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Study of Selected Analytes in in Vitro Fertilization Culture Medium by Capillary Electrophoresis

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Summary

The infertility rate of couples in reproductive age is 15 % and this number is still rising [1]. Due to this fact, assisted reproduction technologies are increasingly in demand, particularly *in vitro* fertilization. Embryos that have reached the blastocyst stage after *in vitro* cultivation are then transferred into the uterus, with multiple embryos usually being transferred at the same time. However, this leads to multiple pregnancies, which are risky for the mother and the fetus as well. On the other hand, singleton pregnancies are much safer and therefore the main aim is to transfer only single embryo with the highest potential to develop into a healthy fetus [2].

Clinical studies focus on the non-invasive assessment of this potential based on culture media analysis, as its composition reflects embryo's metabolism and development. Analysed components are mainly pyruvate (Pyr), lactate (Lac) and amino acids. These analytes are metabolised differently during embryo's development and based on their concentrations it is possible to assess whether the embryo has developed into high-quality blastocyst [3]. However, it is important to distinguish if these changes in culture media composition are due to the embryo metabolism or media aging and possible degradation of analytes.

The aim of this study is to monitor the stabilities of Pyr, Lac and amino acids in culture medium under different storage conditions. The chosen method was capillary electrophoresis, that can be performed in several operating modes and also combined with many types of detections. Pyr and Lac were determined specifically with capillary zone electrophoresis mode using contactless conductivity detection and amino acids with micellar electrokinetic capillary chromatography mode using laser-induced fluorescence detection.

References

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