

Kingdom: Animalia | Phylum: Cnidaria

Cnidaria: Stinging Cell Animals

A structural and functional field guide to Phylum
Coelenterata.

Aquatic Environments



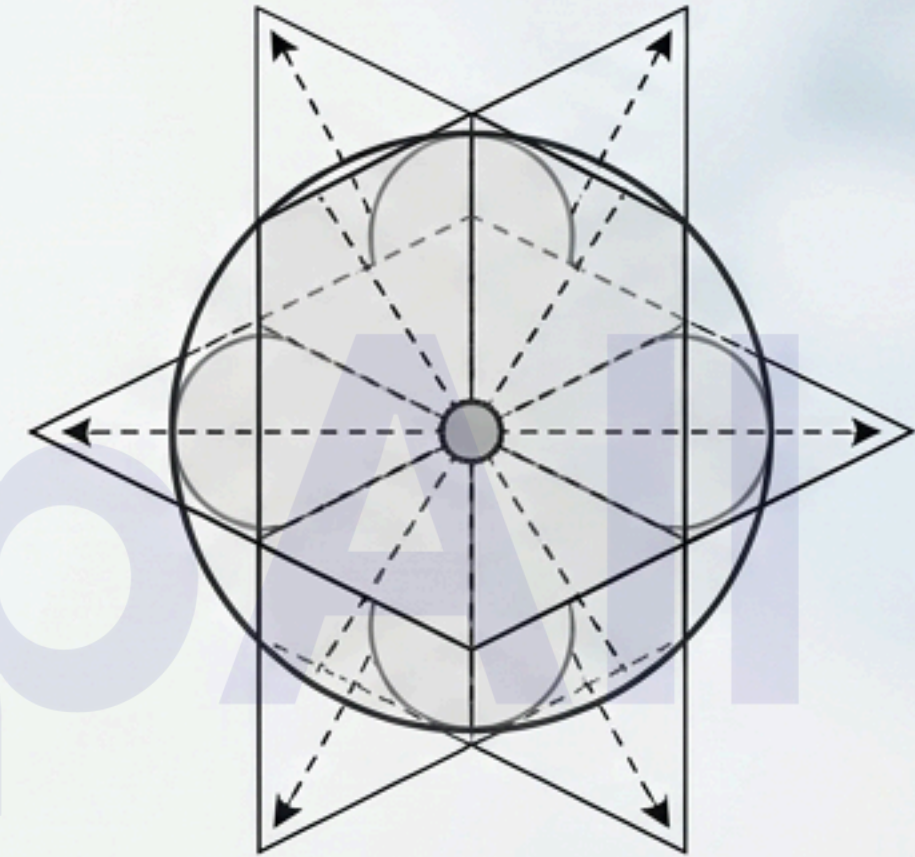
Freshwater
(Rare)



Marine
(Majority)

Mostly marine organisms that exist in two primary lifestyle states: attached to a substrate ('sessile') or mobile ('free-swimming').

Radial Symmetry



Any plane passing through the central axis divides the organism into identical halves.

The Defining Feature: Cnidoblasts

Specialized cells located primarily on the tentacles and body.



The phylum name '**Cnidaria**' is directly derived from the presence of these '**cnidoblasts**' (or '**cnidocytes**').



