

## **Effects of photobiomodulation on breast tumor-bearing mice**

Camila Ramos Silva, Saulo Pereira Toledo and Martha Simões Ribeiro

*Centro de Lasers e Aplicações, Instituto de Pesquisas Energéticas e Nucleares – IPEN-CNEN/SP, São Paulo, SP, Brazil*

ramos.camilasilva@gmail.com

Photobiomodulation (PBM) has gained great prominence in health areas due to the search for less invasive treatments. However, its use is still not indicated in cancer patients due to lack of clarification about its effects on tumor cells. The aim of this work was to evaluate the effects of PBM on breast tumor-bearing mice. Nine BALB/c female mice (6 weeks old) received  $2 \times 10^6$  breast cancer cells (4T1-Luc) into the mammary fat pad and after two weeks, when the tumor volume was about  $0.1 \text{ cm}^3$ , the animals were divided into control (n=3), PBM30 and PBM150 groups. Test groups were submitted to PBM in a single session using a red laser ( $\lambda = 660 \text{ nm}$ , 40 mW) with fluences of  $30 \text{ J/cm}^2$  and  $150 \text{ J/cm}^2$ , respectively. The tumor progression was monitored by a caliper and bioimaging through bioluminescence of 4T1-Luc cells. The anti-fatigue effect of PBM was assessed by a forced swimming test. Our results showed that 3 weeks post-PBM, the lower fluence promoted an increase of the tumor volume compared to control with no treatment. On the other hand, the higher fluence was able to arrest tumor progression as well as increase the swimming time. Taken together, our results suggest that PBM triggers opposite effects on breast tumor-bearing mice depending on fluence used.