

סמינר - SEMINAR

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 08.03.2021
כ"ו בטבת תשפ"א, בשעה 14:30 באמצעות הזום: <https://technion.zoom.us/j/98092225574>

מרצה:

Dr. Woo-Sik Jang
Research Scientist, Solvay Specialty Polymers

על הנושא:

Self-Motile Synthetic Protocells

The seminar will be given in English

להלן תקציר ההרצאה:

Cell motility is central to processes such as wound healing, immune cell surveillance, and embryonic development. Motility requires the conversion of chemical to mechanical energy. An active area of research is to create motile particles, such as microswimmers, using catalytic and enzymatic reactions. Here, we demonstrate autonomous motion in adhesive polymer-based protocells by incorporating and harnessing the energy production of an enzymatic reaction. We prepared biotinylated polymer vesicles that encapsulate catalase, an enzyme which converts hydrogen peroxide to water and oxygen, and adhered these vesicles weakly to avidin-coated surfaces. Upon addition of hydrogen peroxide, which diffuses across the membrane, catalase activity generates a differential impulsive force that enables the breakage and reformation of biotin-avidin bonds, leading to diffusive vesicle motion resembling random motility. The random motility requires catalase, increases with the concentration of hydrogen peroxide, and needs biotin-avidin adhesion. Thus, we have made a protocellular mimetic of a motile cell. The next step of the research is to control the random motion of the protocells. One possibility is to incorporate asymmetric conditions within the protocell structure to induce directional propulsion. Furthermore, we plan to develop applications of coronavirus-related research. The protocells could be carriers of recently developed RNA vaccines.

מארח: פרופ' פנחס בר-יוסף

בברכה,

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