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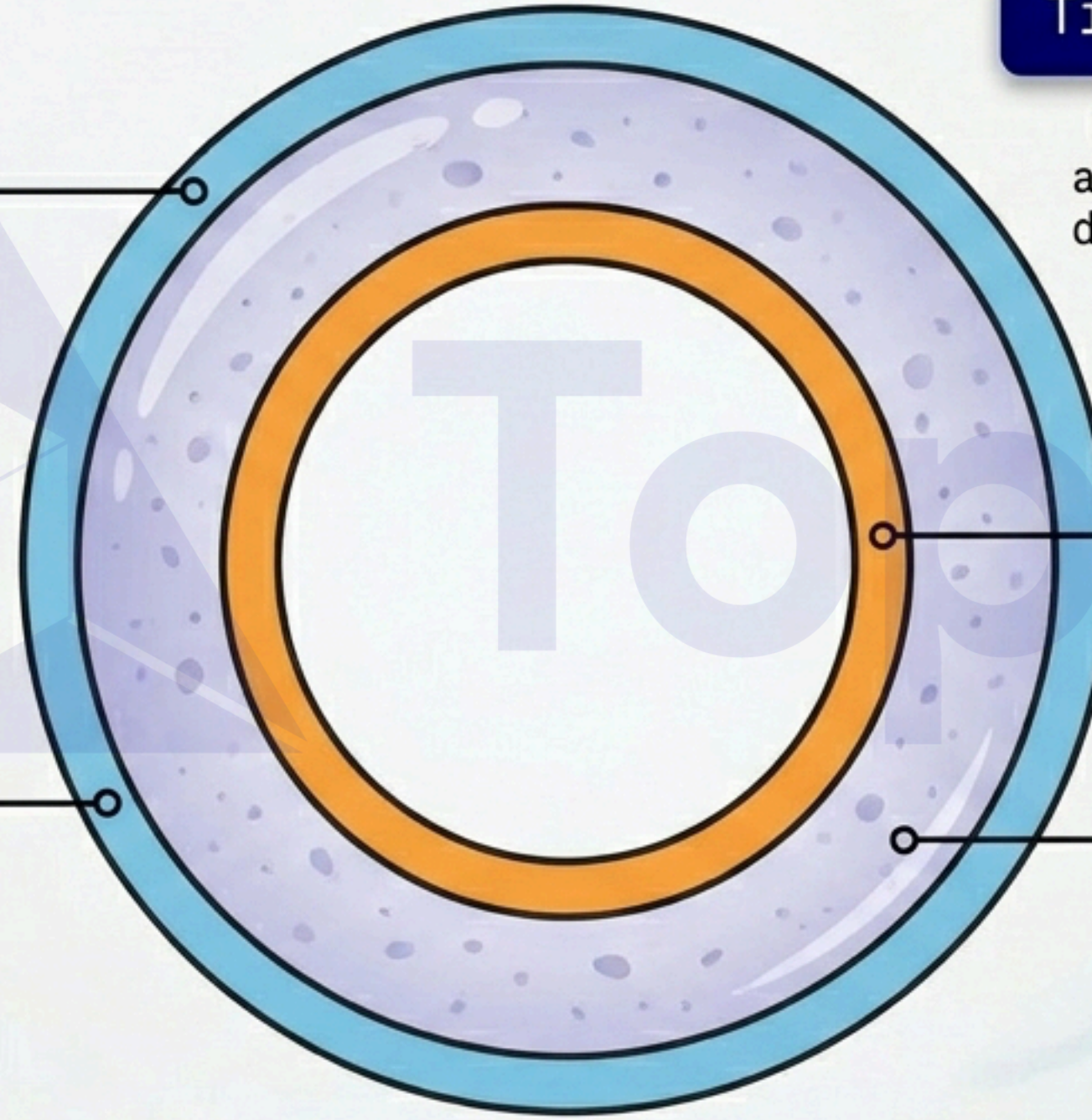


Internal Architecture: Diploblastic Organization

Tissue Level of Organization

'Ectoderm':
The external
embryonic layer.

