UNIVERSITI TEKNOLOGI MARA

CISPLATIN TREATMENT AGAINST BREAST CANCER CELL LINES MCF-7, MDA-MB-231 AND MDA-MB-468

Thesis submitted in fulfilment of the requirements for the degree of Bachelor of Pharmacy (Hons.)

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ABSTRACT

Cisplatin is a chemotherapy drug that is widely used as anticancer drug. Cisplatin increases cytotoxicity by interfering with DNA replication and transcription mechanism. Platinum compounds damage tumours via induction of apoptosis, which is mediated by the activation of various signal transduction pathways such as first inducing reactive oxygen species (ROS), interrupting DNA damage and disrupting calcium signalling in and out of cell. Breast cancer cell lines MCF-7, MDA-MB-231 and MDA-MB-468 were selected and cultured then treated with cisplatin to investigate whether different types of cancer cells give different effect. MTT assay is currently the most extensively used method for IC50 measurements. Here, we used MTT to determine the percentage of cell viability after treated with anticancer agent. The value of IC_{50} of cisplatin for MCF-7 cell lines after 24 hours is 210.14μg/ml. The value of IC_{50} of cisplatin for MDA-MB-468 after 24 hours is 232.60μg/ml. MDA-MB-231 have the highest IC_{50} value which 237.58μg/ml compared to both cell lines. The results obtained highlight the differences between the IC50 for each type of cells. We can conclude that cisplatin reduces cell viability and proliferation in breast cancer cells MCF-7, MDA-MB-231 and MDA-MB-468 cultured for 24 hours.

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CHAPTER 1: INTRODUCTION

Cancer cells are made up of trillions of cells and they can develop anywhere in our body. Human cells normally grow and divide to replace dead cells. For example, when cells are damaged, they will undergo apoptosis process, and will be replaced by new cells. But once cancer developed, these cells will survive when they should die, and new cells form when they are not needed. These extra cells can divide and grow until tumours are formed (What is cancer, 2015)[1]. There are six hallmarks of cancer that we will discuss further on this paper which are self-sufficiency in growth signal, antigrowth signal, evasion of apoptosis, continuous replication, sustained angiogenesis and metastasis. Additionally excessive adipose tissue expansion in obesity will cause dysfunction of adipose that can stimulate tumour growth (Antonia et al., 2016).

Cisplatin is a chemotherapy drug that is widely used as anticancer drug. Cisplatin increases cytotoxicity by interfering with DNA replication and transcription mechanism. Platinum compounds damage tumours via induction of apoptosis, which is mediated by the activation of various signal transduction pathways such as first inducing reactive oxygen species (ROS), interrupting DNA damage and disrupting calcium signalling in and out of cell (Florea & Büsselberg, 2011).

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[1] https://www.cancer.gov/about-cancer/understanding/what-is-cancer