SINTESIS ANALOG KURKUMIN MONOKETON BERBAHAN DASAR TURUNAN BENZALDEHIDA DENGAN SIKLOHEKSANON DAN UJI *IN VITRO* ANTIKANKER TERHADAP SEL KANKER PAYUDARA (T47D) DAN SERVIKS (HeLa)

Rismawati
14/368953/PA/16324

INTISARI

Telah dilakukan sintesis senyawa analog kurkumin monoketon berbahan dasar turunan benzaldehida dengan sikloheksanon melalui reaksi kondensasi aldol silang Claisen-Schmidt dan uji *in vitro* antikanker terhadap sel kanker payudara (T47D) dan serviks (HeLa).

Sintesis analog kurkumin monoketon A ((2*E*,6*E*)-2,6-bis[(2*E*)-3-fenil-2-propena-1-ilidin]sikloheksanon) dan B ((2*E*,6*E*)-2,6-bis(3,4-dimetoksibenzilidin) sikloheksanon) dilakukan dengan cara mereaksikan turunan benzaldehida (sinamaldehida dan veratraldehida) dengan sikloheksanon dalam kondisi basa (KOH) dan pelarut etanol selama 50 menit pada suhu 50 °C. Seluruh senyawa hasil sintesis dianalisis strukturnya menggunakan FTIR, *direct inlet*-MS, ^{1}H- dan ^{13}C-NMR. Uji sitotoksisitas dilakukan terhadap sel kanker T47D, HeLa, dan sel normal Vero dengan metode MTT. Sel normal Vero digunakan sebagai pembanding untuk mengetahui indeks selektivitas senyawa hasil sintesis dalam penghambatan sel kanker T47D dan HeLa.

Senyawa analog kurkumin monoketon A dan B yang dihasilkan berupa padatan berwarna kuning dengan rendemen berurutan sebesar 61,57 dan 59,06%, serta titik leleh berurutan sebesar 143-144 dan 147-149 ^{o}C. Hasil uji sitotoksisitas mengindikasikan bahwa senyawa analog kurkumin monoketon B memiliki sitotoksisitas tertinggi dengan nilai IC_{50} sebesar 5,47 µg/mL terhadap sel kanker HeLa dan paling selektif dalam penghambatan sel kanker HeLa dengan indeks selektivitas sebesar 85,4.

Kata kunci: analog kurkumin, antikanker, metode MTT, uji sitotoksisitas

SYNTHESIS OF CURCUMIN ANALOGUES MONOKETONE FROM DERIVATIVES OF BENZALDEHYDE WITH CYCLOHEXANONE AND IN VITRO ANTICANCER TEST AGAINST BREAST (T47D) AND CERVICAL (HeLa) CANCER CELL

Rismawati
14/368953/PA/16324

ABSTRACT

The synthesis of curcumin analogues monoketone from derivatives of benzaldehyde with cyclohexanone by aldol condensation Claisen-Schmidt reaction and in vitro anticancer test against breast (T47D) and cervical (HeLa) cancer cell had been performed.

The synthesis of curcumin analogues monoketone A ((2*E*,6*E*)-2,6-bis[(2*E*)-3-phenyl-2-propen-1-ylidene]cyclohexanone) and B ((2*E*,6*E*)-2,6-bis(3,4-dimethoxybenzylidene)cyclohexanone) were carried out by reacting derivatives of benzaldehyde (cinnamaldehyde and veratraldehyde) with cyclohexanone in base condition (KOH) and etanol as solvent for 50 minutes at 50 °C. The stuctures of all products were identified by using FTIR, direct inlet-MS, ^{1}H- and ^{13}C-NMR. The cytotoxicity test was carried out with MTT assay against T47D, HeLa cancer cell, and Vero normal cell. Vero normal cell was used as a comparison to determine the selectivity index of the products in T47D and HeLa cancer cell inhibition.

Curcumin analogues monoketone A and B were yielded in 61.57 and 59.06%, respectively as yellow solid. The melting point of curcumin analogues monoketone A and B were at 143-144 and 147-149 ^{o}C, respectively. The cytotoxicity test results indicated that the curcumin analogue monoketone B have the highest cytotoxicity with IC_{50} values about 5.47 µg/mL against HeLa cancer cell and the most selective in HeLa cancer cell inhibition with the selectivity index about 85.4.

Keywords: anticancer, curcumin analogues, cytotoxicity test, MTT assay