

Fabrication of lipid microstructure for oral drug delivery device Master/Semester project

(Section: Microengineering – Mechanical Engineering – Bio engineering– Materials Science)

Co-administration of poorly water-soluble drugs with lipid formulations can enhance the bioavailability of these drugs. Administration of drugs encapsulated lipid formulations can be the one way of achieving this. Recently fabricating the various design of drug-lipid formulations enabled by the development of additive manufacturing techniques. However, most of the device's dimension is limited to mm to cm. Thus, limiting the versatility of the device's pharmacokinetics. Melt electro writing is an attractive tool for decreasing the device's resolution to the micrometer size. The goal of this project is to fabricate lipid drug delivery devices using melt electro writing. Throughout this project, you will prepare and optimize the melt electro writing condition of lipid drug formulation. Then you will investigate the effect of the design, dimension, drug types, lipid types on the device's drug release. Hence the first half of the project will focus on preparing various lipid-drug formations and optimizing their printing condition. And the last half will be focused on printing devices with different designs, and measuring and analyzing their drug release profile.

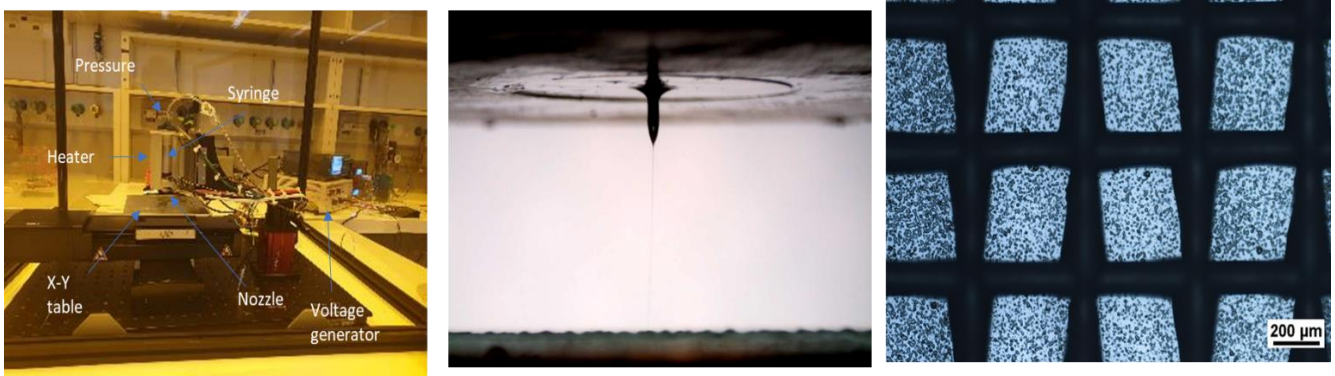


Figure1. From right to left: Melt electro writing tool setup, Lipid Taylor corn, Lipid chess board structure

Work description:

- Preparation of lipid-drug formulation
- Optimizing the melt electro writing condition of lipid-drug formulation
- Fabricating various designs, dimensions of the lipid-drug device
- Measuring and analyzing the drug release profile of the device in digestive system mimicking environment.

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