

Gene Delivery in Plants and Animals

From natural pathogens to engineered biotech vectors.



Nature's Ancient Delivery Experts

Bacteria and viruses have known for ages how to breach eukaryotic cells and force them to do their bidding.

Agrobacterium tumefaciens

A bacterial pathogen targeting dicot plants.



Retroviruses

Viral pathogens targeting animal cells.





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

$$E=mc^2$$



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Key Highlights

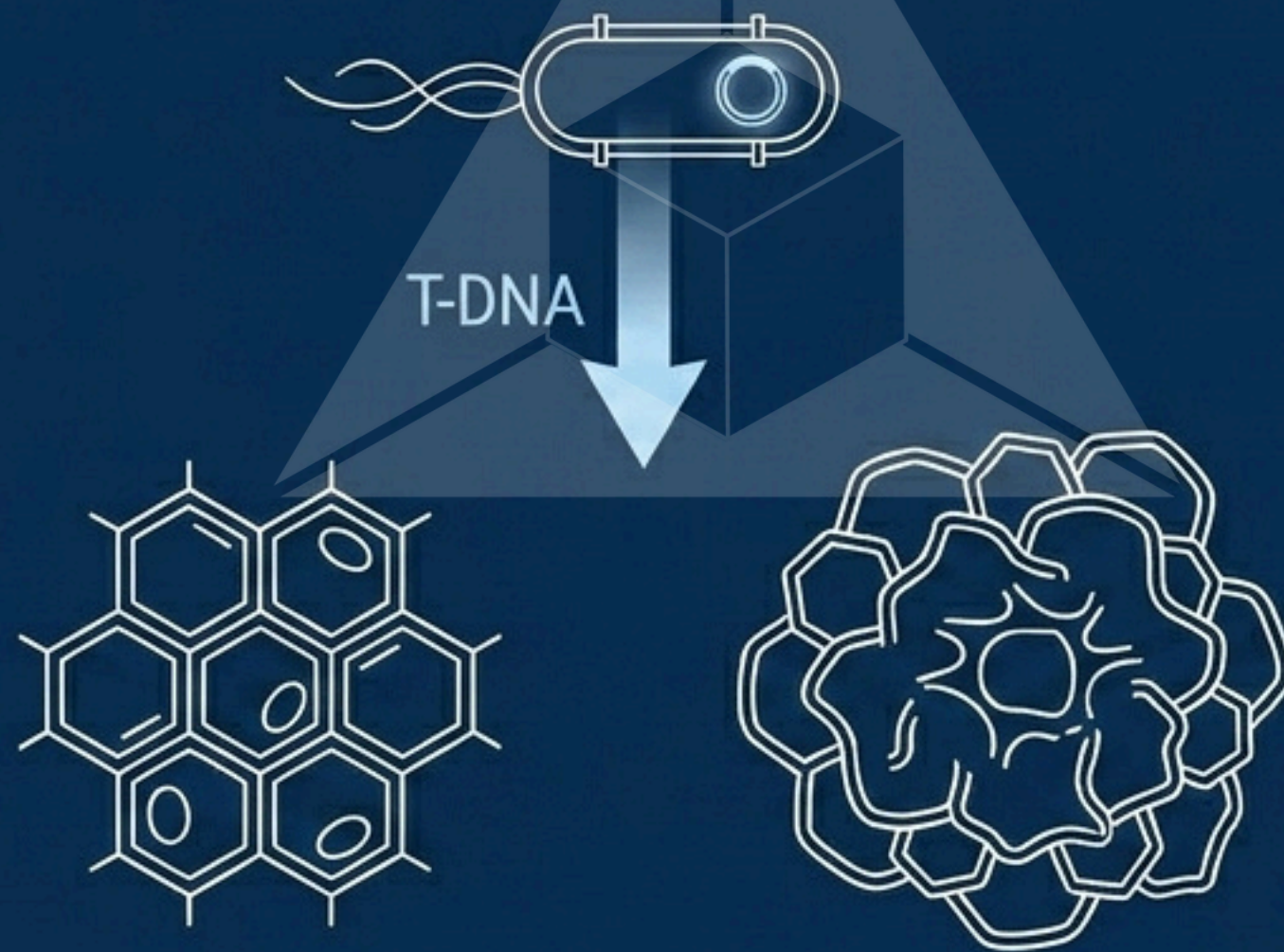
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The Natural Infection Mechanism

