

## **SINTESIS 2-(4-KLOROFENIL)-3-HIDROKSIKROMAN-4-ON DAN 3-(4-KLOROFENIL)-1-(2-HIDROKSIFENIL)PROP-2-EN-1-ON SERTA UJI SITOTOKSISITAS TERHADAP BEBERAPA SEL KANKER**

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### **INTISARI**

Telah dilakukan sintesis dan uji sitotoksitas secara *in vitro* senyawa 2-(4-klorofenil)-3-hidroksikroman-4-on dan 3-(4-klorofenil)-1-(2-hidroksifenil)prop-2-en-1-on. Tujuan penelitian ini untuk menghasilkan senyawa antikanker dan aktifitas sitotoksitas senyawa hasil sintesis diuji terhadap sel kanker HeLa, T47D, WiDr dan sel Vero.

Penelitian ini diawali dengan mereaksikan 4-klorobenzaldehid dan 2-hidroksiasetofenon menggunakan metode *Claisen Schmidt* dengan katalis NaOH 30 % untuk mendapatkan khalkon. Gugus fenol pada khalkon diasetilasi dengan asetat anhidrida dalam etil asetat terkatalisis natrium bikarbonat. Hasil *O*-asetilasi khalkon diepoksidasi melalui reaksi *Algar-Flynn-Oyamada* (AFO) selama 2 jam dan diperoleh 4'-kloroflavanonol. Elusidasi struktur 2'-hidroksi-4-klorokhalkon dan 4'-kloroflavanonol ditentukan dengan spektrometer UV-Vis, FT-IR, GC-MS, <sup>1</sup>H-, <sup>13</sup>C-NMR dan diuji sitotoksitas secara *in vitro* terhadap sel kanker HeLa, T47D, WiDr dan sel Vero.

Senyawa 2'-hidroksi-4-klorokhalkon yang dihasilkan berupa kristal berwarna kuning dengan rendemen 90,01 %. Reaksi AFO menghasilkan 4'-kloroflavanonol berupa kristal berwarna *cream* dengan rendemen 40,82 %. Nilai IC<sub>50</sub> 4'-kloroflavanonol terhadap sel HeLa, T47D, WiDr dan Vero berturut-turut 285.32; 46.88; 998.12 dan 31221.09 µg/mL. Nilai IC<sub>50</sub> 2'-hidroksi-4-klorokhalkon berturut-turut 19.71; 33.18; 20.61 dan 148.85 µg/mL. Hasil penelitian ini menunjukkan 4'-kloroflavanonol aktif menghambat pertumbuhan sel kanker T47D dan 2'-hidroksi-4-klorokhalkon aktif menghambat pertumbuhan sel kanker HeLa, T47D dan WiDr.

Kata kunci : Algar-Flynn-Oyamada, khalkon, 4'-kloroflavanonol, sitotoksitas, antikanker.

***SYNTHESIS OF 2-(4-CHLOROPHENYL)-3-HYDROXYCHROMAN-4-ONE  
AND 3-(4-CHLOROPHENYL)-1-(2-HYDROXYPHENYL)PROP-2-EN-1-ONE  
WITH ITS CYTOTOXICITY ASSAY AGAINST SEVERAL CANCER CELLS***

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**ABSTRACT**

Synthesis and *in vitro* cytotoxicity test of 2-(4'-chlorophenyl)-3-hydroxychroman-4-one and 3-(4-chlorophenyl)-1-(2-hydroxyphenyl)prop-2-en-1-one or and have been accomplished. This study is aimed to obtain anticancer compound and the cytotoxicity activity of synthesized tested against HeLa, T47D, WiDr cancer cell and Vero cell.

Chalcone synthesis was performed by *Claisen-Schmidt* reaction between 4-chlorobenzaldehyde and 2-hydroxyacetophenone in the presence of NaOH 30 % as catalyst. Acetylation of phenol chalcone was performed using acetic anhydride in ethyl acetate catalyzed by sodium bicarbonate. The result of 2'-acetyl chalcone is epoxidized through *Algar-Flynn-Oyamada* reaction for 2h to produce the 4'-chloroflavanonol. Structure elucidation of 2'-hydroxy-4-chlorochalcone and 4'-chloroflavanonol was determined by UV-Vis, FT-IR, GC-MS, <sup>1</sup>H- <sup>13</sup>C-NMR spectrometers and anticancer activity was done by *in vitro* cytotoxicity assay against HeLa, T47D, WiDr cancer cell and Vero.

2'-hydroxy-4-chlorochalcone compound was yielded as yellow crystal in 90.01 %. The AFO reaction produced 4'-chloroflavanonol compound as *cream* crystal in 40.82 %. The cytotoxicity test of the resulted 4'-chloroflavanonol against HeLa, T47D, WiDr dan Vero cells gave an IC<sub>50</sub> value of 285.32; 46.88; 998.12; 31221.09 µg/mL, respectively. 2'-hydroxy-4-chlorochalcone gave an IC<sub>50</sub> value of 19.71; 33.18; 20.61; 148.85 µg/mL, respectively. It was concluded that 4'-chloroflavanonol actively inhibits the growth of T47D cancer cell and 2'-hydroxy-4-chlorochalcone was active to inhibit the growth of HeLa, T47D and WiDr cancer cell.

Keyword :Algar-Flynn-Oyamada, chalcone, 4'-chloroflavanonol, cytotoxicity, anticancer.