## **The Norman Seiden Multidisciplinary Graduate Program**

## **in Nanoscience & Nanotechnology**

הרצאה סמינריונית

חברי הסגל, סטודנטים והציבור הרחב מוזמנים בזה לסמינר שיינתן ע"י:

**אירינה דוידוביץ'**

התוכנית הרב תחומית לננו מדעים וננו טכנולוגיה

עבודת דוקטור בנושא:

"A Nanostructural Study of Blood Cells and Extracellular Vesicles by Cryogenic Electron Microscopy "

שתתקיים ביום ב, 12.08.24, בשעה 13:30

באולם מס. 4 בנין הנדסה כימית (Wolfson department)

כיבוד קל בשעה 13:15

בהנחיית: פרופ' ישעיהו טלמון ופרופ' קרינה לוין

## **The Norman Seiden Multidisciplinary Graduate Program**

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" A Nanostructural Study of Blood Cells and Extracellular Vesicles by Cryogenic Electron Microscopy "

Irina Davidovich

Supervisors: Prof. Yeshayahu Talmon, and Prof. Carina Levin

Cryogenic electron microscopy (cryo-EM) stands out as a powerful and innovative imaging technique, offering unprecedented insights into the complexity and dynamics of biological specimens. Cryofixation preserves cellular structures in their native, hydrated state, avoiding artifacts associated with chemical fixation. Modern cryo-EM provides high-resolution imaging, revealing intricate details of cells, tissues, organelles, and distinct molecules.

Cryo-EM encompasses cryogenic transmission (cryo-TEM) and scanning (cryo-SEM) electron microscopy. Cryo-TEM excels in structural investigations of small biological objects like protein molecules and organelles, while cryo-SEM provides detailed information about cell morphology and ultrastructure. Additionally, cryo-SEM provides information about intercellular interactions and captures different stages of dynamic processes. These capabilities make cryo-EM a unique tool for understanding cellular complexity.

In this work, we explore the potential of cryo-EM for hematology and general cell studies. We present examples of human blood cell studies under physiological and pathological conditions, examining several mechanisms of blood cell function. We discuss the impact of imaging conditions on final micrographs. Additionally, we delve into the complexity of extracellular vesicles (EVs), their subtypes, and the effects of environmental conditions on EV function. Our findings illustrate the extensive information obtainable from cryo-EM data, underscoring its capacity to enhance our understanding of cellular biology.