

Pengaruh medan listrik terhadap kanker darah uji sel in vitro sel raji dan sel limfosit = Electric field effect on blood cancer in vitro test on raji cell and lymphocyte cell

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Abstrak

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Terapi kanker menggunakan medan listrik telah dikembangkan sebelumnya. Terapi ini bekerja berdasarkan prinsip polarisasi sel kanker yang sedang membelah ketika diberi medan listrik dalam waktu tertentu. Dalam penelitian ini telah dilakukan uji in-vitro pada sel kanker raji dan sel normal limfosit. Sel ditanam pada 96 microplate kemudian diberi perlakuan input medan listrik dengan variasi frekuensi (250 Hz & 100 kHz), tegangan (20V, 30V, 50V), jenis sinyal (kotak dan sinusoidal) dan lama perlakuan (0 jam, 48 jam, 96 jam dan 144 jam).

Setelah sel diberi perlakuan, jumlah sel dihitung menggunakan Hemocytometer untuk morfologi sel dan MTT untuk pewarnaan sel. Hasil penelitian menunjukkan

bahwa medan listrik berpengaruh pada pertumbuhan sel (menginduksi). Pada sel limfosit pengaruh medan listrik dapat terlihat secara signifikan pada jam ke-48.

Akan tetapi, pada sel raji pengaruh medan listrik baru dapat terlihat setelah perlakuan 96 jam. Input medan listrik optimal untuk dapat memberi efek letal

(cedera) pada sel raji tanpa berpengaruh toxic pada sel normal yaitu medan listrik sinyal kotak 20 volt dengan frekuensi 100 kHz.

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ABSTRACT

Cancer therapy using electric fields have been developed previously. It works based on polarized division cancer cells when exposed by electric field in a certain

time. In this study, raji and lymphocyte cells in-vitro exposed to an external electrical field has been done.

Cultured cells on 96 microplate then given electric

field treatment with variety input of frequency (250 Hz and 100 kHz), voltage (20 V, 30 V, and 50 V), the signal type (square and sine), and time treatment (0 hours,

48 hours, 96 hours, and 144 hours). Calculation of number cells method using Hemocytometer and MTT for cell morphology and cell staining absorption, respectively. The results show that electric field can induce

cells. The influence of an electric field in lymphocyte cells show significant effect after 48-hours treatment, yet raji cells can only be seen after 96-hours treatment. The optimal treatment of the electric field to be able

provide lethal effects in raji cells without toxic effect in normal cells is input square signal 20 Volt and 100 kHz.;

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