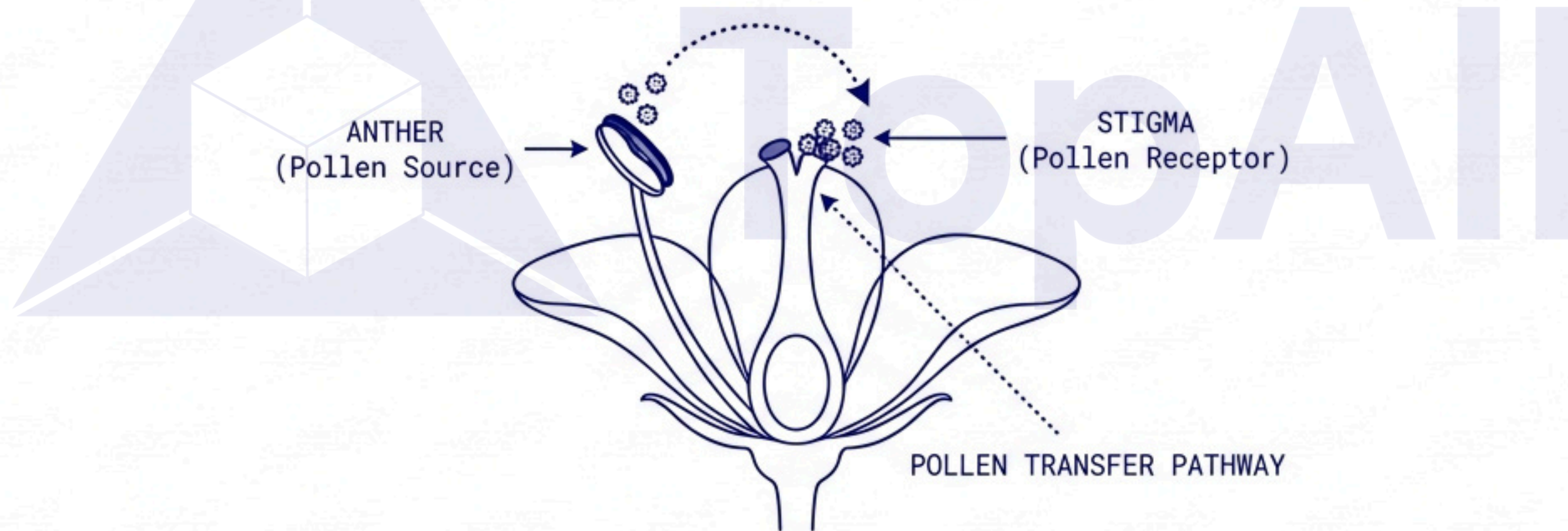
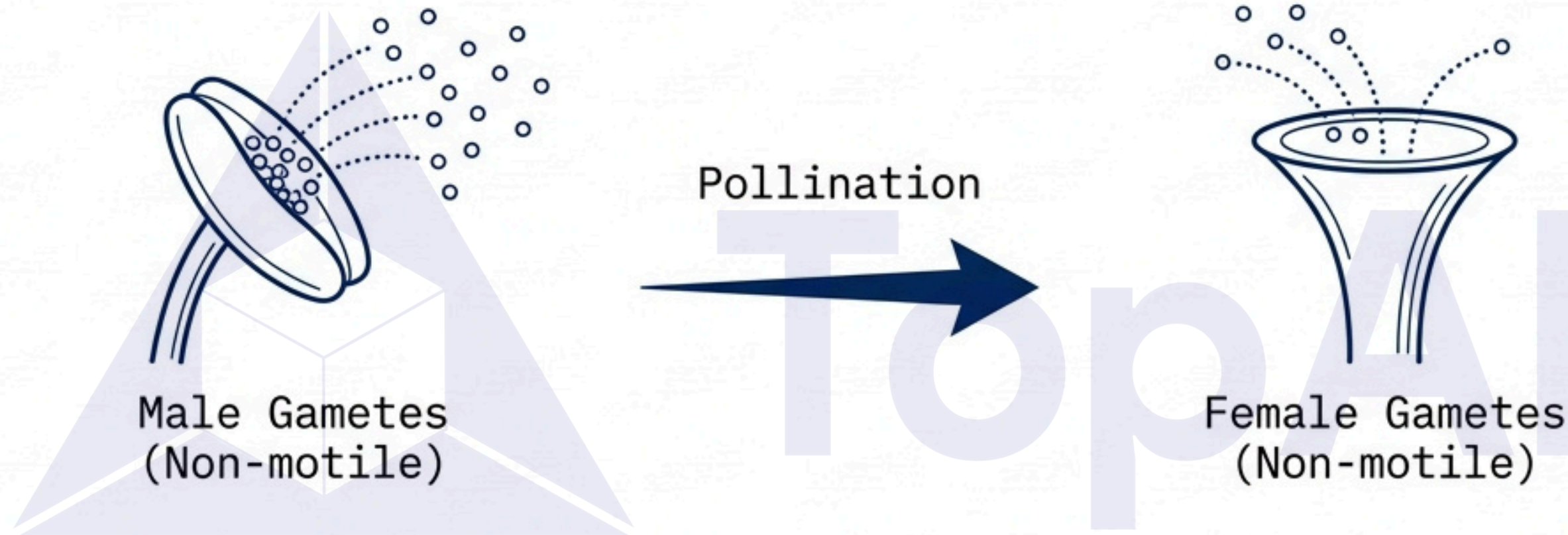


