

## 1 INTRODUCTION

Antineo is a **Contrat Research Organisation (CRO)** that offers preclinical services and expertise in **oncology** to accelerate the research programs of private companies and academic institutions. We offer *in-vitro* and *in-vivo* models representative of various tumors types (syngeneic or xenograft) including resistance models to standard of care.

Antineo's expertise in **oncopharmacology** enables a unique accompaniment for an optimal preclinical study design depending on state-of-the art and concurrent compounds in development.

Recently, we have developed new **Luciferase (Luc+) cell lines**, capable of metabolizing Luciferine. This new method based on **luminescence** allows us to track tumors and metastases in *in-vivo* models thanks to our **Ivis Imager®**.

## 2 MATERIALS & METHODS

The experiments presented were carried out on SCID CB17 and NSG mice, with the **MDA-MB-231** cell line, a model of breast cancer, and **DEL** cell line, a model of lymphoma.

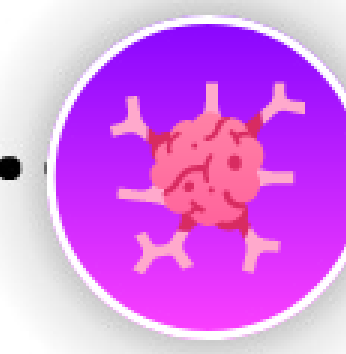
Compared to the fluorescence method, luminescence is a more sensitive approach allowing whole body imaging and the detection of deep tumors and metastasis in live mice <sup>(1)</sup>.



In-vitro culture of MDA-MB-231 / DEL cells and transduction of cells (Luc+)



In-vivo cell injection and follow-up of the tumor



Imager follow-up after tumor uptake <sup>(2)</sup>:

- Injection of luciferin (125 mg/kg) intraperitoneally
- Images acquisition
- Analysis and quantification of the luminescence

