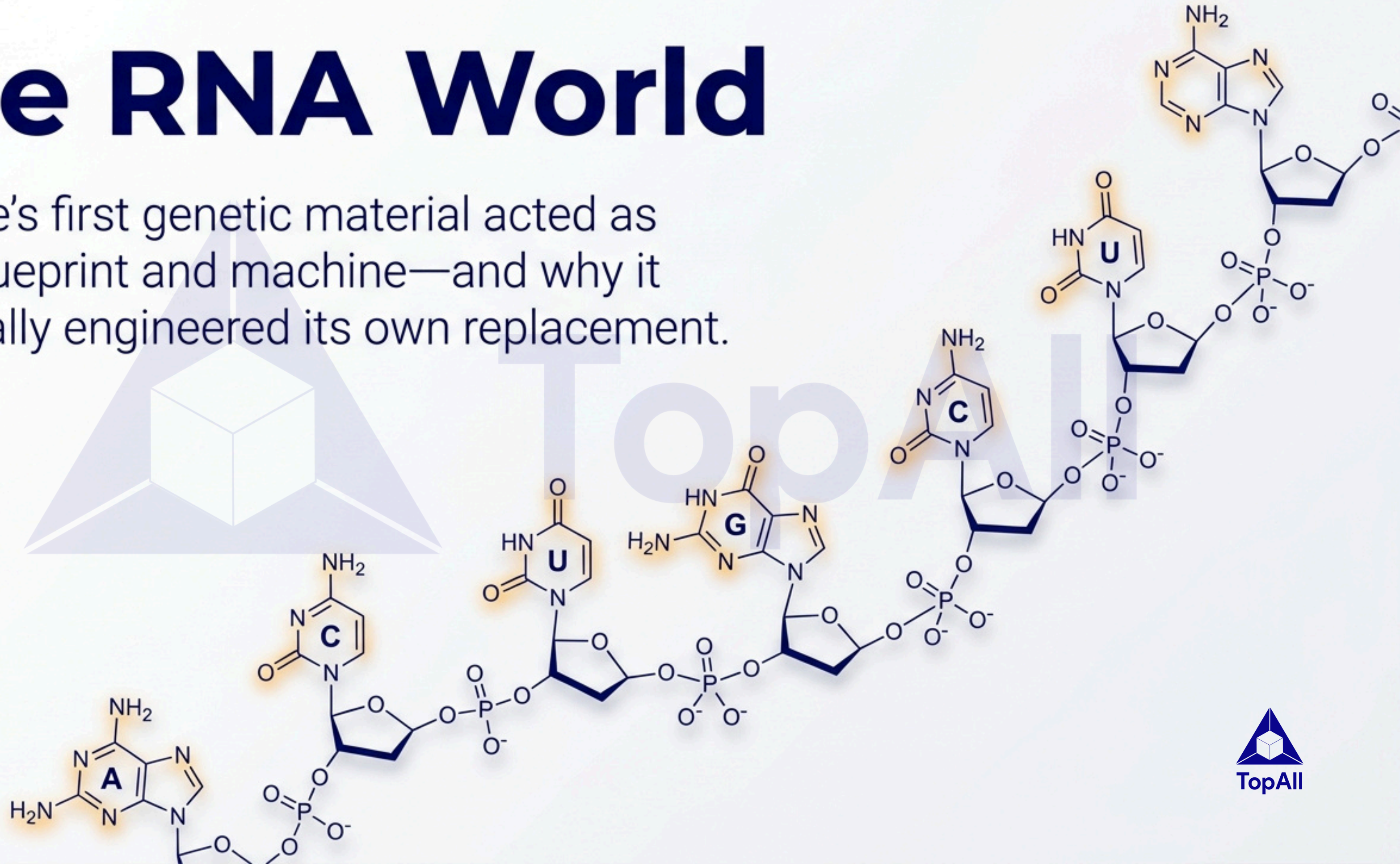
