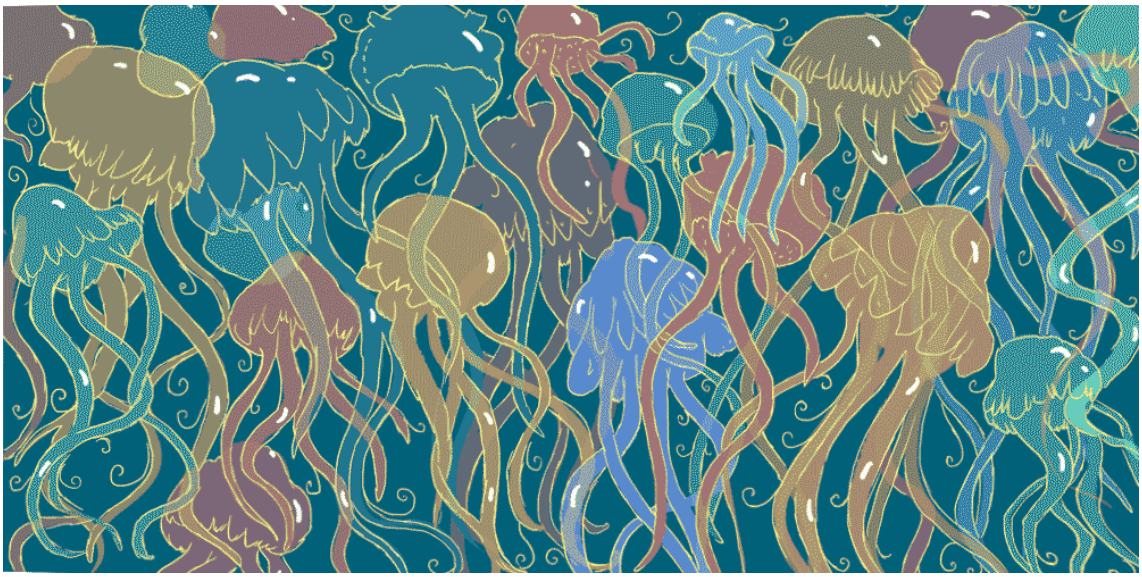

How Are Jellyfish Able to Live Without A Brain?

Jellies have been around for 650 million years—despite the lack of a brain or any blood.

Some people think jellyfish are jerks. That's not surprising considering these squishy creatures seem to float aimlessly in the open ocean, stinging any human they come in contact with. They mess with beachgoers unintentionally.

You can't escape them. These gelatinous animals are everywhere, pestering swimmers around the world. The animals range in all sorts of sizes from less than an inch to over 500 pounds, says the National Oceanic and Atmospheric Administration.

Jellyfish are found in arctic and tropic oceans. Shallow and deep waters. Some even live in freshwater, according to a study in *Current Biology*. Here's where things get a little strange: They only have one, single opening to eat, reproduce, and dispose of waste. One hole for it all. But how jellyfish able to exist in the first place? How can they live, eat, reproduce, and sting—if they don't even have a brain?

In a recent post on Reddit's Ask Science community, Reddit user naegermeister asks, "How the heck do jellyfish work if they have no brain or blood?" "I can't think of any other example of a multi-cellular organism without these essential things…" naegermeister adds. "What organizes the cells? Jellyfish really confuse me…" Jellyfish are peculiar. While they don't possess brains, the animals still have neurons that send all sorts of signals throughout their body. "It is not true that jellyfish have no central nervous systems. They have an unusual nervous system," writes Zen Faulkes, an invertebrate neuroethologist, at the University of Texas Rio Grande Valley. Instead of a single, centralized brain, jellyfish possess a net of nerves. This "ring" nervous system is where their neurons are concentrated—a processing station for sensory and motor activity.

These neurons send chemical signals to their muscles to contract, allowing them to swim. But they just don't just swim aimlessly—some jellyfish can actually navigate. In fact, box jellyfish even have advanced eyes similar to humans. Their complicated eyes allow them to see more favorable habitats that they can swim towards, according to the *Current Biology* study. "These behaviors require not only accurate vision but also precise control of speed and direction of swimming," writes the researchers. Some box jellyfish are so advanced that they even engage in mating rituals, in which a male grabs a female by her tentacles to deposit spermatophores on her. "The box jellyfish solution may thus be linked to the absence of a central brain, but it defeats the idea that a central brain is a prerequisite for advanced behavior," writes the researchers.