Moving Pollen to the Stigma

Mechanisms and Genetic Outcomes of Pollination



The Biological Imperative: Bridging the Gap

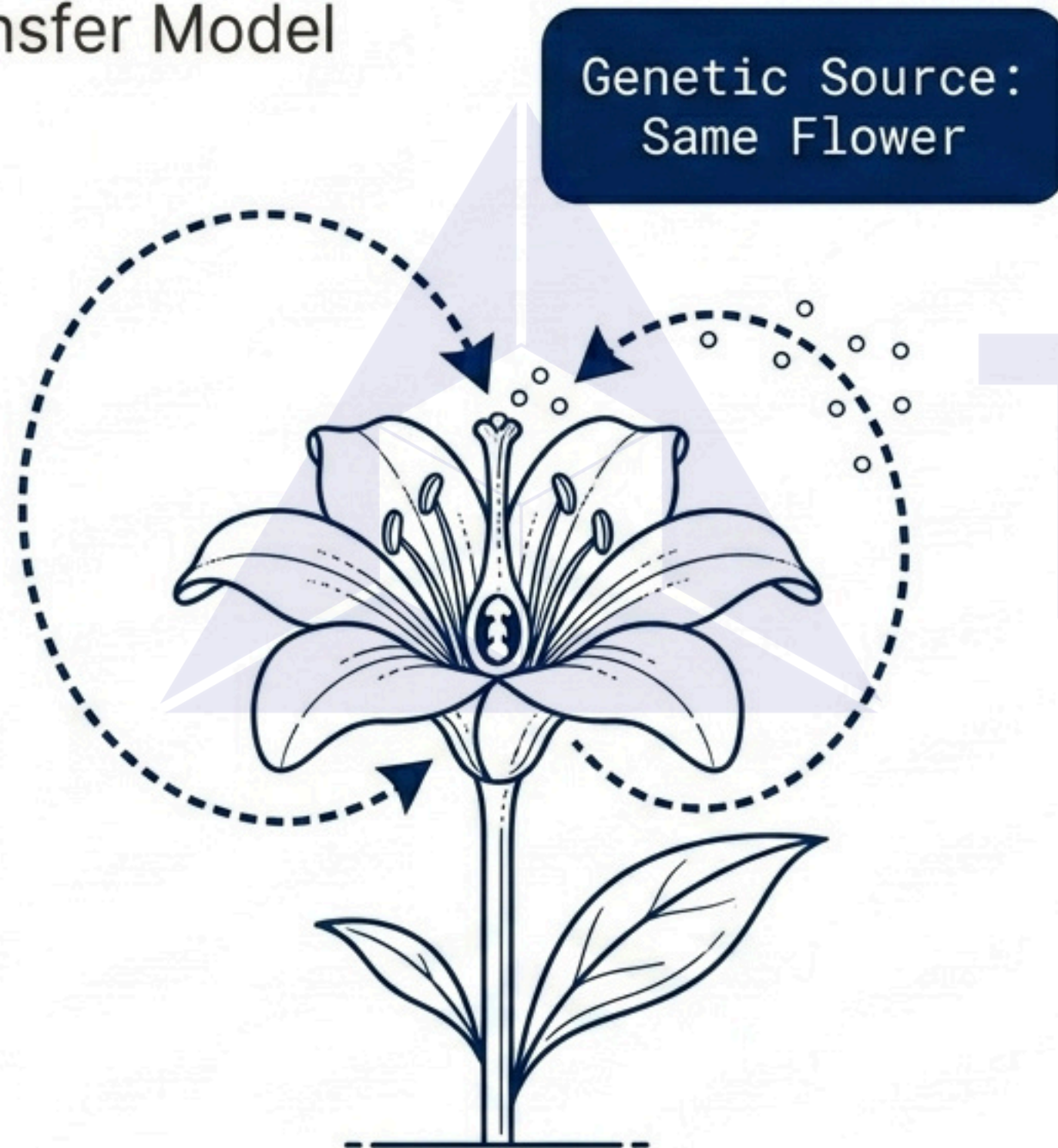


Transfer of pollen grains (shed from the anther) to the stigma of a pistil is termed pollination.

Because both types of plant gametes are non-motile, they must be physically brought together for fertilisation to occur.

Autogamy: Strictly Self-Contained

Transfer Model



Pollination is achieved entirely within the same flower.

