

***T. Yaremchuck***

*Language tutor: T.Yu. Biloshytska  
Candidate of Pedagogical Sciences, Lecturer  
Zhytomyr Ivan Franko State University*

## **OFF WITH HIS HEAD!**

In 2015 Italian neurosurgeon Sergio Canavero claimed that he would do the first human head transplant next year. This transplant could help people with disabilities who are paralyzed from the neck below. The aim of the surgery is to first cut the spinal cord and then repair it before using electrical or magnetic stimulation to 'reanimate' the nerves and even movement in the corpse.

Canavero and scientists from South Korea and the United States published a series of articles about polyethylene glycol (PEG) in the journal *Surgical Neurology International*. In their opinion, this substance can help restore the cut spinal cord.

A neurosurgeon at Konkuk University in Seoul who has been collaborating with Dr Canavero, severed the spinal cords of 16 mice. They injected a chemical called polyethylene glycol (PEG) into the gap between the cut spinal cord in half of the mice. In a month, five of the eight mice who received PEG regained some ability to move but three of the mice died. Those who did not receive PEG also died.

Similar tests using an enhanced version of PEG was given to five rats with severed spinal cords and the South Korean researchers showed electrical signals passed down it after treatment. However, four of the rats were killed in a flood at the team's laboratory and so they were not able to see if movement was restored. The only surviving rat gradually regained the control of the body. The movements of all four limbs were weak at first. In a week the rat could stand, but it was difficult to maintain balance. Two weeks later, according to scientists, the rodent normally walked, stood on its paws and fed on its own. The rats in the control group remained paralyzed [1].

In a final experiment the South Korean team tested the PEG solution in a dog after it's spinal cord was almost completely severed. They claim 90 per cent of the cord had been severed. While the dog was initially paralyzed, three days later the team report it was able to move its limbs. By three weeks it could walk and wag its tail.

However, this experiment also had one fundamental drawback: lack of control. Other scientists have raised serious concerns about the results.

Dr. Canavero claimed scientists in China had performed a head transplant on a monkey where they connected up the blood supply between the head and the new body. They did not, however, reconnect the spinal cord and the animal was unable to regain movement. The experiment demonstrated that when the head was cooled to 15 °C, a monkey could survive the procedure without suffering brain injury. The monkey was kept alive for only 20 hours after the procedure for ethical reasons. However, until now the details of this experiment have not been published [1].

The man who has volunteered to undergo the first human head transplant in the world is Valery Spiridonov who suffers from a genetic disorder – a muscle-wasting disease. It is claimed that the team are hoping to approach Facebook founder Mark Zuckerberg for finance. Vietnam has offered the hospital to host future head transplants.

However, the claims have been met with scepticism by many in the scientific community who warn the experiments in animals do not yet prove a head transplant will work in humans. Others said it could still at least eight years before a human head transplant could realistically be carried out. Failure can cause not only an irreparable blow to the reputation of all the specialists participating in the project, but also to the whole field of science. Therefore, scientists and surgeons are not eager to join the adventure of Canavero.

## **LITERATURE**

1. Doctor planning world's first head transplant [Electronic resource]. – Mode of access: <http://www.dailymail.co.uk/sciencetech/article-3798056/Head-transplant-surgeon-plans-controversial-Frankenstein-experiments-reanimate-corpse.html> – Title from the screen.