

UNIVERSITI TEKNOLOGI MARA

**SDS-PAGE APPROACH FOR THE PROFILING
OF PROTEIN MARKERS IN SPECIFIC DISEASES**

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

Faculty of Pharmacy

October 2007

ACKNOWLEDGEMENT

I would like to thank to my supervisor, Prof. Dr. Mohd Zaki Salleh for his guidance, patience and time spent on this project. I would also like to express my thankfulness to my parents for their tremendous support. This also goes to my laboratory partner, Riza Afzan Asri for her support and sharing of knowledge. Not forgetting to Dr. Teh Lay Kek and Mr. Lee Wee Leng for their patience, guidance and support. Lastly, I would like to say thank you to all my friends for their supports.

Thank you very much.....

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Abstract

Introduction

Profile of human proteins plays an important role especially in studies targeted toward the discovery of disease biomarkers. They carry an archive of important histological information whose determination could serve to improve early disease detection.

Objective

To explore the use of protein substances in plasma and serum as disease marker.

Method

In this study, protein profiles of serum and plasma were compared using samples from healthy subjects and patients with various diseases including diabetes, kidney problem, high cholesterol and hypertension using Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE). Proteins which evidence different levels in the serum and plasma were analyzed and calculated for their relative mobility (R_f) values. These R_f values were plotted in the standard calibration curves of \log_{10} molecular weight of the protein marker versus the distance of migration in order to determine their molecular weight.

Result

The protein profile for each disease was successfully developed using SDS-PAGE analysis. For each disease, there were an absence and/or presence of proteins identified.

CHAPTER 1

INTRODUCTION

Polyacrylamide gel electrophoresis (PAGE) is an important analytical method which is capable of separating biomolecules (Kim *et al.*, 2005). The principle of the technique is simple and in fact, it has been used for many years (Laemmli, 1970). Meanwhile, Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) is a method which has been used with great confidence to determine the molecular weights of a wide variety of proteins. It separates the proteins on the basis of molecular weight (Bazzi *et al.*, 1997) enabling them to be classified by their size (Zaragoza *et al.*, 2003). However, the ability of SDS-PAGE to classify proteins solely based on molecular weight may limit the outcome of a study to a general conclusion only. Nevertheless, it has the advantages of being chemically inert, stable over a wide range of pH, temperature and ion strength and it is transparent (Hames & Rickwood, 1981).