Requirements for open flowers:

1. Synchrony in pollen release and stigma receptivity.
2. Anthers and stigma must lie physically close to each other.

Complete autogamy is rather rare in normal flowers that open and expose their reproductive organs.



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Key Highlights

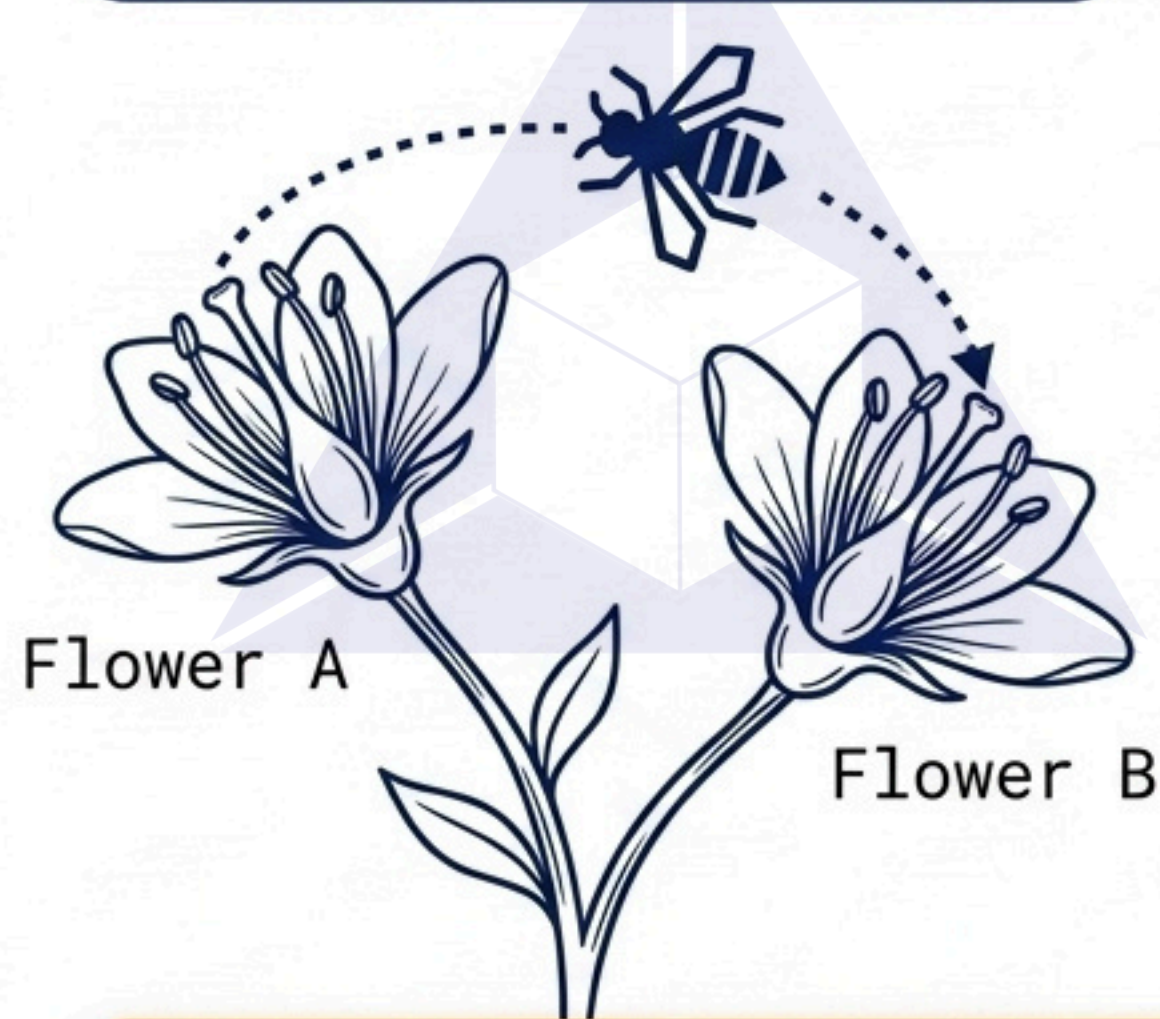
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Geitonogamy: The Functional Paradox

