MiRNA PROFILE OF BOVINE BLASTOCYSTS PRODUCED IN SODIUM ALGINATE HYDROGELS 3D CULTURE

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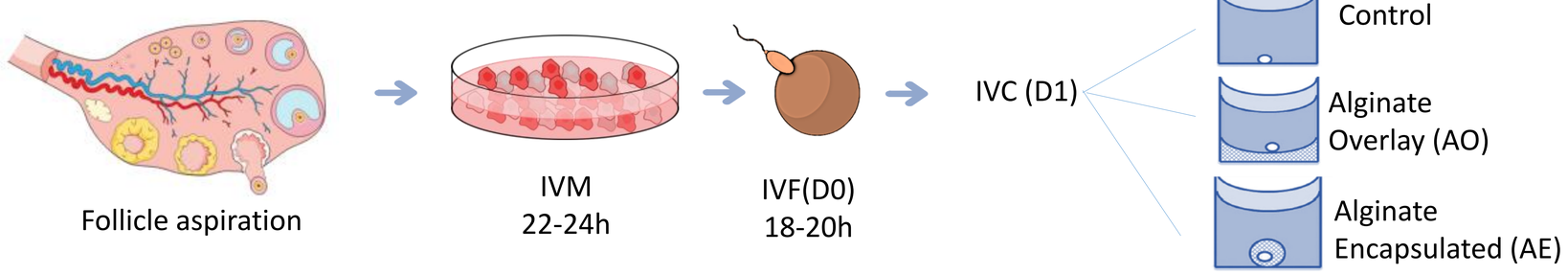
Introduction

Embryos obtained through IVP can differ from embryos produced *in vivo* in epigenetic factors, which can affect pregnancy establishment and postnatal health. I*n vitro* embryos receive different external stimuli which generate different biological intracellular responses. One of the reasons is that the IVP embryos are cultivated in culture plates that can be six times more rigid than the *in vivo* maternal environment. An alternative is the three-dimensional (3D) cultures that are known for inducing changes in proliferation and development pathways in different cells. These pathways can be modulated by mRNAs as well as microRNAs (miRNAs).

Objective

Our objective was to analyze the differences in miRNAs between the conventionally bi-dimensional *in vitro*-produced embryos, *in vitro*-produced embryos in an alginate overlay system, and an alginate encapsulation system.

Materials and Methods



n=3 pools of 10 blastocysts/group

D7: the blastocysts were collected Relative levels of 380 bovine miRNAs were determined by RT-qPCR.

Statistic: ANOVA with posthoc Tukey Test.

Results

We identified a total of 28 miRNAs in all three groups (figure 1). Two miRNAs (miR-1246 and miR-1260b) were upregulated in the control group comparing to the AO group and 1 miRNA (miR-541) was upregulated in the control group comparing to the AE group (figure 2). MirWalk software (version 3.0) was used for analysis of the pathways that can be modulated by these miRNAs (figures 3 and 4).

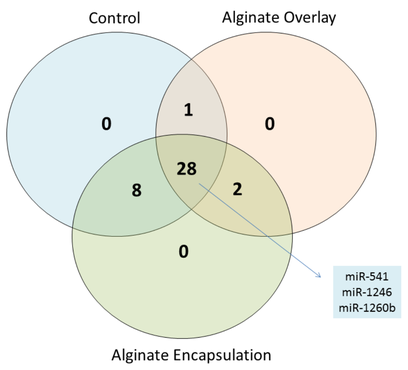


Figure 1. Venn diagram with the distribution of miRNAs found.

