Can Jellyfish Smell? Aurelia aurita Exhibit a Pulse Response to Food Stimuli

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It is believed that jellyfish are opportunistic feeders, meaning they do not actively seek prey, but capture and ingest food they encounter locally. A recent pulse behavioral study has shown that pulsation provides a direct indication of neural activity in sessile jellyfish. To better understand how jellyfish feed, I studied the pulsation of constrained medusoid Aurelia aurita in the presence of a food stimulus. If truly opportunistic feeders, we would expect to see no change in pulse frequency before and after the introduction of the stimulus. However, I observed a marked increase in pulsation rates after the introduction of brine shrimp, as compared to a control of ASW. The average increase of total pulses was 129%, while the reference trials showed an average increase of only 2%. To avoid any response produced by tactile stimulation, I used a brine-essence, olfactory, stimulus, that contained no brine shrimp. I observed an 18% increase in pulse frequency to this stimulus. My results indicate that A. aurita show a clear neural response to a food stimulus. They exhibited a larger response to the brine shrimp, which can be attributed to a tactile stimulation from the shrimp touching the medusas. Interestingly, A. aurita also elicited a response to a chemical stimulus, which suggests that they have the capacity to sense food within their immediate vicinity and are not simple opportunistic feeders.

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