

ABSTRACT

In this thesis, the cyclosporin A-loaded poly(L-lactic acid) nanofibers fabricated by needleless electrospinning technology were studied. Optimized LC-MS/MS method has been used for quantification of cyclosporin in nanofibers extracts following the extraction in water/phosphate buffered saline at 37.5 °C and 140 RPM. Five different types of cyclosporin A-loaded nanofibers which differed in content of cyclosporin and presence of various molecular weight hydrophilic additive poly(ethylene glycol) were extracted for one week in order to assess release behavior of cyclosporin A. The results showed that none of the studied nanofibers provide appropriate cyclosporin A release profile. The best results were obtained with nanofibers containing cyclosporin 10% (m/m) and poly(ethylene glycol) 6000 15% (m/m). High and steady release rate was observed for the first ten hours and then the release rate was gradually falling but maintained for the whole studied period. It has been concluded that although the nanofibers were not suitable for the intended use in transplantation patients the release profile of cyclosporin would be appropriate if the period of initial release was prolonged. This thesis provides basic information on the cyclosporin A release behavior and it may serve as basis for further research with relevant adjustments.

Key words

Cyclosporin A

Immunosuppression

Transplantation

Nanofibers

Poly(L-lactic acid)

Release kinetics

Local administration

LC-MS/MS