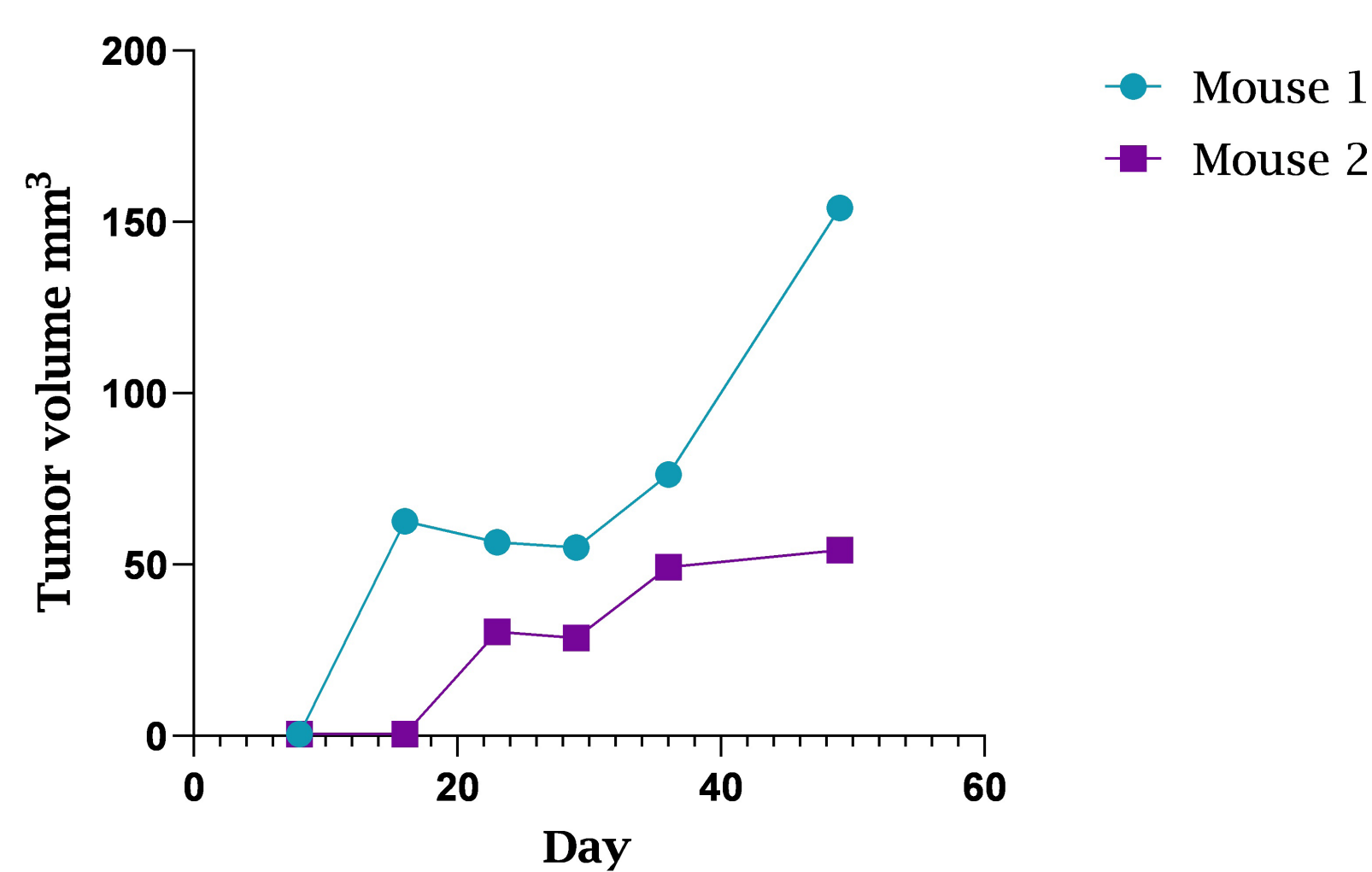


Follow-up of the tumors and potential metastasis