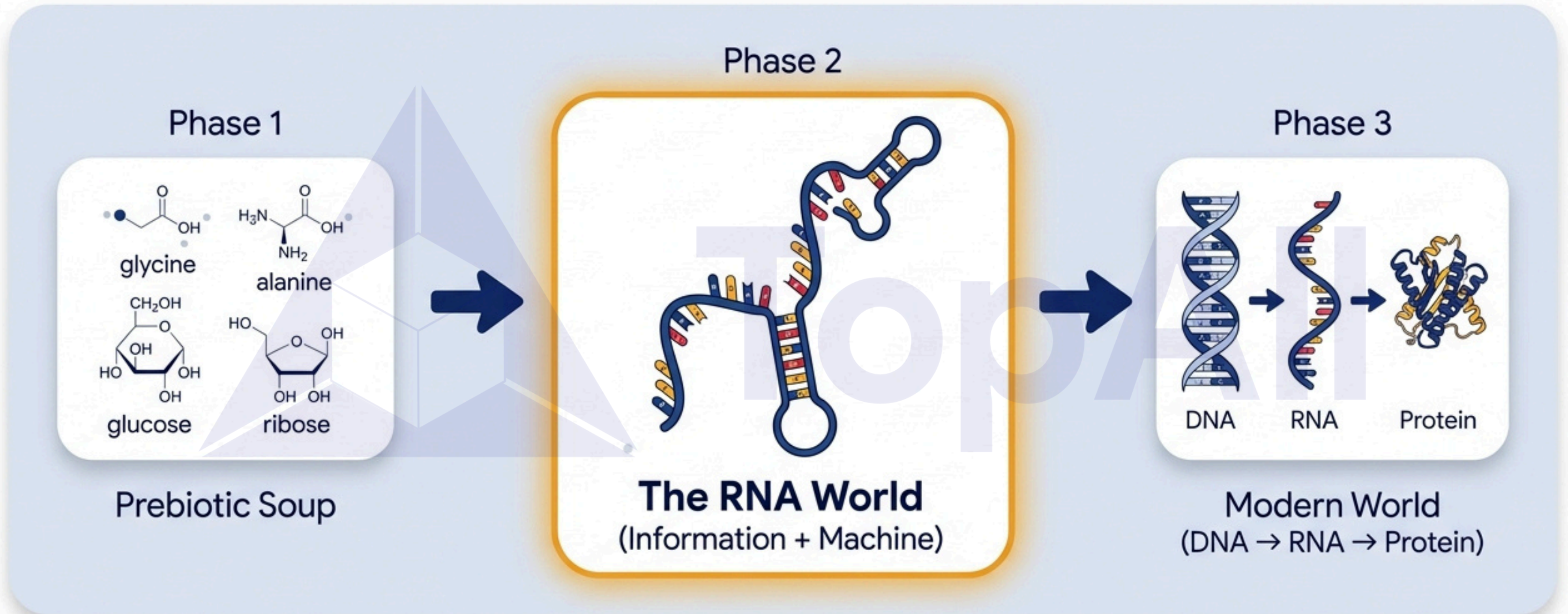


