

Text 4

Directions: Read the following text and mark the correct answer. Read the text again and answer questions 6 – 7 using short phrases only.

NATURE'S TRICKS

Fisheries researchers have recently announced that the opah – a little-known fish, but increasingly popular in seafood markets – now holds the distinction of being the first fish on Earth known to be truly warm-blooded. Biologist Nicholas Wegner of the National Oceanic and Atmospheric Administration (NOAA) examined the gills of an opah and observed that its tissue had a unique design that allowed the animal to maintain warm-bloodedness. *Science* journal published Wegner's paper about the opah, and Wegner said in a statement from NOAA:

Nature has a way of surprising us with clever strategies where you least expect them.

Before this discovery, I was under the impression that the opah was a slow-moving fish, like most other fish in cold environments. But because it can warm its body, it turns out to be a very active predator that chases down quick prey and can migrate long distances.

As Wegner's team dissected a captured opah, Wegner noticed the gills contained an intricate tangle of both red and blue blood vessels. Such a dense network of veins and arteries is observed in other highly skilled marine predators, such as tuna and sharks. However, tuna and sharks do not maintain constant internal heat as opah do. They do generate heat from muscle movement, but only around specific muscle groups. This process creates warmed but isolated muscle tissue for tuna and sharks, and their blood cools instantly when exposed to seawater whenever the fishes' bodies are re-loaded with oxygen via their gills.

The opah, on the other hand, has a net of veins and arteries uniquely located within its gills. That location lets the blood vessels that carry warmed blood from the opah's heart heat the freshly oxygenated blood in the gills. This warm blood then flows throughout the opah's body. In this way, the opah maintains a significantly warmer temperature of its brain, muscles, and most importantly its heart, which gives it a distinct advantage in its ecosystem.

Reaching up to 2 meters in length and weighing over 45 kg, opah dwell in cold, deep water. Wegner said:

Satellite tracking showed opah spend most of their time at depths of 150 to 1,300 feet, without regularly surfacing. Their higher body temperature should increase their muscle output and capacity, boost their eye and brain function and help them resist the effects of cold on the heart and other organs.

The opah also uses its large pectoral fins to generate heat and continually warm the rest of its body. The fish also has thick layers of fat which protect the heart, gills, and pectoral fin muscles from the surrounding cold water.

Wegner's team implanted several opah with small thermometers before releasing them back into the ocean. The recorded data featured temperatures consistently higher than those in the surrounding water.

Some people find the appearance of the opah comical. But this fish has certainly surprised researchers with its unique evolutionary adaptation.

1. Which of the following is NOT true about the opah?

- A) It's been well-researched.
- B) It is an efficient predator.
- C) It lives in deep cold water.
- D) It is in growing demand.

2. According to the text, *truly warm-blooded* refers to the fact that

- A) opah have warmed blood running through their whole body.
- B) opah have a unique network of veins and arteries in their gills.
- C) opah have body temperature higher than that of the environment.
- D) All of the above.

3. According to the article, opah are

- A) fat and slow.
- B) slow and funny.
- C) big and fast.
- D) big and clever.

4. Opah differ from other marine predators by

- A) the location of their blood-warming system.
- B) the blood vessels involved in blood-warming.
- C) the size and location of their muscle tissue.
- D) the length and weight of their body.

5. Some advantages of opah's warm-bloodedness are

- A) better eyesight and greater muscle strength.
- B) higher heart rate and better brain function.
- C) greater speed and higher blood oxygen level.
- D) faster blood circulation and better hunting skills.

6. How did biologists find out about the peculiar circulatory system of opah?

7. What methods of further research were applied after the discovery of opah's warm-bloodedness?