SINTESIS TURUNAN KHALKON DAN UJI ANTIKANKER SECARA *IN VITRO* TERHADAP SEL KANKER PAYUDARA (T47D) DAN KOLON (WiDr)

Yogo Dwi Prasetyo
13/350655/PPA/04111

INTISARI

Senyawa turunan khalkon yang meliputi, 4'-hidroksi-4-metoksikhalkon (**SK 1**), 4'-hidroksi-3,4-dimetoksi-khalkon (**SK 2**), 4'-hidroksi-4-klorokhalkon (**SK 3**), dan 2',4'-dihidroksi-4-klorokhalkon (**SK 4**) telah berhasil disintesis dan diuji sitotoksisitasnya terhadap sel kanker payudara (T47D) dan kolon (WiDr). Turunan khalkon diperoleh melalui reaksi kondensasi Claisen-Schmidt menggunakan turunan benzaldehida dan turunan asetofenon. Sintesis khalkon berlangsung selama 48 jam pada suhu kamar dengan menggunakan metanol sebagai pelarut dan KOH sebagai katalis. Khalkon yang berhasil disintesis dianalisis menggunakan, FT-IR, GC-MS, ^{1}H-NMR, dan ^{13}C-NMR. Uji sitotoksisitas dilakukan secara *in vitro* dengan metode MTT.

Hasil penelitian menunjukkan bahwa senyawa khalkon (**SK 1-4**) berhasil disintesis dengan rendemen berturut-turut 96,1; 96,5; 96,2; dan 92,7%. Hasil uji sitotoksisitas mengindikasikan bahwa khalkon **SK 1 – 4** memiliki aktivitas cukup baik dalam menghambat sel kanker T47D dengan IC_{50} berturut-turut 72,44; 44,67; 57,70; dan 42,66 μg/mL. Nilai IC_{50} khalkon **SK 1 – 4** pada sel WiDr berturut-turut adalah 44,67; 29,51; 20,42; dan 31,62 μg/mL. Khalkon **SK 1 – 3** memiliki indeks selektivitas terhadap sel kanker WiDr lebih dari 3, yakni 3,72; 91.115; dan 6,02. Khalkon yang selektif terhadap sel kanker T47D hanya khalkon **SK 2** dengan indeks selektivitas 60.219.

Kata kunci: turunan khalkon, antikanker, sel kanker T47D, sel kanker WiDr.

SYNTHESIS OF CHALCONE DERIVATIVES AND IN VITRO ANTICANCER TEST AGAINTS BREAST (T47D) AND COLON (WiDr) CANCER CELL

Yogo Dwi Prasetyo
13/350655/PPA/04111

ABSTRACT

Synthesis of 4'-hydroxy-4-methoxychalcone (**SK 1**), 4'-hydroxy-3,4-dimethoxychalcone (**SK 2**), 4'-hydroxy-4-chlorochalcone (**SK 3**), and 2',4'-dihydroxy-4-chlorochalcone (**SK 4**) and its cytotoxicity test againts T47D and WiDr cancer cell lines have been investigated. These were prepared by Claisen-Schmidt condensation of benzaldehyde derivatives and acetophenone derivatives. Synthesis of chalcones was carried out by stirring at room temperature for 48 h using methanol as solvent and KOH 50% as catalyst. The structures of products were analyzed using FT-IR, GC-MS, ^{1}H-NMR, and ^{13}C-NMR. The cytotoxicity of chalcones were tested using MTT assay.

The result showed that chalcones (**SK 1 – 4**) were successfully synthesized with yield of 96.1, 96.5, 96.2, and 92.7% respectively. The anticancer test indicated that chalcone **SK 1 – 4** had a good activity for inhibiting the growth of T47D cancer cells with IC_{50} value 72.44, 44.67, 57.70, and 42.66 μg/mL respectively. IC_{50} values chalcone **SK 1 – 4** againts WiDr cancer cells were 44.67, 29.51, 20.42, and 31.62 μg/mL respectively (WiDr). Chalcone **SK 1 – 3** had an index of selectivity against cancer cells WiDr more than 3, ie 3.72, 91,115, and 6.02. Chalcone **SK 2** selective against cancer cells T47D with selectivity index 60,219.

Keyword: chalcone derivates, anticancer, T47D cell line, WiDr cell line