

New strategies in Sumatran and northern white rhinoceros conservation based on advanced assisted reproduction techniques combined with cellular technologies

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The Sumatran rhinoceros (SR, *Dicerorhinus sumatrensis*) and the northern white rhinoceros (NWR, *Ceratotherium simum cottoni*) are the two megaherbivores which suffer from the most accelerated population decline on our planet over the last decade. The NWR rhino is reduced to a none self-sustaining group of three individuals which are kept under protected condition in Ol Pejeta Conservancy, Kenya. The SR, divided into two subspecies, is dwindled down to fewer than 100 individuals, largely scattered over the islands of Sumatra (under 90 SR) and Borneo (approx. 10 SR). The NWR is already declared as extinct in the wild and the SR has a high risk to follow the same destiny. The current approach of habitat protection will not save the NWR and most likely the SR either. For an effective conservation program, it is critical to increase their reproductive rate substantially. With the application of advanced assisted reproduction techniques such as in-vivo gamete collection and in-vitro embryo production, followed by embryo transfer into surrogate females, combined with emerging cellular technologies based on induced pluripotent stem cells (iPSCs), it might be possible to maintain the genetic variability necessary for self-sustaining populations and rewind the extinction process of these two rhinoceroses. The authors will present the various options embedded in a strategic road map developed at a multidisciplinary meeting under the name “Conservation by Cellular Technologies” and published online in Zoo Biology on May, 3rd 2016 (doi: 10.1002/zoo.21284).

Etorphine free anesthesia protocols optimized for frequent reproductive interventions ranging from semen collection, artificial insemination to Ovum-Pick-Up (OPU) in four rhino species

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In order to elucidate the problems of poor reproductive performance in captive rhinos the EEP and IZW have encouraged intensive and serial reproductive monitoring. A multi-disciplinary and multi-institutional research proposal was initiated. The use of restraint chutes and recent implementation of medical training offered new possibilities of safe handling and management of rhinoceros. However, serial ultrasonographical reproductive assessments, artificial inseminations, semen collections and OPU, as well