INTISARI

Latar belakang: Adanya heterogenitas kanker payudara baik secara intratumoral maupun intertumoral memicu terjadinya keganasan dan juga resistensi terhadap pengobatan. Heterogenitas menjadi tantangan dalam pengobatan kanker. Dibutuhkan kombinasi pengobatan, yaitu dengan terapi dan kombinasi obat-obatan yang mentarget protein biomarker kanker dalam kelas onkogen dan *Tumor Supresor Gen* (TSG). Dibutuhkan pengembangan suatu senyawa yang dapat menghambat perkembangan kanker payudara dan mengetahui suatu protein target terbaru yang dapat dijadikan dasar dalam pengembangan target protein senyawa obat. TNBC (*Triple Negative Breast Cancer*) memiliki sifat agresif yang lebih tinggi, salah satu kelompok TNBC yaitu kelompok *claudin-low* yang memiliki jenis *cell line* Hs578T. Hs578T memiliki sifat invasi lebih tinggi. Hasil penelitian senyawa turunan kalkon memiliki aktivitas "*high therapeutic index"* dan dianggap sebagai "*the new era of medicines*". Kalkon memiliki beragam aktivitas biologis yang terkait dengan subtituen yang terikat pada dua cincin aromatik. Saat ini senyawa turunan kalkon B ($C_{14}H_{12}O_2S$) sebagai sintesis terbaru, belum di uji pada *cell line* HS578T.

Tujuan: Mengetahui apakah senyawa kalkon B dapat menghambat pertumbuhan, proliferasi, menghambat migrasi *cell line* kanker payudara Hs578T dan mengetahui protein pada *cell line* kanker payudara Hs578T sebagai target kalkon B ($C_{14}H_{12}O_2S$) secara *in silico*.

Metode: Uji aktivitas penghambatan secara *in vitro* pada kultur *cell line* kanker payudara Hs578T menggunakan beberapa metode, yaitu: *MTT assay*, *colony formation assay*, *wound healing assay* dan uji *in silico* menggunakan *swiss target prediction* dan GSEA (*Gene Set Enrichment Analysis)*.

Hasil: Hasil uji MTT *assay* senyawa kalkon B diperoleh nilai IC_{50} 23,52 µM yang tergolong sitotoksik moderat dan berpotensi sebagai agen kemoprevensi. Konsentrasi 40 µM menghambat pertumbuhan *cell line* kanker payudara Hs578T dengan persentase sel hidup yang rendah yaitu 3,66%. Hasil uji *colony formation* menghambat proliferasi sel 100 % pada konsentrasi 2,94 (1/8 IC_{50}) dan 5,88 (1/4 IC_{50}). Uji *wound healing* menghambat migrasi secara signifikan pada konsentrasi 2,94 (1/8 IC_{50}) dan 5,88 (1/4 IC_{50}). Konsentrasi 1,47 (1/16 IC_{50}) tidak ada penghambatan pada migrasi sel. Hasil prediksi protein *cell line* kanker payudara Hs578T yang menjadi target kalkon B ($C_{14}H_{12}O_2S$), yaitu semua protein prediksi memiliki nilai *probability* yang rendah dan sama yaitu 0.048952897826.

Kesimpulan: Kalkon B menghambat pertumbuhan, menghambat proliferasi sel dan menghambat migrasi. Kalkon B memiliki nilai IC_{50} 23,52 µM yang tergolong sitotoksik moderat. Sitotoksik moderat berpotensi sebagai agen kemoprevensi. Hasil prediksi memiliki nilai *probability* (kemungkinan) yang rendah sebagai protein prediksi.

Saran: Dibutuhkan uji in vivo yaitu *western blotting* untuk mengetahui protein apa yang menjadi target kalkon B ($C_{14}H_{12}O_2S$) pada *cell line* kanker payudara Hs578T.

Kata kunci: Kalkon B,MTT *assay*, *colony formation*, *wound healing*, *swiss target prediction*, kultur sel.

ABSTRACT

***Background**: The heterogeneity of breast cancer both intratumorally and intertumorally triggers malignancy and also resistance to treatment. Heterogeneity is a challenge in cancer treatment. A combination of treatment is needed, namely with therapy and a combination of drugs that target cancer biomarker proteins in the oncogene and Tumor Suppressor Gene (TSG) classes. It is necessary to develop a compound that can inhibit the development of breast cancer and find out a new target protein that can be used as a basis for developing protein targets for drug compounds. TNBC (Triple Negative Breast Cancer) has a higher aggressive nature, one of the TNBC groups is the claudin-low group which has the Hs578T cell line type. Hs578T has higher invasive properties. The research results of chalcone derivative compounds have a "high therapeutic index" activity and are considered "the new era of medicines". Chalcone has a variety of biological activities related to the substituents attached to the two aromatic rings. Currently, the chalcone derivative compound B (C14H12O2S), as the latest synthesis, has not been tested on the HS578T cell line.*

***Objective**: To find out whether the chalcone B compound can inhibit growth, proliferation, inhibit migration of the Hs578T breast cancer cell line and to identify the protein in the Hs578T breast cancer cell line as a target for chalcone B (C14H12O2S) in silico.*

Method: In vitro inhibitory activity test on Hs578T breast cancer cell line culture using several methods, namely: MTT assay, colony formation assay, wound healing assay and in silico test using Swiss target prediction and GSEA (Gene Set Enrichment Analysis).

***Results**: The results of the MTT assay for chalcone B compound obtained an IC50 value of 23.52 µM which is classified as moderate cytotoxic and has the potential to be a chemoprevention agent. A concentration of 40 µM inhibited the growth of the Hs578T breast cancer cell line with a low percentage of live cells, namely 3.66%. The results of the colony formation test inhibited cell proliferation 100% at concentrations of 2.94 (1/8 IC50) and 5.88 (1/4 IC50). The wound healing test significantly inhibited migration at concentrations of 2.94 (1/8 IC50) and 5.88 (1/4 IC50). Concentration 1.47 (1/16 IC50) did not inhibit cell migration. The prediction results for the Hs578T breast cancer cell line protein which is the target of chalcone B (C 14H 12 O2 S), namely that all predicted proteins have a low and equal probability value, namely 0.048952897826.*

***Conclusion**: Chalcone B inhibits growth, inhibits cell proliferation and inhibits migration. Chalcone B has an IC50 value of 23.52 µM which is classified as moderate cytotoxic. Moderate cytotoxicity has potential as a chemoprevention agent. The prediction results have a low probability value as a predicted protein.*

***Suggestion**: An in vivo test is needed, namely western blotting, to find out what protein is the target of chalcone B (C14H12 O2 S) in the Hs578T breast cancer cell line.*

***Key words**: Kalkon B, MTT assay, colony formation, wound healing, Swiss target prediction, cell culture*