Horses set to gain health benefits from stem cell advance

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Horses suffering from neurological conditions similar to those that affect humans could be helped by a breakthrough from stem cell scientists.

Researchers who are the first to create working nerve cells from horse stem cells say the advance may pave the way for cell therapies that target conditions similar to motor neurone disease.

The research could also benefit horses affected by grass sickness, a neurological condition that affects around 600 horses a year in the UK.

Little is known about the disease, which causes nerve damage throughout the body. It is untreatable and animals with the most severe form usually die or have to be put down.

The advance by the University of Edinburgh's Roslin Institute will provide a powerful tool for those studying horse diseases. It will also help scientists to test new drugs and treatments.

The researchers took skin cells from a young horse and turned them into stem cells using a technique that was originally developed for human cells. The reprogrammed cells are pluripotent, which means they can be induced to become any type of cell in the body.

The team used them to create nerve cells in the laboratory and tested whether they were functional by showing that they could transmit nerve

signals in a test tube.

Horse stem cells have been produced in the laboratory before but this is the first time that scientists have created working cells of a specific type from them.

The study is published in the journal *Stem Cells and Development.*

Vets around the world are already using stem cell therapies to treat horses for other types of conditions. The efficacy of these treatments has not been completely proven and they use adult stem cells, which are harder to maintain and are more restricted in the types of cells that they can become. The approach is mostly used to treat tendon, ligament and joint problems.

Dr Xavier Donadeu from the Roslin Institute, an author of the study, said: "Stem cells hold huge therapeutic potential both for people and animals. Our research is an important step towards realising that potential for horses and provides an opportunity to validate stem-cell based therapies before clinical studies in humans."

More information: R. Sharma et al. Generation of functional neurons from feeder-free, keratinocyte-derived equine induced pluripotent stem cells. *Stem Cells and Development*, 18 February 2014. online.liebertpub.com/doi/abs/ … 0.1089/scd.2013.0565

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