הטכניון - מכון טכנולוגי לישראל

TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY

הפקולטה להנדסה כימית
ע״ש וולפסון
The Wolfson Department of Chemical Engineering

Wolfson Department of Chemical Engineering Seminar

Monday, May 12th, 2025 at 13:30

Room 5

Formulating Multifunctional Bioactive Polymeric Hydrogels with Drug Releasing Capabilities for Potential Wound Healing Management

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MSc Seminar

Advisor: Prof. Shady Farah
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Integral skin barrier is essential for retaining body fluid, thermal insulation, and fortification from exogenous pathogens. Upon injury, a four-stage orchestrated healing process starts: hemostasis, inflammation, cell proliferation, and remodeling to restore the skin's protective function. Following the healing process, the scar formation will happen where the injury was located. However, the scar/fibrosis tissue is not functional as the normal skin, as it lacks original skin's strength, elasticity and functional components like hair follicles and sweat glands. Therefore, this research is aiming to develop and formulate multifunctional bioactive hydrogel to modulate different aspects of the wound healing process, starting from blood clotting to tissue remodeling, to achieve an accelerated and infection-free healing. In this research, we have developed natural polysaccharide-based hydrogel with intrinsic bio-properties, where the physicochemical properties such as swelling and mechanical properties were extensively studied. In addition, we examined two methodologies to achieve the stable therapeutic functionality 1) polymeric-drug conjugation with chemical coordination and 2) a carrier-free drug delivery system integrated into the hydrogel system by physical loading. Both developed systems were studied and compared.

Refreshments will be served at 13:15.