SINTESIS TURUNAN KALKON DARI 3-ASETILKUMARIN DAN UJI AKTIVITASNYA SECARA *IN VITRO* SEBAGAI KANDIDAT ANTIKANKER

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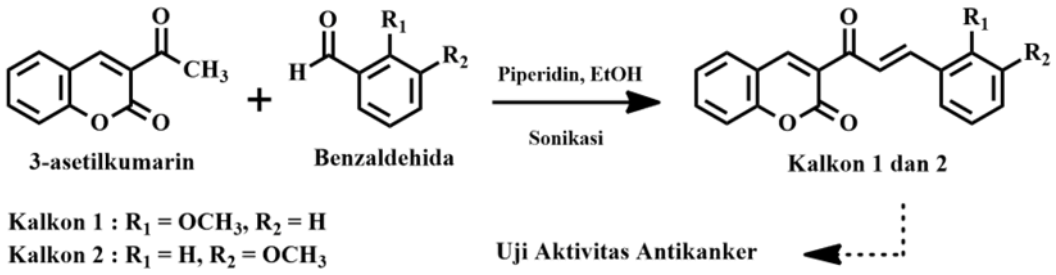
INTISARI

Telah dilakukan sintesis senyawa turunan kalkon berbasis 3-asetilkumarin dan uji aktivitasnya terhadap sel kanker. Senyawa turunan kalkon **1** dan **2** disintesis melalui reaksi kondensasi *Claisen-Schmidt* antara 3-asetilkumarin dengan 2-metoksibenzaldehida dan 3-metoksibenzaldehida dalam pelarut etanol dan katalis piperidin dengan metode sonikasi selama 4 jam pada suhu 60 °C. Produk sintesis kemudian dielusidasi strukturnya dengan FTIR, KLT densitometer, ^{1}H-NMR, dan ^{13}C-NMR. Uji aktivitas antikanker dari senyawa kalkon dilakukan secara *in vitro* terhadap sel kanker serviks (HeLa), kolon (WiDr), dan sel normal (Vero).

Reaksi kondensasi *Claisen-Scmidt* menghasilkan kalkon **1** yang berwujud padatan kuning kecoklatan dengan titik leleh 172-174 °C dan persen hasil 53% dengan kemurnian 89%. Sementara kalkon **2** berupa padatan coklat dengan titik leleh 165-166 °C dan persen hasil 46% dengan kemurnian 90%. Uji sitotosisitas terhadap sel kanker HeLa, WiDr, dan Vero menunjukkan bahwa kalkon **1** memiliki aktivitas terbaik terhadap sel kanker WiDr dengan nilai IC_{50} 3,72 µg/mL dan indeks selektivitas sebesar 6,77.

Kata kunci: 3-asetilkumarin, antikanker, kalkon.



SYNTHESIS OF CHALCONE DERIVATIVES FROM 3-ACETYLCOUMARIN AND THEIR ACTIVITY ASSAY *IN VITRO* AS ANTICANCER CANDIDATES

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ABSTRACT

The synthesis of 3-acetylcoumarin-based chalcone derivatives and their evaluation for anticancer activity has been carried out. Chalcones **1** and **2** were synthesized through a Claisen-Schmidt condensation reaction between 3-acetylcoumarin and either 2-methoxybenzaldehyde or 3-methoxybenzaldehyde, using ethanol as the solvent and piperidine as the catalyst. The reaction was carried out under sonication for 4 hours at 60 °C. The resulting products were then characterized using FTIR, TLC densitometry, ^{1}H-NMR, and ^{13}C-NMR spectroscopy. The synthesized chalcone derivatives were tested *in vitro* for anticancer activity against HeLa (cervical cancer) and WiDr (colon cancer) cell lines, as well as normal Vero cells.

The Claisen-Schmidt condensation reaction produced chalcone **1** as a brownish-yellow solid with a melting point of 172-174 °C, a yield of 53%, and a purity of 89%. Chalcone **2** was obtained as a brown solid with a melting point of 165-166 °C, a yield of 46%, and a purity of 90%. Cytotoxicity assays against HeLa, WiDr, and Vero cells revealed that chalcone **1** exhibited the most potent activity with an IC_{50} value of 3.72 µg/mL and a selectivity index of 6.77 against WiDr cancer cells.

Keywords: 3-acetylcoumarin, anticancer, chalcone.