Low-Wavelength Radiation Effect on PARP1 inhibitor Veliparib

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Radiosensitizer therapy for cancer treatment appeared as an alternative to more conventional strategies, such as radiotherapy, surgical intervention and chemotherapy[1]. Among the therapeutic routes proportioned by these agents, DNA repair inhibitors offer the greatest potential as a coadjutant to cancer radiotherapy. Examples such as Veliparib, Rucaparib and Niraparib act by specifically inhibiting PARP1(Poly ADP-ribosyl polymerase1) enzymatic activity, through active physical bind to this protein catalytic domain[1,2]. PARP1 is commonly associated to the Base Excision Repair (BER) repair pathway in cells, and acts as central node by activation and recruitment of downstream effector proteins, as well as stabilizers of breakage loci[3]. Through this therapeutic course, cell viability is undermined by taking advantage of the already compromised repair mechanisms in tumour cells, meanwhile excessive DNA damage is induced by radiation[2,3].

Nevertheless, as all therapeutic approaches, complications, may arise related to cytotoxic side effects on normal cells and tissues and so, lipidic nano-delivery systems presents a a solution to this predicament, besides the clear advantages related to this systems biocompatibility, biodegradability and low toxicity[4].

Thus, the aims of this work were to (1) analyse the effect of low wavelength radiation on PARP1 inhibitor, (2) test lipidic formulations and (3) survey a suitable liposome formulation. First goal was done by means of a 254 nm UVC germicide lamp, with liposomes being produced by thin film hydration and encapsulation by organic phase supplementation. Radiation effects upon PARP1 inhibitor and liposomes were assessed by means of spectroscopic techniques.

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