

UNIVERSITI TEKNOLOGI MARA

**DESIGN, SYNTHESIS AND DETERMINATION OF
BIOLOGICAL ACTIVITIES OF STILBENE
ANALOGUE ATTACHED TO ZINC (II)-CYCLEN
COMPLEX**

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TABLE OF CONTENTS

	Page
TITLE PAGE	
APPROVAL FORM	
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF SCHEMES	viii
LIST OF PLATES	ix
LIST OF SYMBOLS	x
LIST OF ABBREVIATIONS	xi
ABSTRACT	xiv
CHAPTER ONE (INTRODUCTION)	1
CHAPTER TWO (LITERATURE REVIEW)	2
2.1 Background	3
CHAPTER THREE (MATERIALS AND METHODS)	7
3.1 General Information	7
3.2 Synthesis route	8
3.3 Method	9
CHAPTER FOUR (RESULTS AND DISCUSSION)	11
4.1 3,5-dimethoxystyrene	11
4.1.1 TLC	11
4.1.2 Extraction	12
4.1.3 Column Chromatography	12

ABSTRACT

The significance of this research is to design, synthesis and determination of biological activities of resveratrol (stilbene) analogue attached to Zn^{2+} -cyclen complex. Three established reactions had been used in order to accomplish the research. First, the 3,5-dimethoxybenzaldehyde was utilizes as a starting material of the Wittig reaction. Subsequently, protection of the 4-iodophenol using TBDMS-Cl to yield 4-iodo-*tert*-butyldimethylsilylphenylether. Product of the Wittig reaction and 4-iodo-*tert*-butyldimethylsilylphenylether were then use to synthesize the stilbene analogue. The synthesized compounds were then, purified by chromatographic techniques and sent for 1H -NMR and UV characterization. The outcomes of this research did not make the grade, and the research was postponed due time constraint.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In recent years, there is an increasing pattern of investigations done on natural products in respect to the potential health benefits for the drug of choice to be transported to the specific site of deoxyribonucleic acid (DNA). One of the natural products that have been extensively studied and have wide therapeutic effects is resveratrol and its analogues. Resveratrol or chemically known as stilbene can be found naturally in plant but with restricted distribution. For this reason, the need of synthesizing resveratrol derivatives is important.

Various methods have been studied in transporting this gene-targeted drug. In 1993 Shionoya *et al.* reported that Zn^{2+} -cyclen complexes selectively bind to imide containing nucleobases such as thymine (T) and uracil (U) specific on the minor groove of DNA. A study done by Kinoshita-Kikuta, E., Kinoshita, E. and Koike, T., (2002) concluded that this procedure using Zn^{2+} -cyclen complexes as a transporter for any gene-targeted drugs is simple, rapid, low costing and accurate.¹

The rising interest of research carried out on natural product in respect to the health benefits trigger the researcher to carry out this study. The significance of this research is to design, synthesis and determination of biological activities of resveratrol (stilbene) analogue attached to Zn^{2+} -cyclen complex. The main objective of this study is to give better understanding and proper handling of the instruments and techniques involved in this research.