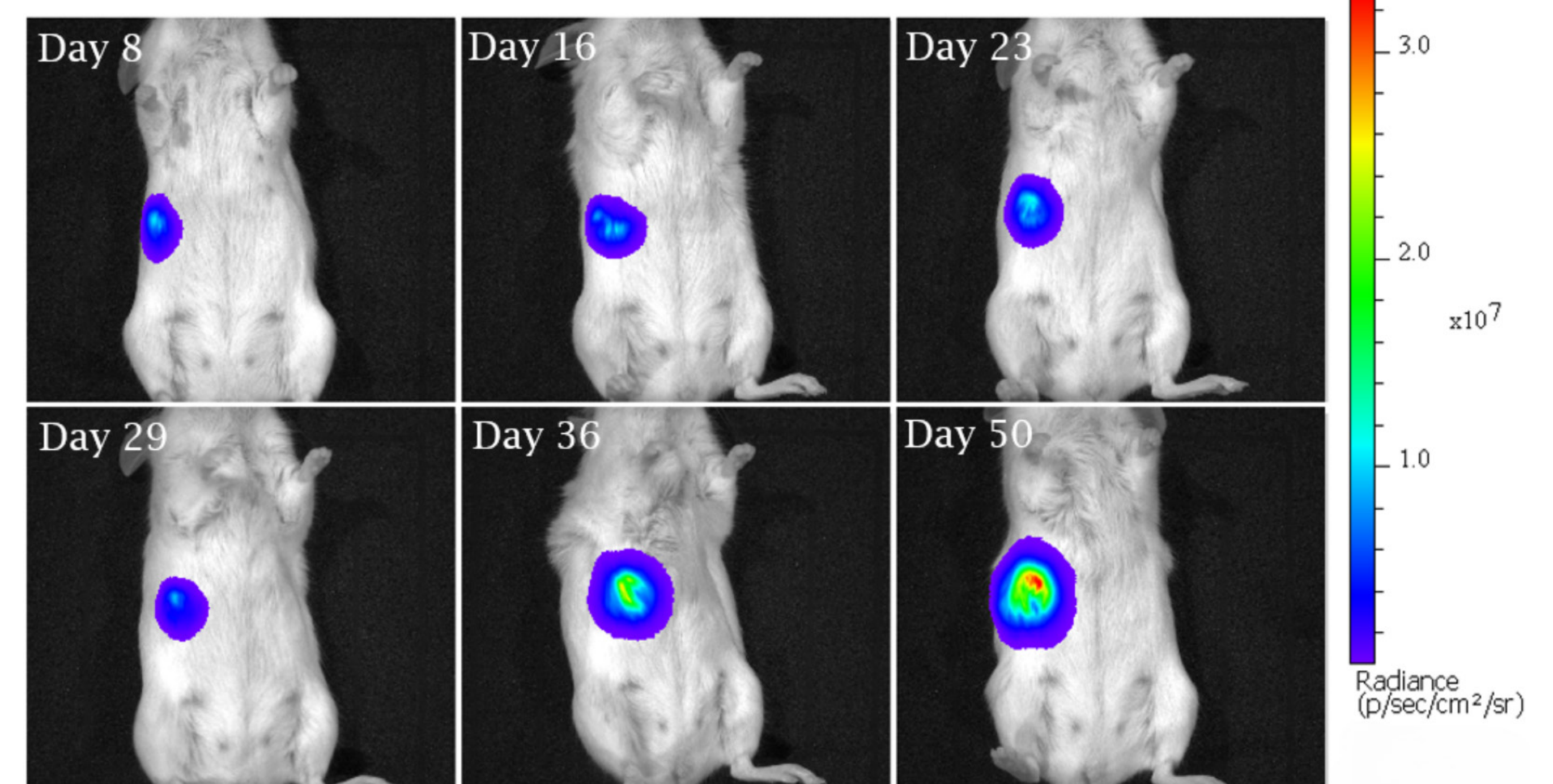
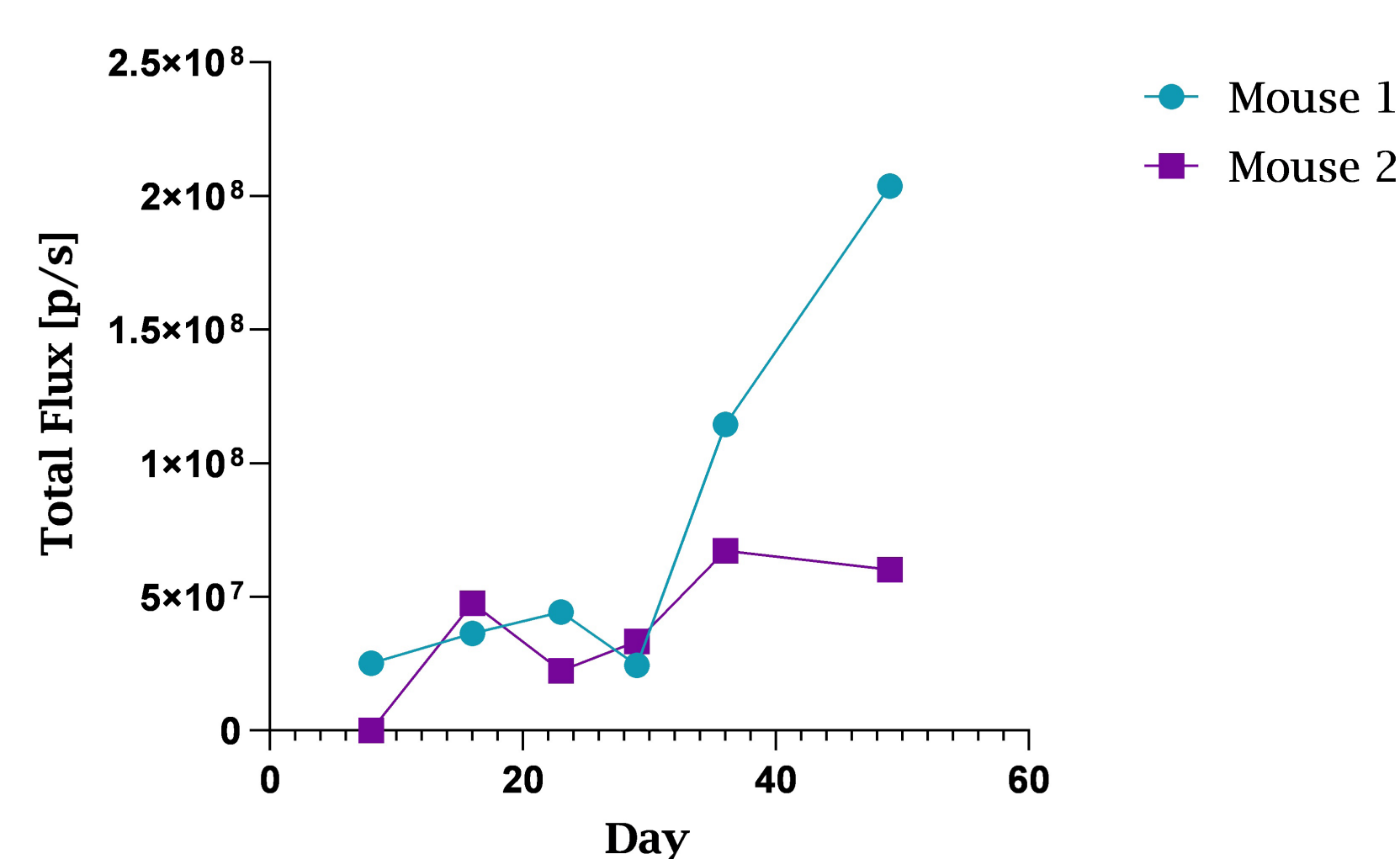
## 3 RESULTS