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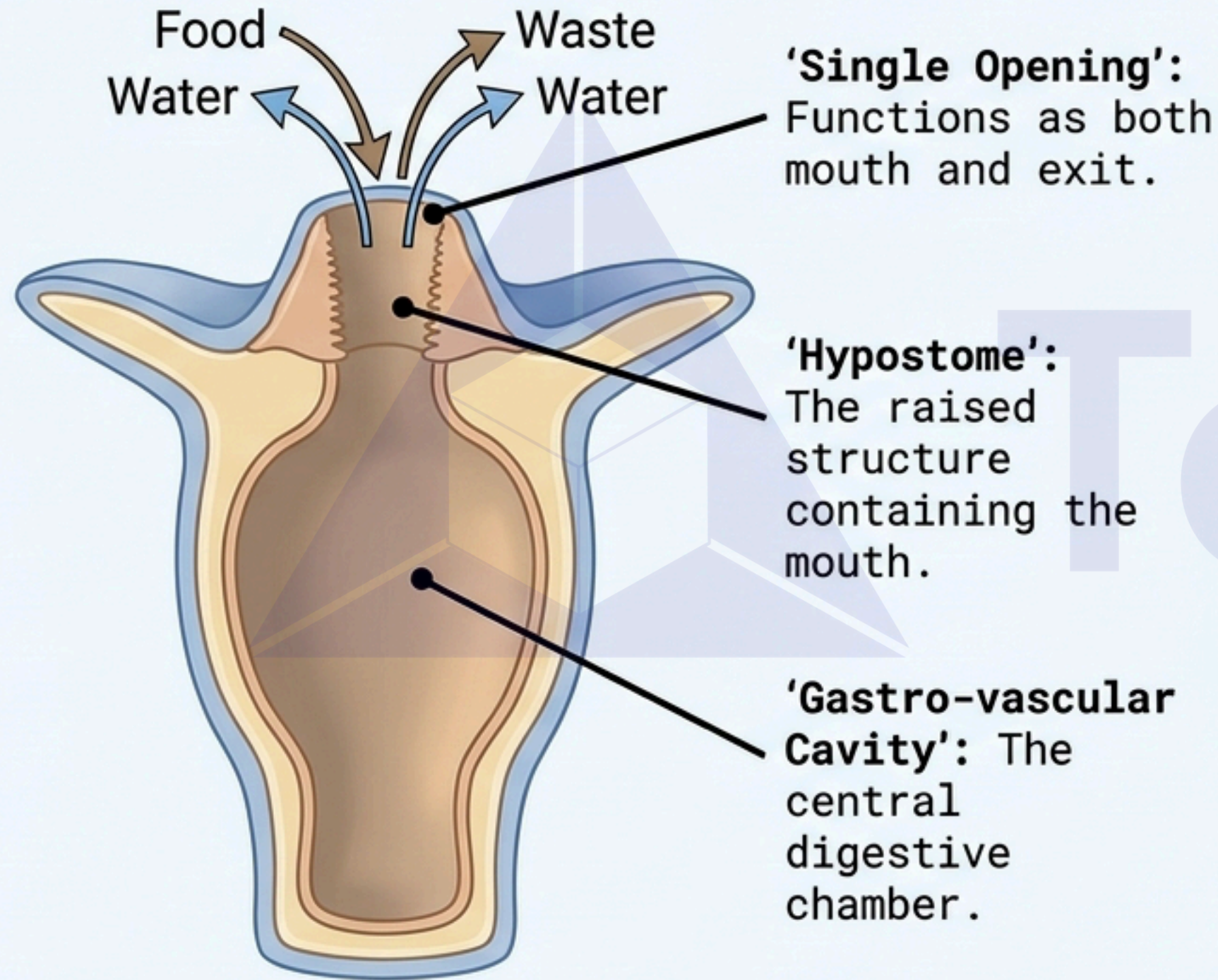


Cells perform the same functions and are arranged into tissues, but do not form complex organ systems.

'Endoderm':
The internal
embryonic layer.

'Mesoglea': An undifferentiated, jelly-like layer sandwiched between the two.