The RNA World

How life's first genetic material acted as both blueprint and machine—and why it eventually engineered its own replacement.



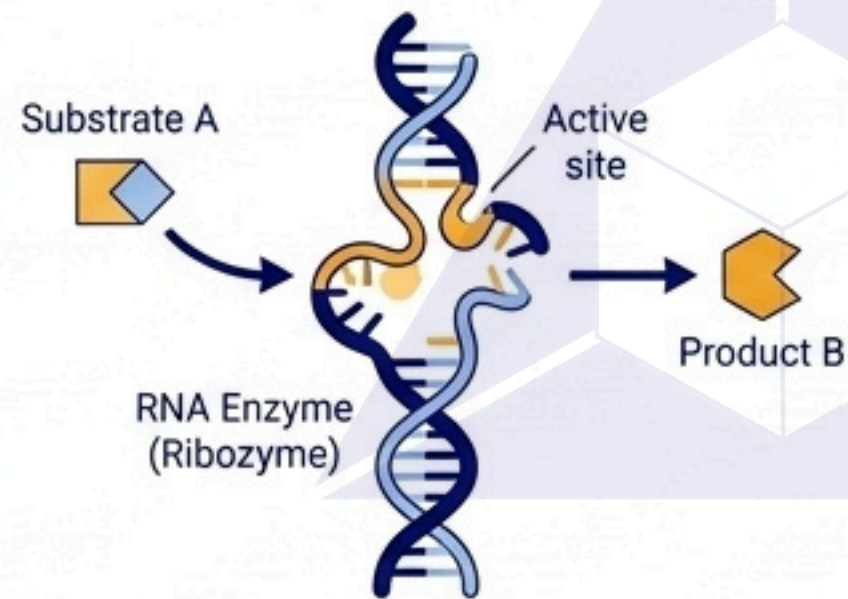
The Genesis of the Central Dogma



There is now enough evidence to suggest that essential life processes **evolved around RNA**. It was the absolute first genetic material.

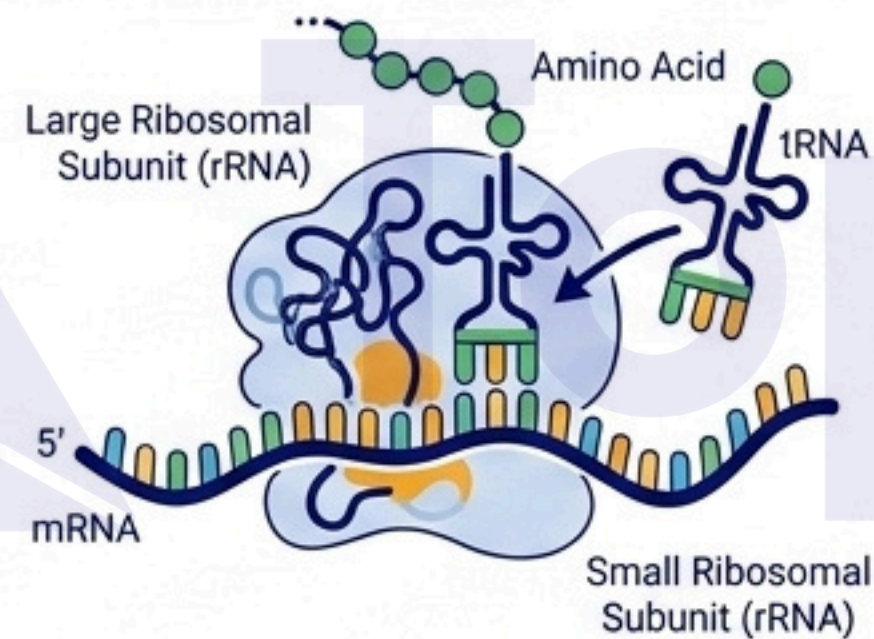
The Original Multi-Tool: RNA's Versatility

