Brain eating Amoeba Seminar questions

Writing -

- Write about a time when you or someone you know swam, boated, fished in a freshwater area.
  OR
- Write about the last time you used freshwater (tap water)

Opening-

- On the 10th paragraph what does the author mean by “the creature is so versatile..”
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- Last paragraph what does the author mean “caseload might rise in future due to climate change or other possible contributing factors”, what does this mean for the future of Amoeba/ and humans?

Core -

- Does the rarity cause any concerns, why?
- What can we do to decrease the risk, and what steps can we take to be more aware of this?
- Would you consider Amoeba to be smart, why or why not?
- If it cost $10 million in research to save 50% of amoeba victims, would it be worth it?
- Why is it important to follow directions?
- The author and scientists say that it is rare but how could 2 cases in Louisiana with use of the neti pot be possible…
- If a person ignored directions on their neti pot and got a flagellate brain amoeba, should they still receive medical care? What if they don’t have insurance or a way to pay? What if they ignored numerous signs on a lake warning “do not swim with your head below water!”

Closing (whip around)

- Name one thing you could do to prevent this from happening
- Are you going to change your ways because of this?

Brain-Eating Amoeba Thrives in Warm, Fresh Water

By: Jennifer Viegas

July 14, 2014 Discovery Channel News

The brain-eating amoeba that killed a 9-year-old Kansas girl last week is an organism that thrives in warm fresh water and can be found in lakes, rivers, hot springs and soil, according to the Centers for Disease Control and Prevention.

The victim, Hally "Bug" Nicole Yust, reportedly had swum in several lakes over the past few weeks near her home in Spring Hill. The Kansas Department of Health confirmed that she died from primary amoebic meningoencephalitis (PAM) caused by the amoeba,*Naegleria fowleri*, which she likely inadvertently inhaled via lake water.

"Once forced up the nose, it can travel to the brain, where it digests brain cells," Jonathan Yoder, an epidemiologist at the Centers for Disease Control and Prevention, told Discovery News. "It's a very tragic disease that thankfully is very rare."

Aside from its rarity, the amoeba "is not looking to prey upon human victims," he said. "They usually go after bacteria in water and soil."

As single-celled organisms, amoebas do not even have brains.

However, Naegleria species, including this disease-causing one, can transform themselves into three different basic "body" types.

"This one-celled organism hunts and eats bacteria as an amoeba, swims around looking for a better environment as a flagellate, and then hunkers down and waits for good times as a cyst," said Simon Prochnik, a computational scientist at the U.S. Department of Energy's Joint Genome Institute. "It is a very rare process to go from amoeba to flagellate like this."

Prochnik, who sequenced the genome of a Naegleria species, explained that when environmental conditions are not favorable, the "stressed" amoeba can quickly grow two tails, transforming it into the flagellate. It can then swim and move around to a better spot, similar to the way that human sperm travel.

To support these three body or "personality" types, as Prochnik calls them, the organism is packed with genes: 15,727 of them. To put that into perspective, humans have 23,000 protein-coding genes.

Since the creature is so versatile, it can lurk in warm, moist places for extended periods.

Two Louisiana residents contracted the amoeba a few years ago after using a neti pot, which looks like a teapot and is used for nasal irrigation to relieve sinus problems. The CDC

determined that the organism was living in the victims' home water system systems. The individuals apparently did not boil the water before placing it in the neti pots.

Yoder said it is important to follow the directions included with neti pots. The instructions usually mention that users should put distilled, boiled water in them and not just water right out of the tap.

If users don't follow these instructions, there is a slim chance they too might get the disease caused by Naegleria fowleri.

According to CDC data, the fatality rate is over 97 percent. Only three people out of 132 known infected individuals in the United States from 1962 to 2013 have survived.

Diagnosing this disease is difficult. Yoder explained that associated symptoms, such as high fever, headache, and stiff neck, are present with bacterial and viral meningitis, so misdiagnoses are possible.

The Kansas Department of Health and Environment reports, however, that the infection is rare and that Yust was only the second known case of a person contracting the infection in Kansas. The state will likely issue warnings to recreational water users, as other states like Florida have done following similar deaths.

"During the hottest time of the summer, water in ponds, lakes, and rivers become very warm and there can be increases in the amounts of amoeba present," said Florida DOH spokesperson Christie Goss. "We advise everyone to be aware of the danger of swimming in such water, but especially of stirring up the sediment in shallow water or diving and swimming under water which can enable the amoeba to enter the nose and possibly infect the brain."

Both the DOH and the CDC add that it may help to "hold your nose, or use nose plugs when jumping or diving into water."

Health officials at the CDC and elsewhere continue to monitor cases of the disease to detect any possible patterns or if the caseload might rise in future due to climate change or other possible contributing factors.