

Micro RNAs isolated from the sperm head and the efficiency of *in vitro* embryo production in cattle

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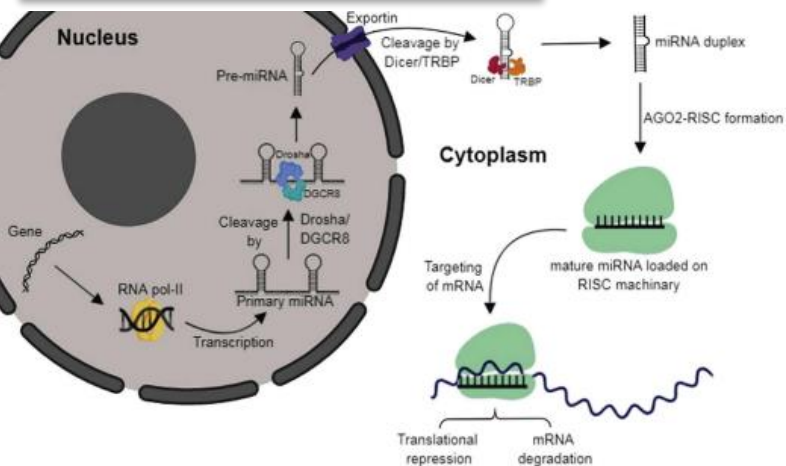
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Introduction



miRNAs with a role in Reproductive Pathways:

- Embryonic stem cells.
- Estral cycle.
- Follicular growth and oocyte maturation process.
- Cleavage and implantation of the embryo.
- Sperm capacitation.
- Spermatogenesis.

miRNAs with a role in Embryonic Development:

- First mitotic division of the zygote
- Positive correlation with cleavage and implantation
- Embryo quality.
- Embryo growth.
- Stem Cell differentiation

Materials and Methods

In this study we correlated, through *in silico* analyzes, the microRNAs isolated from sperm heads of crossbred bulls (n = 6), using the mirVana™ miRNA isolation kit, with the efficiency of these sires in the *in vitro* embryo production. A transcriptomic analysis was performed through of two normalization and filtering software (DESeq2 and edgeR) and PIVE routines of bull sperm with different levels of efficiency.

Results

Bull	Cleavage %	Blastocyst %	miRNA	edgeR R Value	P Value	DESeq2 R Value	P Value
1	68,7±15,5	38,8±23,7	miR-425-5p	0.84	0.04	0.94	0.01
2	80,1±8,1	64,8±50,7	miR-11972	-0.92	0.008	-0.85	0.03
3	71,8±24,3	10,3±1,5	miR-11975/ miR-11976	-0.95	0.03	-0.82	0.05
4	92,8±7,1	14,4±12,6					
5	68,2±16	72,4±46,2					
6	46,5±17,1	31,5±26,3					

Table 2: Sperm microRNAs positively or negatively correlated (p≤0,05) with the blastocyst production rate from *in vitro* embryo production. Values normalized and filtered by software edgeR and DESeq2.

Conclusion

it was concluded that these microRNAs have the potential to be used as fertility biomarkers of bulls submitted to *in vitro* embryo production, in addition to being identified as future study targets for a better understanding of the process of fertilization and earlier embryonic development and mainly to improve the technology in question.

References

^[1] VASHISHT, A.; GAHLAY, G.K. *Molecular Human Reproduction*, v.26, n.4, p.199-214, 2010.

Acknowledgments:



Figure 1: miRNA formation ^[1]

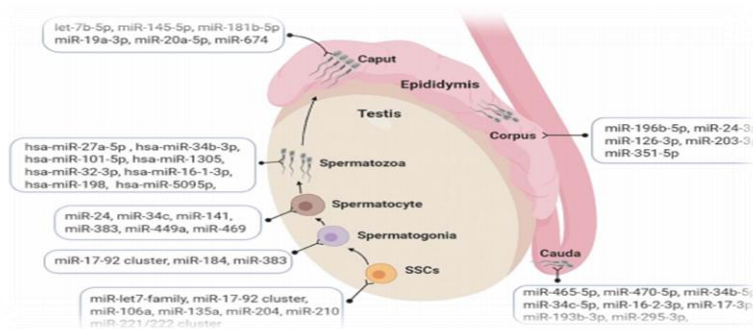


Figure 2: Incorporation of miRNAs in spermatogenesis/spermiogenesis ^[1]