Digestive Anatomy

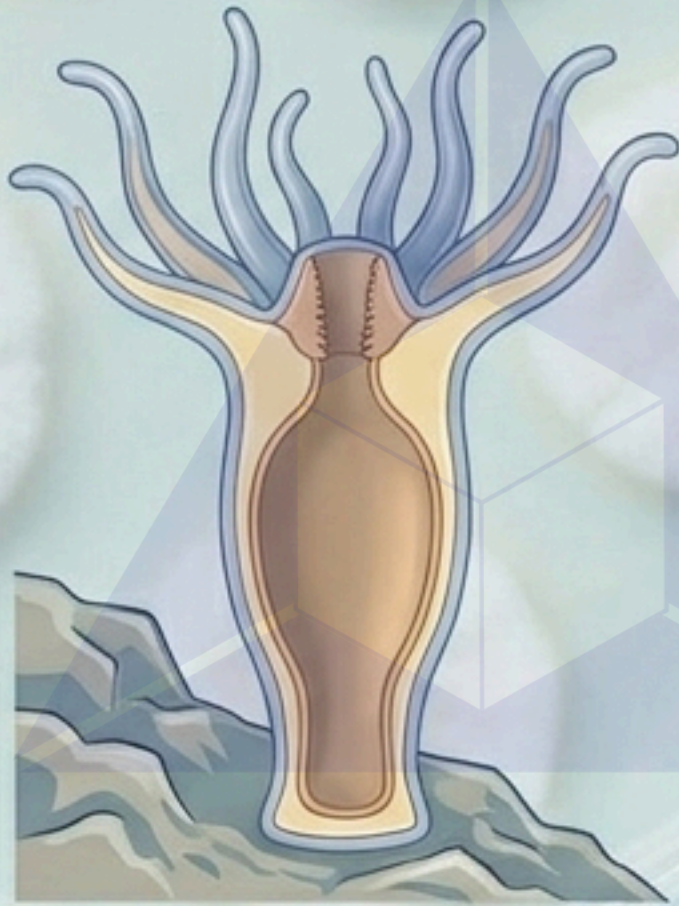


Dual Digestion Mechanism:
Digestion within the gastro-vascular cavity is both extracellular (in the cavity) and intracellular (within the lining cells).

Structural Exception: Some cnidarians, such as corals, secrete a 'calcium carbonate' skeleton for support.

Morphological Duality: Two Basic Body Forms

Body Form 1: The Polyp



‘Sessile’ (anchored) and
‘Cylindrical’

Examples: ‘Hydra’, ‘Adamsia’.

