

عنوان مقاله:

A review of noninvasive bioluminescence imaging and its current applications in breast cancer therapies

محل انتشار:

نهمین کنگره بین المللی سرطان پستان (سال: 1392)

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خلاصه مقاله:

**Introduction:** In vivo bioluminescence imaging (BLI) is a kind of molecular imaging method based on producing light as a result of the reaction between luciferase enzyme and its substrates. Light emitted from cells expressing luciferase can be implemented for determining cell viability and the analysis of cellular and molecular events within the cells. Bioluminescence imaging, as a repetitive and sensitive approach, is an appropriate method especially for cancer studies which are mostly operated on small animals. Breast cancer as the most important cause of cancers in women which is still a challenge in its treatment and prognosis can be one of the main targets for this modern method. **Methods and materials:** Breast cancer cell lines expressing luciferase are prepared by transfecting a related cell line with gene carriers containing luciferase gene. They can be then transferred into a laboratory animal. A suitable luciferase substrate is injected in the neoplastic tissue and then the imaging process will be done. **Results and discussion:** Using such process, we are able to have an accurate analysis of tumor behavior in xenograft models. Researchers have succeeded in the early prognosis of breast cancer metastasis to bones, adrenal glands and lung which are hardly assessable using conventional methods. Studies on breast cancer revealed the role of TGF- $\beta$  in bone metastasis, the role of  $\beta$ -arrestin and CXCR4 and also the endoprotease activity of Furin in breast cancer through gene expression analysis, protein-protein interaction and protein stability and function studies respectively. **Conclusions:** Major application of the described method is to xenograft models of breast cancer and it offers rapid and highly sensitive detection options for preclinical assessment of anticancer therapies in vivo and is an intriguing technique with promising application and usages. This paper is going to review the newest changes in bioluminescence imaging and their application in breast cancer therapies.

کلمات کلیدی:

Bioluminescence, In vivo imaging, Breast cancer, Cancer therapy

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