

Press Release (Press Embargo: Sept. 11th, 2019; 11.00 a.m. CEST)

First ever in-vitro embryos may mark the turn of the tide in the fate of the nearly extinct northern white rhino

*For decades the story of the northern white rhinoceros has been a tale of decline. The number of individuals shrank down to only two in 2018, rendering complete extinction as only a matter of time. An international consortium of scientists and conservationists has now achieved a milestone in assisted reproduction that may be a pivotal turning point in the fate of these magnificent animals. Using eggs collected from the two remaining females and frozen sperm from deceased males, they successfully created **two northern white rhino embryos**. The embryos are now stored in liquid nitrogen to be transferred into a surrogate mother in the near future.*

The in-vitro creation of northern white rhino embryos was achieved at Avantea Laboratories in Cremona, Italy. Prof. Cesare Galli and his team matured and fertilized eggs collected on August 22nd from Najin and Fatu, the two females living at Ol Pejeta Conservancy in Kenya, with sperm from males Suni and Saut. “We brought ten oocytes back from Kenya, five from each female. After incubation seven matured and were suitable for fertilisation (four from Fatu and three from Najin)”, says Galli. “Fatu’s eggs were injected with Suni’s sperm while Najin’s eggs were injected with Saut’s sperm using a procedure called ICSI (Intra Cytoplasm Sperm Injection). Saut’s semen was of really poor quality and we had to thaw additional samples to find viable sperms for ICSI. After ten days of incubation, two of Fatu’s eggs developed into viable embryos that were cryopreserved for future transfer. Najin’s eggs did not make it to a viable embryo despite the fact that one egg initiated segmentation.”

This procedure was made possible by a previous milestone achieved at Ol Pejeta three weeks ago. Scientists were able to collect oocytes (immature eggs) from both Najin and Fatu for the first time ever. The successful egg collection was a joint effort by the Leibniz Institute for Zoo and Wildlife Research (Leibniz-IZW), Avantea, Dvůr Králové Zoo, Ol Pejeta Conservancy and the Kenya Wildlife Service (KWS). Immediately after the collection the eggs were air-lifted to the Avantea Lab in Cremona. “The entire team has been developing and planning these procedures for years”, says Prof. Thomas Hildebrandt from Leibniz-IZW. “Today we achieved an important milestone on



a rocky road which allows us to plan the future steps in the rescue program of the northern white rhino”.

The entire process is part of the “BioRescue” research project. Its goal is to significantly advance assisted reproduction techniques (ART) and stem cell associated techniques (SCAT) complemented with a comprehensive ethical assessment for the benefit of the northern white rhinoceros. The consortium is partially funded by the German Federal Ministry of Education and Research (BMBF) and comprises of internationally renowned institutions from Germany, Italy, Czech Republic, Kenya, Japan and USA. BioRescue aims to prevent the extinction of the northern white rhino.

The ethical assessment of the entire programme and each individual procedure carried out by the BioRescue scientists is a crucial part of the programme. “Breaking new ground automatically implies new questions arising from the new possibilities that we have”, explains BioRescue project head Hildebrandt. “For the egg collection from Najin and Fatu we developed a dedicated ethical risk analysis in order to prepare the team for all possible scenarios of such ambitious procedures and to make sure that the welfare of the animals involved is totally respected”, says Barbara de Mori, the conservation and animal welfare ethics expert from Padua University. “And we carried out a dedicated ethical risk analysis focusing on the quality and security of all the procedures that took place at Avantea”.

“Five years ago it seemed like the production of a northern white rhino embryo was almost unachievable goal – and today we have them. This fantastic achievement of the whole team allows us to be optimistic regarding our next steps. In coming months we need to optimize the process of transfer and following development of an embryo in a body of a surrogate mother. The technique for collection of eggs was developed in cooperation with many European zoos and we are happy that this unique cooperation can continue even with attempts at successful embryo transfer”, says Jan Stejskal, Director of Communication and International Projects from Dvůr Králové Zoo, where Najin and Fatu were born.

