Can blindness be reversed? New experiments show hope.

Scientists have long been attempting to cure blindness in humans. Various experiments have been carried out, but not many have brought promising results. However, recently, researchers have discovered a couple of techniques that show hope.

One of these researches in the US involved testing a technique on blind living mammals – mice in this case – to reverse a type of congenital blindness. This technique has the potential to create new treatments for blindness in humans. The human eye has two types of cells in the retina, which are responsible for vision. These photoreceptor (light-sensing) cells are called rod and cone cells. Rod cells are the more sensitive ones and play a more important role in peripheral and night vision. They detect changes in light, shapes, and movement. Therefore, damage to these cells results in partial or full blindness.

In this technique, scientists have found that blindness can be reversed by converting nerve cells which are responsible for other tasks in the eye to rod cells. In the previous treatments, blindness was either slowed down or stopped. However, through this treatment, it would actually be possible to reverse blindness. It is, therefore, a major breakthrough in ophthalmology, provided that it passes the trials and results in successful cases.

If the rod cells are successfully grown, this could be great news for those who are born blind. Additionally, this technique can help those suffering from progressive eye diseases, which result in vision loss. What's interesting is that the restoration of rod cells can even protect cone cells, as shown by research. Since the cone cells are responsible for detailed vision and color, this means that in individuals who have lost sight due to eye disease could preserve detailed vision.

Dr. Bo Chen from the Icahn School of Medicine, New York, is one of the leading researchers in this study. He explains the two-step procedure that they used in this study: In the first step, they gave the mice a treatment which included the gene responsible for producing beta-catenin. This protein leads to the multiplication of the retinal nerve cells (Müller glia). In the second treatment, these nerve cells were transformed into rod cells.

These cells were observed for weeks. The research team found that they developed normally and became identical in appearance to the normal healthy rod cells. They even formed all the needed nerve system connections that are fundamental for processing sight. The technique was tested on mice which had been born blind due to genetic engineering. It was shown to reactivated the brain areas which are responsible for visual processing.

While experts comment that this technique may not restore perfect sight, it is still a significant step. It carries the potential of sight restoration – at least, limited – in patients who are at the risk of partial or complete blindness.

Another important study shows that an implant device can cure blindness. This device, called Orion, consists of two things: a pair of glasses and a brain implant. The glasses have a camera, through which visual information is transformed into the brain. This means that the images are sent directly into the brain, without having anything to do with the eyes.

How successful is this device? It doesn't provide complete vision but can make a significant change by enabling the person to somewhat see and perceive spacial location. The researchers were able to partially restore vision in six patients who were not born blind but had lost vision later in life. This means that their brain's visual cortex was normal, therefore making it possible to use this technique. It is yet to be tested on those born blind, and even with the current results, there's still a long way to go. Nevertheless, the study leader Daniel Yoshor has high hopes. He

says, “This is an exciting time in neuroscience and neurotechnology, and I feel that within my lifetime we can restore functional sight to the blind.”

Research findings, such as those discussed above, sound promising. The fields of medicine and technology are witnessing game-changing and rapid advancements. If all goes well, we might have cures for partial and complete blindness, which may be congenital and or occur later in life. Excitingly, this could be a reality sooner than we expected.