

Dicot Seed Structure

An anatomical dissection and blueprint of dicotyledonous seeds.

EMBRYO AXIS

The central axis of the seed from which the plant develops. Includes the plumule, hypocotyl, and radicle.

PLUMULE & RADICLE

PLUMULE (SHOOT SYSTEM PRECURSOR)

Develops into the stem, leaves, and flowers. Represents future aerial growth.

RADICLE (ROOT SYSTEM ORIGIN)

Develops into the primary root, anchoring the plant and absorbing nutrients.

TESTA
(SEED COAT)

HILUM

MICROPYLE

PLUMULE
(EPICOTYL)

COTYLEDONS
(EMBRYONIC
LEAVES)

HYPOCOTYL

RADICLE
(EMBRYONIC ROOT)

COTYLEDONS

The two large seed leaves. Primary function is nutrient storage for the developing seedling.

TESTA & HILUM

TESTA (PROTECTIVE LAYER)

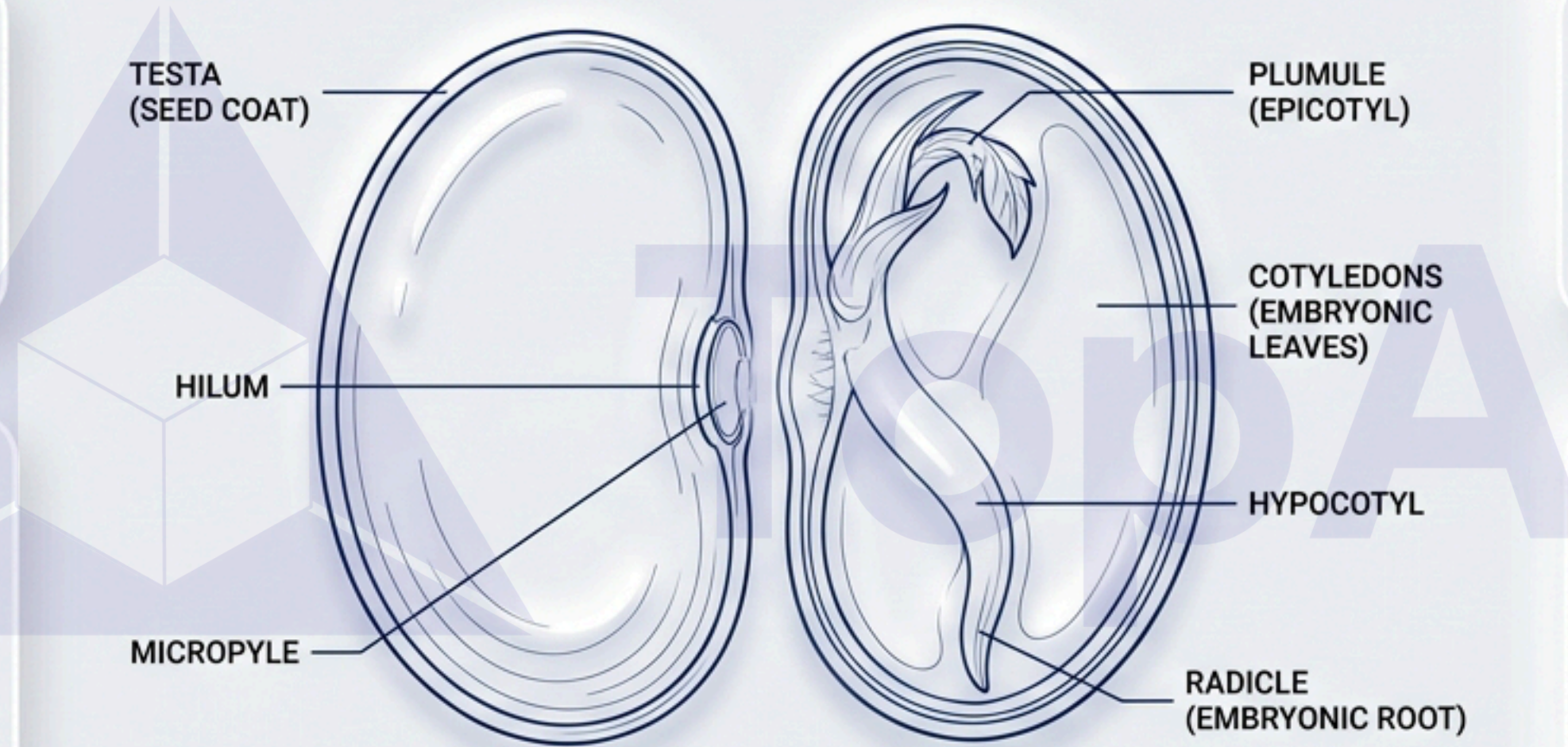
Tough outer coat shielding the embryo from physical damage and desiccation.

