

Embryo-derived EVs and their involvement in implantation

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A few years ago, our group characterized EVs secreted by human ICSI-created embryos and demonstrated that they can be internalized by endometrial cells. Others have shown that bovine embryos that develop to the blastocyst stage secrete EVs enriched in a distinct miRNA, which, when administered in a synthetic form, could significantly increase the capacity of blastocysts to hatch and consequently implant. The transfer of RNA transcripts from EVs secreted by human trophoblast spheroids to endometrial cells has been demonstrated. As a result, the expression of endometrial genes critical for implantation would be modified. Indeed, embryo-secreted EVs appear to be important in the establishment of implantation. Beyond their role in embryo–endometrial dialog, interest in embryo-derived EVs derives also from their possible usefulness as biomarkers of embryo ploidy status. We have examined whether euploid and aneuploid human embryos secrete EVs with a diverse transcriptomic profile that can disclose their genetic makeup. Overall, our data suggest that aneuploid embryos secrete EVs that can induce a transcriptomic response that is incompatible with implantation in the decidualized endometrium.