INTERVIEWER: You're listening to Brains On, where we're serious about being curious.

[MUSIC PLAYING]

MOLLY BLOOM: This is Brains On from NPR News and Southern California Public Radio. I'm Molly Bloom. Today, we're answering two questions that were sent to us from Charlie. He's from Mercer Island, Washington.

SUBJECT 1: My question for today is, what do jellyfish eat? And why do they sting? Well, my mom told me a story about searching for jellyfish, and I wondered, why didn't it sting her?

MOLLY BLOOM: To find out, we spoke to Rebecca Helm. She studies jellyfish at Brown University. She focuses on the jellyfish life cycle.

SUBJECT 2: When I go to the beach and see a jellyfish on the shore, that's actually not what jellyfish look like most of the time.

MOLLY BLOOM: When we think of jellyfish, we see a creature that has a bell-like body with tentacles around the edge. But for most of their lives, that's not what they look like at all.

SUBJECT 2: They spend much of their lives attached to the sea floor as little animals called polyps.

MOLLY BLOOM: These polyps have a column-shaped body with a ring of small tentacles around a mouth at the end.

SUBJECT 2: That polyp will go through a process of metamorphosis, where it'll sort of transform into what looks like a little stack of tires. Each little ring will pop off and become a tiny jellyfish.

MOLLY BLOOM: So that means each one of these tiny polyps ends up turning into many jellyfish. One animal turns into many animals. Yeah, I know. Amazing. That process is called strobilation, which is a pretty fun word to say. Strobilation, strobilation, strobilation. But these fascinating creatures are also dangerous.

SUBJECT 2: All jellyfish sting, but very few jellyfish sting people. So there is the big difference. All jellyfish use specialized cells to sting their prey, but oftentimes, that prey is things like shrimp, or crabs, or other animals that really don't look a whole lot like people. But for jellyfish that eat fish, OK, now we're getting into dangerous territory.

Fish have backbones, people have backbones. It turns out humans and fish are, relatively speaking, pretty closely related. We're much more closely related to fish than we are to something like a crab. And so when a jellyfish is trying to catch a fish, and it accidentally hits a person with its tentacle, it turns out those same stinging cells and those same toxins can be very dangerous for people, too.

MOLLY BLOOM: So all jellyfish sting, but we, as humans, are only susceptible to the stings of certain jellyfish, the ones that eat vertebrates, like fish. Unfortunately, these jellyfish can't really distinguish between a fish vertebrate and a human vertebrate, so they sting us all. Ouch. So how do they do it? How do jellyfish sting?

SUBJECT 2: This is actually one of the most wonderful and bizarre things about jellyfish. So jellyfish sting with specialized cells that sort of look like the needle that you would get a shot with at the doctor's office. They have a sharp barb, but it's actually tucked inside the cell most of the time. It has a little trigger on the outside of the cell, which is sort of round and the cell itself is filled with all sorts of toxins.

When something brushes up against that little trigger, it causes that needle to shoot out, to fire off, and inject all of those toxins into whatever brushed against it. If you're really unlucky, maybe you brushed against it and caused that little cell to shoot out that barb and inject those toxins into your skin.

MOLLY BLOOM: Jellyfish sting so they can eat, and the way they eat their prey is very cool, too.

SUBJECT 2: When a jellyfish wants to eat a shrimp, it'll sting the shrimp, and then with the tentacle, it'll bring that shrimp towards its mouth. It'll then use these long, frilly appendages, called oral arms, which are actually sort of long, frilly lips that grow off the mouth, to sort of wrap around the shrimp, and then it'll slowly move that shrimp into its stomach, where it's digested. And then all the liquefied pieces of shrimp will then pass through its gastrovascular cavity to feed the different parts of the jellyfish.

And then anything that's remaining of the shrimp, like little hard bits of the shell, will actually be spit back out the mouth. So it goes in the mouth, and then when it's all done, it goes right back out the mouth. The mouth is actually located underneath that structure that looks like a bell. So that sort of bell-shaped or bull-shaped structure is actually called the bell. That's the scientific term for it. So that's pretty convenient.

Underneath that bell is where the mouth is located, sort of in the center of that ring of tentacles, which is at the margin of the bell.

MOLLY BLOOM: There are 200 species of jellyfish. Specifically, these are scyphozoan jellyfish. They are the ones we think of when we hear the word jellyfish. There are also hydrozoan jellyfish, but they're so small, you don't usually see them.

SUBJECT 2: One of my favorite jelly species is called pelagia noctiluca or the mauve stinger jellyfish. And it's this sort of pinky-purply color, and it's very, very bioluminescent, which means it can produce its own light. Really beautiful jelly. It has a horrible, horrible, painful sting, but to look at, it's really pretty.

MOLLY BLOOM: Jellyfish are incredible, and they've even been to space. To hear about the space travels of the jellyfish, head to our website brainson.org. While you're there, you can also listen to past episodes and subscribe to our newsletter. We'll tell you about new episodes and other fun stuff.

Also, if you and your family like Brains On, tell the world about us. One tweet, one Facebook status update, or one little old blog post would help spread the word. Thanks.

[MUSIC PLAYING]

Do you have a question like Charlie, or a mystery sound to share, or just want to say hi? Email us any time at brainson at M, as in Minnesota, pr.org. Speaking of which, it's time to announce the next inductees of the brains honor roll. These are the awesome kids who keep the show going with their excellent ideas and questions. Here they are.

[MUSIC PLAYING]

[LISTING HONOR ROLL]

[MUSIC PLAYING]

Shh. Do you hear that? Yes, it's time for the mystery sound.

SUBJECT 3: Mystery sound.

MOLLY BLOOM: This sound comes to us from Olivia in Atlanta. Ready? Here it is.

[RUSTLING NOISES]

That's a tough one. Here's a hint. If you don't hold on tight, it could float away. Let's hear it one more time.

[RUSTLING NOISES]

All right, here's the answer.

SUBJECT 4: That was the sound of me playing with a deflated mylar balloon.

MOLLY BLOOM: Thanks, Olivia, and that's it for this episode of Brains On. Remember, you can always send us your own mystery sounds, just like Olivia. Email them to BrainsOn at M, as in Minnesota, pr.org. We'll be back in a couple of weeks with more answers to your questions. Thanks for listening.

(SINGING) Ba ba ba ba ba ba ba brains on.