HILUM (ATTACHMENT SCAR)

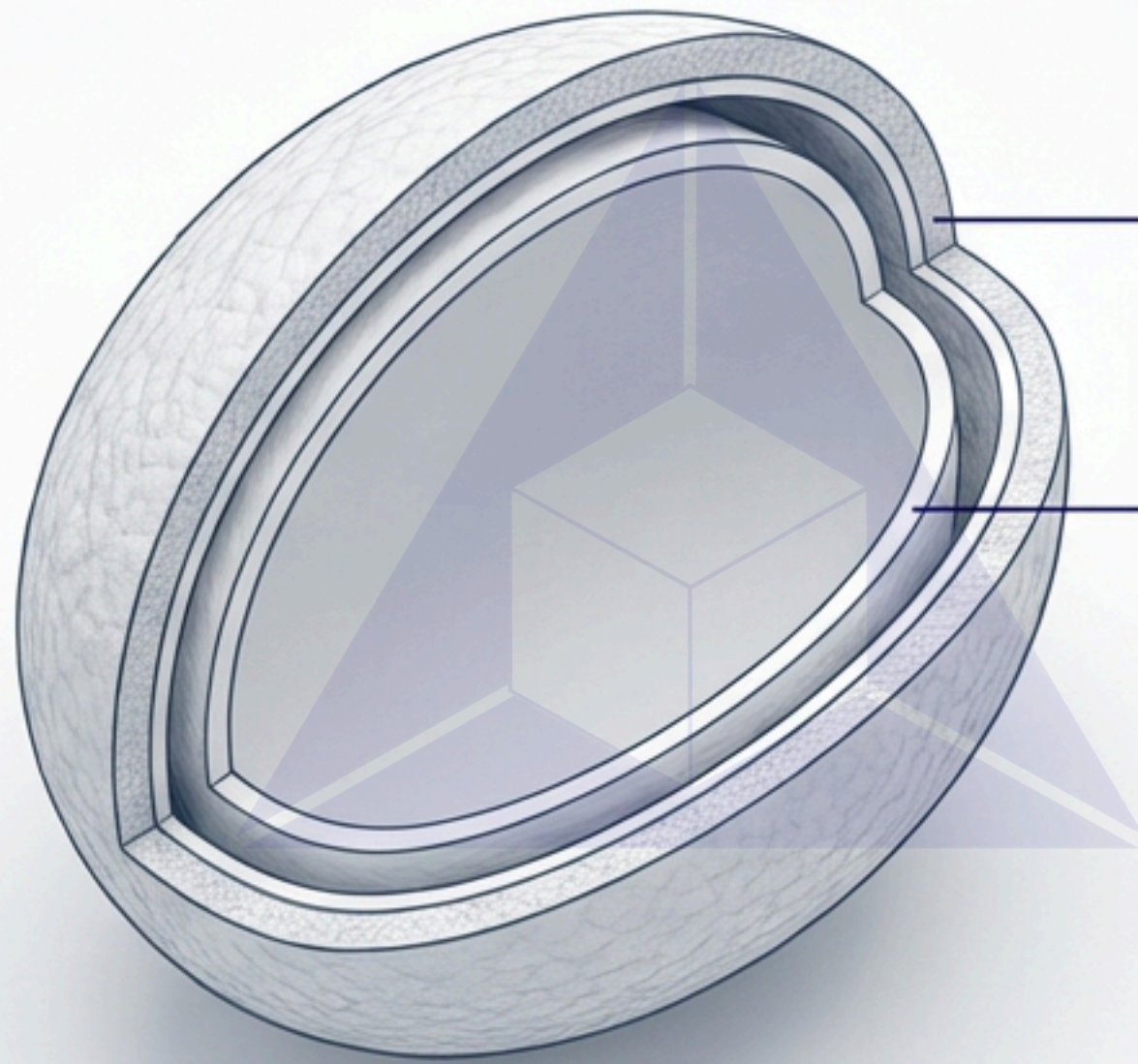
Mark left on the seed coat from its attachment to the fruit (ovary wall).

