Embryo Transfer Encyclopedia Article

Embryo Transfer

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Embryo Transfer

Embryo transfer involves the insertion of fertilized early-stage embryos into the female reproductive system. The technique does not alter the genetic composition of the embryo, which was determined at **fertilization**.

Developments in reproductive technology are occurring at a rapid rate in human biology. *In vitro* fertilization, embryo culture, preservation of embryos by freezing (cryopreservation), and cloning technology all yield embryos that are produced outside of the female reproductive system.

There would be no need for embryo transfer if mammalian embryos could be cultured to maturity in the laboratory. While cell culture *in vitro* has made remarkable advances, embryos can be sustained in culture for only a brief period, usually up to the blastocyst stage, or approximately five to six days. Accordingly, their survival is dependent upon transfer to the hospitable and nurturing environment of the uterus of a mother or foster mother.

Embryo transfer started well over a century ago. In one of the first experiments involving embryo transfer, initially performed in 1890 by Walter Heape of Cambridge University, the uterus of one variety of rabbit (a Belgian hare doe) was used for the nourishment, growth and complete fetal development, of another variety of rabbit (an Angora). Heape referred to the Belgian hare doe as a "foster-mother." Since that time, foster-mothering of this type has been extended not only to domestic animals, but also exotic and endangered animal species. Eventually, embryo transfer techniques were applied to humans, as *in vitro* fertilization became available to bypass certain infertility problems.

Transfer can be accomplished by direct non-surgical insertion of the embryo into the female reproductive tract (via the vagina and cervical opening of the uterus), or surgically. A common procedure is to utilize an injection catheter that in some ways functions as a hypodermic syringe. The injection apparatus consists of a thin hollow tube that contains a plunger. At the distal end of the tube is connected a plastic straw containing the embryo and a small drop of culture medium. The apparatus is inserted into the uterus, via the vagina, and the embryo is released within the uterus by gentle pressure on the plunger. Alternatively, surgical embryo transfer is an option in some cases. The upper end of the Fallopian (ovarian) tube is located and the embryo is placed within that site.