UNIVERSITI TEKNOLOGI MARA

IMAGING OF SODIUM FLUORESCEIN AND ALBUMIN-FLUORESCEIN ISOTHIOCYANATE IN BIOLOGICAL TISSUE USING FLUORESCENCE PROBE SPECTROSCOPY TECHNIQUE

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Dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Pharmacy (Hons)

Faculty of Pharmacy

November 2009

ACKNOWLEDGEMENT

First of all, praise to Almighty God for His blessings in giving me the strength and courage to finish this research project.

I would like to thank the very important people who have made this major task became a reality. First and foremost, million thanks go to my project supervisor, Associate Professor Dr. Wong Tin Wui for his guidance, concern, consideration, understanding, and patience.

The highest appreciation is addressed to members of Pharmaceutical Technology Research Laboratory, Faculty of Pharmacy, UiTM, and post-graduate students for giving constructive ideas and productive suggestions on how to conduct and improve this research project. Not to be forgotten, to my friends and classmates for the morale supports.

Special gratitude is dedicated to my family for their bunch of love, support, encouragement, understanding, and thoughtfulness throughout this research project and my educational endeavours.

It is for sure, without the contribution from these special people, I might not be able to complete this research project successfully.

Thank you.

Mohd Shahiri bin Abd Ghapar

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Abstract

Patients often prefer oral drug delivery as it is the most convenient and the safest route of administration. Question on whether or not the drug consumed might be able to reach to the intended site of action and is absorbed optimally for its therapeutic effectiveness has resulted in the development of imaging technique. Since few decades ago, there were several methods developed with the aim to image drug and other biological compounds within the body. However, these methods were relatively ineffective with regards to cost, requiring skilled personnel and knowledge, time consuming and involving complex process. This led the study to investigate the potential of fluorescence probe spectroscopy technique to image drug absorption in gastrointestinal tract. The technique was able to detect the presence of fluorescence marker solution on gastrointestinal tissue and subsequently quantify its presence. The relative fluorescence irradiation intensity varied directly with the concentration of fluorescence marker. Its spectrum was influenced by the anatomical attributes of gastrointestinal tract.

Keywords: fluorescence probe spectroscopy, fluorescence marker, relative fluorescence irradiation, gastrointestinal tissue

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Administration of drug by oral route remains the most important and convenient drug delivery pathway for patients today. Although alternative drug delivery routes such as parenteral and topical routes have been adopted, the oral drug delivery of pharmaceuticals is a popular choice for it provides the easiest, the safest and most economical approach in medication.

From the perspective of therapeutic effectiveness, a drug must be able to reach its intended site of action after administration. Drug is absorbed into the blood stream from the site of administration and distributed to site of action after permeating through various barriers (Katzung, 2004). Typically, a drug will undergo various biological and chemical barriers occurred within the body, particularly when gastrointestinal tract is concerned. This in turn might eventually alter the degree of drug absorption and distribution.