SINTESIS DAN UJI SITOTOKSISITAS TURUNAN KHALKON DAN FLAVON TERHADAP SEL KANKER HeLa, T47D DAN WiDr SECARA *IN VITRO*

Retno Aliyatul Fikroh
14/373217/PPA/04758

INTISARI

Senyawa turunan khalkon dan flavon telah berhasil disintesis dan diuji sitotoksisitas terhadap sel kanker. Senyawa khalkon (**1**-**2**) disintesis melalui reaksi kondensasi Claisen-Schmidt dari 2-hidroksiasetofenon atau 2,4-dihiroksiasetofenon dengan 6-bromoveratraldehida. Sintesis khalkon (**1**-**2**) dilakukan dengan refluks (65°C) selama 24 jam menggunakan metanol sebagai pelarut dan NaOH sebagai katalis. Senyawa flavon (**3**-**4**) disintesis melalui siklisasi oksidatif senyawa khalkon (**1**-**2**) dengan katalis iodin dalam pelarut dimetilsulfoksida (DMSO) pada kondisi refluks (120°C) selama 4 jam. Senyawa hasil sintesis dianalisis strukturnya dengan FTIR, GC-MS/MS-*direct*, KLT-*scanner*, ^{1}H- dan ^{13}C-NMR. Senyawa hasil sintesis diuji sitotoksisitas terhadap sel kanker HeLa, T47D, dan WiDr dengan metode MTT assay.

Hasil penelitian menunjukkan bahwa senyawa **1** (2'-hidroksi-2-bromo-4,5-dimetoksikhalkon), senyawa **2** (2',4'-dihidroksi-2-bromo-4,5-dimetoksikhalkon), senyawa **3** (2'-bromo-4',5'-dimetoksiflavon) dan senyawa **4** (7-hidroksi-2'-bromo-4',5'-dimetoksiflavon) diperoleh dengan rendemen secara berurutan sebesar 78; 72; 28 dan 30%. Hasil uji sitotoksisitas menunjukkan bahwa senyawa **1** memiliki aktifitas sedang dalam menghambat sel kanker WiDr dengan nilai IC_{50} sebesar 87,09 µg/mL sedangkan senyawa **2** memiliki aktifitas sedang dalam menghambat sel kanker HeLa dan WiDr dengan nilai IC_{50} sebesar 48,97 dan 47,86 µg/mL. Uji sitotoksisitas terhadap senyawa **3** dan **4** dinyatakan tidak aktif dalam menghambat sel kanker Hela, T47D dan WiDr dengan nilai IC_{50} lebih dari 100 µg/mL.

Kata kunci: khalkon, flavon, uji sitotoksisitas, antikanker

SYNTHESIS AND IN VITRO CYTOTOXICITY TEST OF CHALCONE AND FLAVONE DERIVATIVES AGAINTS HeLa, T47D AND WiDr CANCER CELLS

Retno Aliyatul Fikroh
14/373217/PPA/04758

ABSTRACT

Synthesis and cytotoxicity test against cancer cell lines of chalcone and flavone derivatives have been investigated. The chalcone derivatives (**1**-**2**) was synthesized by Claisen-Schmidt condensation of 2-hydroxyacetophenone or 2,4-dihydrozyacetophenone with 6-bromoveratraldehyde. The synthesis of chalcones (**1**-**2**) was carried out by reflux condition (65°C) for 24 hours using methanol as a solvent and NaOH as a catalyst. The flavone derivatives (**3**-**4**) were synthesized by oxidative cyclization of chalcone (**1**-**2**) with iodine as a catalyst in reflux condition (120°C) for 4 hours. The structures of synthesized compounds were characterized by FTIR, GC-MS/MS-direct, TLC-scanner, ^{1}H- and ^{13}C-NMR. The cytotoxicity of compound (**1**-**4**) was tested against HeLa, T47D and WiDr cancer cell lines by MTT assay.

The results showed that 2'-hydroxy-2-bromo-4,5-dimethoxychalcone (**1**), 2',4'-dihydroxy-2-bromo-4,5-dimethoxychalcone (**2**), 2'-bromo-4',5 –dimethoxy flavone (**3**) and 7-hydroxy-2'-bromo-4',5'-dimethoxyflavone (**4**) produced 78, 72, 28 and 30,33% in yield, respectively. The cytotoxicity test indicated that compound **1** had a moderate activity for inhibiting the growth of WiDr cancer cells with IC_{50} 87,09 µg/mL, while compound **2** had a moderate activity for inhibiting the growth of HeLa and WiDr cancer cells with IC_{50} 48,97and 47,86 µg/mL. The cytotoxicity test indicated that compound **3** and **4** were not active for inhibiting the growth of HeLa, T47D and WiDr cancer cells with IC_{50} value more than 100 µg/mL.

Keyword: chalcone, flavone, cytotoxicity, anticancer