

SOD1 Expression in blastocoel fluid-conditioned media from IVF generated embryos may serve as a biomarker for pregnancy outcomes

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INTRODUCTION

- National success rate for first attempt egg retrieval for IVF among women <35 years of age is 55%, but this rate drops as age increases.
- Preimplantation genetic testing for aneuploidy (PGT-A) of IVF-embryos has been developed to improve IVF success rates.
- PGT-A assesses trophectodermal cells from day 5 embryos but is problematic due to growing evidence of placental mosaicism.
- Previous studies have outlined the relationship between SOD1 release and implantation potential. ¹
- SOD1 is known to have antioxidant capabilities—helping combat ROS. ²

METHODS

SOD1 expression in blastocoel fluid

53 blastocoel fluid-conditioned media samples with know PGT-A status and/or pregnancy outcomes were obtained. cDNA was synthesized from individual samples, then SOD1 expression was assessed with RT-qPCR (TaqMan Gene Expression Assay). GAPDH was also assessed as a housekeeping gene in each sample.

H₂O₂ levels in media samples

H₂O₂ levels were also measured using individual blastocoel fluid-conditioned media samples using a H₂O₂ fluorescence assay (Abcam) with a Tecan fluorescent plate reader.

RESULTS

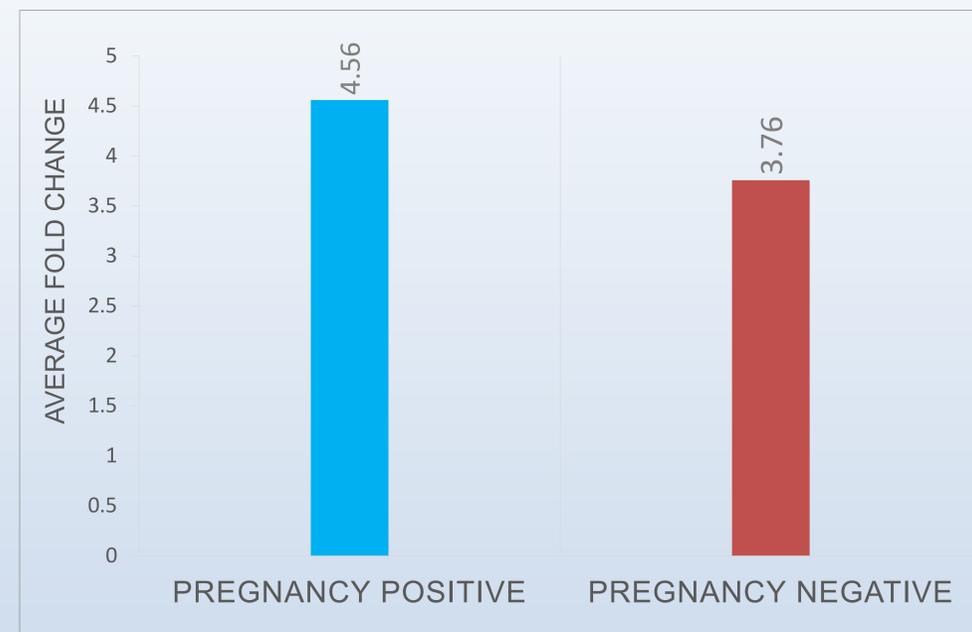


Figure 1: Expression levels of SOD1 among 53 blastocoel fluid-conditioned media samples. SOD1 expression was higher in positive implantation embryos compared to negative implantation embryos (p=0.064)

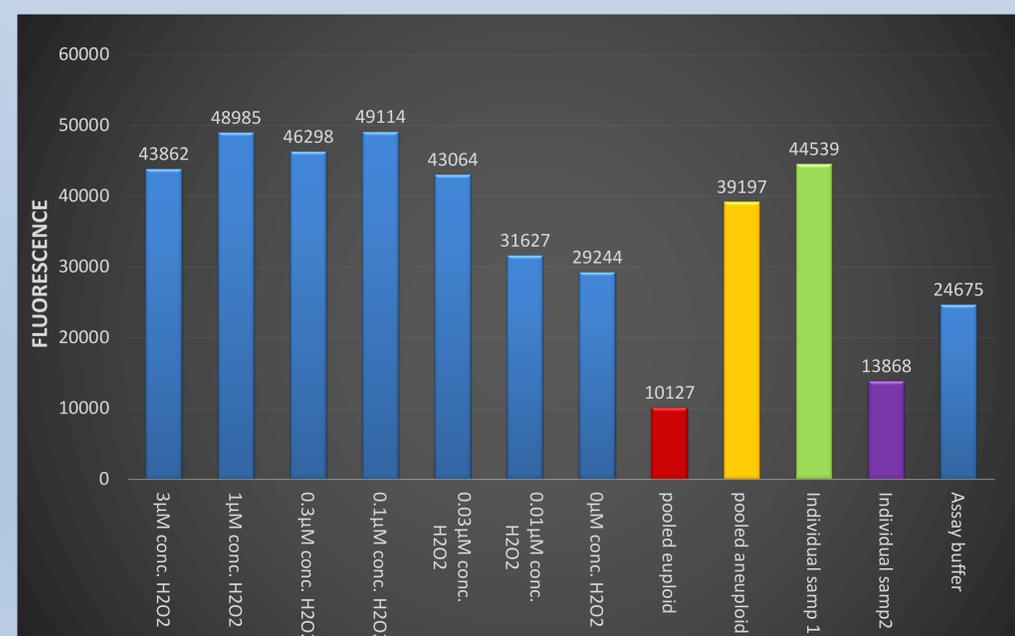


Figure 2: H₂O₂ levels within pooled aneuploid and euploid samples, as well as individual media samples.

DISCUSSION

- This study reveals a positive correlation between SOD1 levels and positive pregnancy outcomes
- Blastocoel fluid conditioned media contains varying levels of ROS(hydrogen peroxide) that can be detected in individual media samples.
- We hypothesize SOD1 expression in preimplantation embryo could serve as a means for combatting ROS during preimplantation embryo development
- Further research is required to elucidate the specific mechanism behind SOD1 action in the preimplantation embryo.

REFERENCES

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M.S. and this research were funded by an HSC Prisma Seed Grant.