### Monitoring of a breast cancer line - (MDA-MB-231 Luc+)

Tumorogenesis of MDA-MB-231 Luc+ cells after subcutaneous implantation of  $5.10^6$  cells/mice in 2 mice

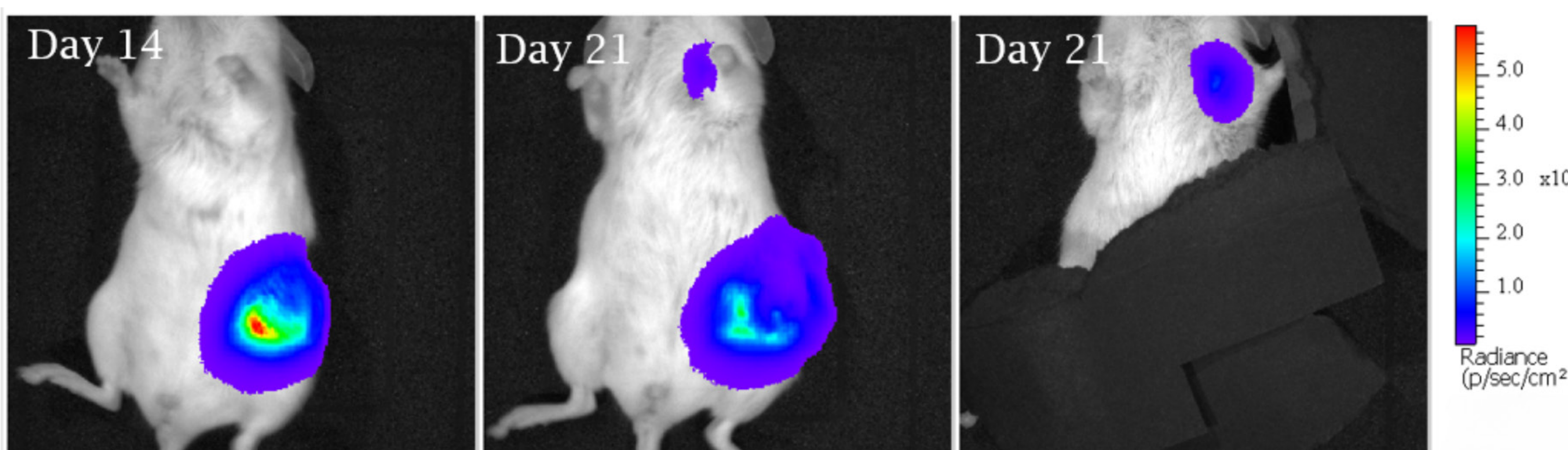


Bioluminescence signal of MDA-MB-231 Luc+ cells after subcutaneous implantation of  $5.10^6$  cells/mice in 2 mice



