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| הפקולטה להנדסה כימית  ע"ש וולפסון |  |  |
| The Wolfson Department of Chemical Engineering |  |  |

**Wolfson Department of Chemical Engineering Seminar**

**Monday, May 6, 2024 at 13:30**

**Room 1**

**Using Brain-Targeted Nanoparticles to Treat Parkinson’s Disease**

**Mor Sela Golan**

**PhD final seminar**

Advisor: Prof. Avi Schroeder

Department of Chemical Engineering, Technion-Israel Institute for Technology

Nanotechnology is emerging as a significant tool in precision medicine, especially for treating complex neurological conditions like Parkinson's disease (PD). PD is a progressive nervous system disorder primarily affecting dopaminergic neurons, leading to severe motor symptoms.

In my research, I explored the use of nanotechnology for targeted therapy in PD, specifically focusing on reducing the aggregation of alpha-synuclein (AS) protein in the midbrain substantia nigra.

My approach involved developing nanoparticles coated with targeting moieties to bind disease biomarkers on the blood-brain barrier. Loading these nanoparticles with the SynO4 monoclonal antibody (mAb), known for its affinity to AS oligomers, significantly increased mAbs’ concentration in brain cells, reducing AS aggregation and neuroinflammation and improving motor function in mice.

This innovative nano-delivery system not only demonstrates its effectiveness in treating PD but also suggests a potential treatment avenue for other neurodegenerative disorders like Alzheimer's disease.

In summary, this study underscores the potential of nanotechnology in enhancing the precision of therapeutic interventions. It offers insights into how tailored nanoscale approaches could reshape the treatment of complex neurological disorders1.

**References:**

[1] Sela, M. et al. Brain‐Targeted Liposomes Loaded with Monoclonal Antibodies Reduce Alpha‐Synuclein Aggregation and Improve Behavioral Symptoms of Parkinson's Disease. Advanced Materials, 2304654 (2023).

Refreshments will be served at 13:15.