

A METABOLOMICS APPROACH TO IDENTIFY ANEUPLOID EMBRYOS TO INCREASE THE EFFECTIVENESS OF ART

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Can euploid embryos be identified in a non-invasive manner by measuring the concentration of specific metabolomic biomarkers in spent culture media?

✓ Conclusions

Using a non-invasive approach based on metabolomics analysis using a Mass Spectrometry equipment, we are able to differentiate between euploid and aneuploid embryos. With this non-invasive approach, 90% of the aneuploid embryos can be discarded, avoiding the transference of non-viable embryos, reducing the time to pregnancy.

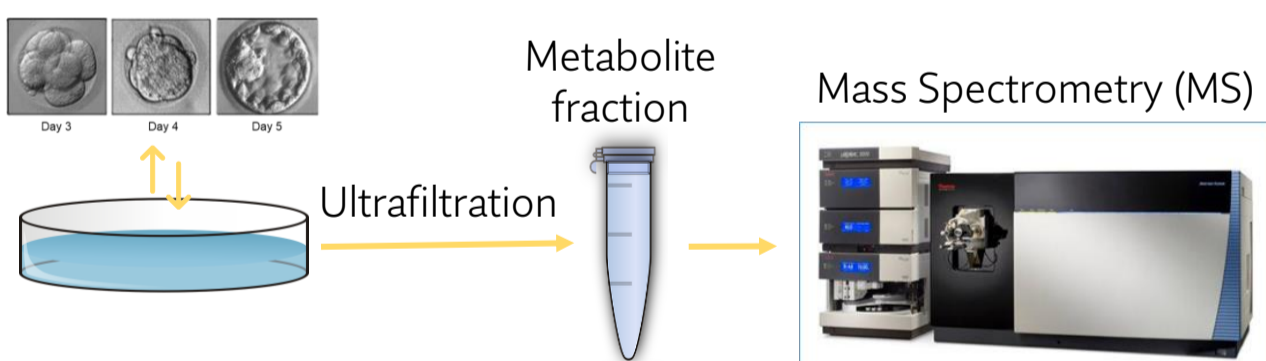
📄 Introduction

Preimplantation Genetic Testing (PGT) has been used to avoid the transfer of aneuploid embryos, which would not result in a successful pregnancy. However, embryo biopsy is invasive and operator-dependent, resulting in wide variability in implantation rates. Recently, metabolomics studies on spent culture media have shown promising results to predict implantation potential. In this study, we aim to determine if euploidy status can also be ascertained by non-invasive metabolomics analysis.

🧪 Methods

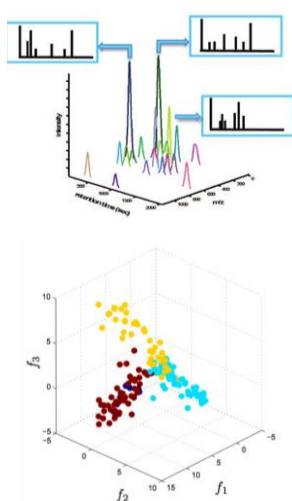
- Spent media samples (n=116), in culture between day 3 and 5
- From embryos later analysed by PGT: 60 aneuploid, 42 euploid and 14 mosaic.

○ Sample analysis:



