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Chromosomal dynamic of mammalian embryos containing massive lipids

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Background
Bovine oocytes and embryos contain massive lipids, disturbing observation of chromosome behavior. An improvement of microscopic technique enables us to observe chromosomal dynamics in murine and human embryos using a confocal laser microscope (CLM) after an injection of a mixture of mRNAs without impairing their developmental competence. The present work describes dynamic change of chromosomes in bovine embryos.
Methods
Pronuclear ova (n = 83) following *in vitro* maturation and fertilization were injected with a mixture of mRNAs encoding EGFP-EB1 and mCherry-histone-H2B. Dynamic changes of their chromosomes were monitored continuously using a CLM in an incubator for 148 h.
Results
Confocal imaging study revealed that 14 embryos developed to the blastocyst stage 17%). Twenty embryos cultured individually without RNA injection or confocal imaging developed to the blastocyst stage (21%).
Times required from insemination to 2-cell, 4-cell and 8-cell stages of embryos which developed to the blastocyst following RNA injection and CLM imaging were 28.3, 38 and 49.3 h, respectively. These values were comparable to those of their counterparts. Ten embryos formed multinuclei after first mitosis (12%). In one of these embryos, chromosome(s) packaged in micronucleus took part in a spindle with chromosomes of main nucleus at 2nd mitosis, developing to the blastocyst stage.
Conclusion
Our data revealed that chromosomal dynamics in bovine embryos in spite of

containing a lot of lipids. This work opens new prospective on the analysis of chromosomal dynamic of mammalian embryos containing massive lipids, such as cattle and pigs.