

4. The digestive system

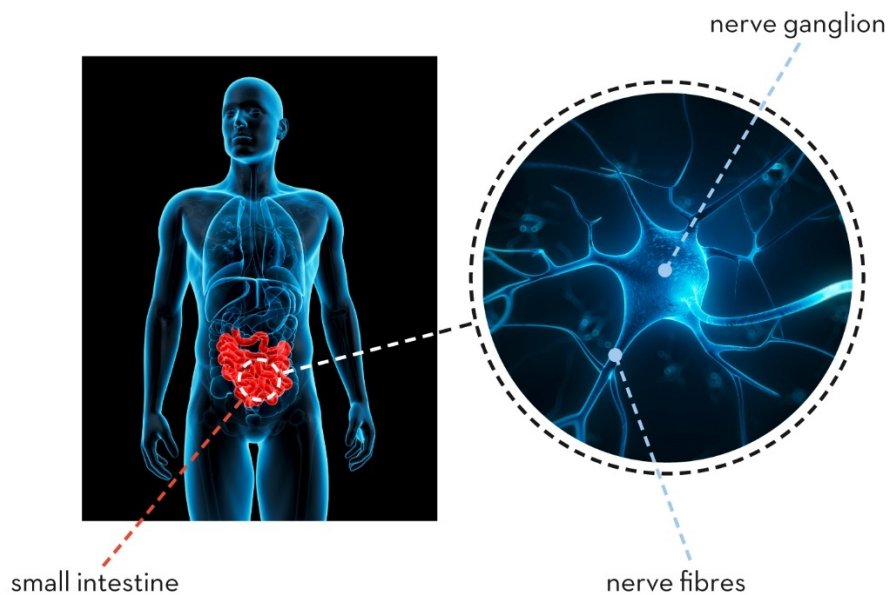
4.1 The organs in the digestive tract

4.1.4

The abdominal brain

THE NERVOUS SYSTEM

Humans have an **autonomous nervous system** that makes it possible for the heart to beat, blood to flow and for us to breathe without thinking about it. One part of this autonomous nervous system controls the intestine, so it is called the **enteric nervous system**. This system allows us to transform the food we have eaten, without necessarily being aware of what happens between these two steps. Its nerve cells are located in the intestinal wall.



The entire length of the intestine is surrounded by nerve cells densely connected to each other. Remember that the intestine is more than 5 metres long, which means there is a 'brain' of 100 million neurons wrapped around it!

Near the end of the 19th century, two British scientists, called Bayliss and Starling, carried out an experiment. They isolated a segment of the intestine from the rest of the body and observed that this segment could continue functioning in a solution of nutrients. Its activity only stopped when they blocked all of this segment's nerve cells. So, the intestine can work independently and can continue to do its job even when its nerve links are cut off from the rest of the nervous system.

The abdominal brain

What do we call the part of the nervous system which controls the intestines?

- Peripatetic nervous system
- Enteric nervous system
- Spheric nervous system

The enteric nervous system is also known as...

- the abominable brain
- the abdominal brain
- the gastric brain

The abdominal brain is wrapped around...

- the intestines
- the heart
- the brain

There are neurons in the intestines.

- False
- True

The abdominal brain cannot work without the brain.

- True
- False

Which of the following functions is not carried out by the abdominal brain?

- Propulsion of the bolus
- Regulation of the digestive system
- Cardiovascular regulation

In the late 19th century, Bayliss and Starling proved that the intestines depend on the central nervous system.

- True
- False

How many neurons does the abdominal brain have?

- 1 million
- 10 million
- 100 million

Bayliss and Starling isolated a piece of intestine and placed it alongside some food.

- False
- True

Bayliss and Starling illustrated that intestinal neurons are indispensable for nutrient absorption.

- False
- True

Answers

What do we call the part of the nervous system which controls the intestines?

- Peripatetic nervous system**
Wrong! That does not actually exist!
- Enteric nervous system**
Well done! That's right!
- Spheric nervous system**
Wrong! Try again!

The enteric nervous system is also known as...

- the abominable brain**
Wrong! That was a trick answer.
- the abdominal brain**
Well done! This is the other name given to your enteric nervous system as it is located in your abdomen.
- the gastric brain**
Wrong! That's not quite right.

The abdominal brain is wrapped around...

- the intestines**
Well done! There is a whole network of neurons around your intestines to ensure they work.
- the heart**
Wrong! Try again!
- the brain**
Wrong! Try again!

There are neurons in the intestines.

- False**
Wrong! That's not the right answer.
- True**
Well done! Over 100 million interconnected neurons ensure your digestive system works well.

The abdominal brain cannot work without the brain.

- True**
Wrong! That's not the right answer.
- False**
Well done! Bayliss and Starling proved that the abdominal brain could work independently from the brain.

Which of the following functions is not carried out by the abdominal brain?

- Propulsion of the bolus**
Wrong! Your abdominal brain does carry out this function.
- Regulation of the digestive system**
Wrong! Your abdominal brain does carry out this function.
- Cardiovascular regulation**
Well done! This does not depend on your abdominal brain, but on your autonomic nervous system, influenced by your central nervous system.

In the late 19th century, Bayliss and Starling proved that the intestines depend on the central nervous system.

- True**
Wrong! That's not the answer we're looking for.
- False**
Well done! Their experiment illustrated that the intestines work independently from the central nervous system.

How many neurons does the abdominal brain have?

- 1 million**
Wrong! It's more than that!
- 10 million**
Wrong! It's more than that.
- 100 million**
Well done! It is said that the abdominal brain comprises an average of 100 million neurons.

Bayliss and Starling isolated a piece of intestine and placed it alongside some food.

- False**
Well done! It was not food that was used, but nutrients.
- True**
Wrong! Remember, by the time food reaches your intestines, it is no longer whole.

Bayliss and Starling illustrated that intestinal neurons are indispensable for nutrient absorption.

- False**
Wrong! That's not the right answer.
- True**
Well done! By blocking the nerve cells of a piece of intestine, they realised that the intestine no longer fulfilled its role.