

UNIVERSITI TEKNOLOGI MARA

**ANTICANCER AND ANTIMICROBIAL
ACTIVITIES OF SUPERNATANT FERMENTED
WITH *PEDIOCOCCUS PENTOSACEUS* LAB8 OR
LACTOBACILLUS PLANTARUM LAB10**

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ABSTRACT

Chemotherapy is one of the mainstay of treatments against CRC and infectious diseases. This approach, however, suffers from limitations which include development of side effects and drug resistance. Probiotics appear to be a safer option when compared to chemotherapy as they can reduce symptoms and improve tolerability and effectiveness of chemotherapy. As such, the present study was undertaken to assess the anticancer and antimicrobial potential of *Pediococcus pentosaceus* LAB8- and *Lactobacillus plantarum* LAB10-fermented supernatant. LAB8 and LAB10 are unique strains of Lactic Acid Bacteria (LAB) with probiotic characteristics isolated from local fermented food. For anticancer assay, HCT116 (human colorectal cancer) cells were treated with serial dilutions of LAB8- and LAB10-fermented supernatant (0.1-4%) for 72 hours. The SRB assay was then performed to determine cell viability. 5-FU was included as positive control. For antimicrobial assay, Gram negative *E. coli* and Gram positive *S. aureus* were exposed to LAB8- and LAB10-fermented supernatant (3.125-50%) overnight. Minimum inhibitory concentration (MIC) was determined by observing for the lowest concentration whereby visible growth of pathogens was inhibited. Ampicillin was included as positive control. The present results showed that at the highest tested concentration, 4%, LAB8- and LAB10-fermented supernatant inhibited cell viability by 16% and 42%, respectively. LAB8-fermented supernatant yielded equal potency (MIC=25%) against *S. aureus* and *E. coli*. LAB10-fermented supernatant, on the other hand, was more selective towards *E. coli* (MIC=12.5%) than *S. aureus* (MIC=25%). Generally, the positive controls were

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Cancer is one of the deadliest diseases with no curable treatment. It may originate from different parts of the body like breasts, cervix, nasopharynx, lungs and colon cancer. Colorectal cancer (CRC), in particular, was reported for its highest incidence in Asia when compared to other regions (WHO, 2012a). In Malaysia, CRC is the second most reported cancer, accounting for 14% of all cancers (WHO, 2012b). The increased cases of CRC could be attributed to increasing socioeconomic status and westernised lifestyle whereby risk factors like obesity, physical inactivity and poor dietary choices are most prevalent (Masley & Polenz, 2014; Veettil et al., 2016). Infectious diseases, on the other hand, are defined as diseases that are caused by pathogenic microorganisms like parasites, fungi and bacteria (WHO, 2012a). It can spread indirectly and directly from one person to another. Tuberculosis and pneumonia, for example, are ranked fourth from the top ten Malaysian burden of disease after ischaemic heart disease, road injuries and cerebrovascular disease (MIMS, 2016).