

## **Possible Gene Expression and Imprinting Defects in Assisted Reproductive Technology**

**Mi Kyung Chung**

*CHA Fertility Center, CHA General Hospital, Pochon CHA University, Seoul, Korea*

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ART procedures happen in a time critical for correct establishment of the epigenetic modifications associated with a normal development. Conditions, the mammalian embryo is exposed during the preimplantation period of development, might change gene expression and the imprinting status of specific genes shown to unfavorably affect cell physiology and viability of the conceptus. Sensitivity of the embryo to its surroundings (suboptimal media formulations, cryopreservation, oxygen and ammonium) decreases developmental processes.

Recovery of immature oocytes after *in vitro* maturation (IVM) of these oocytes has an important value in infertility medicine. This technique can rescue immature oocytes, control the treatment for patients with many endocrine characteristics and, overcome the limitation of conventional assisted reproductive technology (ART) system. The developmental competence of the oocyte also impacts gene expression in the embryo. So superovulation and IVM have been implicated in abnormal methylation and imprinting in the resultant embryo. Without detailed knowledge of *in vivo* processes that regulate nuclear and cytoplasmic maturation of oocyte and developmental competence of embryo, it will be difficult to understand and to remedy the shortcomings within the IVM systems. That is why it is imperative that the analysis of specific gene expression and function of genes during oocyte maturation have to continue.

The safety assessment of ART procedures is essential to infertility treatments and the community. Nevertheless, it is not always appropriate for a direct comparison to be made between animal studies and children born after IVF-ET. It is questioned that most cattle data have been received from *in vitro*-matured oocytes and that genes imprinted in laboratory animals are certainly imprinted in the human. Nevertheless, the epigenetic alterations may be related with infertility. And symptoms may be exposed through ART afterward. Whatever the etiology, further research is required into long term health outcomes for children conceived through ART and epigenetic consequences of ART procedures.