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Potential role of extracellular vesicles in oxidative stress response and its implication on animal fertility

Fertility is a wide term which is influenced by a network of genetic, nutritional, physiopathological and management and environmental factors. Environmental stress including oxidative stress is strongly considerable in vivo and in vitro factor in reproductive and molecular biology studies. Oxidative stress is a result of the imbalance between formation of free radicals including reactive oxygen species (ROS) and their scavengers by antioxidant molecules. Excessive level of ROS leads to disfunction and damage of cellular components resulted in cell apoptosis². The cells respond and react with the changeable surrounding environment via communicating with other cells and extracellular matrix through several mechanisms including the secretion of extracellular vesicles such as exosomes (30-150 nm)³. Exosomes are found to be secreted in all types of cells and fluids that have been studied so far⁴. Depending on their origin and releasing conditions exosomes carry

different genetic information molecules that can be transferred to neighbor or long-distance cell/tissue resulting in signaling responses⁵. Exosomes released under stress conditions are differed in their RNA and protein contents compared to exosomes released under normal conditions⁶. Bovine granulosa cells derived-exosomes carried cascades of cellular antioxidant molecules that enhanced cellular functions under oxidative stress conditions⁷. Moreover, exosomes released from bovine oviductal epithelial cells were differed in their microRNAs content under oxidative stress conditions compared to those released under normal conditions (Saeed- Zidane et al-unpublished data). In conclusion, under oxidative stress conditions exosomes may influenced animal fertility through their effects on the cellular signaling and communication of follicular and oviductal cells.

Biography

Mohammed Zidane (PhD) has completed his PhD and postdoctoral studies from the Institute of Animal Science, Animal Genetics/Breeding and Husbandry group, Faculty of Agriculture, University of Bonn, Germany. Mohammed Zidane had a Master of Animal Reproductive Physiology and Bachelor of Animal Science. Mohammed Zidane published several papers in international journals and he presented in several international conferences. Mohammed Zidane is a member of organizing committee of the international meeting on Veterinary and animal Science.

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