

Stem cells and equine health

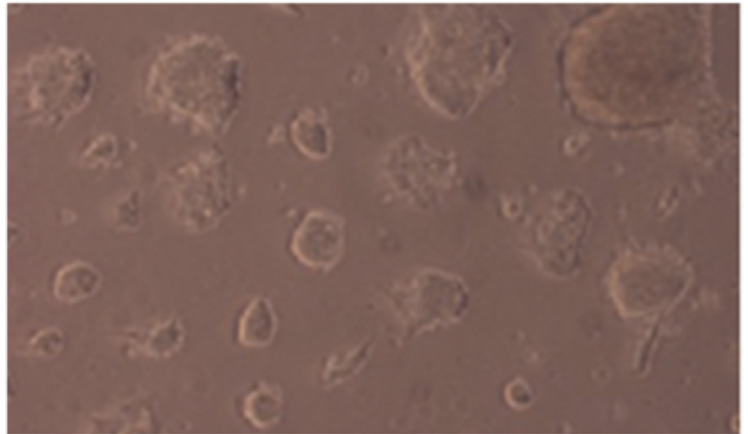
What do we know?

Owners of high-value sport horses are increasingly turning to stem cell therapies to treat tendon, ligament and cartilage injuries.

Stem cell treatments in horses primarily use mesenchymal stem cells (MSCs), stem cells that differentiate into cells that form bone, tendon, fat and cartilage.

MSC treatments typically involve injecting MSCs from the bone or fat of a horse into areas with damaged tendons or cartilage.

Some experimental studies have shown positive results, but many stem cell treatments offered by companies have not been proven to be safe or to work at all.



Equine skin cells can be reprogrammed to become stem cells, like the ones in this image.

What are researchers investigating?

MSCs in bone marrow and fat are quite scarce, making it difficult to get enough cells for treatments. Researchers wish to develop alternative ways to get MSCs more quickly, including using MSCs from donor horses or making them from embryonic stem cells and/or induced pluripotent stem cells (iPSCs).

More research is needed to establish that MSC treatments for horses are safe and effective. Most studies supporting the use of MSCs to treat horse injuries look at a small number of horses, use vastly differing methods, don't have treated and untreated groups and don't look at the long-term effects.

What are the challenges?

In theory, MSC treatments will be most effective if cells are injected into the injured area as soon as possible. However, most current treatments require several weeks to collect cells, grow them in a lab then inject the MSCs back into the injured horse. Researchers are considering other ways to more quickly obtain large numbers of MSCs for treatments.

Treatments using iPSCs have great potential for future treatments in humans and horses, but researchers are still determining how to reliably make specific cell types in uniform batches that can be used for treatments.