

סמינר - SEMINAR

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום בי 5.02.2019 (כי באדר אי, תשעייט), בניין דן קאהן, אודיטוריום 1, 30.14

מרצה:

Dr. Amit Ron

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<u>על הנושא:</u>

Get in Shape: Cell Shape Is an Independent Repository of Retrievable Information

The seminar will be given in English

<u>להלן תקציר ההרצאה:</u>

Cells sense and interact with their environment using chemical and physical signals including cellmatrix and cell-cell contacts. These signals often control the global and local shapes of cells by modulating the cytoskeletal structure, but can the local shape alone provide functionally relevant information? We hypothesize that physiologically relevant shapes can encode information needed to maintain the cell in a differentiated state. This conjecture raises two follow-on questions: (i) how is the information stored in cell shape retrieved; and (ii) how does this information contribute to cellular phenotype? Theoretical analyses, based on reaction-diffusion system and optimal control theory, indicate that information from cell shape can be resolved from physical signals and uniquely retrieved by adopting shapes with distinct surface-to-volume relationships. We used microfabricated 3-D biomimetic chips to validate the predictions from the theoretical analyses. We constructed single-cell patterns representing simplified versions of the in vivo morphology of two cell types, kidney podocytes, and smooth muscle cells. In both types, cells in the shapes showed marked phenotypic changes, as measured by expression levels of physiologically important proteins and localization of these proteins to the appropriate subcellular compartment. Using differential proteomics and functional ablation assays, we found that β3 integrin and its binding partners from the ezrin-radixin-moesin (ERM) family are involved in the transduction of shape signals. These observations indicate that physiological cell shape, including local specialization, embodies information obtained during the development, which is utilized to maintain the cell in the .differentiated state

מארח: פרופי אולג גנדלמן : מארח

בברכה,