Visual Transfer Model

Genetic Source: Same Plant



Acts like Cross-Pollination

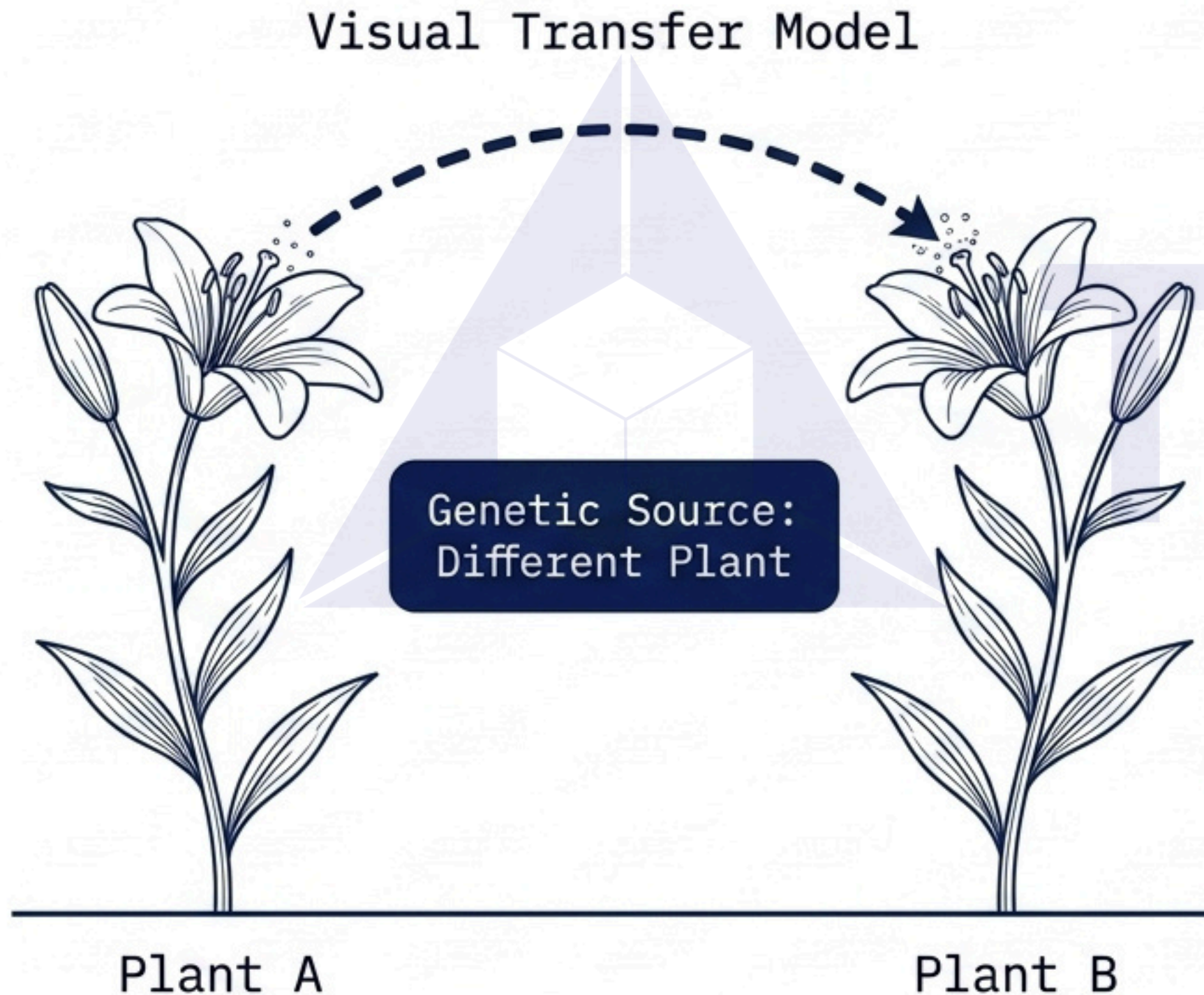
Functionally involves a pollinating agent to physically move the pollen between different flowers.

