



Mitochondrial DNA dynamics during *in vitro* culture and pluripotency induction of a bovine Rho0 cell line

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Genet. Mol. Res. 14 (4): 14093-14104 (2015)

Received May 18, 2015

Accepted October 14, 2015

Published October 29, 2015

DOI <http://dx.doi.org/10.4238/2015.October.29.29>

ABSTRACT. Large number of cellular changes and diseases are related to mutations in the mitochondrial DNA copy number. Cell culture in the presence of ethidium bromide is a known way of depleting mitochondrial DNA and is a useful model for studying such conditions. Interestingly, the morphology of these depleted cells resembles that of pluripotent cells, as they present larger and fragmented mitochondria with poorly developed cristae. Herein, we aimed to study the mechanisms responsible for the control of mitochondrial DNA replication during mitochondrial DNA depletion mediated by ethidium bromide and during the *in vitro* induction of cellular pluripotency with exogenous transcription factor expression in a bovine model. This article reports the generation of a bovine Rho0 mesenchymal cell line and describes the analysis of mitochondrial DNA

copy number in a time-dependent manner. The expression of apoptosis and mitochondrial-related genes in the cells during mitochondrial DNA depletion were also analyzed. The dynamics of mitochondrial DNA during both the depletion process and *in vitro* reprogramming are discussed. It was possible to obtain bovine mesenchymal cells almost completely depleted of their mitochondrial DNA content (over 90%). However, the production of induced pluripotent stem cells from the transduction of both control and Rho0 bovine mesenchymal cells with human reprogramming factors was not successful.

Key words: mtDNA; Depletion; Pluripotency; Induced cells; Cattle