Penggunaan Kembali Obat Simvastatin sebagai Kandidat Antikanker Terhadap Lini Sel Kanker Paru-Paru = Drug Repurposing of Simvastatin as an Anticancer Candidate for Lung Cancer Cell Line

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Abstrak

Penelitian ini mengevaluasi potensi simvastatin sebagai agen antikanker terhadap sel kanker paru-paru A549. Simvastatin, yang umumnya digunakan sebagai obat penurun kolesterol, diuji kemampuannya dalam menghambat viabilitas sel kanker dan meningkatkan spesies oksigen reaktif (ROS) dalam sel A549. Uji MTS digunakan untuk mengukur viabilitas sel dan menentukan nilai IC50, sedangkan uji DCFH-DA digunakan untuk mengukur produksi ROS. Penelitian ini menggunakan variasi konsentrasi simvastatin (25 Î¼M, 50 Î¼M, 100 Î¼M) dan variasi waktu (0 hari, 2 hari, 4 hari, 6 hari). Hasil penelitian menunjukkan bahwa simvastatin
secara signifikan menurunkan viabilitas sel A549 seiring dengan peningkatan konsentrasi dan durasi pengobatan. Konsentrasi 100 Î¼M setelah 144 jam berhasil menghilangkan seluruh viabilitas sel A549. Simvastatin juga menunjukkan aktivitas sitotoksik tertinggi pada konsentrasi 28.07 Î¼M (11.75 Î¼g/mL) setelah 144 jam. Selain itu, simvastatin meningkatkan kadar ROS dalam sel A549, dengan konsentrasi 50 Î¼M selama 96 jam menghasilkan peningkatan ROS tertinggi sebesar 0.34%. Temuan ini menunjukkan bahwa simvastatin berpotensi sebagai agen antikanker yang efektif terhadap sel kanker paru-paru A549.
.....This study evaluates the potential of simvastatin as an anticancer agent against A549 lung cancer cells. Simvastatin, commonly used as a cholesterol-lowering drug, was tested for its ability to inhibit cancer cell viability and increase reactive oxygen species (ROS) in A549 cells. The MTS assay was utilized to measure cell viability and determine the IC50 value, while the DCFH-DA assay was employed to measure ROS production. The study used varying concentrations of simvastatin (25 Î¼M, 50 Î¼M, 100 Î¼M) and different time points (0 days, 2 days, 4 days, 6 days). The results demonstrated that simvastatin significantly reduced A549 cell viability with increasing concentration and duration of treatment. A concentration of 100 Î¼M after 144 hours eliminated A549 cell viability. Simvastatin also exhibited the highest cytotoxic activity at a concentration of 28.07 Î¼M (11.75 Î¼g/mL) after 144 hours. Furthermore, simvastatin increased ROS levels in A549 cells, with a concentration of 50 Î¼M over 96 hours resulting in the highest ROS increase of 0.34%. These findings indicate that simvastatin has potential as an effective anticancer agent against A549 lung cancer cells.