In this study the quality of total RNA, isolated from fresh spermatozoa, was compared between boars with good and poor semen freezability (GSF and PSF, respectively). Semen from 3 boars with GSF exhibited significantly higher total motility, mitochondrial function, plasma membrane integrity and reduced lipid peroxidation compared with 3 boars with PSF after cryopreservation. There were variations in the quality of RNA isolated from spermatozoa of boars with GSF and PSF. Boars with GSF exhibited mainly full-length, intact RNA, whereas substantial amounts of degraded RNA were detected in spermatozoa from boars with PSF. Further understanding of the biological relevance of RNAs in sperm function is critical to improve the freezability of boar semen.

**Key words**: boar, spermatozoa, semen freezability, RNA profiles

**Introduction**

Cryopreservation causes changes in the membrane structure of spermatozoa, resulting in reduced fertilization ability (Yeste 2016). Analysis of different sperm attributes has confirmed that cryo-induced damage to spermatozoa differs among individual boars, suggesting varying sperm response to the freezing-thawing procedure (Fraser et al. 2010). Moreover, it has been demonstrated that the susceptibility of boar spermatozoa to sustain injury after cryopreservation has a marked effect on the sperm cryo-survival, and that the identification of boars with high cryo-tolerance is the most practical way to improve the fertility potential of frozen-thawed (FT) semen (Fraser et al. 2014, Yeste 2016). It has been reported that the identification of sperm freezability markers might be useful in the selection of boars for cryopreservation (Yeste 2016).

Accumulating evidence has confirmed that spermatozoa carry a wide diversity of RNA that is implicated in capacitation, sperm-egg interactions and embryo development (Card et al. 2013, Schuster et al. 2016). Numerous messenger RNA (mRNA) transcripts have been reported to be markers for post-thaw sperm motility and viability (Card et al. 2013). More recently, it has been suggested that the quality of sperm-borne