



**MOLECULAR IDENTIFICATION OF *Staphylococcus epidermidis* AND  
*Corynebacterium species* IN NASAL ISOLATES AMONG MEDICAL  
LABORATORY TECHNOLOGY STUDENTS IN UiTM PUNCAK ALAM**

By

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## ABSTRACT

### MOLECULAR IDENTIFICATION OF *Staphylococcus epidermidis* AND *Corynebacterium species* IN NASAL ISOLATES AMONG MEDICAL LABORATORY TECHNOLOGY STUDENTS IN UiTM PUNCAK ALAM

*Staphylococcus epidermidis* and *Corynebacterium species* are opportunistic human pathogens and they are human nasal flora with the capability to survive in hospital environments. This two types of organism colonize a sizeable proportion of the human population and has become the most important cause of nosocomial infections in recent years. Students of Medical Laboratory Technology (MLT) often exposed to the hospital environments, hence increasing the chances of carrying and spreading these organisms to the community and patients. Thus, this research aim to determine the prevalence of *Staphylococcus epidermidis* and *Corynebacterium spp.* from nasal isolates of MLT students in UiTM Puncak Alam. In this research, 144 students are involved which consists of 70 and 74 pre-clinical and clinical students respectively. During sampling, a self-administered questionnaire was given and nasal swab were collected. Several identification test are performed to identify *S. epidermidis* and *Corynebacterium spp.* from the sample. Further reconfirmation was performed by real time polymerase chain reaction (qPCR), which targeting SE1 and PAC (*tox*) gene respectively, and the data obtained are analyse with categorical analysis (i.e. Chi-square and Fisher's exact tests). 53 (36.8%) *S. epidermidis* were isolated in which 29 (41.4%) were from clinical while the remaining 24 (32.5%) were from pre-clinical students. There was no significant relationship between *S. epidermidis* and *Corynebacterium spp.* nasal isolates and clinical attachment status ( $p > 0.05$ ). There was no statistical relation with gender ( $p = 0.895$ ) and race ( $p = 0.669$ ). Besides, the relationship between *S. epidermidis* and *Corynebacterium spp.* nasal carriage with gender, race, medical history and hygienic factors in pre-clinical and clinical groups were also not significant. There was no *Corynebacterium spp.* isolated in this study.

**Keywords:** *Staphylococcus epidermidis*, *Corynebacterium species*, nasal isolates, nasal carriers, real-time PCR, Medical Laboratory Technology (MLT) students

# CHAPTER 1

## INTRODUCTION

### 1.1 Study background for *Staphylococcus epidermidis*

*Staphylococcus epidermidis* (*S. epidermidis*) is a gram-positive bacterium, coagulase-negative cocci and it grows best in aerobic conditions. The morphological characteristics of *S. epidermidis* are white, raised, convex colonies about 1 to 2 millimeters in diameter, and is not hemolytic on blood agar. While on mannitol salt agar plate, the colonies appears in pink colour and the medium colour are maintained as *S. epidermidis* is a non-mannitol fermentors. Others, it is a catalase-positive, coagulase-negative and oxidase-negative, facultative anaerobe. Besides, *S. epidermidis* is sensitive to novobiacin, providing an important test to distinguish it from *S. saprophyticus*, which is coagulase-negative as well, but novobiacin resistant.

*S. epidermidis* is a commensal human skin, nasal and oral mucosa primarily considered as non-pathogenic. In recent decades, however, the bacterial has become one of the most listed hospital-acquired infections (HAIs) as they are normal flora of nasal with the capability to survive in hospital environments and medical devices. The 2008 National Nosocomial Surveillance System Report in US has listed *S. epidermidis* as one of the most frequents isolated bacterial in hospitals and as the most important pathogen involved in bacteremia, cardiovascular infections, and infections of the nose, eye, ear, and also throat (Vuong & Otto, 2002).