

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND SYNTHESIS OF RESVERATROL
ZINC (II)-CYCLEN COMPLEX (ANALOGUE III)**

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ABSTRACT

The significant of this study is to design and synthesis of resveratrol (stilbene) analogue, 3,4-dimethoxy-4'-bromomethyl stilbene appended onto Zn(II)-cyclen complex. Three established reaction had been used in order to accomplish this research study. For the first reaction, the 3,4-dimethoxy styrene and 4-iodobenzylbromide was utilizes as a starting material of Heck reaction to synthesis *trans* 3,4-dimethoxy-4'-bromomethyl stilbene. The synthesis compound was then purified by silica gel column chromatography technique and sent for ¹H-NMR and FT-IR characterization in order to confirm the product structure. The second step is, the 1,4,7,10-tetraazacyclododecane (cyclen) obtained by dechlorinated of tetrachlorinated cyclen and then followed by protected cyclen with tert-butyloxycarbonyl to produced 1,4,7-tris(tert-butyloxycarbonyl)-1,4,7,10-tetraazacyclododecane. Subsequently, the third reaction was done by appended resveratrol analogue, *trans* 3,5-dimethoxy-4'-bromomethyl stilbene to protected cyclen, triboc-cyclen. But the outcomes of this research study did not make the grade, it is because no final product has been produced (resveratrol Zn(II)-cyclen complex) and the research was postponed due to time constraint.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Resveratrol (3,4',5-trihydroxy stilbene) is a natural substance that present in the plant and reported to have biological activities that include antimicrobial, antifungal, antioxidant, chemopreventive agent and etc. The study on resveratrol has been increased in the last few years due to phenomenon of 'French paradox' which refers to consumption of wine is associated with lower incidence of coronary heart disease and cancers. Even though resveratrol reported has been to have a lots of biological activities but its not widely distribute in plant. Due this reasons, synthesis of resveratrol derivatives is important.

DNA cleavage is responsible in wide range of biochemical processes of the organism. Involving of the enzyme in this biochemical process (DNA cleavage) is often depending on the active site such as metal constituents.¹ Thus, appropriate metal use in the synthesis of the complex can contribute to produce effective DNA targeting agent.^{1,2} Zn(II) is the best suitable physiological metal ion use in designing the complex.¹