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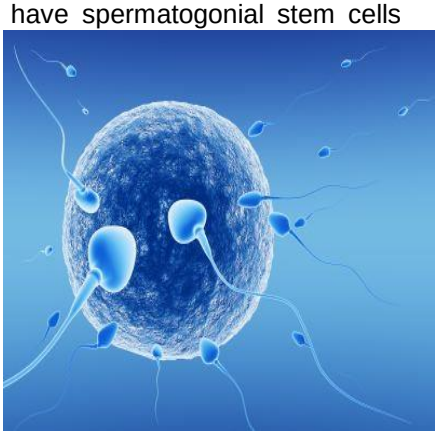
Fertility Preservation in Young Male Cancer Patients

Chemotherapy and radiation treatments for cancer and other conditions can cause permanent infertility. Therefore, patients should take steps to preserve their fertility before initiating gonadotoxic treatments. Semen cryopreservation is standard for adult males and allows them to father their own genetic children using the assisted reproductive technologies of intrauterine insemination, in vitro fertilization or intra cytoplasmic sperm injection (ICSI). Unfortunately, this option is not available to prepubertal boys who are not producing sperm. Due to the efficient treatments available to date the survival rate for childhood cancer patients is approaching 80% and enables them to look beyond cancer to a productive life of which parenthood is an important part. Distress over infertility can have long-term psychological and relationship implications. Although prepubertal boys do not produce sperm, they do have spermatogonial stem cells (SSCs) in their testes that are able to initiate spermatogenesis at puberty. Several teams around the world are now cryopreserving testicular tissue of prepubertal boys in anticipation that new fertility restoring techniques will be available in the near future.



The Technology

Spermatogenesis is a highly productive stem cell-based system that produces millions of sperm each day. This productivity is possible because a small population of SSCs generates progeny that undergo several rounds of transit amplifying divisions before producing terminally differentiated sperm. Thus, transplantation of a relatively small number of SSCs is adequate to functionally reconstitute spermatogenesis in infertile recipients. We have recently shown that by using a novel culturing system we succeeded to promote in vitro differentiation and production of sperm cells from spermatogonial stem cells in rodent testis cells. We are now further testing this approach on human cells with spermatogonial stem cells taken prior to chemotherapy and radiation, from a young male population diagnosed with cancer. We hope that our approach will be a valuable solution to a great need by allowing spermatogenesis and preservation of natural fertility in young patients who currently have no options to conserve their fertility.

Applications

Conservation and regeneration of sperm or spermatogonial stem cell fertility in chemotherapy and radiation treated cancer patients

Patent Status

Pending

Research Team

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