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Cell study may aid bid for motor neurone therapies

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The quest for treatments for motor neurone disease, spinal cord injury and strokes could be helped by new research that shows how key cells are produced.

Scientists at the University of Edinburgh have been able to manipulate the production of motor neurones – which control all muscle activity – in zebrafish.

Zebrafish are important in helping scientists understand how motor neurones are produced, because unlike mammals, they are able to create new motor neurones as adults.

Humans can generate motor neurones during embryonic development but lose the ability to generate these cells, which are important for speaking, walking and breathing, after birth.

This means that the body is unable to replace these cells if they become damaged as a result of motor neurone disease, stroke or spinal cord injury.

The study, published in the *Journal of Neuroscience*, found that motor neurone production could be increased in adult zebrafish with a drug that inhibits the so-called notch-signalling pathway.

Dr Catherina Becker, from the University of Edinburgh's Centre for Neuroregeneration, said: "If we can find out more about the cell

mechanisms involved in zebrafish to make motor neurones, we could potentially manipulate these pathways in humans with the hope of being able to generate new motor neurones."

The research focussed on early stage cells – known as progenitor cells – in zebrafish, which have the ability to generate motor neurones.

Scientists found that when a protein – called Notch 1¬ – was expressed, signals were sent that stopped the progenitor cells from making motor neurones.

Stopping the Notch1 protein from sending these signals meant that researchers were able to increase the production of progenitor cells and motor neurones in the zebrafish.

Humans have progenitor cells, very similar to those found in zebrafish, which are located in the central nervous system. However, after embryonic development, these cells lose the ability to become motor neurones in humans.

The study could help research to find ways to turn progenitor cells into motor neurons following damage caused by motor neuron disease, spinal cord injury or stroke.

Provided by University of Edinburgh