SINTESIS *N*-BENZOIL PIRAZOLINA BERBAHAN DASAR VERATRALDEHIDA DAN 4-KLOROASETOFENON SERTA UJI SITOTOKSISITASNYA TERHADAP BEBERAPA SEL KANKER

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INTISARI

Sintesis *N*-benzoil pirazolina dengan bahan dasar veratraldehida dan 4-kloroasetofenon serta uji sitotoksisitasnya terhadap beberapa sel kanker telah dilakukan. Penelitian ini bertujuan untuk mempelajari sintesis *N*-benzoil pirazolina dari suatu senyawa kalkon berbahan dasar veratraldehida dan 4-kloroasetofenon serta mengetahui sitotoksisitas senyawa *N*-benzoil pirazolina hasil sintesis terhadap beberapa sel kanker.

Penelitian diawali dengan sintesis senyawa kalkon yang dibuat dengan mereaksikan veratraldehida dan 4-kloroasetofenon dengan pelarut etanol menggunakan katalis basa NaOH 30% (b/v) dengan metode pengadukan. Tahap selanjutnya adalah sintesis *N*-benzoil pirazolina dengan cara mereaksikan senyawa kalkon, metanol, hidrazin monohidrat dan benzoil klorida dengan katalis asam asetat glasial menggunakan metode sonokimia. Produk yang terbentuk kemudian dianalisis dengan spektrometer FT-IR, GC-MS, ^{1}H-NMR dan ^{13}C-NMR. Uji sitotoksisitas dilakukan terhadap sel kanker WiDr, HeLa, MCF-7 dan T47D dengan metode MTT.

Berdasarkan hasil penelitian dihasilkan senyawa kalkon berupa padatan berwarna kuning kehijauan dengan titik leleh 101,0 – 105,8 °C dan rendemen sebesar 64,70%. Senyawa N-benzoil pirazolina yang dihasilkan berupa padatan berwarna putih dengan titik leleh 164,8 – 165,2 ^{o}C dan rendemen sebesar 80,95%. Hasil uji sitotoksisitas *N*-benzoil pirazolina memberikan sitotoksik lemah terhadap WiDr dan tidak sitotoksik terhadap HeLa, MCF-7 dan T47D. Nilai IC_{50} senyawa *N*-benzoil pirazolina terhadap sel kanker WiDr, HeLa, MCF-7 dan T47D berturut-turut sebesar 203,82; 1145,51; 1169,79 dan 2399,77 μg/mL.

Kata kunci: veratraldehida 4-kloroasetofenon, *N*-benzoil pirazolina, sitoksisitas

SYNTHESIS OF *N*-BENZOYL PYRAZOLINE DERIVATIVES FROM VERATRALDEHIDE AND 4-CHLOROACETOPHENONE AND ITS CITOTOXICITY TEST TOWARD SOME CANCER CELLS

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ABSTRACT

Synthesis of *N*-benzoyl pyrazoline from veratraldehyde and 4-chloroacetophenone and its in vitro test as an anticancer agent have been conducted. The aim of this research was to study the formation of *N*-benzoyl pyrazoline from chalcone, which was yielded from reaction between veratraldehyde and 4-chloroacetophenone and also to test the cytotoxicity of *N*-benzoyl pyrazoline toward some cancer cells.

The chalcone synthesis was carried out by stirring a mixture of veratraldehyde and 4-chloroacetophenone in ethanol solvent and used base catalyst of 30% NaOH (w/v). The next step was synthesis of *N*-benzoyl pyrazoline by reacting chalcone, methanol, hydrazine monohydrate, benzoyl chloride and acid catalyst of glacial acetic acid used sonochemistry methode. The structure elucidation was carried out by FT-IR, GC-MS, ^{1}H-NMR and ^{13}C-NMR spectrometers. Citotoxicity test was performed towards WiDr, HeLa, MCF-7 and T47D cancer cells with MTT method.

This research produced chalcone as greenish-yellow solid with melting point of 101.0 – 105.8 °C and showed 64.70% yield. The *N*-benzoyl pyrazoline compound that was produced was a white solid with melting point of 164.8-165.2 °C and showed 80.95% yield. The cytotoxicity test showed that *N*-benzoyl pyrazoline has weak toxicity against WiDr cell, and no toxicity against HeLa, MCF-7 and T47D. The IC_{50} value of *N*-benzoyl pyrazoline against WiDr, HeLa, MCF-7 and T47D cancer cells was 203.82; 1145.51; 1169.79 dan 2399.77 µg/mL respectively.

Keywords: veratraldehyde, 4-chloroacetophenon, *N*-benzoyl pyrazoline, citotoxicity