**RESULTS**

Metastatic bioluminescent PDX models derived from tumors of different histotypes were successfully established by transduction of luciferase into PDX primary tumor cells. Tumor cell dissociation, luciferase transduction, and re-implantation have been described in detail elsewhere (Dumas et al., 2013). Bioluminescent tumor models are analyzed as listed in Table 2. For all models, metastasis detection assay has been performed on mice grafted with growing luciferase-engineered PDXs subcutaneously into appropriate immunodeficient mouse strains. Additional PDX collection screening for identification of metastatic models was performed by ex vivo fluorescence. For imaging, PDX models were transduced with lentivirus containing luciferase gene and growing luciferase-engineered PDXs subcutaneously into immunocompromised nude (Athymic Nude-Foxn1nu) or SCID (Nude-SCID) mice. Tumor growth and metastasis formation were monitored throughout passages by whole body visualization and ex vivo organ imaging at the end point using the Xenogen IVIS® Lumina. Before in vivo imaging, mice were injected with 150 mg/kg of luciferin solution. To investigate the influence of the primary tumor on metastatic spread and to prolong the follow-up for metastasis monitoring, we decided to keep PDX passages on nude mice and graft tumors on SCID only to perform metastasis induction studies. To enable evaluation of metastasis response to treatment, we labeled tumors with lentivirus-mediated luciferase insertion, allowing longitudinal follow-up of metastasis formation by non-invasive imaging. A review of our metastatic bioluminescent PDX panel is described here with a particular focus on the heterogeneity of the metastatic spread in breast cancer model, HBCx-14-Luc1.

**DISCUSSION**

The ability of tumor cells to spread and form metastases is one of the key parameters used to classify tumors and metastatic potential. Metastatic detection of primary tumor cells is a gold standard method associated with poor prognosis. The paucity of pertinent models to investigate the biology of metastatic events prevents the set-up of anti- metastatic therapies. We describe herein our human patient-derived xenograft (PDX) collection models suitable to assess anti-metastatic therapy.

In order to identify metastatic PDX models, we developed a multidisciplinary strategy involving PDX primary tumor cells transduced with lentivirus-mediated luciferase insertion, allowing longitudinal follow-up of metastasis formation by non-invasive imaging. A review of our metastatic bioluminescent PDX panel is described here with a particular focus on the heterogeneity of the metastatic spread in breast cancer model, HBCx-14-Luc1.

**FIGURES AND TABLES**

**REFERENCES**


2. ACR-NCTM EORTC, 2013, Boston, MA

3. Xentech, 4 rue Pierre Fontaine – 91000 Evry-France.