

**UNIVERSITI TEKNOLOGI MARA**

**SELF NANOEMULSIFYING DRUG DELIVERY  
SYSTEM OF GRISEOFULVIN**

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## TABLE OF CONTENTS

	Page
<b>TITLE PAGE</b>	
<b>APPROVAL SHEET</b>	ii
<b>ADKNOWLEDGEMENT</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	viii
<b>LIST OF FIGURES</b>	ix
<b>LIST OF ABBREVIATIONS</b>	x
<b>ABSTRACT</b>	xi
<b>CHAPTER 1 (INTRODUCTION)</b>	1
1.1 Research Background	1
1.2 Statement of Problem	4
1.3 Significance of Study	5
1.4 Objectives	7
1.5 Hypothesis	7
<b>CHAPTER 2 (LITERATURE REVIEW)</b>	8
2.1 Emulsion	8
2.2 Nanoemulsion	11
2.3 Challenges in oral drug delivery	13
2.4 The Biopharmaceutical Classification Scheme	15
2.5 Lipid as Carrier	18

## **ABSTRACT**

The oral drug delivery is fraught with low and erratic bioavailability owing to enzymatic degradation of drug, poor permeability, poor solubility and dissolution. The objective of the study was to develop and characterize Self Nanoemulsifying Drug Delivery System (SNEDDS) of Griseofulvin, a Biopharmaceutical Classification Scheme class II for improved oral delivery. The components for nanoemulsion were identified by solubility studies and tendency for self-emulsification in various excipients. Castor oil, Cremophor RH40 and Labrafil were selected as oil, surfactant and co-surfactant respectively. The effects of varying ratios of surfactants:co-surfactants:oil ratios of SNEDDS were studied. Droplet size and zeta potential of the formulations were investigated. The SNEDDS exhibited good efficacy for self-emulsification.

Keywords: Self emulsifying systems, Nanoemulsion, Cremophor RH40, Labrafil, Castor oil, SNEDDS

# CHAPTER 1

## INTRODUCTION

### 1.1 Research Background

An emulsion is a system consisting of two immiscible liquid phases, one of which is dispersed throughout the other in the form of fine droplets (Rodríguez-Abreu & Lazzari, 2008). The phase that is present as fine droplets is called the dispersed phase and the phase in which the droplets are suspended is the continuous phase. Most emulsions have droplets with diameters of 0.1-100 $\mu$ m and are inherently unstable systems. Its smaller globules exhibit colloidal behavior and the stability of a hydrophobic colloidal dispersion (Leal-Calderon, Thivilliers, & Schmitt, 2007).

Pharmaceutical emulsions usually consist of water and oil. Emulsions can be divided into two groups which are simple emulsion and multiple emulsions. For the simple emulsion, the dispersed phase is distributed throughout the continuous phase. Simple emulsions can later be divided into two types which are oil in water (o/w) emulsions and water in oil (w/o) emulsions. Oil in water in oil (o/w/o) emulsion and water-in-oil in water (w/o/w) emulsion are the subdivision of multiple emulsions (Rodríguez-Abreu & Lazzari, 2008).