

SINTESIS 7-HIDROKSI-4'-METOKSIFLAVANON DAN UJI SITOTOKSIK PADA SEL KANKER SERVIKS (HeLa) DAN SEL KANKER KOLON (WiDr) SECARA *IN VITRO*

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INTISARI

Telah dilakukan sintesis senyawa 7-hidroksi-4'-metoksiflavanon dengan menggunakan bahan awal *p*-anisaldehida hasil derivatisasi dari anetol yang terkandung di dalam minyak adas. Senyawa 7-hidroksi-4'-metoksiflavanon diuji sitotoksik terhadap sel kanker serviks dan kolon (sel HeLa dan WiDr) untuk mengetahui potensi senyawa tersebut sebagai kandidat agen antikanker.

Sintesis dilakukan melalui dua tahap reaksi. Pada tahap pertama sintesis senyawa intermediet 2',4'-dihidroksi-4-metoksikhalkon. Tahap kedua siklisasi senyawa 2',4'-dihidroksi-4-metoksikhalkon menjadi senyawa 7-hidroksi-4'-metoksiflavanon. Sintesis senyawa 2',4'-dihidroksi-4-metoksikhalkon dilakukan dengan cara pengadukan pada suhu ruang selama 48 jam dengan katalis KOH. Siklisasi senyawa 2',4'-dihidroksi-4-metoksikhalkon menjadi 7-hidroksi-4'-metoksiflavanon dilakukan dengan cara refluks selama 12 jam di dalam pelarut etanol dengan katalis H₂SO₄. Uji sitotoksik senyawa 7-hidroksi-4'-metoksiflavanon secara *in vitro* dilakukan dengan menggunakan metode MTT. Senyawa hasil sintesis dianalisis dengan spektrofotometer UV-Vis, FTIR, GC-MS, ¹H dan ¹³C NMR.

Senyawa 7-hidroksi-4'-metoksiflavanon berhasil disintesis dan diperoleh padatan berwarna kuning terang dengan titik leleh 172-174 °C serta rendemen sebesar 56,67%. Uji sitotoksik menghasilkan nilai IC₅₀ yang terukur sebesar 40,13 µg/mL terhadap sel HeLa dan 37,85 µg/mL terhadap sel WiDr. Berdasarkan nilai IC₅₀ yang terukur senyawa 7-hidroksi-4'-metoksiflavanon mempunyai aktivitas sitotoksik yang cukup aktif dan dapat berpotensi sebagai kandidat agen antikanker.

Kata Kunci: sintesis, flavanon, antikaker, uji sitotoksik, sel HeLa dan WiDr.

SYNTHESIS OF 7-HIDROXY-4'-METHOXYFLAVANONE AND CYTOTOXIC TEST IN VITRO AGAINST CERVICAL CANCER CELL (HeLa) AND COLON CANCER CELL (WiDr)

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ABSTRACT

Synthesis of 7-hydroxy-4'-methoxyflavanone has been conducted using *p*-anisaldehyde which derived from anetol of fennel oils. The 7-hydroxy-4'-methoxyflavanone has been tested their cytotoxicity against cervical and colon cancer cells (HeLa and WiDr cell lines) to detemine the potential of the compound as a candidate of anticancer agent.

Synthesis has been performed in two steps. The first step was synthesis of 2',4'-dihydroxy-4-methoxychalcone as an intermediate. The second step was cyclization of the chalcone to the flavanone. Synthesis of the chalcone was carried out by stirring at room temperature for 48 hours in the presence of KOH as catalyst. Cyclization of the chalcone to the flavanone was carried out by refluxing for 12 hours in ethanol in the presence of H₂SO₄ as catalyst. Cytotoxicity of 7-hydroxy-4'-methoxyflavanone was tested *in vitro* by MTT assay method. The compounds were analyzed by UV-Vis, FTIR, GC-MS, ¹H and ¹³C NMR.

The result showed that 7-hydroxy-4'-methoxyflavanone was successfully obtained as a bright yellow solids with melting points 172-174 °C, and yield percentage of 56.67%. Cytotoxic test gave the IC₅₀ values of HeLa and WiDr cell lines were 40.13 and 37.85 µg/mL, respectively. Based on the IC₅₀ values were measured the 7-hydroxy-4'-methoxyflavanone has cytotoxicity quite active and can be potentially as a candidate of anticancer agent.

Keywords: synthesis, flavanone, anticancer, HeLa and WiDr cell lines