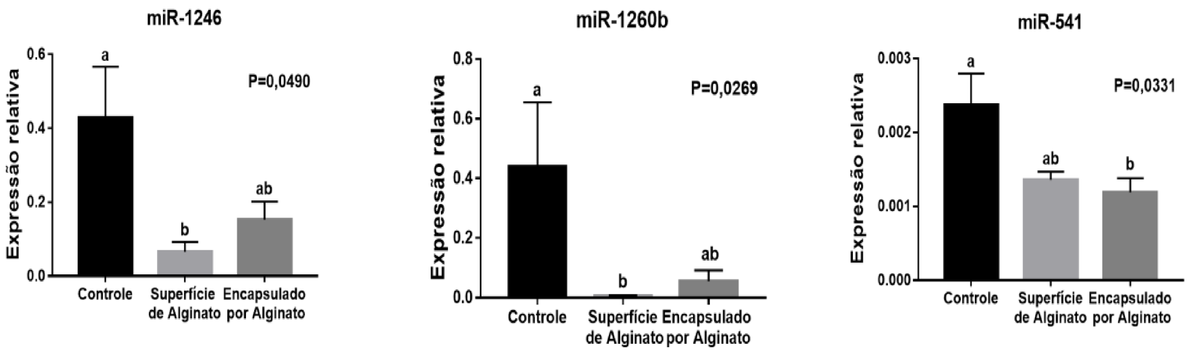


Figure 2. Differently expressed miRNAs in this experiment.

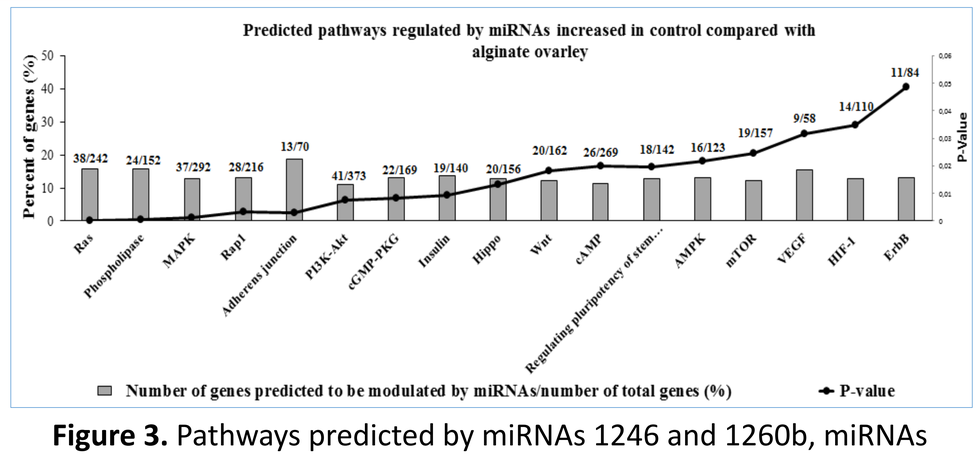


Figure 3. Pathways predicted by miRNAs 1246 and 1260b, miRNAs increased in the control group compared to the AO group.

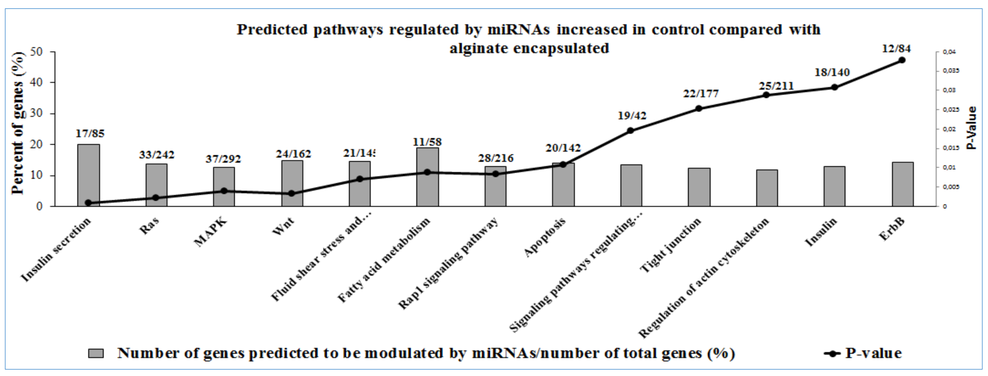


Figure 4. Pathways predicted by miRNA 541, which showed increased expression in the control group compared to the AE group.

Conclusion

The results demonstrate that different embryo culture systems can modulate miRNAs secreted by blastocysts. These miRNAs are predicted to regulate important pathways that are crucial for embryo development.

Acknowledgements:

(2014/22887-0 and 2019/25675-7)