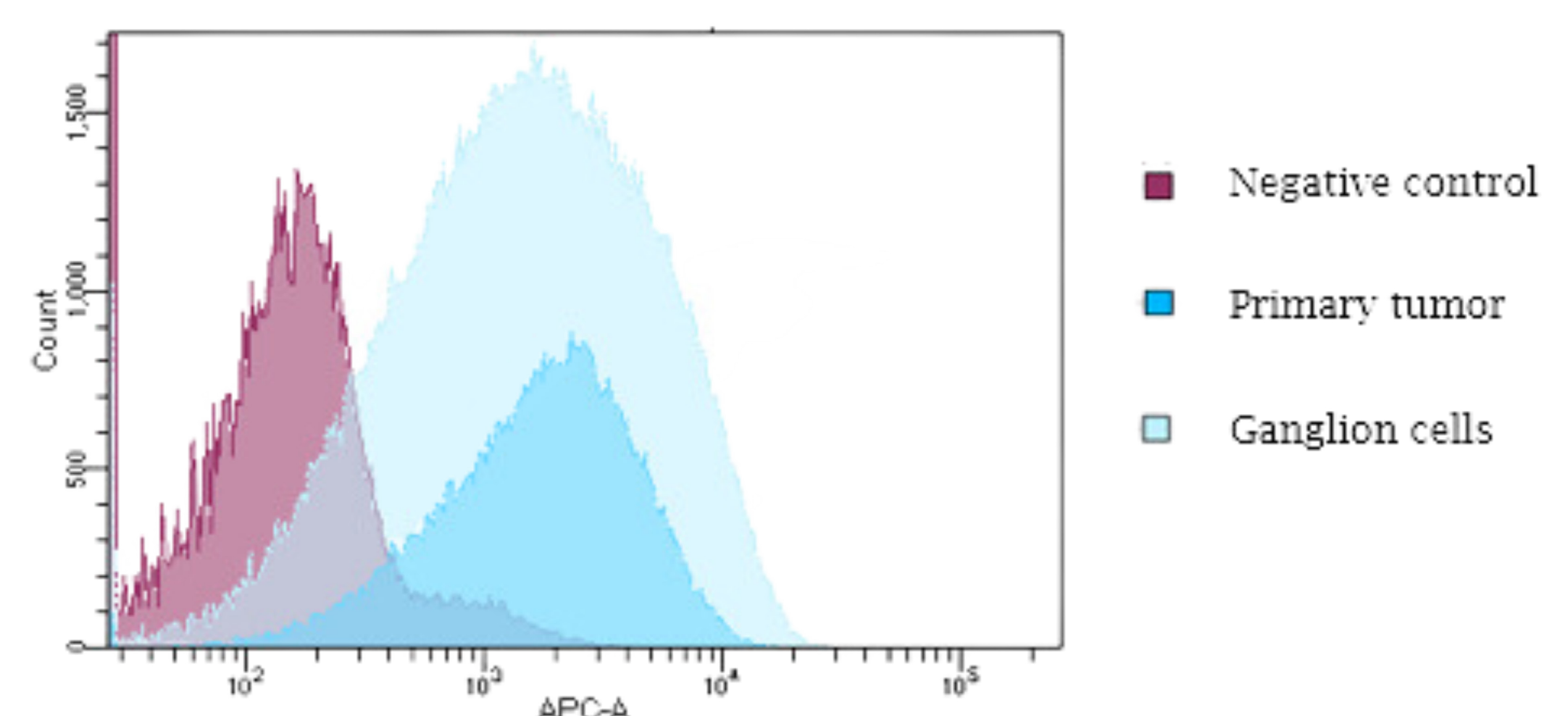
- Correlation between tumor volume measured with a caliper and the bioluminescence signal
- Consistent tumor growth after 2 months of monitoring

### Monitoring of a metastasis from a T Lymphoma - (DEL Luc+)



- Detection of a second signal different from the primary tumor, localized under the left paw
- Collection of the lymph node and dissociation of the cells for FACS analysis
- Validation of the second signal resulting of a metastasis from primary tumor

### Labeling of Luciferase DEL cells with anti-CD25 antibody



## 4 CONCLUSION & PERSPECTIVES

We have developed Luc+ cell lines by transduction, and we have realized a first **longitudinal follow-up** of the MDA-MB-231 cell line (breast cancer), and a second **monitoring** of the DEL cell line (lymphoma cancer), injected subcutaneously, and the associated metastasis.

The images obtained with the Ivis Imager® allow us to **regularly monitor tumors and potential metastases over time and without loss of luminescence**.

We also offer alternative experimental designs with the Ivis Imager®:

- Tracking of a **luminescent compound to follow its biodistribution**
- **Orthotopic injection** for a more precise and non-measurable follow-up with the classic method (caliper)
- Development of on-demand models

### References:

1. Genevois, Coralie, et al. « In Vivo Follow-up of Brain Tumor Growth via Bioluminescence Imaging and Fluorescence Tomography ». *International Journal of Molecular Sciences*, vol. 17, no 11, octobre 2016, p. 1815. PubMed, <https://doi.org/10.3390/ijms17111815>
2. Liu, Shirley, et al. « Brightening up Biology: Advances in Luciferase Systems for in Vivo Imaging ». *ACS Chemical Biology*, vol. 16, no 12, décembre 2021, p. 2707-18. DOI.org (Crossref), <https://doi.org/10.1021/acscchembio.1c00549>.

