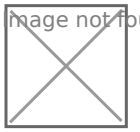
Docket #: S13-022

Non-Invasive Imaging for the Detection of Human Embryonic Aneuploidy at the Blastocyst Stage

Stanford researchers have developed a non-invasive method of assessing chromosomal composition in human embryos at the blastocyst stage, thus potentially improving chances of success following in vitro fertilization (IVF). Experiments suggest that euploid human blastocysts exhibit cell cycle parameter timing that is different from aneuploid blastocysts and serve as the first example of the use of non-invasive imaging to predict ploidy at the blastocyst stage.
Given the high rate of human embryonic aneuploidy, this technology could improve IVF outcomes by reducing the transfer of aneuploid embryos, thus reducing the risk of high-order multiple pregnancies.

Figure



Experiment Design

Stage of Research

- **Proof-of-concept** – Studies showed that early parameters can predict blastocyst development and are correlated with embryonic ploidy
- Current research efforts are aimed at refining cell cycle parameter timing for aneuploidy detection and determining whether other imaging parameters are predictive of human embryo viability

Applications

- **Human embryo transfer selection for IVF** - distinguishes between euploid and aneuploid human blastocysts via non-invasive analysis of cell cycle parameter timing

Advantages

- **Can lead to improved IVF success rate** by improving embryo selection
- **Non-invasive imaging method** - Currently, the use of pre-implantation genetic screening (PGS) requires removal of the embryo to perform a biopsy.
- **Improved prediction of embryo viability** - fewer embryos could be transferred, thus reducing the risk of high-order multiple pregnancies
- **Embryos can be selected sooner** for implantation, reducing risk of epigenetic changes

Publications

- Friedman, B. E., Chavez, S. L., Behr, B., Lathi, R. B., Baker, V. L., & Reijo Pera, R. A. Non-invasive imaging for the detection of human embryonic aneuploidy at the blastocyst stage. Fertility and Sterility 98, no. 3 (2012): S38
- US Patent Application US20140349334 A1

Patents

- Published Application: 20140349334
- Issued: 9,404,908 (USA)

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