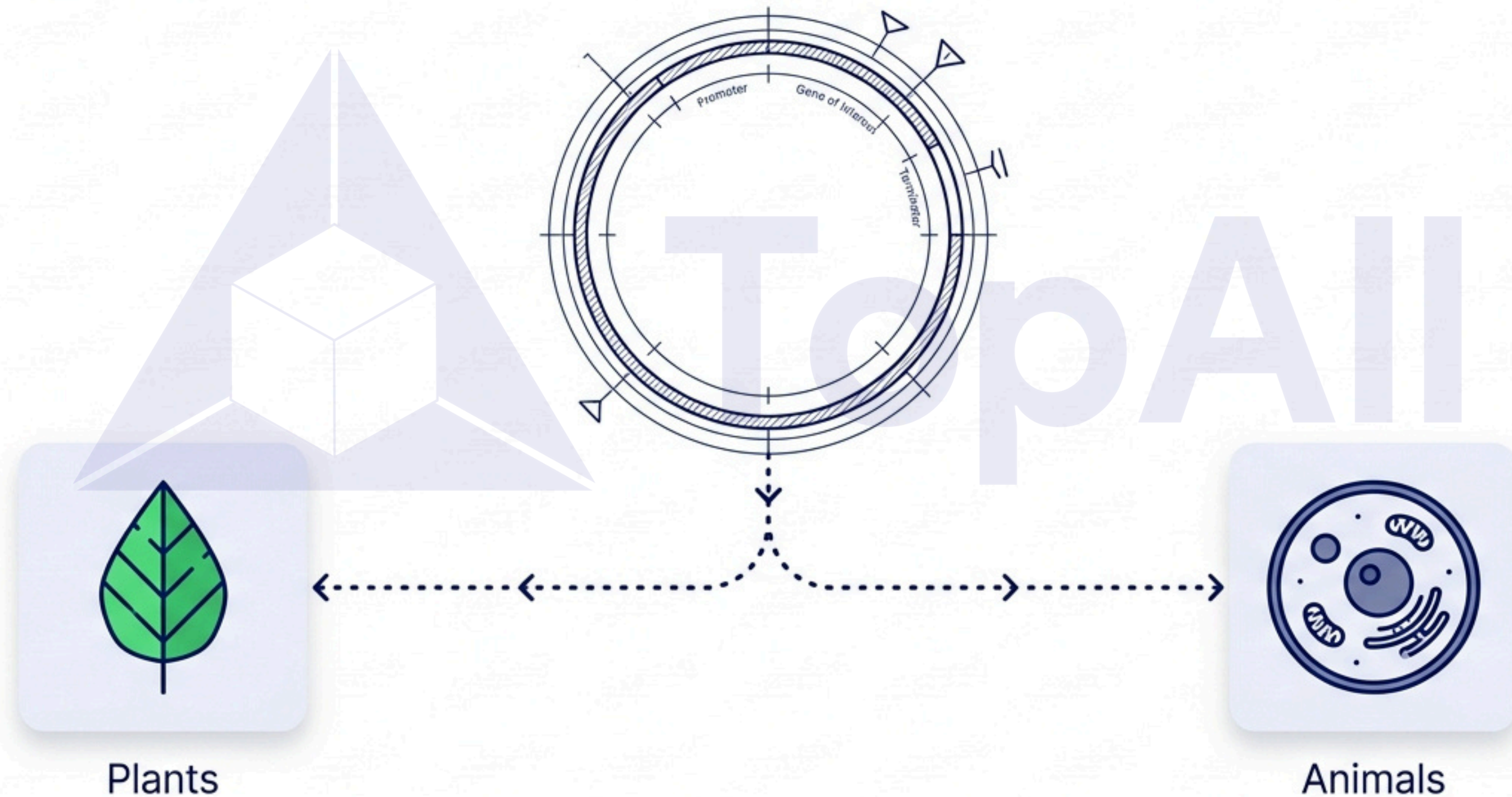
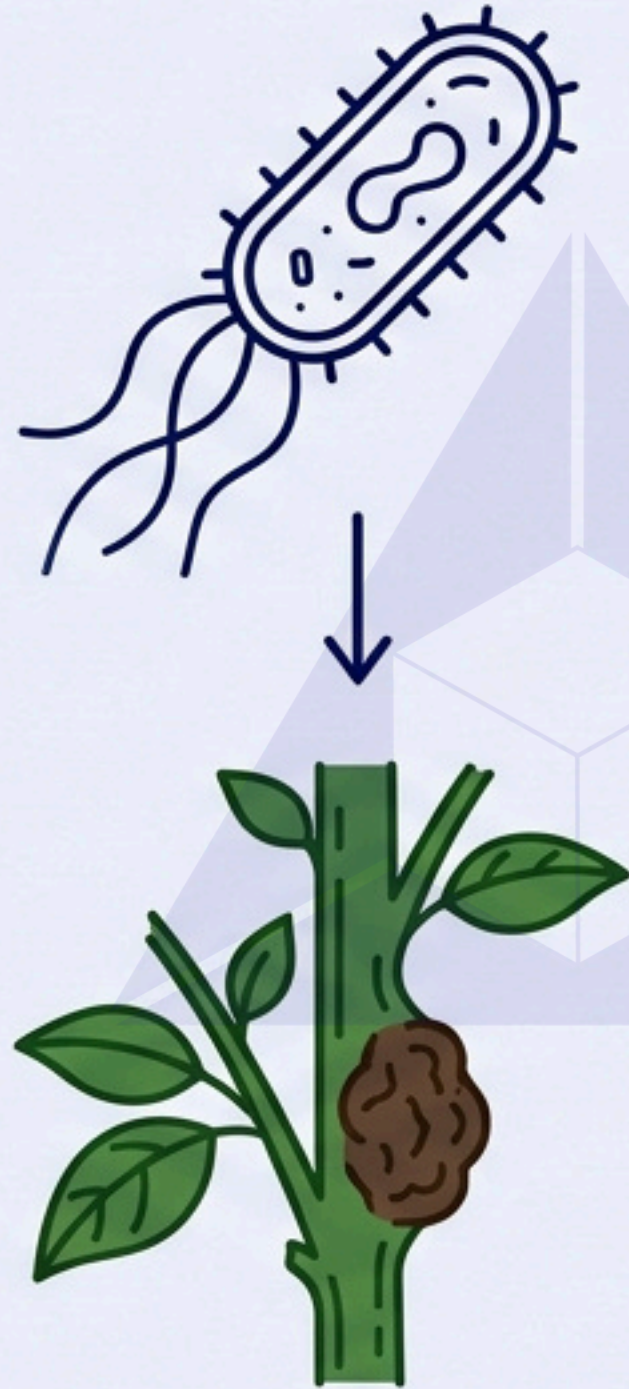