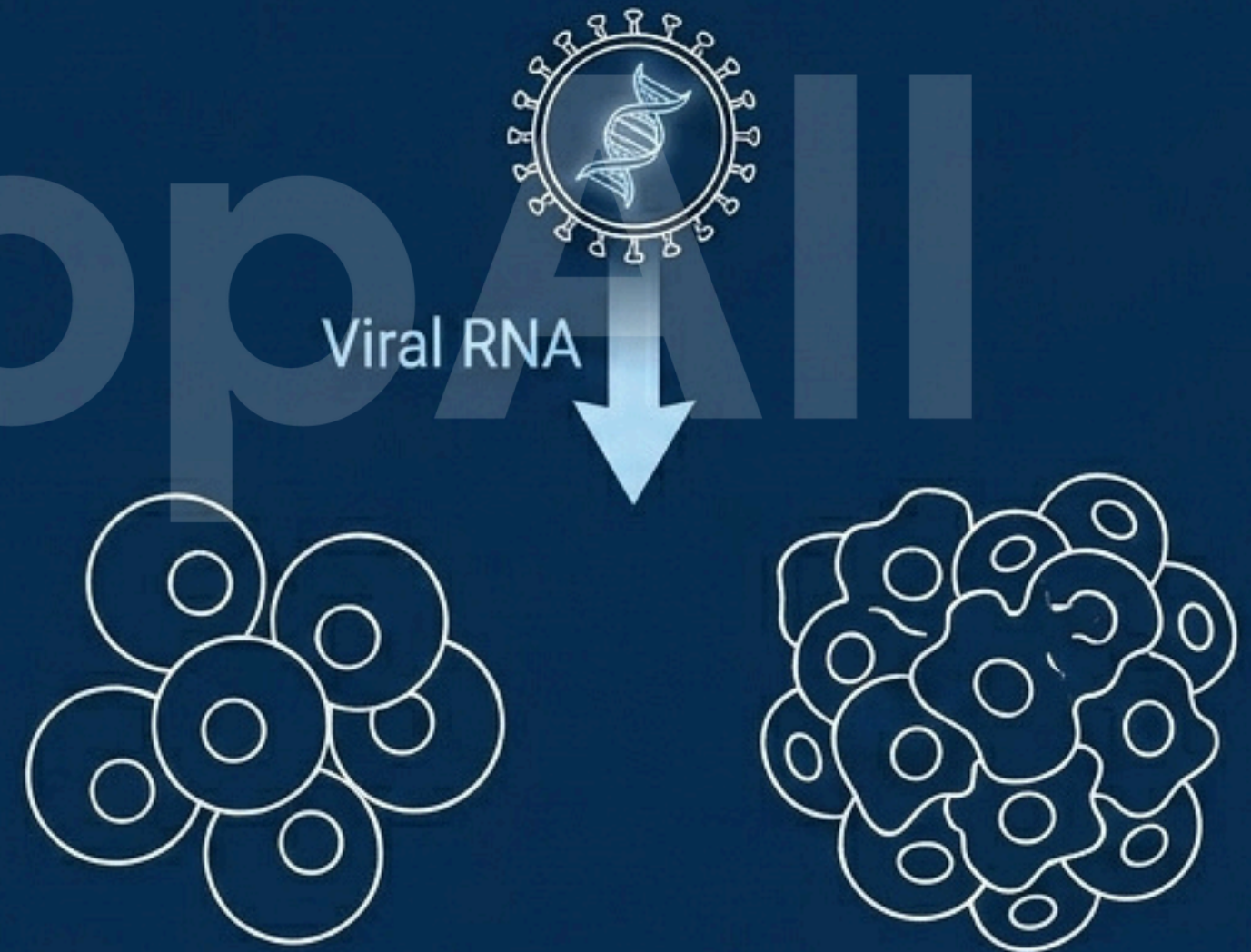
The T-DNA Hijack

The bacteria delivers 'T-DNA' to transform normal dicot cells into a tumor, directing them to produce chemicals required by the pathogen.



