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

Wednesday, March 19th, 2025 at 19:00 (China Time)/13:00 (Israel Time)

Zoom link: https://gtiit.zoom.us/j/91434034614

Ultrathin, breathable and surface-adaptable hydrogels for long-term electrophysiology monitoring on hairy plant

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MSc Seminar

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Abstract:
Plant health is crucial for improving agricultural productivity, reducing crop losses, and enhancing environmental sustainability. Endogenous electrical signals serve as rapid, long-distance indicators of plant responses to environmental stressors, injuries, and mechanical damage. However, effective electrophysiological monitoring faces challenges due to the complex and uneven surfaces of plants, particularly those with trichomes. Conventional electrodes struggle to maintain stable adhesion, leading to signal instability and unreliable long-term monitoring.
To address these limitations, we propose an in-situ ultrathin hydrogel that seamlessly conforms to hairy plant surfaces upon application. This hydrogel transitions from a liquid precursor to a solid gel, ensuring strong adhesion without disrupting natural plant functions such as gas exchange and water transpiration. Its adaptability to plant surface enables continuous, non-invasive monitoring of wound responses over extended periods. This approach provides a novel platform for high-fidelity, real-time electrophysiological sensing, paving the way for advanced plant health monitoring technologies in precision agriculture.