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DOCKING OF MOUSE P-GLYCOPROTEIN (ABCB1a/MDR3) WITH RHODAMINE B AND VINBLASTINE

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ABSTRACT

P-glycoprotein (Pgp) is an ATP-dependent transport protein that is selectively expressed at entry points of xenobiotics. It acts as an efflux pump that prevents xenobiotics from entering sensitive organs. Pgp also plays a key role in the absorption and blood-brain barrier penetration of many drugs. The overexpression of Pgp in cancer cells has been associated with multidrug resistance in tumors. To date, there is still no research has been done to identify the specific amino acid at the binding site in Pgp that vinblastine binds to computationally. Predictions of the binding sites were done using the Q-siteFinder. This study also uses the Autodock software to find the amino acid residues that the vinblastine and rhodamine B interacts with. The results concluded that there are two binding sites predicted from Pgp which are the TM 6 and TM 12. The results also concluded that mouse Pgp interacts with Phe 332, Phe 339, He 336 in TM6. In TM 12, Leu 971, lie 977, Val 978, Gly 980 and Ala 981 were found to have interaction with mouse Pgp. Based on the findings of this study also, it can be concluded that drugs often bind to TM 6 and TM 12 that are important for function. Overall, this study suggested that the Autodock software provides a quick, and inexpensive way of evaluating potential drug efflux problem at the early stages of drug development.