The Cellular Takeover

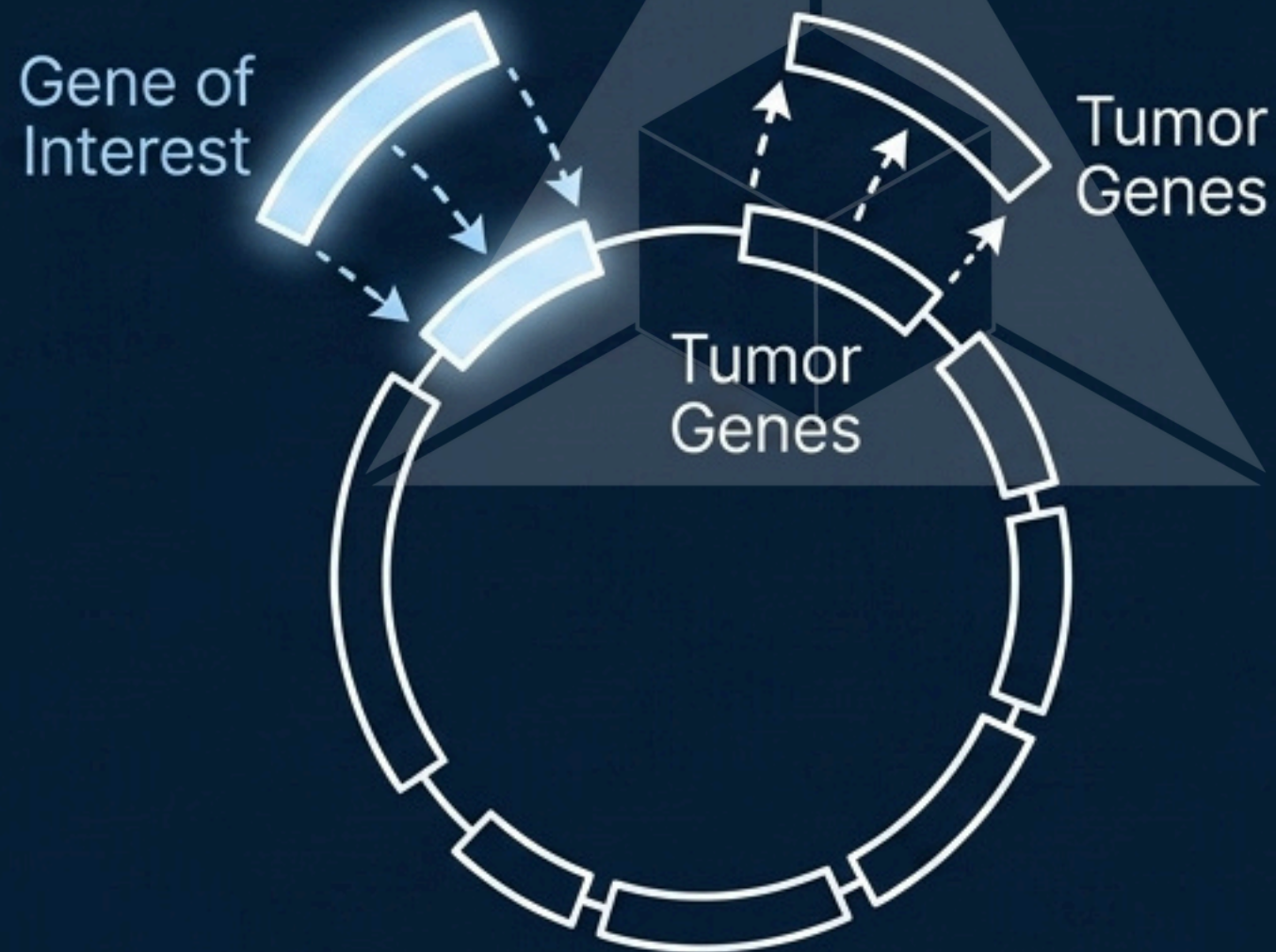
Retroviruses insert their genetic material to transform normal animal cells into cancerous cells.