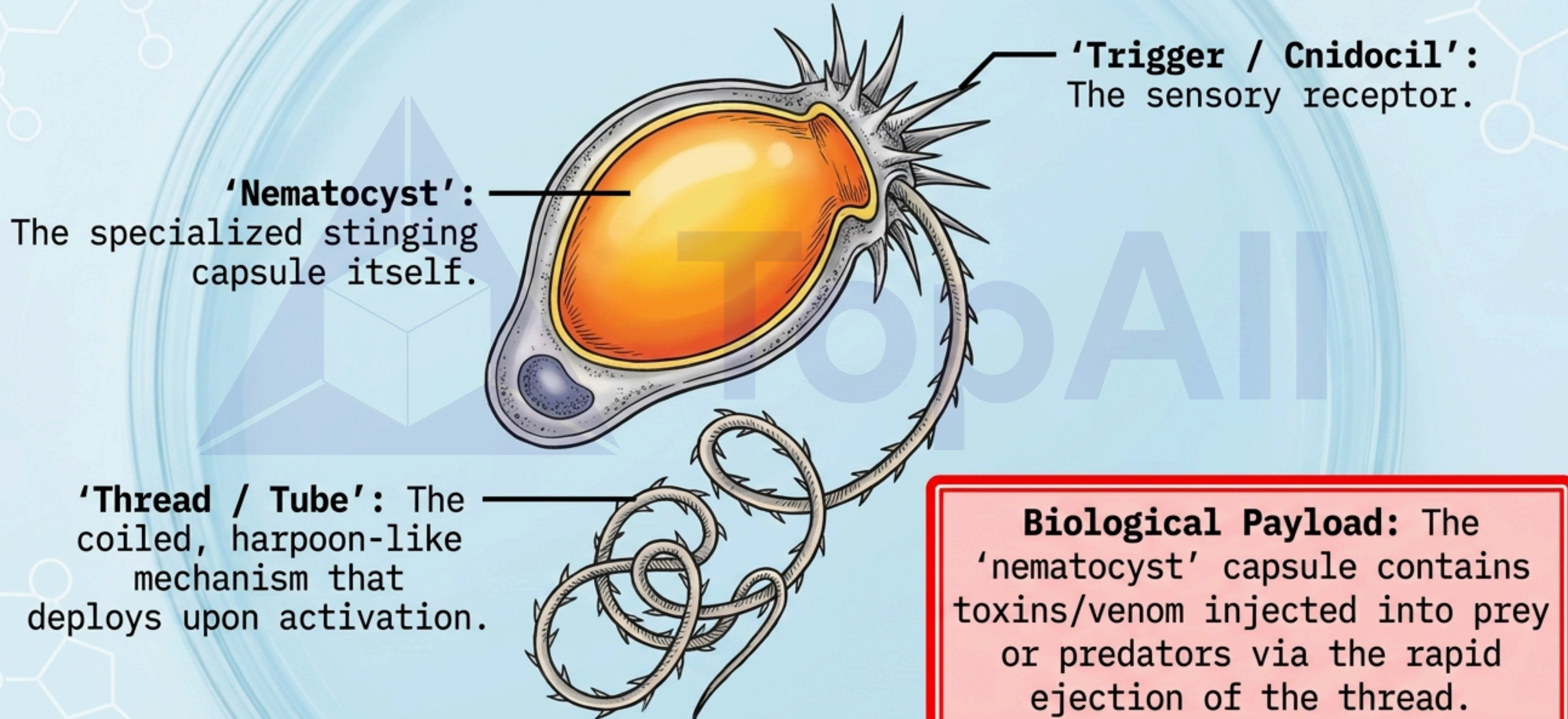
Body Form 2: The Medusa



‘Free-swimming’ and
‘Umbrella-shaped’

Examples: ‘Aurelia’ (Jellyfish).

Cellular Deep Dive: The Cnidoblast



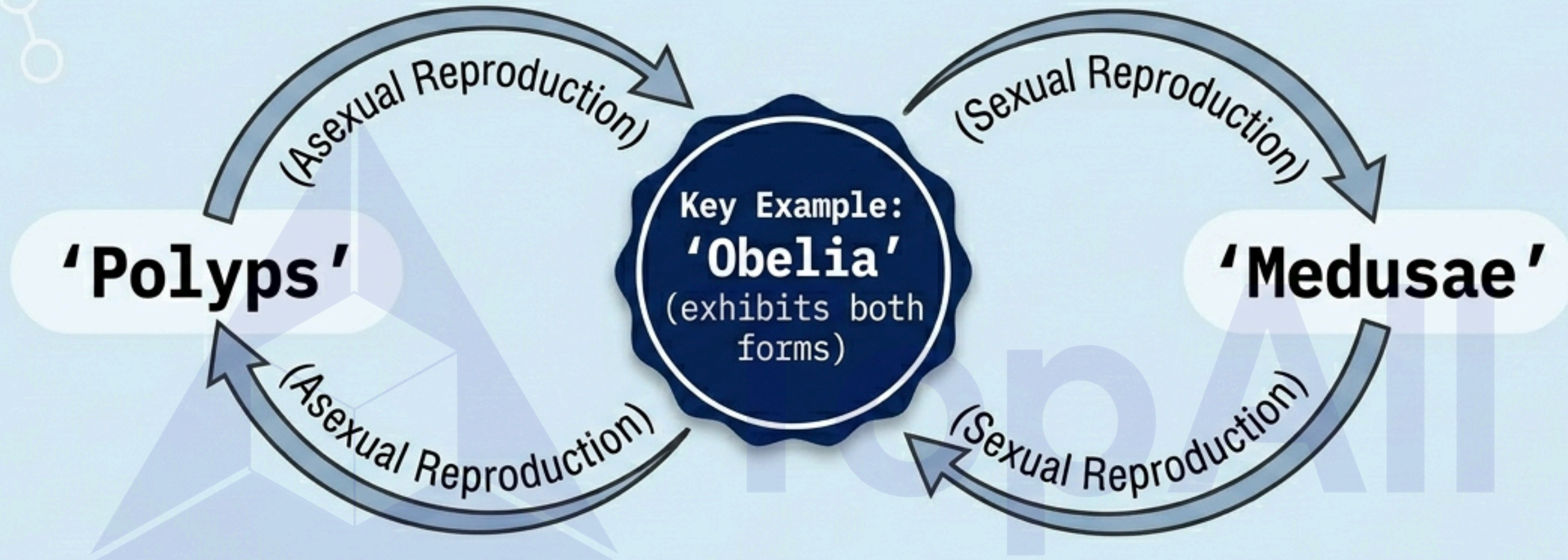
'Trigger / Cnidocil':
The sensory receptor.

'Nematocyst':
The specialized stinging capsule itself.

'Thread / Tube': The coiled, harpoon-like mechanism that deploys upon activation.

Biological Payload: The 'nematocyst' capsule contains toxins/venom injected into prey or predators via the rapid ejection of the thread.

Metagenesis (Alternation of Generations)



Taxonomy Gallery

'Physalia'
Portuguese
man-of-war

'Adamsia'
Sea anemone

'Pennatula'
Sea-pen

'Gorgonia'
Sea-fan

'Meandrina'
Brain coral



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