Title

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Authors

Gastelum, Gilbert
Chang, Eric Y
Shackleford, David
et al.

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Multimodal Bioluminescent and Positronic-emission Tomography/Computational Tomography Imaging of Multiple Myeloma Bone Marrow Xenografts in NOG Mice

Gilbert Gastelum[1], Eric Y Chang[2], David Shackleford[3], Nicholas Bernthal[3], Jeffery Kraut[4], Kevin Francis[5], Victoria Smutko[1], Patrick Frost[6]

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Abstract

Multiple myeloma (MM) tumors engraft in the bone marrow (BM) and their survival and progression are dependent upon complex molecular and cellular interactions that exist within this microenvironment. Yet the BM microenvironment cannot be easily replicated in vitro, which potentially limits the physiologic relevance of many in vitro and ex vivo experimental models. These issues can be overcome by utilizing a xenograft model in which luciferase (LUC)-transfected 8226 MM cells will specifically engraft in the mouse skeleton. When these mice are given the appropriate substrate, D-luciferin, the effects of therapy on tumor growth and survival can be analyzed by measuring changes in the bioluminescent images (BLI) produced by the tumors in vivo. This BLI data combined with positronic-emission tomography/computational tomography (PET/CT) analysis using the metabolic marker 2-deoxy-2-(^{18}F)fluoro-D-glucose (^{18}F-FDG) is used to monitor changes in tumor metabolism over time. These imaging platforms allow for multiple noninvasive measurements within the tumor/BM microenvironment.