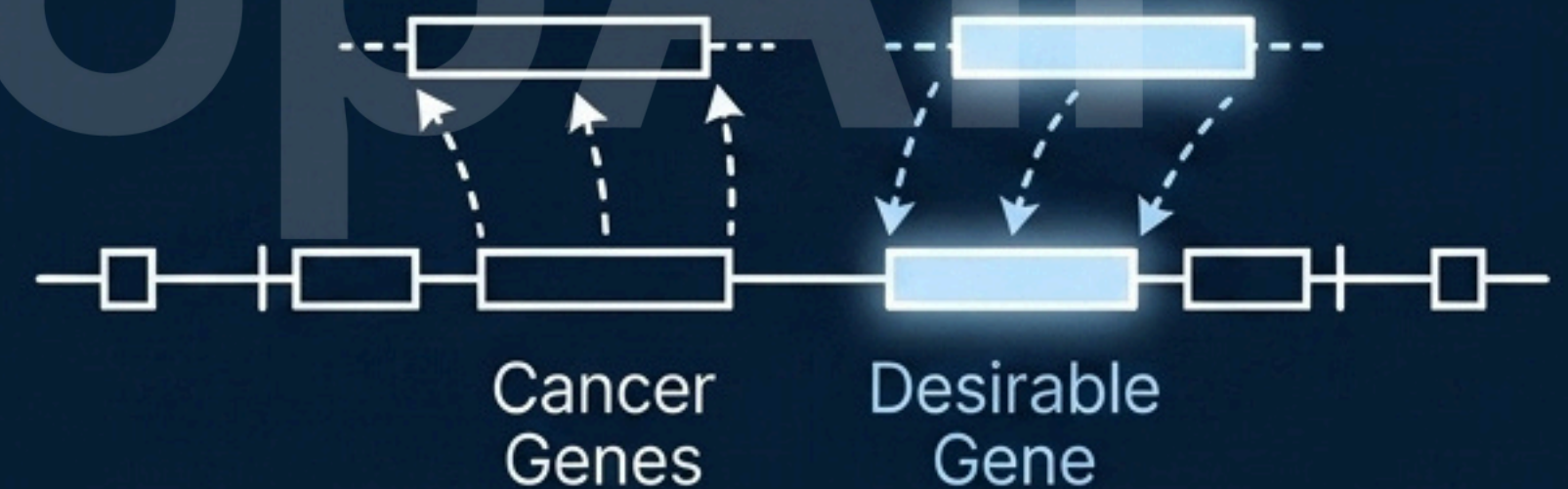
The Biotech Plot Twist: Disarming the Pathogens

Keep the delivery vehicle. Swap the payload.

Tumor-inducing genes are **removed** from the Ti plasmid.



