UNIVERSITI TEKNOLOGI MARA

STRUCTURE-BASED DRUG MODELING OF CURCUMA LONGA AS ALTERNATIVE DRUG FOR BREAST CANCER

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ABSTRACT

Overexpression of epidermal growth factor (EGFR) tyrosine kinase was related to occurance, lymph metastasis and pathologic types of breast cancer. Inhibition of the EGFR tyrosine kinase activity by small molecules has proved effective for the treatment of breast cancer. Study has been done before where the crystal structure of EGFR has been used to identify inhibitor chemotypes by docking-based in silico screening of a large virtual chemical library followed up by experimental validation. Several compounds have been identified since then and one of them is Lapatinib which interact with EGFR coded in Protein Data Bank (PDB) as 1xkk receptor. We analyzed the compound presence in *Curcuma longa* and identify the one that can give more or less similar effects such as Lapatinib through in silico models.

CHAPTER 1

INTRODUCTION

1.1 Breast Cancer

Breast cancer is one of the most common illnesses among world's populations and the incidence rates differ according to geographical variations. In 2008, the College of Radiology – Breast Health Information Centre estimated that 35 per 100,000 of the Malaysian population will have breast cancer. The number seems small but it is the number one cause of cancer death among women in Malaysia. There are various factors that may contribute to breast cancer one of it is genetic defect, and this may affect the regulation of Epidermal Growth Factor Receptor – Tyrosine Kinase (EGFR-TK).

1.2 Tyrosine Kinases (TKs)

Tyrosine kinases (TKs) is one of the enzymes present in the human body involves in phosphorylation, that is a process of transferring phosphate group from ATP to tyrosine residues in a protein. Receptor Tyrosine Kinases (RTKs) is an example of the protein and it plays an important role in normal cellular processes of signal transduction. RTKs subsequently may also play critical role in the development and progression of many types of cancer (Zwick *et al.*, 2001).