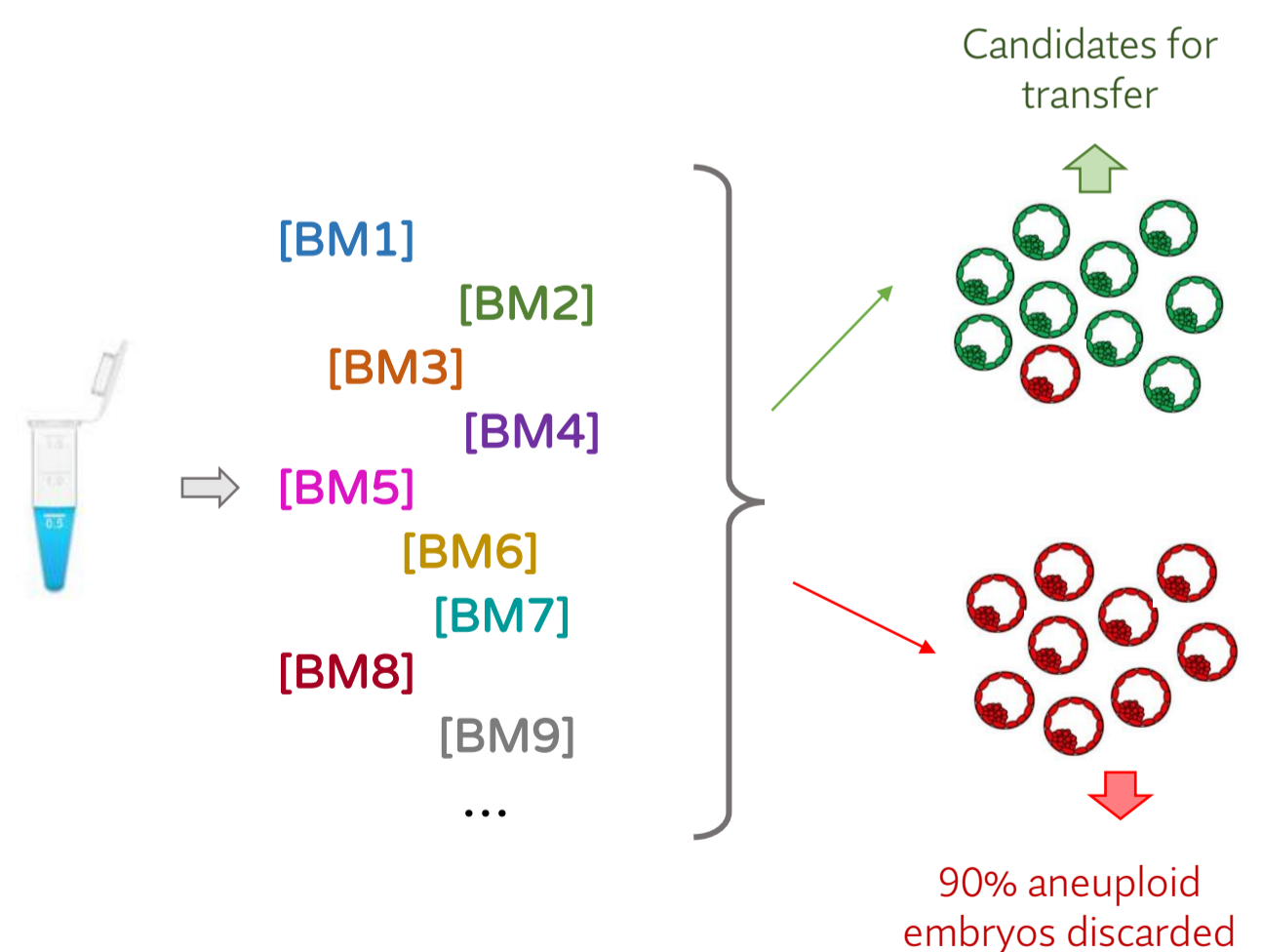
○ Biomarker identification:

- 1 Metabolite quantification, after processing raw files from MS
- 2 Dimension reduction (more than 5,000 metabolites detected) and metabolite selection
- 3 Building a classification method for spent media samples



📊 Results

- A subset of biomarkers (n<50) was identified that showed significant differences between euploid and aneuploid samples.
- These metabolite concentrations are increased in euploid samples compared to mosaic and aneuploid embryos.



- Measuring the concentration of these biomarkers we are able to discard 90% of aneuploid embryos in a non-invasive approach.

Specific metabolites in embryo spent culture media are correlated with blastocyst euploidy status.

If you are interested in collaborating in the project, please contact metabolomics@overture.life