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|  |  |  הטכניון - מכון טכנולוגי לישראל TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY  |
| הפקולטה להנדסה כימיתע"ש וולפסון |  |  |
| The Wolfson Department of Chemical Engineering |  |  |

**Wolfson Department of Chemical Engineering Seminar**

**Tuesday, December 29th, 2020 at 15:00**

**Online seminar via Zoom**

 <https://technion.zoom.us/j/99168573895>

**Next-generation approaches for peripheral organ modulation**

**Dr. Dekel Rosenfeld**

Research Laboratory of Electronics and the McGovern Institute for Brain Research, MIT

The field of bioelectronic medicine seeks to develop novel approaches for modulating electrogenic cells within organs, to advance translational applications to repair organ dysfunction and study organ function in health and disease. The key challenges are allowing longitudinal stimulation, minimally invasiveness, minimal damage to the surrounding tissue, deep organ stimulation, specificity and temporal control. Therefore, there is a growing demand for developing functional materials and new technologies that fit the current biomedical research. In this talk, I will present a strategy to use iron oxide nanoparticles that demonstrate hysteretic heating under weak alternating magnetic fields, to trigger heat-sensitive ion channels, endogenously expressed in peripheral organs. I will demonstrate the use of the magnetothermal switch in biological applications starting from materials design, through in vitro demonstration and in vivo application.