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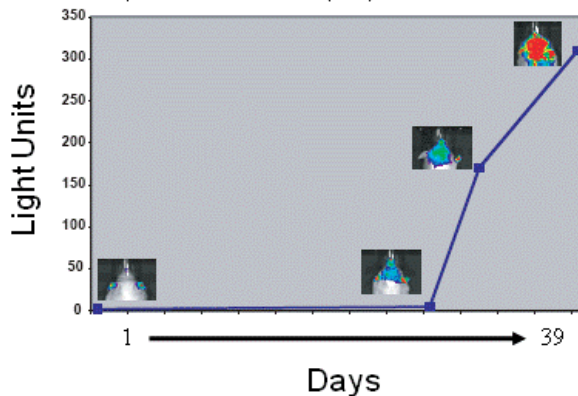
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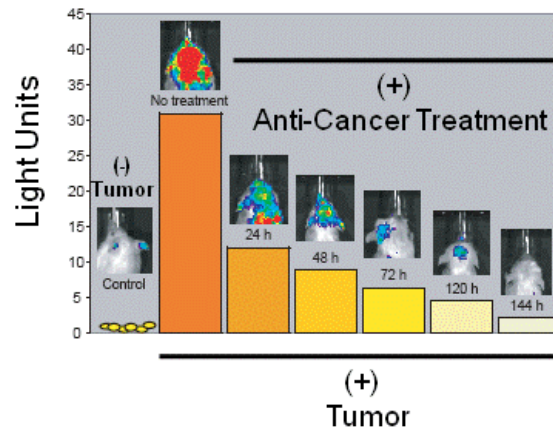
monitored over time using a single Ef-Luc Mouse.

The target market for the Ef-Luc mouse is preclinical CROs, biotech and pharma research and development operations, and academic researchers.

Brain tumor formation can be monitored over time using a single Ef-Luc mouse. The same Ef-Luc mouse was imaged every 3 days for 39 days. Light output correlates with brain tumor size as measured by histologic analysis (data not shown).
Adapted from *Nature Medicine* (2004) 10:1257-1260



Efficacy of anti-cancer treatment can be measured over time in a single Ef-luc mouse. A single tumor bearing Ef-Luc mouse was treated with an anti-cancer agent or left untreated and monitored for reduction in brain tumor proliferation for 6 days. Light output correlates with cessation of tumor cell proliferation measured by immunohistochemical staining (data not shown).
Adapted from *Nature Medicine* (2004) 10:1257-1260



Background

E2F1 is a transcription factor whose activity is repressed by the retinoblastoma protein (Rb), a master regulator of cell-cycle progression through the G₁ to S transition. A common feature in many distinct types of human malignancies is the loss of Rb function, resulting in upregulation of E2F1 transcriptional activity and dysregulation of cell-cycle control. Therefore, the Ef-Luc mouse can be considered a general reporter animal useful for the detection and imaging of multiple different tumor types.

The Ef-Luc mouse is an ideal tool for monitoring cell-cycle activity during tumor development in a living animal using bioluminescence imaging. Areas of abnormally high cell proliferation in the Ef-Luc mouse, namely cancerous cells, drive expression of luciferase. The resulting luciferase can be detected by injection of the Ef-Luc mouse with the luciferase substrate luciferin; luciferase oxidation of luciferin produces light that is then detected through the body of the mouse and is proportional to tumor cell burden.

Advantages

High sensitivity allows detection of small subcutaneous tumors (<1,000 cancer cells) and deeper lesions (1-3 cm deep), which can be undetectable by standard measurement methods.

Universal tumor detection increases the applicability of the Ef-Luc mouse model to multiple tumor types.
Quantitative measurement of tumor burden reveals subtle changes in tumor growth.
Rapid real-time imaging allows spatial and temporal resolution of tumor growth.
This noninvasive method with minimal toxicity allows repeated imaging of a single animal.
Fewer mice are needed per study, which reduces the cost of animal studies.

Areas of Application

Efficacy evaluation of anticancer treatments and therapies
Assessment of carcinogenic potential of compounds and environmental insults
Development of novel bioluminescent models of known cancer mouse models by cross-breeding
Evaluation of metastatic potential of primary tumors
Investigation of molecular mechanisms critical for tumor maintenance

References

Uhrbom L, et al. (2004) Nature Medicine. Nov; 10(11):1257-1260.

Lead Inventor

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Patent Information

U.S. patent issued: [7,041,869](#)

Contact Information

For more information, please contact TRMOTDRTM@mskcc.org.

Stage of Development

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