That is why

Why are octopuses so smart?

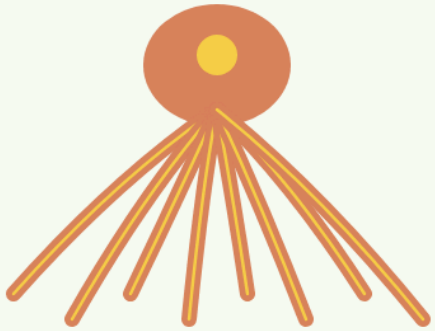
A big brain sets the goals, while more than half of the nerve cells sit in the arms and handle the details.

A Where the nerve cells are

About 500 million neurons in all.



More than half sit in the eight arms.

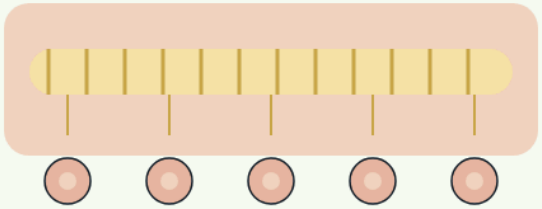


Brain (yellow) and a nerve cord down the center of every arm.

Octopus brains are uniquely large among invertebrates, yet most cells are out in the arms.

B Inside one arm

Nerve cord, segmented like a corrugated pipe



Suckers

Segments

Small gaps between them let nerves and blood vessels reach the muscles.

A map of suckers

Each sucker gets its own patch of the cord. Hundreds of suckers can move and change shape on their own.

Tasting fingers

Suckers carry sensors that taste and smell whatever they touch.

C The skin rule, and the boss

Cut-off arms stayed very active for about an hour, grabbing what they were offered, with no brain at all.

1 They never grab skin

A chemical in octopus skin stops the grab reflex. A skinned arm gets grabbed.

2 The brain can overrule

Live octopuses sometimes grab a cut-off arm, and treat a stranger's arm as food more often than their own.

Planning ahead

Veined octopuses carried stacked coconut shells up to 20 meters, to use later as a shelter (4 times in 500 diver hours).

Octopus and human lines split more than 600 million years ago.

Like a head chef calling the order while eight line cooks run their stations.

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