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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**

**Wolfson Department of Chemical Engineering, Lecture Hall No. 6**

**Wednesday, October 13th, 2021, at 13:30**

**Pickering emulsions stabilized by shellac-based nanoparticles**

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**Mid PhD Seminar**

Advisor: Prof. Havazelet Bianco-Peled

In the past two decades there has been a growing interest in Pickering emulsions, comprising of two immiscible liquids stabilized by solid particles which are embedded in the liquid interface and prevent coalescence of the dispersed phase. Utilizing particles rather than the classical surfactants overcomes toxicity issues and provides better stability. Shellac is a natural resin, widely used in the food and pharmaceutical industry and possess advantageous properties such as antimicrobial properties, lack of toxicity and biodegradability. However, it has not been investigated as a stabilizer for Pickering emulsions.

The aim of this study is to investigate the potential of shellac-based nanoparticles to create a stable Pickering emulsion for incorporating poor water-soluble entities for various applications, in the agricultural field. It is estimated that by 2050, food production will have to be doubled to feed the ever-growing world population. Therefore, new technologies for sustained release of pesticides and herbicides, that will minimize the crop costs and environmental side effects while increasing crop revenues, are required. An emulsion based on naturally derived and biocompatible materials will be a valuable candidate for such applications. To do so, we developed a facile manner to fabricate shellac-based nanoparticles that are stable for a long period of time. These particles were then used to stabilize a wide range of oil concentrations (1%-40%) oil for a period of up to 3 months. As part of a systematic study on this novel system to understand the stability mechanism we characterized them using static light scattering, light microscopy, and cryogenic electromagnetic microscopy. In collaboration with Dr. Ran Lati's lab in Volcani institute this system showed promising results as a platform for naturally occurring signaling systems for weed control in various plant types.

**Refreshments will be served at 13:15**