UNIVERSITI TEKNOLOGI MARA

MOLECULAR DOCKING STUDY OF QUASSINOIDS DERIVATIVES AND MOUSE P-GLYCOPROTEIN

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Abstract

P-glycoprotein is a multidrug resistance protein that caused the failure of chemotherapeutic treatments due to the protein overexpression in cancer cells. Quassinoid is a natural compound that exhibits an antileukemic activity which has potential to treat cancer disease. In this study, quassinoids derivatives are predicted to have potential interaction with the p-glycoprotein. The results from Autodock Vina presents the finding of interaction between quassinoids derivatives-P-glycoprotein complexes. The results obtained show the quassinoids derivatives bind to amino acid residues GLN 986 of P-glycoprotein. This study shows the potential interactions of quassinoids derivatives with P-glycoprotein.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

P-glycoprotein (Pgp) is also known as ATP binding cassette sub family B member 1 (ABCB1) transporter or multidrug resistance protein 1 (MDR1). Basically, the ABC transporter formed when there is two transmembrane domain (TMD) and two nucleotide binding domains (NBD) join together (Gottesman, Fojo, & Bates, 2002). In cancer cell, this Pgp plays an important role in chemotherapy success. Pgp or ABCB1 gene codes for a glycosylated membrane protein that originally detected in cells that had developed resistance to cancer chemotherapy agents. Some drugs act as both substrates and inhibitors of Pgp. Other drugs act only as substrates or as inhibitors. Pgp has reduced the drug efficacy in penetrating the cells.

In this study, it is aim to study possible quassinoids interactions to the Pgp. Consequently, the target chemical compound may have potential inhibition of Pgp activity. Quassinoids is one of the major altered metabolically triterpenes besides the limonoids (Zhengming Guo, Suryanarayana Vangapandu, Robert William Sindelar,