הטכניון – מכון טכנולוגי לישראל **הפקולטה להנדסת מכונות**

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ד' 14.09.16 (יא' באלול, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

יוצא: אילון לוי

מנחה: פרופ"מ מורן ברקוביץ'

על הנושא:

Towards a Microfluidic Device for Cell Pairing

The seminar will be given in English

להלן תקציר ההרצאה:

In recent years, new technologies have revealed tremendous amounts of heterogeneity and cell-to-cell variability in the immune system. Hundreds of polyfunctional human T-cells (i.e. T-cells releasing multiple cytokines) have been previously profiled using a novel microfluidic device which allows for serial, time dependent single cell analysis. This revealed that cells release their cytokines in a predominantly sequential manner, a process beginning asynchronously from cell to cell, suggesting the existence of an intricate regulatory program for cellular cytokine release. To study the responses of individual cells, it is important to understand the basic and underlying cell-to-cell interactions, which requires the ability to create isolated environments containing a controlled number of cells. Numerous methods have been previously developed for highly efficient single-cell capture chips where each cell is in an isolated chamber, and also for pairing cells within a large shared environment; however, to the best of our knowledge there is no device that can pair cells within isolated chambers.

Our goal is to design a device that will be an easy-to-use platform for studying communication between two distinct cells. In order to do so, we developed a device that is capable of trapping single cells with high efficiency and potentially moving the trapped cells to environmentally isolated chambers. We took two approaches in which we tried to develop the device: In the first approach, we used hydrodynamic traps to capture the cells, and then moved them to isolated chambers by gravity. In the second approach, we used dielectrophoresis (DEP) to trap and move the cells. We successfully captured the cells using DEP traps based on the design of Taff & Voldman 2005, and are currently working on optimizing the trapping, and moving the cells to the isolated chambers.

בברכה,

פרופ'/א אמיר שמן

מרכז הסמינרים