DEVELOPMENTAL SIGNIFICANCE

The dicot seed blueprint is a compact, dormant stage essential for plant dispersal, survival under unfavorable conditions, and subsequent germination into a new plant. The structure ensures the protection and nutrition of the next generation.



The Outer Defense: Seed Coat



testa

The tough, outermost layer of the seed coat.

tegmen

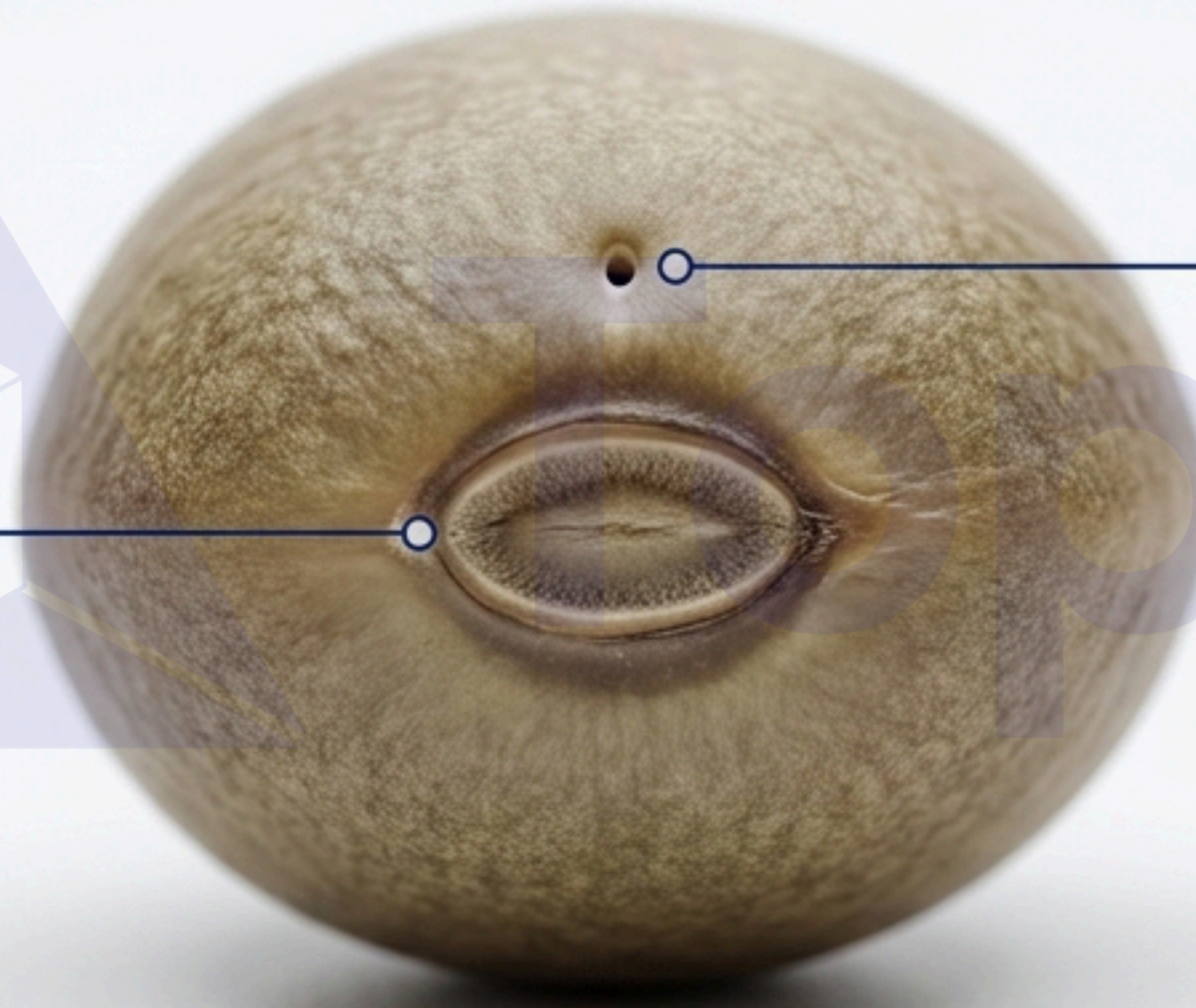
The delicate, inner layer of the seed coat.

