UNIVERSITI TEKNOLOGI MARA

EFFECT OF MICROBES ON WOUND HEALING

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ABSTRACT

This study investigated the effects of type and load of microbes on wound healing status of rat skin. P. aeruginosa and S.aureus, the most common wound infection pathogen, were used as microbes of interest. The findings indicated that the use of P.aeruginosa resulted in slower wound healing of rat skin than that of S. aureus. High microbial load gave rise to a slower wound healing than low microbial load.

Key words: *P.aeruginosa*; *S.aureus*; microorganism; microbe; wound.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In this research, the study is about a microbiological testing of cellulose matrix for use as drug delivery system which is imperative in development of pharmaceutical dosage form. For the definition, microbiological is an adjective from word microbiology which means the science dealing with the study of microorganisms (Saunders, 2004). For Testing, where the root word is test means a set of questions, exercises, or practical activities to measure someone's skill, ability, or knowledge (Longman Dictionary of Contemporary English, 2005). For cellulose, it means a rigid, colourless, unbranched, insoluble, long-chain polysaccharide, consisting of 3000 to 5000 glucose residues and forming the structure of most plant structures and of plant cells (Saunders, 2004). For matrix, it means the intercellular substance of a tissue or the tissue from which a structure develops (Saunders, 2004).

Pseudomonas aeruginosa is a Gram-negative opportunistic pathogen that infects primarily immunocompromised individuals and causes many recalcitrant infections. This bacterium is extremely refractory to therapy and host immune attack when it forms biofilms. Cells within a biofilm are usually enmeshed in an extracellular matrix produced by the microorganism itself. This matrix is a complex mixture of exopolysaccharides, proteins and DNA. DNA is derived from lysed cells and secreted through small DNA containing vesicles located in the outer membrane. Different strains of *P. aeruginosa* vary with respect to pilus-mediated DNA binding (Ramos et al., In Press). *P. auroginosa* is a species of gamma proteobacteria, belonging to the larger family of *pseudomonads*. The microorganism has a rod-shaped characteristic and is classified as gram-negative bacteria. This microorganism contains one polar flagella or unipolar which provides it motility. *Pseudomonas* family is well-known as an aerobic microbe. *P. aeruginosa* typically infects the pulmonary tract, urinary tract, burns, wounds, and also causes other blood infections. It is the most common cause of infections of burn injuries and of the external ear, and is the most frequent colonizer of medical devices such as catheters. Pseudomonas can, in rare circumstances, cause community-acquired pneumonias, as well as ventilator-associated pneumonias, being one of the most common agents isolated in several studies (Wikipedia, 2009).

Staphylococcus aureus is a common pathogen (Pereira et al., In Press). It is associated with serious community and hospital acquired diseases and has for long been considered as a major problem of Public Health (Pesavento et al. 2007). Some strains of these