Genetically Autogamy

Because the pollen comes from the same parent plant, there is zero new genetic variation introduced.

Geitonogamy is a unique case: it is functionally cross-pollination (requiring an agent) but genetically autogamy (self-pollination).

Xenogamy: True Genetic Crossing



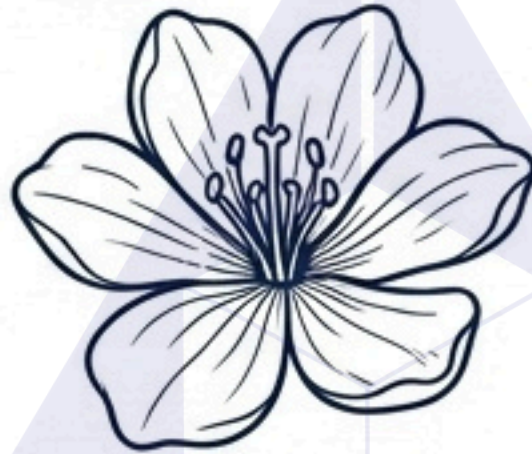
Transfer of pollen grains from anther to the stigma of a different plant.

This is the only type of pollination that brings genetically different types of pollen grains to the stigma, driving genetic diversity.

Floral Adaptations: Open vs. Closed Systems

Plants like Viola, Oxalis, and Commelina produce two distinct types of flowers on the same plant.

Chasmogamous Flowers



- **Structure:** Exposed anthers and stigma. Similar to typical flowers.
- **Strategy:** Permits cross-pollination (requires external agents).

