Efek Derivat Asam Salisilat Teralkilasi Terhadap Sel Kanker HeLa = The Effects of Alkylated Salicylic Acid on Cervical HeLa Cancer Cell Line

Priscilla Ardianto, author

Abstrak

Latar belakang: Kanker serviks merupakan salah satu jenis kanker terbanyak pada wanita. Studi terdahulu telah mendemonstrasikan hubungan antara proses inflamasi yang dimediasi oleh COX-2 dengan proliferasi sel kanker. Asam salisilat telah diteliti dan berpotensi untuk menjadi terapi antikanker karena dapat menghambat enzim COX.
Tujuan: Penelitian ini diadakan untuk menilai dan membandingkan efek derivat asam salisat teralkilasi terhadap proliferasi sel kanker serviks HeLa.
Metode: Derivat asam salisilat teralkilasi disintesis dengan mereaksikan asam salisilat dan n-alkohol menggunakan teknik esterifikasi Steglich. Sifat fisika dan kimia produk reaksi ditentukan dengan observasi, melting point apparatus, dan pelarutan dalam air. Produk reaksi dianalisa menggunakan teknik kromatografi lapis tipis. Derivat asam salisilat teralkilasi diuji menggunakan teknik MTT untuk mengetahui persentase inhibisi dan nilai IC50 terhadap sel HeLa. Nilai IC50 tersebut dibandingkan dengan nilai IC50 senyawa awal asam salisilat.
Hasil: Profil kromatografi lapis tipis dari asam salisilat teralkilasi menggunakan eluen non-polar (n-heksana:etil asetat = 4:1) adalah: metil salisilat (Rf=0.75), etil salisilat (Rf=0.78), butil salisilat (Rf=0.90), isoamil salisilat (Rf=0.95), dan oktil salisilat (Rf= 0.81). Hasil uji MTT menunjukan bahwa baik asam salisilat maupun derivat teralkilasinya menunjukan aktifitas sitotoksik terhadap sel HeLa.
Diskusi: Semua derivat asam salisilat teralkilasi yang diuji memiliki efek anti-proliferatif yang lebih baik dari senyawa awal asam salisilat. Namun, efek tersebut tidak sebaik efek proliferatif dari obat anti-kanker doxorubicin. Panjang rantai alkil tidak mempengaruhi efek anti-proliferatif. Butil salisilat memiliki efek anti-proliferatif yang terbaik dibandingkan dengan derivat asam salisilat teralkilasi lainnya.
Kesimpulan: Asam salisilat teralkilasi, terutama butil salisilat, memiliki potensi untuk dikembangkan sebagai obat antikanker serviks.
.....Background: Cervical cancer is one of the most frequently found cancer in women. Various studies have demonstrated the correlation between inflammation mediated by COX-2 enzyme and cancer proliferation. Salicylic acid has been studied for its anti-cancer properties due to its ability in inhibiting COX enzymes.
Purpose: This research was conducted to observe and compare the effects of alkylated salicylic acid derivatives on the proliferation of cervical cancer HeLa cell.
Methods: Alkylated salicylic acid was synthesized by reacting salicylic acid with n-alcohol through Steglich esterification. Its products' physical and chemical properties were determined by observation, meting point apparatus, and dissolving them in water. The products of reaction were analysed by thin layer chromatography. Alkylated derivatives of salicylic acid were tested using MTT assay to determine their percentage inhibition and IC50 value against HeLa cell. IC50 values were compared with the IC50 value of salicylic acid.
Result: The thin layer chromatography profile for alkylated salicylic acids using non-polar eluent (n-hexane

: ethyl acetate = 4 :1) are as: methyl salicylate (Rf=0.75), ethyl salicylate (Rf=0.78), butyl salicylate (Rf=0.90), isoamyl salicylate (Rf=0.95), and octyl salicylate (Rf=0.81). The MTT result shows that both salicylic acid and its alkylated derivatives showed cytotoxic activity.
Discussion: All alkylated derivatives of salicylic acid has better anti-proliferative activity compared to salicylic acid, however those properties were lacking compared to established anti-cancer drug doxorubicin. The length of alkyl chain was not related with anti-proliferative activity. Out of all alkylated salicylic acid derivatives, butyl salicylate had the best anti-proliferative activity