UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF HALF MAXIMAL INHIBITORY CONCENTRATION IC50 OF HYDROGEN PEROXIDE ON FIBROBLAST SKIN CELL

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ABSTRACT

Hydrogen peroxide can be used to promote the cell growth in the wound healing process if the concentration is ideal for the cell. In this research, the determination of half maximal inhibitory concentration of hydrogen peroxide in CRL-2522 fibroblast skin is conducted through MTT assay method. The CRL-2522 was cultured in a favourable media before proceed with the MTT assay. The positive control was treated with media while negative control was treated with 5% concentration of hydrogen peroxide. The hydrogen peroxide was diluted into a various concentration, such as 0.3%, 1%, 1.25%, 2.3% and 3%. After the cell confluent in the 96-well plate, the different concentration of hydrogen peroxide was used as a treatment in each wells. In conclusion, hydrogen peroxide had a value of IC50 which is above 3% of the concentration.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Wound healing is a natural body reaction which leads to the restoration of the structural and functional integrity of injured tissue (Ammar et al., 2015). Wound healed with scar formation, resulting in significant aesthetic disfigurement and dysfunction. The skin acts as a barrier to the environment and need to be repaired immediately when there is an injury (El-Sayed, 2016). The wound repair process consists of three stages such as inflammation, cell proliferation and tissue regeneration (Wild et al., 2010). Therefore, this research is conducted more specifically about the treatment available for the wound healing on the skin cell. The alternative treatment that become an issue on wound healing is hydrogen peroxide.

Actually, low concentration of hydrogen peroxide is produced and required for optimal healing (Loo et al., 2012). Hydrogen peroxide promotes a cell proliferation if the concentration is ideal for the cell to grow. But, it is also a reactive oxygen species (ROS) that can cause the cell death (Bienert et al., 2016). Thus, the information about the half maximal inhibitory concentration (IC50) from the MTT assay method is very important to know the concentration that can reduce the number of cells in half of the population.

This research is conducted by using the hydrogen peroxide because of more studies continue to collect a data about hydrogen peroxide which is not really effective when comes to wound healing stages and slow down the entire process. Thus, the research aimed to get the information about a various concentration of hydrogen peroxide that can cause a cell death until half of the cell population.

The determination of half maximal inhibitory concentration can be beneficial to a researcher in the future in order to carry out a further study about the effective concentration that can lead to the therapeutic usage of the hydrogen peroxide. Thus,