Primary Function: The seed coat provides absolute physical protection for the delicate embryo inside.

Surface Topography: Hilum and Micropyle

hilum

A distinct scar on the seed coat representing where the developing seed was attached to the fruit.



micropyle

A small pore located directly above the hilum.

Functional Insight: The micropyle serves as a crucial gateway for water absorption and gas exchange during germination.



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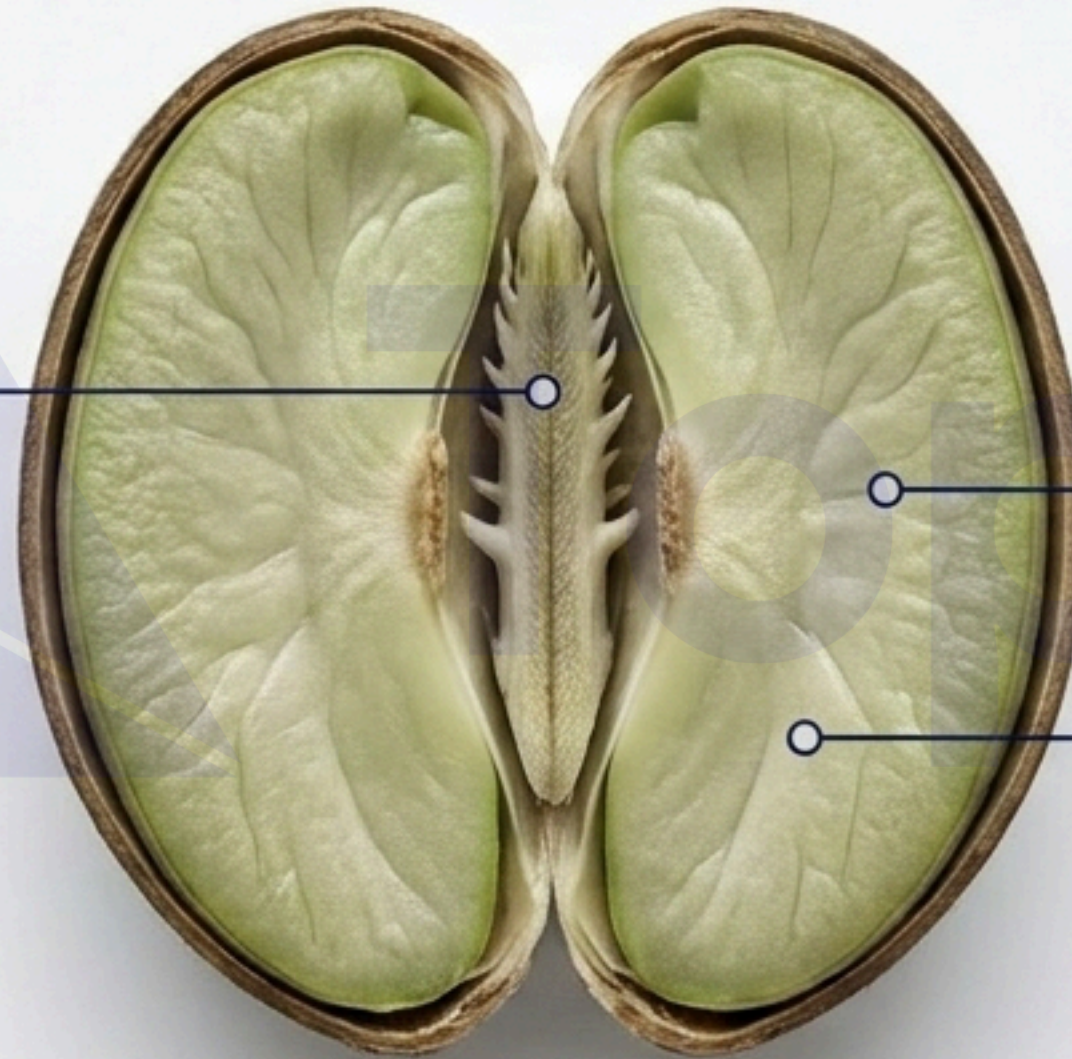
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The Interior Engine: Embryo & Cotyledons