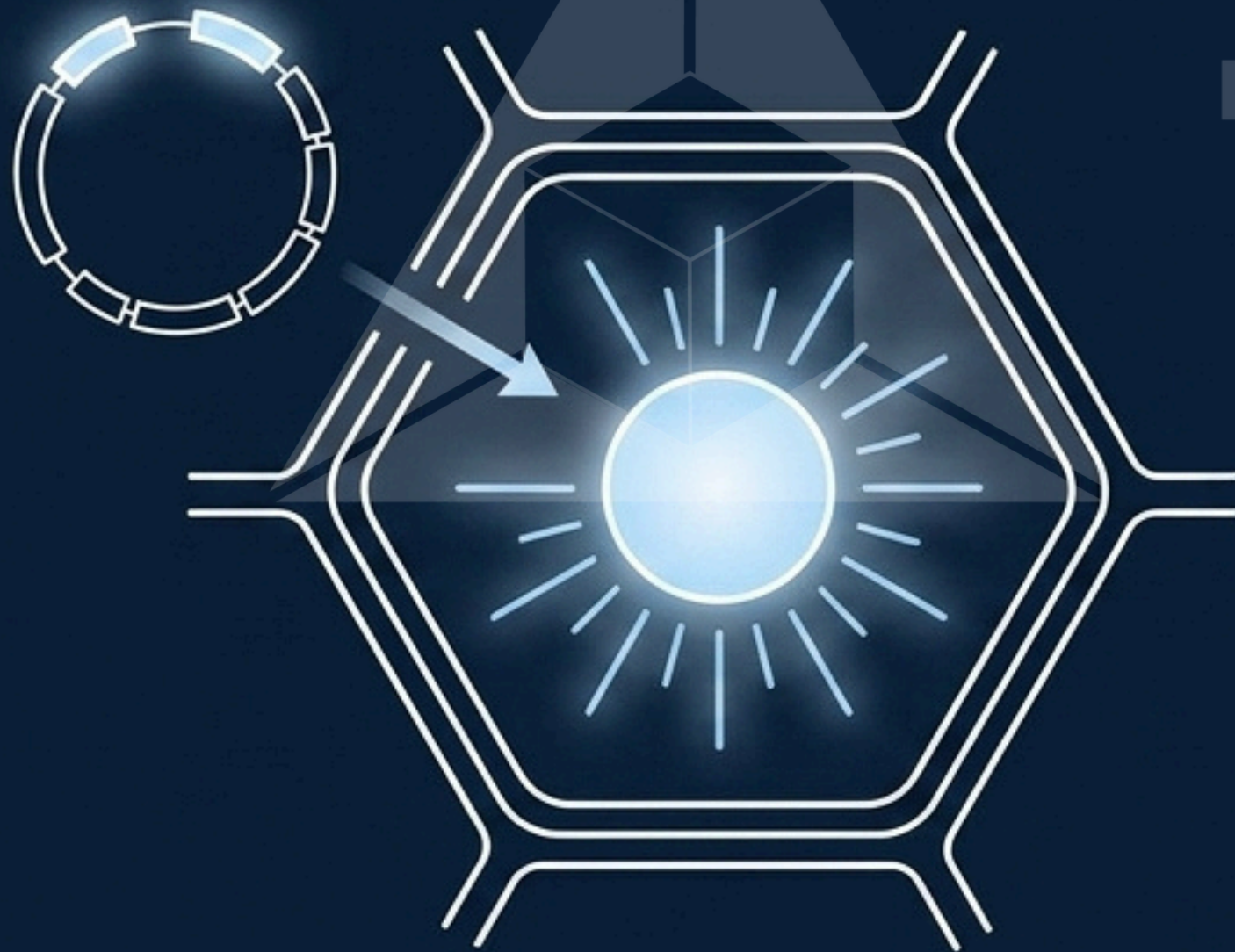
Cancer-causing genes are stripped from the **retrovirus**.



