2019 Young Investigator Award 2nd Runner-Up

616: RNA-SEQ ANALYSIS OF BLASTOCOEL FLUID REVEALS A UNIQUE GENE EXPRESSION SIGNATURE PROFILE IN EUPLOID EMBRYOS THAT SUCCESSFULLY IMPLANT

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Objective

Discovering a molecular signature in day-5 blastocysts that is suggestive for a successful uterine implantation would provide reproductive specialists an additional tool for selecting the very best embryo for transfer. This study assessed global gene expression using RNA-Seq in blastocoel fluid-conditioned media from euploid embryos resulting in (un)successful implantations.

Design

Retrospective analysis of day-5 euploid blastocoel fluid gene expression and implantation outcomes.

Materials and Methods

Blastocoel fluid-conditioned media was obtained following biopsy of ICSI-generated day-5 blastocysts. RNA was extracted and libraries prepared using a SMART-Seq Stranded kit followed by Illumina NextSeq500 sequencing. Sequences were aligned to the human genome, reads counted and gene expression determined. The PANTHER classification system (pantherdb.org) was used to identify signaling pathways most represented in the RNA-Seq gene lists per sample. Embryo implantation-related genes were included in the analysis (Sanchez-Ribas et al.,Fert Steril 2019;111:991).

Results

A greater number of expressed genes (n=1484) were found associated with no euploid implants than embryos (n=778) that did implant. A greater percentage of genes belonging to apoptotic (1.2 vs 0.6%), GnRH (2.4 vs 1.4%), inflammation (3.1 vs 0.8%) and Wnt (2.3 vs 1.5%) signaling pathways were found to be associated with a successful vs. unsuccessful implants. These pathways are elevated in the embryo implantation-related genes. The ubiquitin-proteasome signaling pathway had a greater expression percentage in the negative (0.9%) pregnancy outcomes than positive (0.3%) outcomes.

Conclusions

We identified specific gene expression in unique signaling pathways in conditioned media from euploid embryos capable of establishing a successful pregnancy outcome.

Support

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Disclosure

None