Gene Delivery in Plants and Animals

Repurposing Nature's Pathogens into Biotechnological Tools



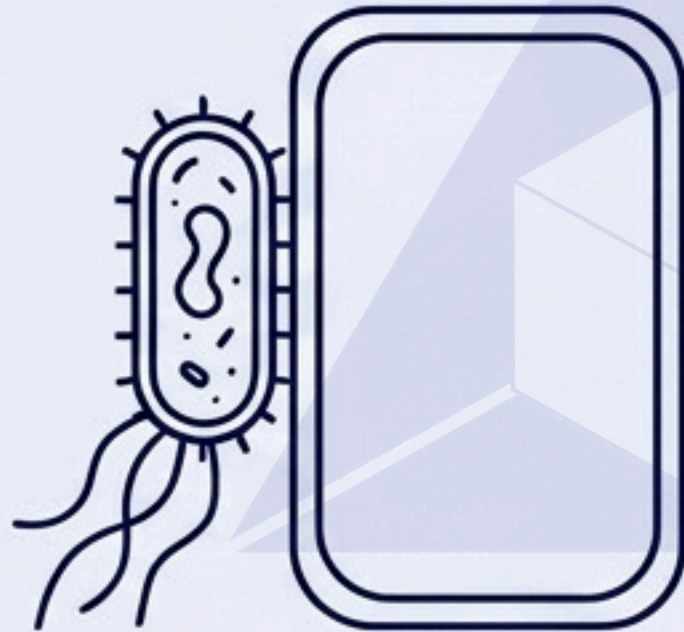


Agrobacterium tumefaciens

- **Target:** Several dicot plants.
- **Alias:** Nature's original genetic engineer.
- **Action:** Forces host cells to produce chemicals required by the pathogen.

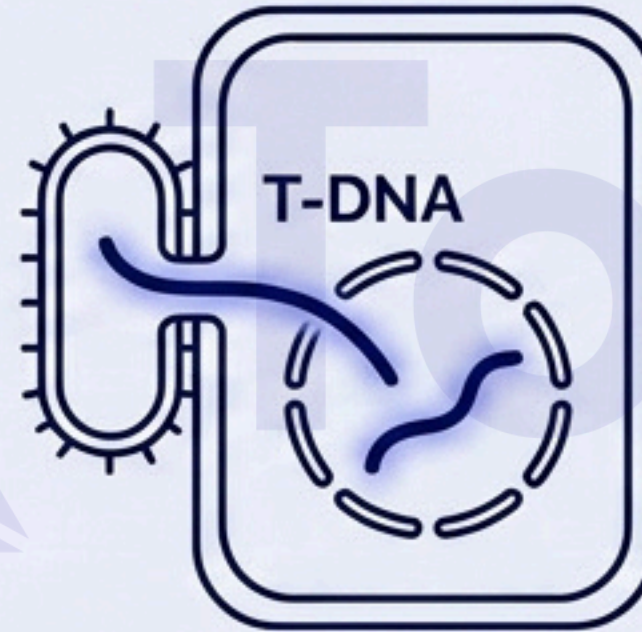
Mechanism of Natural Hijack: T-DNA Delivery

