

**UNIVERSITI TEKNOLOGI MARA**

**SYNTHESIS OF IMIDAZOLE-PYRIDINE DERIVATIVES  
AS POTENTIAL ANTI-BACTERIAL AGENT**

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Dissertation submitted in partial fulfillment of the requirement for the Degree in  
**Bachelor of Pharmacy (Hons.)**

**Faculty of Pharmacy**

2013

## ACKNOWLEDGEMENT

Alhamdulillah, all praise to Allah SWT for making this wonderful experience in my life especially in the research field. I would like to thank to both of my parents for their prayers for me. My greatest and deepest gratitude towards my supervisor, Associate Professor Dr. Hesyam Rashwan for his advice and support. Not to forget my co-supervisor, Dr. Mohammad Taha for his guide and care during my process in finishing my research. My special thanks and gratitude to my colleagues especially to Fatin Umami Farhanah binti Mohd Nor and Noor Arfiqah binti Ahmad for their sincere help, useful suggestion and moral support. Lastly, I would like to thank UiTM family especially the staff of Faculty of Pharmacy.

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## ABSTRACT

Lately, there are many problems encounter due to the infectious diseases regarding the resistance towards anti-bacterial agents. Synthesis of new compound should be considered in order to solve these problems. Many studies and researches have been conducted which show that both imidazole and pyridine derivative show promising anti-bacterial properties. Thus, the incorporation of both compounds by synthesis is believed to produce greater anti-bacterial agent. In this study, 21 out of 26 of imidazole-pyridine derivatives have been synthesized and pure in order to study their potential anti-bacterial properties. Their chemical reactions have been monitored by using Thin Layer Chromatography (TLC) and their chemical structures have been studied by using Nuclear Magnetic Resonance (NMR). The synthesized products have shown pure which can be used for the further studies for their potential anti-bacterial activity.

## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND OF STUDY

Pyridine is the nitrogen-containing compound that is widely used as components or modifiers for the pharmaceutical products and agricultural chemicals due to their high biological activities (Shimizu et al., 1998). The chemical formula for pyridine is  $C_5H_5N$  and structurally related to the benzene structure by means that it is heterocyclic organic compound. Pyridine derivatives have been reported possess many biological activities such as hypoglycemic activity (Kim et al., 2004), anti-proliferative (Nassar, 2010), anti-inflammatory (Thirumurugan, Mahalaxmi, & Perumal, 2010), analgesic activity (Abele, Abele, & Lukevics, 2003), inhibitor of aggregation of blood cells (Abele et al., 2003), sedative, anti-depressant and anti-spasmodic (Abele et al., 2003), anti-tubercular (M.Patel & Mahesh T., 2011), anti-malarial (El-Kashef, Farghaly, Al-Hazmi, Terme, & Vanelle, 2010), and anti-bacterial properties (Goda, Abdel-Aziz, & Attef, 2004).

Imidazole is a five-membered ring organic compound which is the chemical formula is  $(CH)_2N(NH)CH$ . Imidazole derivative known as imidazoles have been reported to possess many biological activities as well as pharmacological properties