

LENTIVIRAL VECTORS WITH DUAL FLUORESCENCE/LUMINESCENCE REPORTERS

SUMMARY

Researchers at NCI developed twelve lentiviral vectors that express both fluorescent and luminescent markers as a single fusion protein under various gene promoters.

REFERENCE NUMBER

E-132-2011

PRODUCT TYPE

- Diagnostics
- Research Materials

KEYWORDS

- vectors
- tumor visualization
- bioluminescence
- fluorescence

COLLABORATION OPPORTUNITY

This invention is available for licensing.

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DESCRIPTION OF TECHNOLOGY

The National Cancer Institute's [Protein Expression Laboratory](#) seeks parties to co-develop dual luminescent/fluorescent cancer biomarkers.

In research settings, visualization of tumors or tumor cells is often done using either bioluminescence or fluorescence. However, both of these methods have shortcomings: bioluminescence is not sensitive enough to sort individual tumor cells, and fluorescence cannot be used effectively to view internal tumors and is best used with surface tumors.

Researchers at NCI developed twelve lentiviral vectors that express both fluorescent and luminescent markers as a single fusion protein under various gene promoters. By combining the two reporters into a single fusion protein, the tumor can be visualized within the animal as well as sorted from non-tumor cells

for post-necropsy experiments. The advantage of bioluminescent visualization allows for *in vivo* experiments that more closely simulate the biological development of tumors in organs, rather than at the skin surface. Additionally, since twelve different vectors with different gene promoters were constructed, they can be tested in individual tumor models to find the best vector for visualizing that particular tumor cell line. The vectors are able to sustain long-term expression of both visualization markers, depending on the cell type and promoter in each vector.

POTENTIAL COMMERCIAL APPLICATIONS

- Useful for experiments in which both *in vivo* and *in vitro* analysis is desired.
- For screening cancer cell lines and in tumor models for reporter gene activity.
- Useful in drug development.

COMPETITIVE ADVANTAGES

- The bioluminescent marker allows for effective visualization of deep (non-surface) tumors in mice.
- The fluorescence label permits efficient sorting of tumor cells from normal (non-labeled) cells after tumors are excised from the mice.
- The vectors allow *in vivo* experiments that more closely simulate the biological development of tumors in organs rather than at surface of skin.
- The vectors sustain long-term expression.

INVENTOR(S)

- Dominic Esposito (NCI)
- Chi-Ping Day (NCI)
- [Glenn T Merlino](#) (NCI)

DEVELOPMENT STAGE

- Prototype

PUBLICATIONS

Day, C.P.; *et al. Pigment Cell Melanoma Res.* 2009, 22(3):283-295. [PMID [19175523](#)]

PATENT STATUS

- **U.S. Filed:** None: Research Tool

THERAPEUTIC AREA

- Cancer/Neoplasm