Stem cells used to successfully treat arthritis in gorilla at Budapest zoo

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Credit: University of Sheffield

Stem cell therapy has been used to treat osteoarthritis in a gorilla for the first time, by scientists at the University of Sheffield.

Liesel, the elderly matriarch at the Budapest Zoo has been finding it difficult to walk on her left leg for some time now, suggesting that she may be suffering from arthritis.

An international team, led by Endre Sós, Chief Vet and Acting Director General at the Budapest Zoo and Professor Mark Wilkinson, an Orthopaedic Surgeon and leading international expert in the treatment of human arthritis from the University of Sheffield, carried out a comprehensive assessment of Liesel's major joints and used mesenchymal stem cells to treat alterations in her left hip and knee joints.

Osteoarthritis is a progressive degenerative process of the joint. Once the cartilage is worn and damaged, the process is irreversible and current treatments focus on symptomatic control but not to treat the disease itself.

The use of stem cells for the treatment of arthritis and regeneration of the damaged cartilage has been successfully piloted in several animal species in recent years, such as dogs and horses and small-scale clinical trials in humans have also proven to be a promising treatment for this condition. Liesel is thought to be the first primate in the world to receive the treatment and successfully benefited from the work of the research team.

Following previous successful research trials on arthritis-affected dogs, Stem CellX—a company made up of a team of international scientists working in the field of stem cells, regenerative medicine, and genetics—was established to develop new technologies for the formulation of stem cell-based products for arthritis treatment in animals.

Stem CellX founder and Professor of Cell Signalling at the University of Sheffield, Endre Kiss-Tóth has collaborated with Professor Mark Wilkinson for a number of years to explore novel treatment options for human arthritis. They now jointly lead a preclinical program to test Stem CellX technologies for the development of a similar stem cell treatment

in human patients.

The company recently partnered with Budapest Zoo to provide this treatment for animals in need, as well as supplying zoos globally.

The mesenchymal stem cells used for the procedure on Liesel were isolated from a piece of fat tissue donated by N'yaounda, a young female gorilla who underwent a planned minor operation in 2022. A specialist team at Stem CellX then isolated, purified and cultured these cells at their R&D base in Hungary to formulate a cell suspension that could be kept deep-frozen until the treatment.

Professor Kiss-Tóth and Professor Wilkinson are now jointly leading a preclinical program to test Stem CellX technologies for the development of a similar stem cell treatment in human patients.

Professor Endre Kiss-Toth, from the University of Sheffield and Founder of Stem CellX said, "It has been a great privilege to be part of this word-first collaboration and bring together Stem CellX expertise in stem cell technologies, with the internationally leading clinical skills and knowledge in osteoarthritis pathogenesis of the University of Sheffield to provide a novel treatment option for Liesel to improve her quality of life in her golden years."

"We are now following her recovery closely, in the hope to see marked improvement in her movements and in the use of her osteoarthritis affected leg."

Professor Mark Wilkinson, from the University of Sheffield and Leader of Clinical Orthopaedic Team, said, "I was delighted to be part of the team doing this ground-breaking work and having the opportunity to treat Liesel's arthritis. We are currently developing a similar treatment for humans. This work is in its very early stages but hopefully will lead

to a real solution for patients to the pain and suffering that arthritis causes."

Honorary Associate Professor, Endre Sós, Leader of the Zoo Team said, "The advanced husbandry and veterinary practices in modern zoos result in increased longevity in many species, including apes. Our task is to provide the best medical care and best quality of life for these animals, despite their age-related conditions. Stem-cell therapy hopefully brings in a new era in this field as well."

Provided by University of Sheffield