It was the partnership between Dvůr Králové Zoo, Ol Pejeta Conservancy and Kenya Wildlife Service that led to the translocation of Najin, Fatu and two male northern white rhinos from the Czech Republic to Kenya in December 2009 – ultimately leading to the international collaboration that now achieved the turn of the tide in the fate of the northern white rhino. “This is a major step



forward in our efforts to recover the northern white rhinos. All concerned are to be hugely congratulated. We have a very long way to go and we most remember that for most species facing extinction, the resources that are being dedicated to saving the northern whites simply don't exist. Global human behaviour still needs to radically change if the lessons of the northern white rhinos are to be learned," says Richard Vigne, Managing Director of Ol Pejeta Conservancy.

"The Kenyan government is greatly encouraged by breaking of new ground in the assisted reproduction technique and remains committed to facilitating the pioneering process all the way. It has been decade of race against time and we are excited at the progress in reversing the hitherto bleak outlook for the northern white rhino," says Hon. Najib Balala, Kenya's Cabinet Secretary for Tourism and Wildlife.

"The pioneering in vitro embryos of the northern white rhino is a strong testament to what committed partnership can achieve in pushing the frontiers of science to save a creature from extinction," says Brig. (Rtd) John Waweru, the Director General of Kenya Wildlife Service.

Well-established, inspiring partnerships are a key to the success of the BioRescue project. The consortium is happy and proud to announce a long-term partnership with Merck. "The news that two viable northern white rhino embryos have been conceived is a significant step towards saving the species from extinction. At Merck, we are proud to be a part of this ambitious project and we are committed to our close and long-term partnership with the consortium to safeguard biodiversity for many years to come. We are in it together to give the project the best chance of success", said Jan Kirsten, Global Head Business Franchise Fertility at Merck. "As experts in fertility, we are passionate about bringing our expertise to this collaboration."

The support of additional funding from companies and private donors will help to win our race against time and is a fundamental contribution to save biodiversity and to take environmental responsibility.

All consortium partners are working hand in hand to save the northern white rhino from extinction.



Media Package

(Available: 11.09.2019; 10.00 h a.m.)

www.biorescue.org/mediapackage/

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Consortium Partners

Avantea is a laboratory of advanced technologies for biotechnology research and animal reproduction based in Cremona, Italy. Avantea has over twenty years of experience and the know-how in assisted reproduction of livestock developed through years of research conducted in the biomedical and animal reproduction fields. www.avantea.it/en/



Dvůr Králové Zoo is a safari park in the Czech Republic. It's one of the best rhino breeders outside of Africa and the only place where the northern white rhino bred in human care. Dvůr Králové Zoo coordinates efforts to save the northern white rhinos. safaripark.cz/en/

Ol Pejeta Conservancy is the largest black rhino sanctuary in east Africa, and is the only place in Kenya to see chimpanzees. It is also home to the last two northern white rhinos on the planet. Ol Pejeta's cutting edge wildlife security includes a specialised K-9 unit, motion sensor cameras along its solar-powered electric fence, and a dedicated Rhino Protection Unit.

www.olpejetaconservancy.org

Kenya Wildlife Service is the government institution that conserves and manages wildlife for Kenyans and the world. It also enforces related laws and regulations. www.kws.go.ke

The University of Padua in Italy is one of the oldest in the world. Its Department of Comparative Biomedicine and Food Science is developing leading research and education in the field of wildlife conservation and welfare, with a special focus on ethical assessment and evaluation of research projects and educational programs <http://bca.unipd.it/ethics-laboratory-veterinary-medicine-conservation-and-animal-welfare>

The **Leibniz Institute for Zoo & Wildlife Research (IZW)** is an internationally renowned German research institute of the Leibniz Association. Its mission is to examine evolutionary adaptations of wildlife to global change and develop new concepts and measures for conservation. To achieve this, the Leibniz-IZW uses its broad interdisciplinary expertise in conducting research for conservation in close dialogue with the public and stakeholders.

www.leibniz-izw.de

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