embryonal_axis

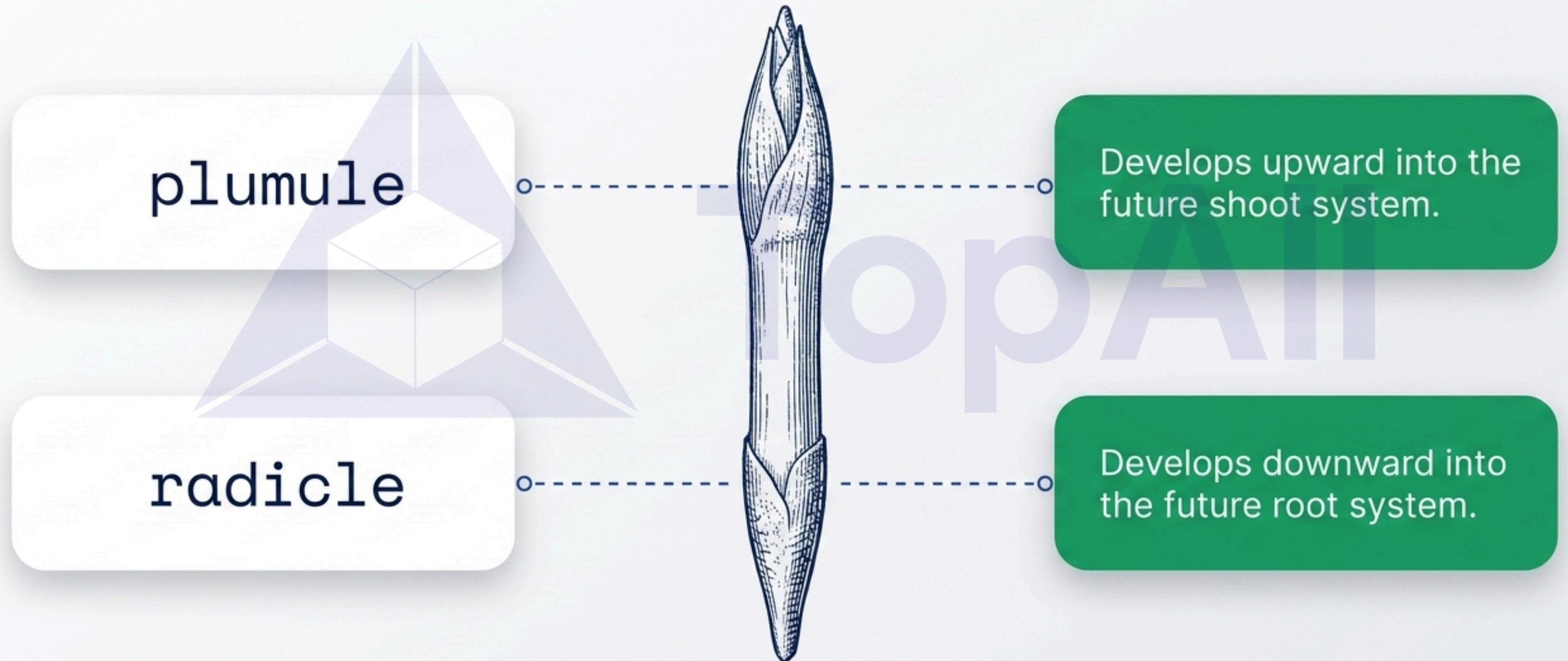
The central spine of the embryo contained entirely within the seed coat.

