

**SINTESIS TURUNAN N-ASETILPIRAZOLINA BERBAHAN DASAR
VERATRALDEHIDA DAN 5-BROMO-2-HIDROKSIASETOFENON
SERTA UJI SITOTOKSISITASNYA TERHADAP
BEBERAPA SEL KANKER**

Islah Muttaqin
13/349615/PA/15523

INTISARI

Sintesis turunan *N*-asetilpirazolina berbahan dasar veratraldehida dan 5-bromo-2-hidroksiasetofenon serta uji sitotoksitasnya telah dilakukan. Penelitian diawali dengan sintesis senyawa 5-bromo-2-hidroksiasetofenon dari 2-hidroksiasetofenon dengan reagen KBrO_3 , HBr 47% dan asam asetat glasial, selanjutnya dilakukan sintesis senyawa kalkon dari 5-bromo-2-hidroksiasetofenon, veratraldehida, dan NaOH 40% dalam pelarut metanol dengan metode pengadukan selama 48 jam. Sintesis senyawa turunan *N*-asetilpirazolina dilakukan dengan cara sikloadisi senyawa kalkon hasil sintesis dengan hidrazin hidrat dan penambahan katalis asam asetat glasial serta menggunakan metode refluks selama 24 jam. Untuk membuktikan kebenaran struktur senyawa hasil sintesis, dilakukan elusidasi struktur dengan spektrometer FTIR, GC-MS, *Direct*-MS, TLC-Scanner, dan $^1\text{H-NMR}$. Senyawa turunan *N*-asetilpirazolina hasil sintesis diuji aktivitas antikankernya terhadap sel kanker WiDr, HeLa, T47D, dan MCF-7 serta selektivitasnya terhadap sel normal Vero dengan metode MTT.

Berdasarkan hasil penelitian diperoleh senyawa kalkon berupa padatan berwarna oranye cerah dengan rendemen 83,98% dan titik leleh 166,50-167,80 °C, sedangkan senyawa *N*-asetilpirazolina berupa padatan hijau kecokelatan dengan rendemen 66,67% dan titik leleh 151,50-153,80 °C. Senyawa *N*-asetilpirazolina menunjukkan sitotoksitas sedang terhadap sel kanker WiDr, HeLa, T47D, dan MCF-7 dengan nilai IC_{50} masing-masing sebesar 50,95; 97,84; 52,40; dan 152,87 $\mu\text{g/mL}$. Senyawa *N*-asetilpirazolina hasil sintesis kurang selektif terhadap sel normal Vero karena memiliki IC_{50} $20 \leq \text{IC}_{50} < 200$ $\mu\text{g/mL}$ yaitu sebesar 115,34 $\mu\text{g/mL}$.

Kata kunci: *N*-asetilpirazolina, brominasi, kalkon, sitotoksitas.

SYNTHESIS OF *N*-ACETILPYRAZOLINE DERIVATIVE FROM VERATRALDEHYDE AND 5-BROMO-2-HYDROXYACETOPHENONE AND ITS CYTOTOXICITY TEST AGAINST SOME CANCER CELLS

Islah Muttaqin
13/349615/PA/15523

ABSTRACT

Synthesis of *N*-acetylpyrazoline derivative from veratraldehyde and 5-bromo-2-hydroxyacetophenone and its cytotoxicity test have been carried out. First, 5-bromo-2-hydroxyacetophenone compound was synthesized from 2-hydroxyacetophenone using KBrO_3 , HBr 47% and acetic acid glacial. Second, chalcone was synthesized from 5-bromo-2-hydroxyacetophenone and veratraldehyde using NaOH 40% (w/v) under stirring for 48 hours. Third, synthesis of *N*-acetylpyrazoline was conducted by refluxing the chalcone and hydrazine hydrate using acetic acid glacial for 24 hours. The structure elucidation of products was confirmed by FTIR Spectrophotometer, GC-MS, Direct-MS, TLC-Scanner, and $^1\text{H-NMR}$ Spectrometer. *N*-acetylpyrazoline was evaluated for cytotoxicity against WiDr, HeLa, T47D, and MCF-7 cancer cell lines and also its selectivity to Vero normal cell line by MTT assay.

Based on the results, chalcone was obtained as bright orange solid with a yield of 83.98% and m.p of 166.50-167.80 °C while *N*-acetylpyrazoline, as green-brownish solid, was yielded 66.67% with m.p of 151.50-153.80 °C. Cytotoxicity test shows that *N*-acetylpyrazoline had moderate cytotoxicity against WiDr, HeLa, T47D and MCF-7 cancer cell lines with IC_{50} values respectively 50.95; 97.84; 52.40; 152.87 $\mu\text{g/mL}$. *N*-acetylpyrazoline is less selective against Vero normal cell line because it has $\text{IC}_{50} 20 \leq \text{IC}_{50} < 200 \mu\text{g/mL}$ with the value of 115.34 $\mu\text{g/mL}$.

Keywords: *N*-acetylpyrazoline, bromination, chalcone, cytotoxicity.