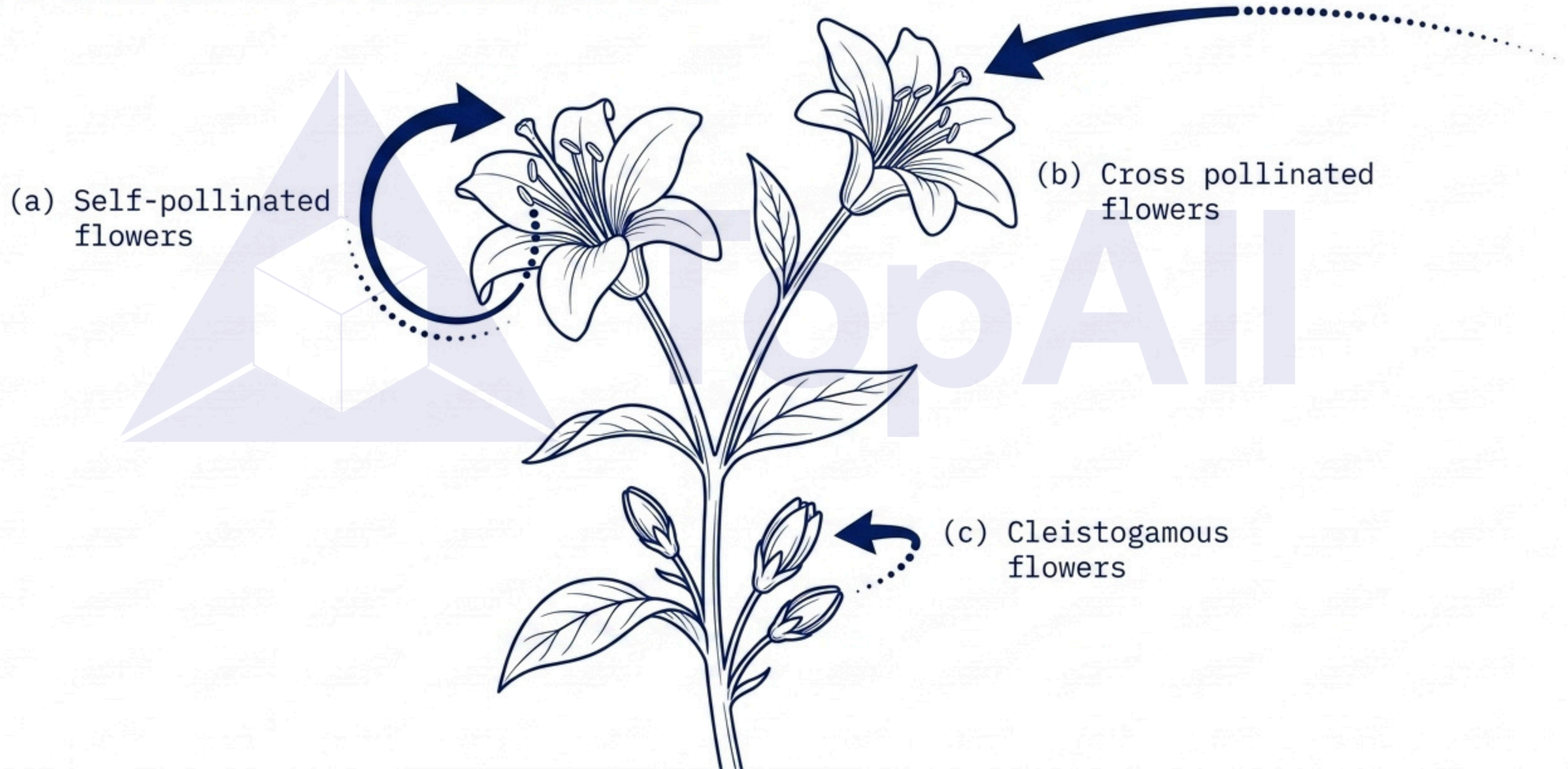
Cleistogamous Flowers



- **Structure:** Do not open at all. Anthers and stigma lie close together inside.
- **Strategy:** Invariably of cross-pollen landing on the stigma.

Cleistogamous flowers produce an assured seed-set even in the total absence of pollinators.

The Pollination Spectrum Visualised



Key Takeaway



Pollination strategies represent an evolutionary balancing act. Plants must balance the **guaranteed reproductive success** of self-pollination (ensured by mechanisms like cleistogamy) against the **environmental resilience** gained through the genetic diversity of cross-pollination (achieved via xenogamy).



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