Analisis termogram sel kanker paru A549 menggunakan differential scanning calorimetry = Thermogram analysis of A549 lung cancer cells using differential scanning calorimetry

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Abstrak

Kanker paru merupakan penyebab utama keganasan di dunia. Kanker paru memiliki insidensi dan angka kematian yang cukup besar pada populasi laki-laki maupun perempuan. Diperlukan metode diagnosis dan pemantauan terapi yang efektif untuk mengatasi masalah kanker paru di dunia. Penelitian ini merupakan studi eksperimental secara in vitro dengan sel A549. Kultur sel A549 ditumbuhkan dalam medium DMEM lalu diekstraksi dengan RIPA buffer. Sel A549 dengan dan tanpa pemberian doxorubicin, serta sel normal dibuat masing-masing sebanyak 4 sampel dan dianalisis menggunakan Differential Scanning Calorimetry (DSC).

Hasil analisis profil termogram DSC yang didapatkan berupa titik lebur dan entalpi lebur. Rata-rata titik lebur dan entalpi lebur dari tiap sampel dianalisis secara statistik menggunakan uji Anova satu arah dilanjutkan dengan uji post-hoc bonferroni. Penelitian ini menunjukkan adanya perbedaan bermakna rata-rata titik lebur antara sel normal dan sel A549 serta antara sel A549 dan sel A549 dengan pemberian doxorubicin. Berdasarkan hasil ini, DSC memiliki potensi untuk digunakan sebagai alat diagnosis dan pemantauan terapi kanker paru.

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Lung cancer is the major cause of malignancy in the world. Lung cancer has significant incidence and mortality rate in both male and female populations. An effective method of diagnosis and monitoring therapy is needed to overcome lung cancer problems in the world. This research is an experimental in vitro study with A549 cell line. A549 cell culture was grown in DMEM medium and extracted with RIPA buffer. A549 cells with and without doxorubicin treatment, and normal cell, were prepared 4 samples each and analyzed using Differential Scanning Calorimetry (DSC).

The results of the DSC thermogram profiling obtained in the form of melting point and enthalpy. The average melting point and enthalpy of each sample were analyzed statistically using one-way ANOVA test followed by Bonferroni post-hoc test. This study showed a significant difference in the average melting point between normal cell and A549 cell, also between A549 cell and A549 cell with doxorubicin treatment. Based on these results, DSC has the potential to be used as a diagnostic and therapeutic monitoring tool for lung cancer.