Cryopreservation of ovarian tissue has been widely accepted as an option for fertility preservation among cancer patients. The number and viability of primordial ovarian follicles differ by multiple factors, such as the patient’s age, the type of cancer, the regimen and dosage of cancer treatment.

In order to find out if cancer therapy affects the quality of cryopreserved ovarian tissue, we compared the in vitro maturation and viability of ovarian follicles in thawed human ovarian tissue collected at the time of diagnosis or after initiation of cancer treatment. Ovarian tissue from 34 cancer patients diagnosed with leukemia, lymphoma or sarcoma was donated at the time of cryopreservation or after (non-treated patients n=16, treated patients n=18). The morphology of ovarian follicles was studied by light microscopy in thawed ovarian tissue, before in vitro culture and after 7 days culture.

The morphological analysis showed that the age dependent follicle density in cryopreserved ovarian tissue was not decreased when ovarian tissue collection was performed after cancer therapy. However, after 7 days of culture, the density, viability and the growth of primordial follicles were significantly reduced in ovarian tissue cryopreserved after cancer treatment compared to ovarian tissue cryopreserved before treatment.

This study confirms higher density of follicles and better survival and maturation in culture, when ovarian cryopreservation was performed before initiation of cancer treatment. In vitro culture of thawed ovarian cortical tissue can be used as a quality control method in order to evaluate the maturation capacity of human ovarian follicles for fertility preservation.