Metabolism



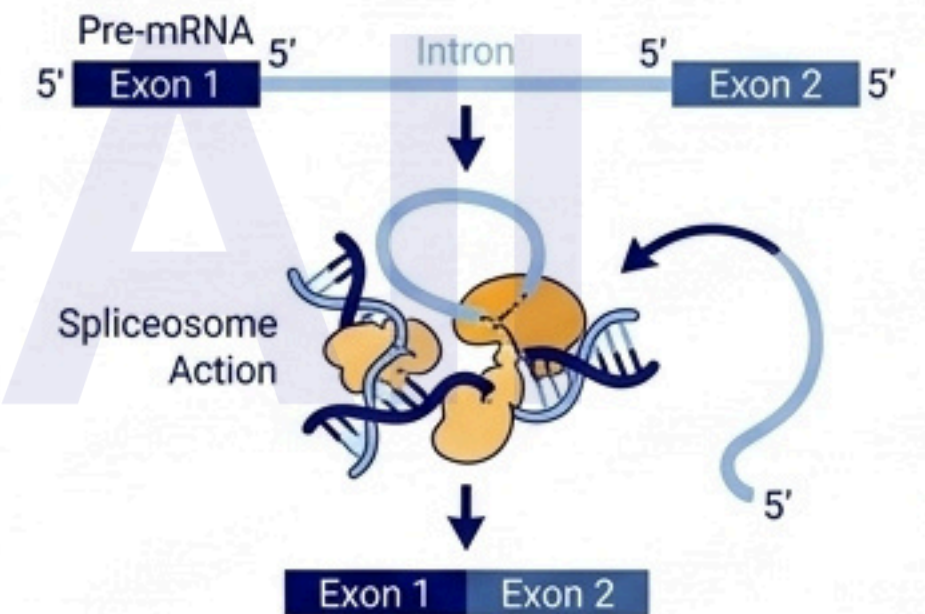
Essential metabolic processes originally evolved around RNA.

Translation



The protein-synthesizing machinery was built entirely around RNA.

Splicing



RNA self-edits and processes its own genetic code.



**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



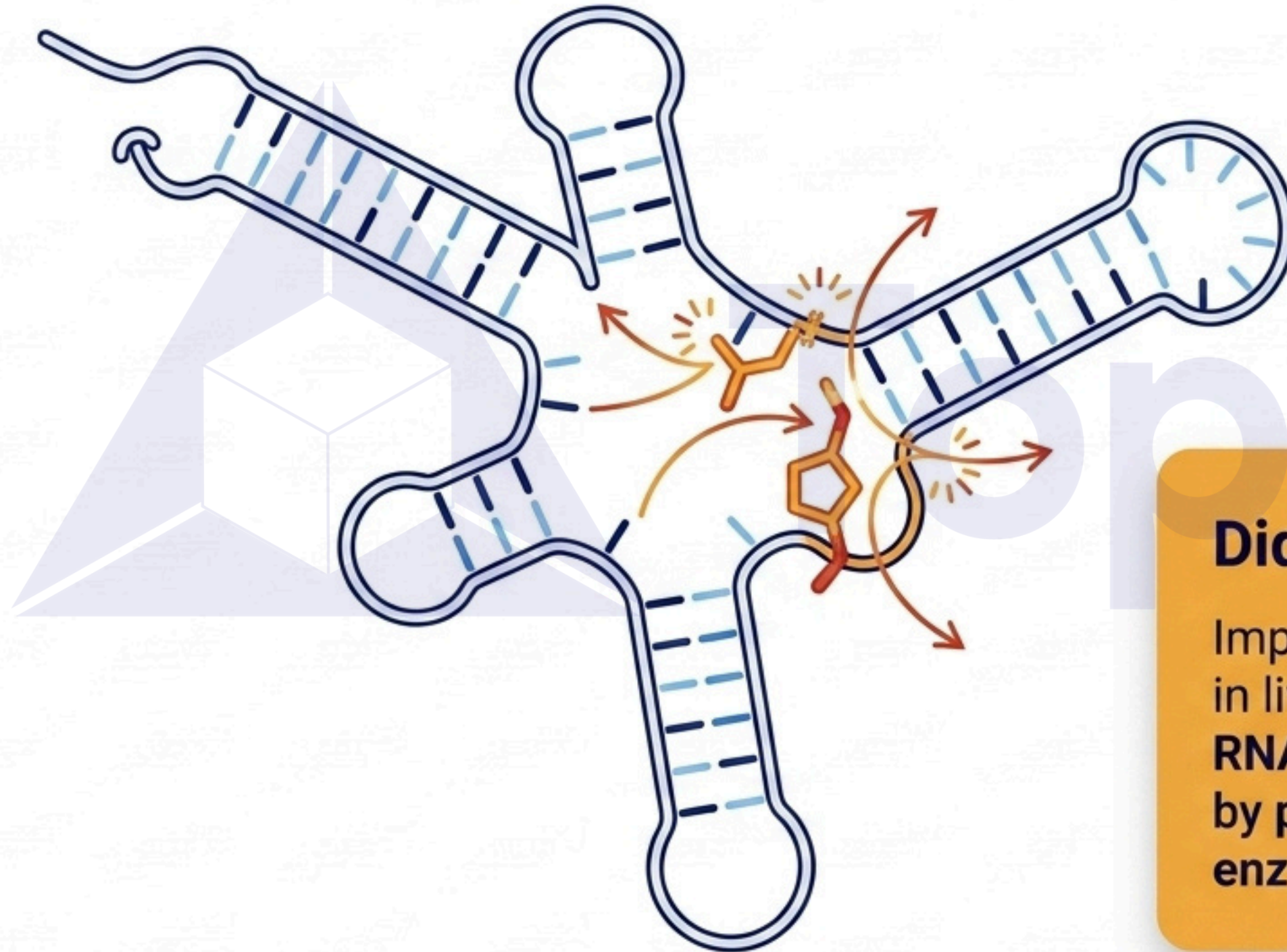
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Key Highlights