The Engineered Vectors

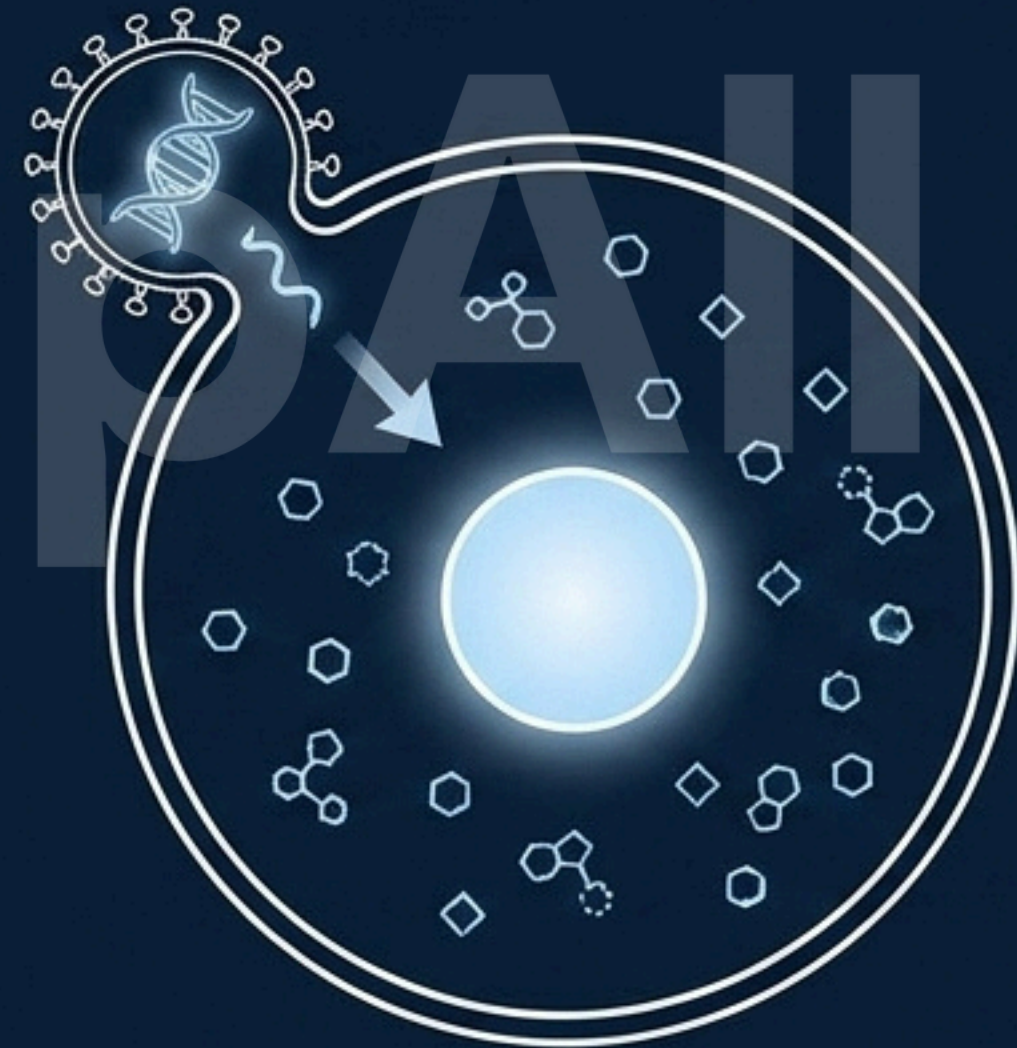
Non-Pathogenic Ti Plasmid

Delivers genes of interest into a variety of plants without causing disease.



Disarmed Retrovirus

Safely delivers desirable genes directly into target animal cells.



The NEET Takeaway: Vector Vector Synthesis

Target Organism	Natural Pathogen	Original Effect	Engineered Vector	Primary Modification
 Dicot Plants	<i>Agrobacterium tumifaciens</i>	Delivers T-DNA to cause tumors	 Ti Plasmid	Tumor-inducing genes removed (Disarmed)
 Animal Cells	Retrovirus	Transforms normal cells to cancerous cells	 Disarmed Retrovirus	Cancer-causing genes stripped



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