



BioMed Research International

Special Issue on

***In Vitro* Manipulation of Gametes and Embryo**

CALL FOR PAPERS

Couple infertility has become a sanitary emergency, with 1 out of 6 couples needing medical assistance for reaching pregnancy. Recent demographic analyses indicate that the number of women of reproductive age will increase up to 2.1 billion by 2050 (UNFPA 2011) with a consequent increase in the absolute number of infertile couples. ART (assisted reproductive technology) represents an important treatment option for infertile couples and, year-on-year, is increasingly utilised. Data from the European Society of Human Reproduction and Embryology indicate that >1 million ART cycles per year take place in the EU with ~5% of live births in some countries being from IVF/ICSI. So far, over 13 million ART children have been born worldwide. Most used ARTs are intrauterine insemination (IUI), *in vitro* fertilization (IVF), and intracytoplasmic sperm injection (ICSI). The latter, in particular, relies on choice of the male gamete by the operator, bypasses all the natural barriers of fertilization, and is highly invasive for the oocyte. ARTs are also widely used for breeding to promote reproductive efficiency. In particular cases, even cloning is used to produce embryo for preserving valuable genetics.

Assisted reproduction implies the manipulation of male/female gametes and the embryo to an extent depending on the type of technique applied. Spermatozoa are previously prepared with different procedures, including *in vitro* incubation and centrifuging steps and selection by different techniques and tools. At the same time, oocytes are kept in *in vitro* condition for both selection and/or *in vitro* maturation when needed. When fertility preservation is needed, or in artificial insemination for breeding, gametes and/or embryos are cryopreserved, implying a cycle of freezing and thawing.

Once the embryo is formed, it is cultured *in vitro* till the blastocyst stage and, when needed, monitored with embryoscope and/or manipulated for preimplantation genetic diagnosis (PGD) and preimplantation genetic screening (PGS). During the above procedures, gametes and embryos are kept in a possible oxidative environment and undergo other stressful conditions possibly provoking structural, morphological, metabolic, genetic, and epigenetic effects. However, whether such effects have consequences for implantation, embryo and foetus development and the health of the offspring is currently mostly unclear. Although it has been suggested that the reported increase in birth defects of ART babies can be due to the genetic background of the infertile parents rather than the assisted technology itself, the pertinent studies are still few and not conclusive.

The purpose of the present special issue is to collect information from experts in the different fields that are involved in the *in vitro* management of gametes and embryo, providing new insights in technical, biological, and clinical aspects.

Potential topics include, but are not limited to:

- ▶ Damage to gametes and embryos during *in vitro* manipulation for ART
- ▶ Effect of cryopreservation on gametes and embryos
- ▶ Consequences of damages to gametes during *in vitro* manipulation on ART outcome and health of offspring
- ▶ New strategies of gametes and embryos manipulation to prevent damage

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/bmri/urology/mge/>.

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Manuscript Due

Friday, 13 November 2015

First Round of Reviews

Friday, 5 February 2016

Publication Date

Friday, 1 April 2016