- » 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



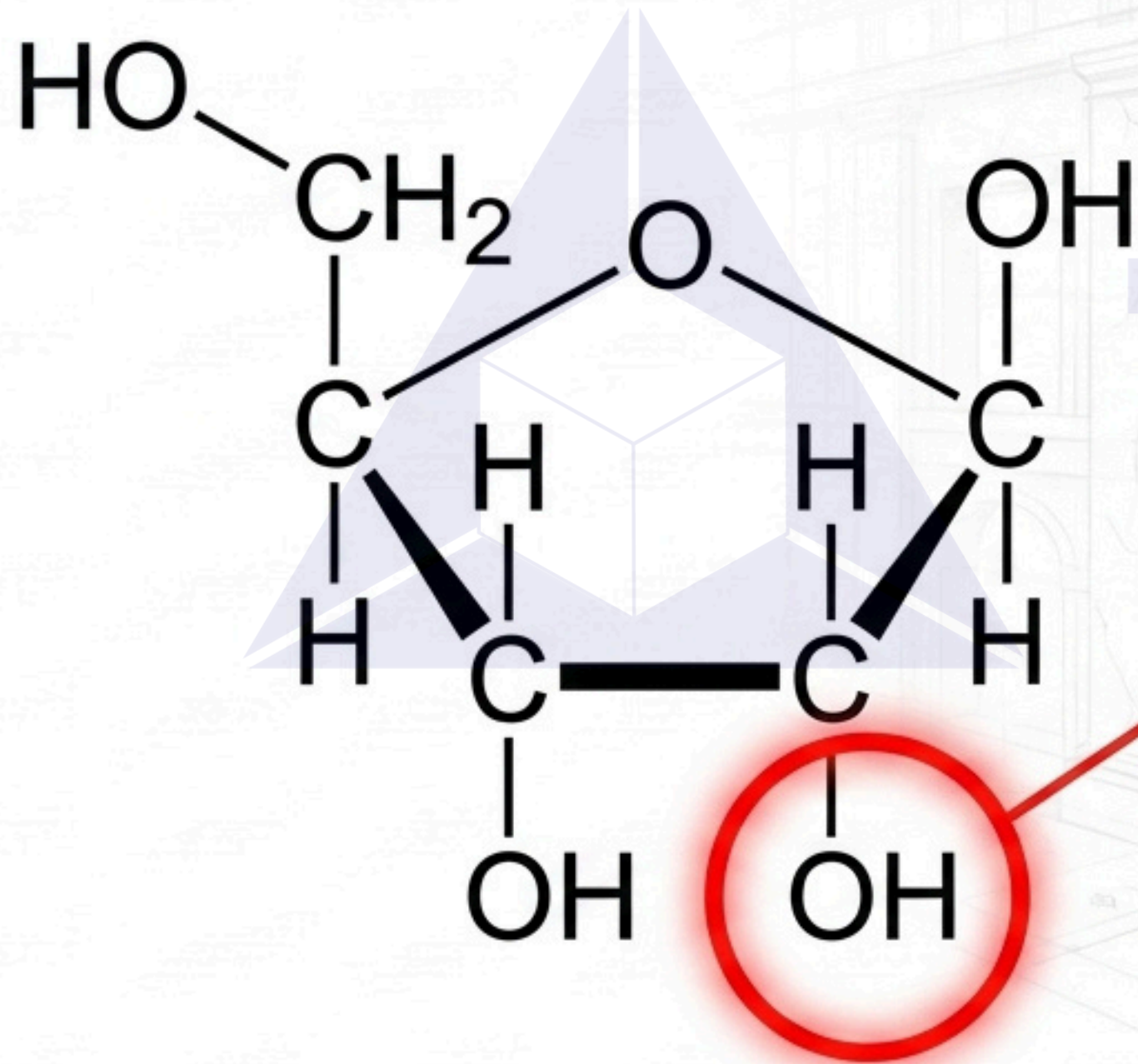
RNA as a Catalyst: The Ribozyme



Did you know?

Important biochemical reactions in living systems are catalyzed by **RNA catalysts (ribozymes)**, not by protein enzymes. Protein enzymes evolved later!

The Fatal Flaw: The Cost of Being a Catalyst

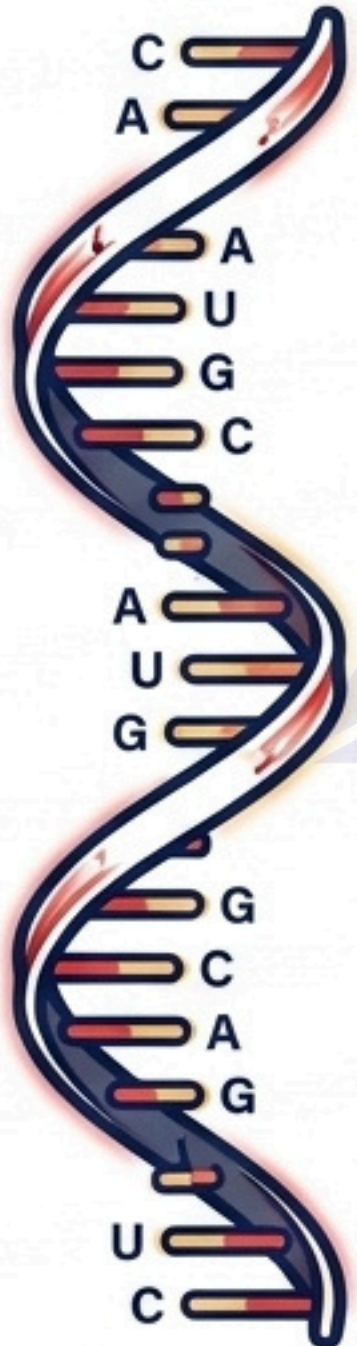


The 2'-OH group is highly reactive. It makes RNA labile (easily degradable) and unstable.

Being a great catalyst made **RNA terrible for long-term genetic storage.**

DNA: Engineered for Stability

RNA



Sugar Upgrade: Removal of the reactive oxygen (Ribose → Deoxyribose).

Base Upgrade: Substitution of Uracil with Thymine (confers additional chemical stability).

Structural Upgrade: Addition of a complementary second strand (resists changes and allows for the evolution of repair mechanisms).

DNA



The Ultimate Division of Labor

DNA (The Vault)



Role: Storage of Genetic Information.

Why?: Chemically less reactive, structurally highly stable.

RNA (The Messenger & Machine)



Role: Transmission & Execution of Genetic Information.

Why?: Reactive, catalytic, and easily expressed.

**Life began in an RNA world, but evolution divided the labor.
DNA stores the blueprints; RNA builds the house.**



You've Learned the Theory.

Now Let's Test It.

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