

ESHRE 2020 Virtual (5-8 July 2020)

Questions for the speakers

Session 49: Embryo metabolism and development

Human blastocysts show distinct changes in their metabolism between day 5 and 6 - Denny Sakkas (U.S.A.)

Q: What time after thawing do you start imaging? have you imaged post-thaw recovery of embryos?

A: we image about 2h after thawing. We have done some imaging for 48h after thawing. We are writing up a paper at the moment.

Q: How long do you image for. How much does the FAD/NADH signal fluctuate over time (during imaging) given dynamic nature of metabolism

A: We normally image for a few minutes but have done some long term incubations (24-48h) that do show changes in metabolism.

Q: Do you think that aneuploidies could be responsible for metabolic differences since aneuploid embryos have increased energy requirements?

A: Yes they could be. See the presentation by Shah et al at ESHRE this year

Q: Would you expect that fluorescent imaging will be applicable to the clinical setting, e.g. by implementing fluorescent excitation and time lapse imaging?

A: Yes this is what we hope to trial in the coming months.

Q: Is the shift in the metabolism from day 5 to 6 based on the culture medias? What do you think about this?

A: The shift is intrinsic to the embryo. We have not looked at different media and whether they affect the shift.

Q: In regarding your presentation, the metabolism being more important than the genetic in blastocyst?

A: Both are important but obviously if an embryo is aneuploid then it will not progress. Even though its metabolic profile may be favourable. We still need to examine these questions with a clinical trial

Q: What %O₂ was used and how might variations in this impact the results?

A: We used 5% O₂ in all our experiments. For the role of O₂ during embryo development you may want to look at a paper on mouse eggs/embryos that is about to be published in JARG by Seidler et al.

Q: The spread in values suggest that the outliers you report could confound analysis. have you also applied non parametric statistics to this data?

A: Yes

Q: Were there patient age differences in embryos day 5-6? Did you have embryos from same patient that made it to freeze on day 5 versus 6?

A: Good question. We will have to go back to examine this. However from the overall data we did see patients with differences in their own day 5 and 6 embryos.

Blastocyst quality modulates the generation of an inflammatory microenvironment by decidualized cells - Laura Fernandez (Argentina)

Q: For how long did the embryos conditioned the medium you used?

A: The medium we used was the second step of a sequential medium system. Embryos were grown in the first medium during 3 days and then grown in the second medium during 2 days. The latter is the medium we recovered and used for the assays, so the embryos conditioned the medium during 2 days.

Q: Is it possible that then double embryo transfer in which one embryo is worse would impair the implantation for the good one because of caspases?

A: It is a possibility. It may also be possible the opposite situation, where the presence of a good quality embryo may favor the tolerogenic microenvironment for a worse quality embryo. We should take into account that the initial response is locally restricted to the implantation site, so there might be different initial responses to each embryo. In addition, the present results were obtained using in vitro models. Further studies are necessary to elucidate whether the mechanisms operate similarly in vivo and rule out any factor not contemplated in vitro.

What can we learn from the first 24 hours of embryo development? A fully automated AI-based algorithm for identifying high-quality blastocysts. - Daniella Gilboa (Israel)

Q: Could later analysis improve your algorithm?

A: Still we did not explore further development analysis

Q: Can you please list some parameters evaluated by your AI algorithm?

A: Between them the % of the membrane which is smooth or wrinkled. Also the size of PN and their position and movement

Q: Did you limit the analyzed parameters or let the AI to analyze whole image by pixels to find related characteristics related with high quality embryos

A: Actually, is limited to some parameters, as explained before.

Q: How do you address differences in same embryo due to the real 3d shape of embryo for AI algorithms?

A: Actually the only way to do address differences is to use the 9 different focal planes that TLM is providing to AI.