

# Preparation, Characterization and Release Study of Microspheres Loaded with Mycophenolic Acid Using Different Ratios of Two Molecular Weight PLGA

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**Abstract:** Microspheres as controlled drug delivery technology has proved many advantages in controlling drug release for long period of time. Different types of polymers have been used in preparation of microspheres with different characteristics. Biodegradable polymers offer the advantage of being degraded in the body to biocompatible materials, thus no need to remove the residuals after drug release. The aim of this study was to investigate the effect of molecular weight of the carrying polymer (PLGA) on the pattern, mechanism and time of release of mycophenolic acid from prepared microspheres using different ratios of two different molecular weight PLGA (RH202 and RH203). The microspheres were prepared by solvent evaporation method and characterized for their morphology, yield value, loading efficiency, size distribution, bulk density, degree of hydration and DSC analysis. Then the release of the drug was studied in 37 °C phosphate buffer saline pH 7.4 using suitable dialysis cell. Results showed that ratio of 40:60 RH202:RH203 gave the most uniform zero-order drug release of about 88 mcg/day over 70 days in phosphate buffer saline pH 7.4 and 37 °C with anomalous type of drug diffusion in addition to polymer erosion. It was concluded that mycophenolic acid can be loaded on two molecular weight PLGA blend successfully with good yield value and loading efficiency and ratio of 40:60 RH202:RH203 gives zero-order drug release in vitro for about 70 days in phosphate buffer saline pH 7.4.

**Key words:** Microspheres, PLGA, RH202 and RH203, mycophenolic acid, zero-order release, controlled drug release.

## Nomenclature

PLGA:	Poly lactic-co-glycolic acid
HPLC:	High performance liquid chromatography
TLC:	Thin layer chromatography
PVA:	Polyvinyl alcohol
SEM:	Scanning electron microscope
DSC:	Differential scanning calorimetry
PBS:	Phosphate buffer saline

## Greek Letters

$\Lambda$ :	Lambda max
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## 1. Introduction

Controlled drug delivery technology represents one of the frontier areas of science, which involves multidisciplinary scientific approach, contributing to human health care. These delivery systems offer numerous advantages compared to conventional dosage forms, which include improved efficacy, reduced toxicity, and improved patient compliance and convenience. Such systems often use macromolecules as carriers for the drugs. By doing so, treatments that would not otherwise be possible are now in conventional use [1].

Microspheres can be defined as solid,