1. Infection



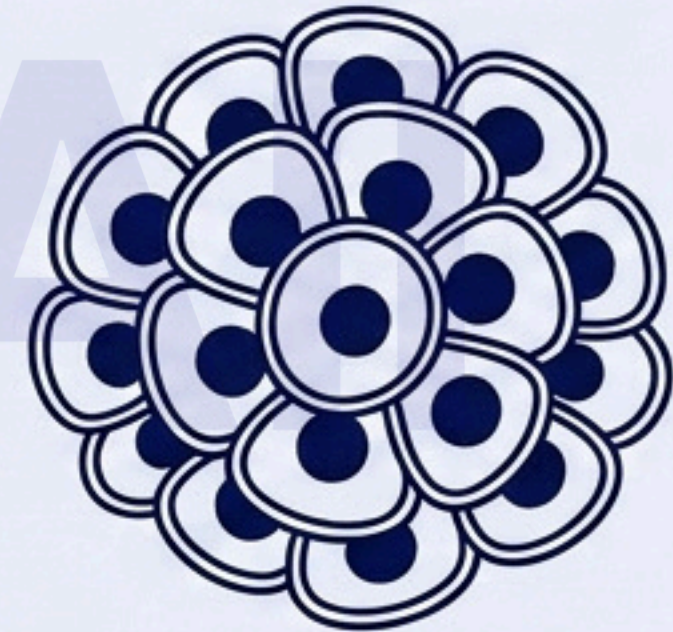
Agrobacterium
infects the plant.

2. Transfer



Delivers a piece of DNA
known as 'T-DNA'

3. Transformation



Transforms normal
plant cells into a tumor.



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$$E=mc^2$$



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The Biotechnological Pivot: Disarming the Weapon

Pathogenic Ti Plasmid



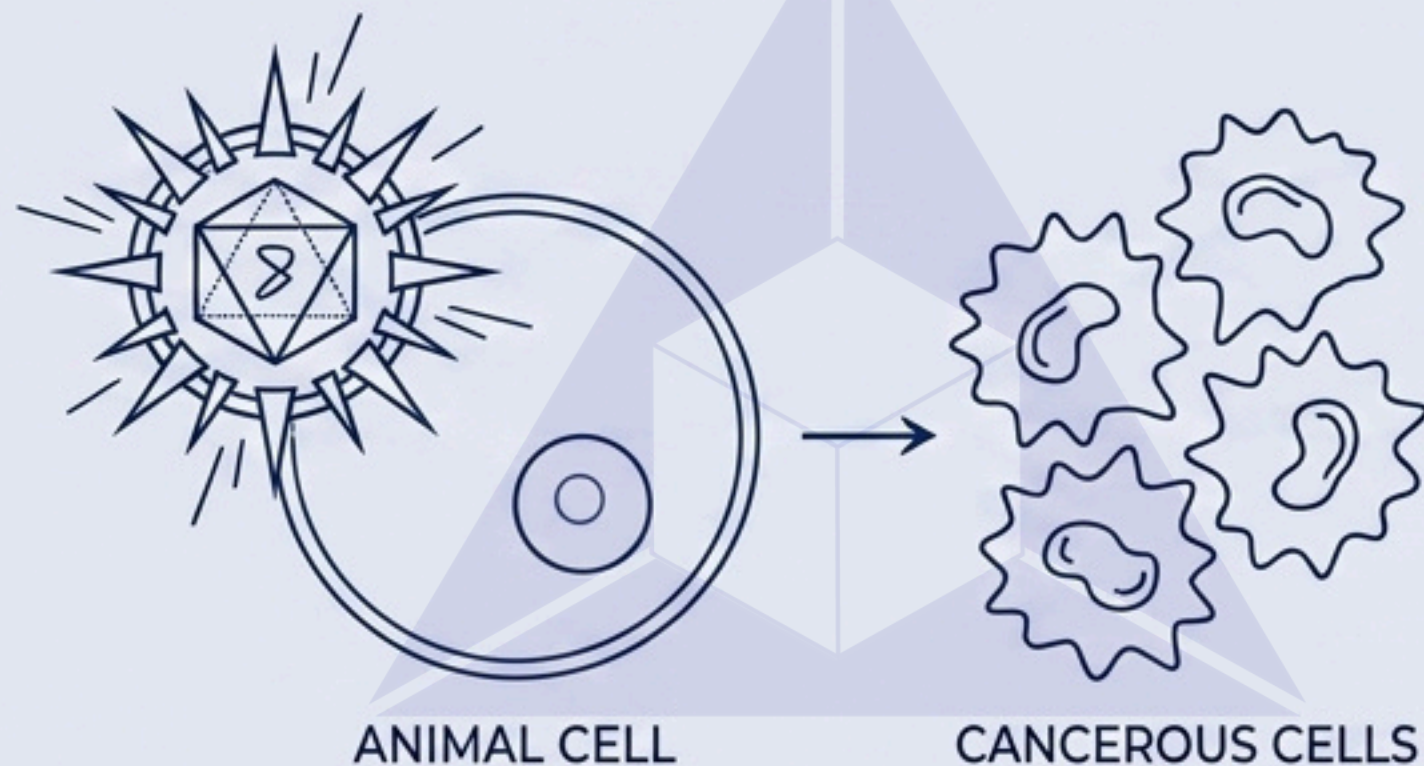
- Tumor Inducing
- Pathogenic to plants
- Causes tumors

