

**UNIVERSITI TEKNOLOGI MARA**

**DETECTION OF *Klebsiella pneumoniae* USING POLYMERASE  
CHAIN REACTION (PCR)**

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## ABSTRACT

*Klebsiella pneumoniae* is the gram-negative bacteria that most frequently encountered by the physician worldwide due to their ability to cause nosocomial infections such as nosocomial pneumonia, urinary tract infections, and intraabdominal infections. It is also a potential community-acquired pathogen causing primary liver abscesses, metastatic meningitis and endophthalmitis. The laboratory identification of these bacteria may be time-consuming. So, the purpose of this study was to develop a Polymerase Chain Reaction method for the rapid identification of the *K. pneumoniae* which is critical for the definitive diagnosis of the disease caused by those bacteria. Four pairs of primer have been designed to aid with the identification of these bacteria through the selected genes. The detection using PCR has revealed that *K. pneumoniae* was specific to those selected genes because the bands from gel electrophoresis of PCR products appeared when viewed under UV. Thus, PCR method developed is successful in detecting the *Klebsiella pneumoniae* rapidly and specifically.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

*Klebsiella pneumoniae* is a Gram-negative bacterium which belongs to a family of Enterobacteriaceae. It is classified as facultative anaerobe in which it can make ATP by aerobic respiration when oxygen is present. *K. pneumoniae* is usually found as normal flora of the mouth, skin, and intestines.

*K. pneumoniae* is among the most common pathogen encountered by the physician worldwide due to their ability to cause nosocomial infections such as nosocomial pneumonia, urinary tract infections, and intraabdominal infections. It is also a potential community-acquired pathogen causing primary liver abscesses, endophthalmitis and metastatic meningitis. The infants, elderly as well as immunocompromised person tend to have high risk of infections caused by this bacteria.

The growing number of *Klebsiella pneumoniae*-causing infections may be due to their pathogenicity. This includes capsular polysaccharides which devoid the bacteria from host serum complement as well as being phagocytised by polymorphonuclear