

Fertility Preservation in Women: Preserving the Precious Life of Human

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Received: June 09, 2018; **Published:** July 04, 2018

Keywords: *Vitrification; IVF; Fertility Preservation; Oncofertility; Ovarian Tissue Cryopreservation*

The ability to cryopreserve human oocytes, embryos and ovarian tissue is a valuable tool in modern clinical embryology, in order to preserve fertility in women who for social, medical or other reasons wish to postpone childbirth. Recent advances in cryobiology have made it possible to preserve various types of reproductive cells or tissue with little or no loss of viability.

It was the efforts of Dr. Masashige Kuwayama that allowed the first successful cryopreservation of a human oocyte in 1999 by vitrification and the commercialization of his highly efficient vitrification protocol "The Cryotop Method" in 2005, that resulted in a breakthrough in human ova and embryo cryopreservation, with an excellent post-warming survival [1]. His latest cryopreservation protocol, "The Cryotech Method" results in literally 100% post-warming survival of cryopreserved ova and embryos of all stages.

Vitrification method allows the clinical embryologist to manage clinical in vitro fertilization (IVF) cases where fertility preservation or a postponement of childbirth is deemed necessary. Career or single women are nowadays very often cryopreserve their oocytes or embryos in order to delay maternity.

There is a special category of patients that need to preserve their fertility through assisted reproduction technologies: cancer patients that need to be treated through chemotherapy and/or radiotherapy. A whole new field of reproductive medicine, known as Oncofertility, has emerged and aims at the fertility preservation of oncologic patients where chemotherapy (especially with alkylating agents) and/or radiotherapy have been found to be gonadotoxic, resulting in adverse side effects such as gonadal function loss and sterility [2].

In the case of leukemias, myeloproliferative and myeloplastic diseases (oncologic indications) or hemoglobinopathies (non-oncologic indication), ovarian tissue cryopreservation has become the standard of care [3]. Amazing new technologies are emerging such as the combination of ovarian tissue cryopreservation, the *ex-vivo* oocyte retrieval in immature state from the tissue, followed by *in vitro* maturation of the oocytes and eventually the cryopreservation of both the remaining ovarian tissue and the ova retrieved [4,5].

The "gift" of maternity is unique and precious for every woman. Ovarian tissue cryopreservation, *ex-vivo* follicular aspiration, oocyte *in vitro* maturation, oocyte and embryo cryopreservation by vitrification, are recent advances of clinical embryology that allow the successful fertility preservation in women suffering from cancer or in those that wish to postpone maternity due to social reasons. Fertility preservation is the unique "gift" of science to those women that want to preserve their right to maternity, their right to give birth to a new precious human life.

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Volume 7 Issue 8 August 2018

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