Storage: Often fleshy and packed full of reserve food materials to fuel initial growth.

cotyledons

Two distinct, fleshy leaf-like structures flanking the axis.

Poles of the Axis: Radicle & Plumule



Biological Variation: Endosperm Presence

Endospermic Seeds

A food-storing tissue formed as a result of double fertilisation remains present.

Examples: castor_seed



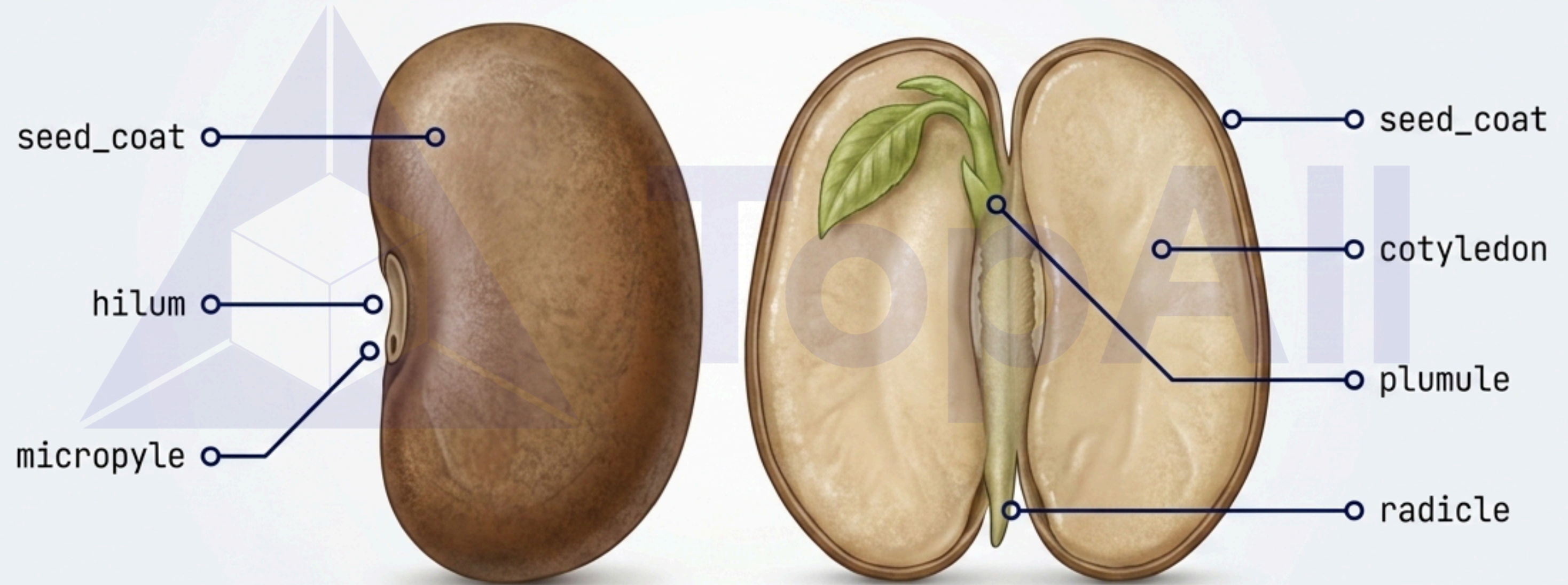
Non-endospermous Seeds

The endosperm is entirely consumed during embryo development and is not present in mature seeds.

Examples: bean gram pea



Master Blueprint: Dicotyledonous Seed



The complete anatomical structure seamlessly integrates absolute external protection with internal energy reserves to guarantee successful germination.



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