Modified Ti Plasmid



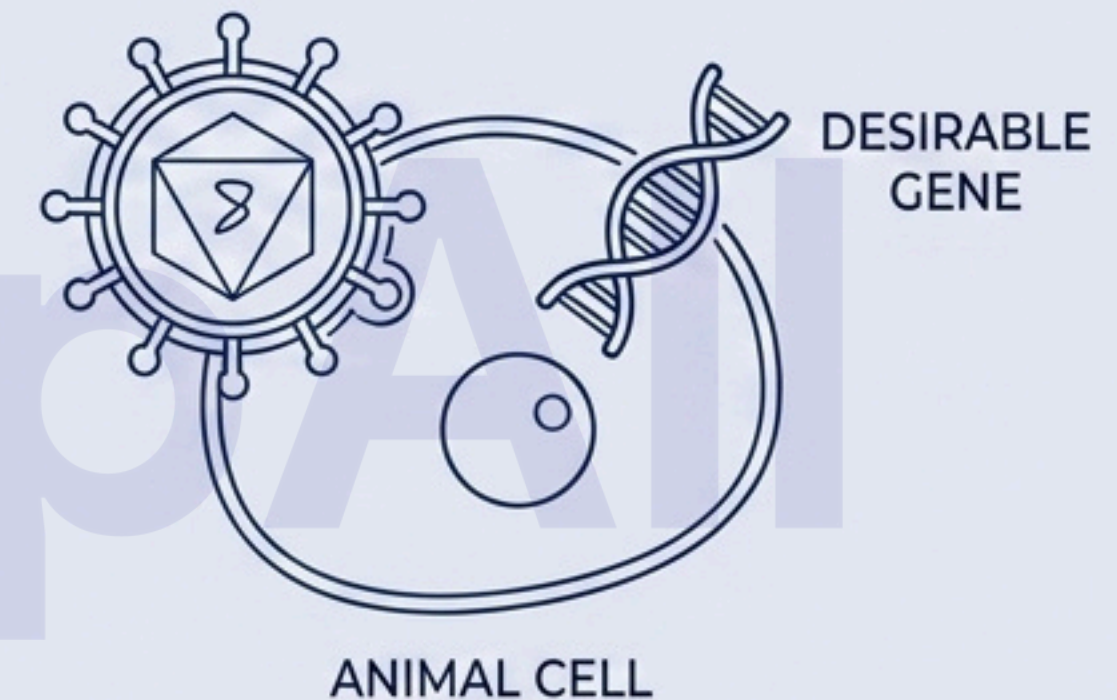
- Disarmed
- Non-pathogenic
- Delivers genes of interest

Nature's Way: Wild Retroviruses



Natural retroviruses have the ability to transform normal animal cells into **cancerous cells**.

Biotech's Way: Disarmed Vectors



Disarmed retroviruses are used as **vectors** to deliver desirable genes safely into animal cells.

NEET Key Takeaway: Vector Synthesis

	Plants (Dicots)	Animals
Natural Vector	Agrobacterium tumifaciens (Ti Plasmid)	Retroviruses
Natural Effect	Induces Tumors	Transforms into Cancerous cells
Biotech Application	Modified into non-pathogenic cloning vector	Disarmed to act as delivery vector
Ultimate Result	Delivers Gene of Interest	Delivers Gene of Interest





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