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PROGRAM AND ABSTRACT BOOK

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Ilustração da Capa: Alexandre Takashi

EB.14 - Red LED irradiation impacts the cytotoxic response of murine breast cancer cells to ionizing radiation

Mayara Santana Pinto [1], **Camila Ramos Silva[1]**, Camila de Almeida Salvego[1], Martha Ribeiro Simões[1]
[1]CELAP, Instituto de Pesquisas Energéticas e Nucleares (São Paulo, Brasil)

Breast cancer is a disease of worldwide importance since it is considered the 5th leading cause of cancer deaths. Triple-negative breast cancer (TNBC) is a molecular subtype that presents resistance to conventional radiotherapy, demanding high doses of ionizing radiation (IR) for a prolonged period of treatment. On the other hand, low-level light irradiation (LLLI) has been studied to sensitize cells before IR exposure. However, the literature is poor regarding the association of both techniques in TNBC cells. Thus, we aimed to assess the effect of LLLI before IR exposure on two TNBC cell lineages. MDA-MB-231 (human TNBC) and 4T1 (murine TNBC) were cultivated, seeded at a density of 2.5 x 10^5 cells/cm², and maintained in an incubator (37ºC, 5% of CO_2) overnight. LLLI was performed with a red LED (λ= 660 ± 11 nm, 38.2 mW/cm²) delivering energies of 1.2 J and 6.0 J. One-h after LLLI, the cells were submitted to both 2.5 and 5.0 Gy doses from a ^{60}CO source. After 24-h, mitochondrial activity (MA) was quantified by MTT assay with n= 9/group. Our data showed that 4T1 cells exposed to LLLI at 1.2 J exhibited higher MA than cells exposed to IR2.5. In contrast, cells exposed to 6 J of LLLI showed lower MA than IR5. Concerning MDA-MB231 cells, no statistically significant differences were noticed among groups regardless of IR and LLLI doses. These findings indicate that LLLI before IR could sensitize only murine breast cancer. Besides, an appropriate combination of IR and LLLI doses seems to play a role to kill TNBC cells.

Keywords: Photobiology, radiotherapy, radiomodifier
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EB.15 - Fetuin detection by a promising optical-magnetic multimodal nanoprobe functionalized with Cramoll lectin

Weslley Felix de Oliveira[1,2], Mariana Paola Cabrera[3], João Victor Araújo de Lima [2], Luana Cassandra Breitenbach Barroso Coelho[1], Giovannia Araújo de Lima Pereira[3], Beate Saegesser Santos[4], Paulo Euzébio Cabral Filho[2], Maria Tereza dos Santos Correia[1], Adriana Fontes[2]
[1]Departamento de Bioquímica, Universidade Federal de Pernambuco (PE, Brazil), [2]Departamento de Biofísica e Radiobiologia, Universidade Federal de Pernambuco (PE, Brazil), [3]Departamento de Química Fundamental, Universidade Federal de Pernambuco (PE, Brazil), [4]Departamento de Farmácia, Universidade Federal de Pernambuco (PE, Brazil)

Many researchers are seeking to develop smart nanomaterials due to the diversity of potential applications. Bimodal nanoprobes (BNPs) have gained attention, especially those consisted of quantum dots (QDs) and iron oxide nanoparticles (SPIONs), due to the possibility of combining the advantageous superparamagnetic response of SPIONs and the singular optical properties of QDs. Furthermore, BNPs can be conjugated with biomolecules, such as Cramoll lectin, a glucose/mannose-binding protein purified from *Cratylia mollis* seeds, to become site-specific. To obtain a multimodal system (BNPs-Cramoll) to detect the fetuin glycoprotein whose levels may be altered in pathologies. Carboxyl-coated QDs were covalently combined to aminated SPIONs, and then BNPs were conjugated with Cramoll. The optical properties and the zeta potential of nanosystems were determined. *Candida albicans* yeasts were incubated with BNPs-Cramoll and analyzed through fluorescence microscopy and flow cytometry to evaluate the specificity/efficiency of the nanoprobe. Fetuin detection was performed through fluorimetry. The QD absorption band was absent in the supernatant of BNPs, indicating effective conjugation with SPIONs. There was a redshift in the maximum emission of BNPs compared to bare QDs; lectin conjugation did not cause a spectral shift. BNPs-Cramoll had a less negative surface charge than BNPs. Approximately 90% of yeast cells were homogeneously labeled by BNPs-Cramoll and after inhibition with methyl-α-D-mannopyranoside, a labeling reduction of *ca.* 3x was observed. When incubated with different concentrations of fetuin (0.675-10.8 mg/mL), a linear decay in the BNPs-Cramoll fluorescence was identified. Incubation with bovine serum albumin (control) did not significantly decrease the fluorescence. BNPs-Cramoll showed to be a specific fluorescent-magnetic nanoprobe able to detect fetuin, promising for the biosensing of this glycoprotein.

Keywords: quantum dot, magnetic nanoparticle, lectin
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