

Pengaruh perlakuan variasi medan listrik terhadap tingkat letal cell line MCF-7 (human breast cancer) in vitro dan pengukuran nilai kapasitansi sel = Effect of electric field treatment variation against lethal level cell line MCF-7 human breast cancer in vitro and measurement of cell capacitance value

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Abstrak

[ABSTRAK

Electro Capacitive Cancer Therapy (ECCT) telah dikembangkan untuk terapi kanker payudara dengan medan elektrostatik dari gelombang sinyal yang berasal dari elektroda kapasitif. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh perubahan nilai beda potensial dan output gelombang sinyal yang dihsilkan ECCT terhadap pertumbuhan sel kanker dan cedera sel yang menyebabkan kematian sel. Dilakukan eksperimen in vitro menggunakan cell line MCF-7 (kanker payudara manusia) selama 24, 48 dan 72 jam perlakuan. Kemudian dilakukan perhitungan jumlah sel dengan hemocytometer dan pengukuran kapasitansi sel sebelum dan sesudah diberikan perlakuan. Hasil eksperimen menunjukkan bahwa ECCT standar sinyal kotak 18 Volt dan ECCT non standar sinyal kotak 31.2 Volt dapat menghambat pertumbuhan sel dan hasil morfologi sel tampak cedera yang mengindikasi adanya kematian, sedangkan ECCT standar sinyal sinusoidal 18 Volt mampu menginduksi pertumbuhan sel sehingga jumlahnya semakin banyak jika dilihat dari koefisien pertumbuhan yang tinggi. Pengukuran nilai kapasitansi sel menunjukkan korelasi antara banyaknya jumlah sel dengan besarnya nilai kapasitansi yang terukur. Peningkatan nilai kapasitansi dapat menunjukkan penambahan aktifitas kelistrikan sel dan tingkat keganasan dari sel kanker.

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ABSTRACT

Electro Capacitive Cancer Therapy (ECCT) has been developed for breast cancer therapy that generated electrostatic field from electrical wave in capacitive electrode. The purpose of this research is to find out the effect of potential difference and signal wave output ECCT to cancer cell growth and cell injury that leads to lethal cell. In this study, in vitro experiment use MCF-7 cell line (human breast cancer) during 24, 48 and 72 hours treatment and than measured the number of cell with hemocytometer and value of capacitance after and before treatment. The results showed that potential ECCT square signal wave standard 18 Volt and square signal non-standard 31.2 Volt can inhibit cancer cell growth and cell morphology results seem to indicate the existence of injury deaths. While, from growth coefficient, ECCT sinusoidal signal wave standard 18 Volt can increase of

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