

# Stem cell research to benefit horse owners and trainers

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In a potential breakthrough for the performance horse industry (such as racing and polo), Melbourne scientists are aiming to harness stem cells to repair tendon, ligament, cartilage and bone damage in horses.

Dr Paul Verma, from the Monash Institute of Medical Research, is working with US company, ViaGen Inc, to develop equine embryonic stem cell lines, with the aim of creating a 'bank' of genetically matched stem cells preserved for individual horses.

Damage to tendons, ligaments, cartilage and bone are common in performance horses such as race horses and polo horses.

Tendon, ligament and cartilage injuries can range from minor inflammation to a complete rupture, which can result in permanent lameness and the end of a horse's competitive life. Once a horse has damaged a tendon or ligament, the risk of re-injury is very high.

Bone damage also varies in severity, with the most serious cases resulting in the euthanasia of the injured horse.

Stem cells have the potential to reverse this damage. "We have developed techniques to derive stem cells from horse embryos, and, through a pilot study, we have successfully created a number of horse embryonic stem cell lines," Dr Verma said.

"The next step will be to look at using these stem cell lines to regenerate

tendon, ligament, cartilage and bone cells. Once the stem cells can be coaxed into 'becoming' the appropriate tissue cells, they can be transplanted to replace the damaged tissue."

The natural source of therapeutic cells developed by Dr Verma will be recognised by a horse's immune system as its own; there will be no risk of horses rejecting the tissue generated from the stem cells.

Dr Irina Polejaeva, ViaGen's Chief Scientific Officer, said the risk of rejection will be overcome because the cells generated are genetically identical to the horse receiving treatment.

Dr John van Veenendaal, specialist equine surgeon, said having a ready access to a bank of individually-tailored equine cells would speed up the rehabilitation process.

"Current stem cell therapies involve aspirating bone marrow cells from the injured horse. The cells are then sent to a laboratory and grown into the required tissue cells; a process that takes three weeks. Having access to a less invasive, faster method of treating injured horses would be fantastic," Dr van Veenendaal said.

Horse trainer Peter Morgan, who is renowned for his rehabilitative training for injured thoroughbred horses, said the implications for the racing industry could be enormous.

"This research could change the way we look at and treat injured racehorses. It would mean injured horses could get back onto the track much more quickly. If we were able to race stud mares successfully for longer, it would increase the value of the mare and her offspring," Mr Morgan said.

Source: Monash University

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