SINTESIS N-ASETILPIRAZOLINA DARI VERATRALDEHIDA DAN 4-HIDROKSIASETOFENON SERTA UJI SITOTOKSISITASNYA TERHADAP BEBERAPA SEL KANKER

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INTISARI

Sintesis N-asetilpirazolina serta uji sitotoksisitasnya terhadap beberapa sel kanker telah dilakukan. Senyawa kalkon [1-(4-hidroksifenil)-3-(3,4-dimetoksifenil) propenon] disintesis dari veratraldehida dan 4-hidroksiasetofenon melalui reaksi kondensasi Claisen-Schmidt dengan katalis basa. Selanjutnya refluks terhadap campuran kalkon, hidrazin monohidrat dan asam asetat glasial menghasilkan senyawa N-asetilpirazolina [1-Asetil-3-(4-hidroksifenil)-5-(3,4-dimetoksifenil) pirazolina]. Produk hasil sintesis dianalisis menggunakan spektrometer FT-IR, GC-MS, ^{1}H- dan ^{13}C-NMR serta uji sitotoksisitas antikanker terhadap sel Vero, sel kanker HeLa, MCF-7 dan T47D dilakukan dengan metode MTT.

Hasil reaksi kondensasi Claisen-Schmidt antara veratraldehida dan 4-hidroksiasetofenon menggunakan katalis NaOH 40% (b/v) yang diaduk selama 48 jam menghasilkan senyawa kalkon dengan persen hasil sebesar 84,51%. Hasil siklisasi antara senyawa kalkon dengan hidrazin monohidrat dan asam asetat glasial yang direfluks selama 6 jam menghasilkan senyawa N-asetilpirazolina dengan persen hasil sebesar 88,28%.

Hasil pengujian sitotoksisitas terhadap sel kanker menunjukkan bahwa IC_{50} senyawa N-asetilpirazolina terhadap sel Vero, sel kanker HeLa, MCF-7 dan T47D berturut-turut sebesar 43.958; 7.642; 680 dan 2.702 µg/mL. Senyawa N-asetilpirazolina menunjukkan tidak toksik terhadap sel kanker tersebut dan tidak membunuh sel Vero.

Kata kunci: veratraldehida, kalkon, N-asetilpirazolina, uji antikanker.

SYNTHESIS OF N-ACETYLPYRAZOLINE FROM VERATRALDEHYDE AND 4- HYDROXYACETOPHENONE AND ITS CYTOTOXICITY TEST TOWARD SOME CANCER CELLS

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ABSTRACT

Synthesis of N-acetylpyrazoline and its cytotoxicity test against some cancer cells have been carried out. The chalcone [1-(4-hydroxyphenyl)-3-(3,4-dimetoxyphenyl) propanol] has been synthesized from veratraldehyde and 4-hydroxyacetophenone under alkaline condition via Claisen-Schmidt condensation. After that, refluxing the mixture of chalcone, hydrazine monohydrate and glacial acetic acid yielded N-acetylpyrazoline [1-Acetyl-3-(4-hydroxyphenyl)-5-(3,4-dimetoxyphenyl) pyrazoline]. All of the products were analyzed using FT-IR, GC-MS, ^{1}H- and ^{13}C-NMR spectrometers and the testing anticancer cytotoxicity toward Vero cell, HeLa, MCF-7 and T47D cancer cells were performed by MTT assay.

The Claisen-Schmidt condensation between veratraldehyde and 4-hydroxyacetophenone in the presence of NaOH 40%(w/v) under stirring for 48 hours, yielded chalcone in 84.51%. The cyclization reaction between chalcone, hydrazine monohydrate and glacial acetic acid under reflux for 6 hours produced N-acetylpyrazoline in 88.28% yield.

The result of cytotoxicity test againts cancer cells showed that the IC_{50} of N-acetylpyrazoline againts Vero cell, HeLa, MCF-7 and T47D cancer cells were 43958; 7642; 680 and 2702 µg/mL, respectively. The N-acetylpyrazoline was not toxic againts cancer cells and did could not extinguish the Vero normal cells.

Key words: veratraldehyde, chalcone, N-acetylpyrazoline, anticancer test.