

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND SYNTHESIS OF
RESVERATROL-Zn(II)-CYCLLEN COMPLEX
ANALOGUE II**

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ABSTRACT

The significant of this study is to design and synthesis of resveratrol (stilbene) analogue, 3-methoxy-4'-bromomethyl stilbene appended onto Zn^{2+} -cyclen complex. Three established reactions have been used in order to accomplish this research study. For the first reaction, the 3-methoxy styrene and 4-iodobenzyl bromide was utilized as a starting material of Heck reaction to synthesis *trans* 3-methoxy-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 to obtain 1,4,7,10-tetraazacyclododecane (cyclen) by performing dechlorinated reaction of cyclen tetrahydrochloride, followed by cyclen protection reaction with tert-butyloxycarbonyl (Boc anhydride) to produce 1,4,7-tris(tert-butyloxycarbonyl)-1,4,7,10-tetraazacyclododecane. Subsequently, the third reaction was performed by appending the resveratrol analogue, *trans* 3-methoxy-4'-bromomethyl stilbene onto protected cyclen, 3 Boc-cyclen. Nevertheless, the outcomes of this research study did not make the grade because no final product has been produced (resveratrol Zn^{2+} -cyclen complex) and the research was postponed due to the time constraint.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

One of the natural products that have been widely studied and have broad therapeutic effects is resveratrol and its analogues. Resveratrol (*trans*-3,4',5-trihydroxy stilbene) is a phytoalexin and a polyphenolic compound which is commonly presents in the skin of red grapes, peanuts and mulberries.¹⁵ It is of particular interest to humans because it is naturally available in the diet. However, it is not widely distributed in plants. For this reason, it is important to synthesize its derivatives.

Resveratrol has been reported to have many biological activities which include anti-microbial, antifungal and antioxidant. It is widely considered to possess cardiovascular protective properties due to the phenomenon of 'French paradox'.^{2,11} Furthermore, it has been implicated as a cancer chemoprotective agent as it interferes with all the three stages of chemically induced carcinogenesis namely tumor initiation, promotion and progression.²