Preparation and characterization of nanoporous microparticles as potential carrier for pulmonary drug delivery using supercritical fluid technology

Lungs are considered a promising non-invasive route for local and systemic drug delivery. Comparing to other routes, pulmonary drug delivery system has many advantages, such as a high surface area with rapid absorption due to high vascularization, avoidance of the first pass metabolism and the elimination of gastric effect for unstable drugs in gastric media. Also, it allows permeability of large molecules such as proteins from thin membranes of lungs.

In my work I aim to prepare nanoporous microparticles from biodegradable polymers such as alginate and hyaluronic acid as potential carrier for pulmonary drug delivery using SFT. Full physicochemical characterization for the prepared carriers will be performed, including: Fourier Transform-Infrared (FT-IR) Spectroscopy, Tapped Density Measurement, Particle Size Analysis, Differential Scanning Calorimetric (DSC) Analysis, Thermogravimetric Analysis (TGA), Powder X-ray Diffraction, Specific Surface Area and Porosity Determination, Scanning Electron Microscopy (SEM), cascade impactor test, and stability studies.

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