



MECHANICAL ENGINEERING, MSc SEMINAR

Thursday, December 11, 2025 at 13:30-14:00, Lady Davis Building, Auditorium 250

Biomimetic Nanofiber/Hydrogel Scaffolds with Tunable Mechanical Properties for Enhanced Ovarian Tissue Auto-Transplantation

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Abstract

Infertility caused by gonadotoxic cancer treatments, such as chemotherapy and radiotherapy, is a significant challenge for young female survivors. While ovarian cortex auto-transplantation offers a potential solution, preserving the patient's genetic material, its clinical application is limited by poor graft survival and ischemic damage.

This study introduces a bioengineered system designed to mimic the natural ovarian extracellular matrix (ECM), aiming to improve tissue integration and follicular viability. The system utilizes a nanofiber-reinforced hydrogel, comprising electrospun gelatin fibers embedded within an alginate matrix, to provide enhanced mechanical support and cell adhesion during transplantation. High-resolution scanning electron microscopy, rheological, cytological, and mechanical analyses confirmed the composite scaffold's ability to mimic physiological ECM. Preliminary *in vivo* studies using a mouse model demonstrate that this engineered ECM could significantly enhance fertility preservation outcomes. These findings establish a promising foundation for developing safer and more effective clinical strategies to restore fertility after cancer therapy.

Note: The seminar will be given in Hebrew