Breast tumor model: 4T1
syngeneic – metastasizing – intravenous

➢ Metastasizing mouse tumor models

In metastatic tumor models, tumor spreading originates either from a primary tumor or is artificially induced by intravenous or intracardial tumor cell injection. The metastatic pattern is dependent on the tumor cell line with a preference of lung metastasis in case of intravenous injection. For human tumor cell lines immune-compromised mice are used with the advantage to study classical antitumoral test compounds. In contrast, murine tumor cell lines can be grown in immune-competent mice (syngeneic), providing a functional immune system to assess novel immunotherapeutic approaches.

➢ 4T1 luc cells (CPQ-289)

Origin: breast / mouse BALB/c
Description: mammary gland tumor cell line
Modification: stable expression of firefly luciferase

➢ Study example

4T1-luc cells are injected intravenously and cell growth is monitored via whole body in vivo bioluminescence. The animals are randomized into treatment groups according to the luciferase signal. During the study, tumor growth is monitored via bioluminescence once per week, animal behavior is monitored daily and animal weights are measured three times per week. At necropsy, organs of interest are isolated and homogenized and the amount of luciferase-expressing 4T1-luc cells per organ will be quantified via ex vivo luciferase analysis.
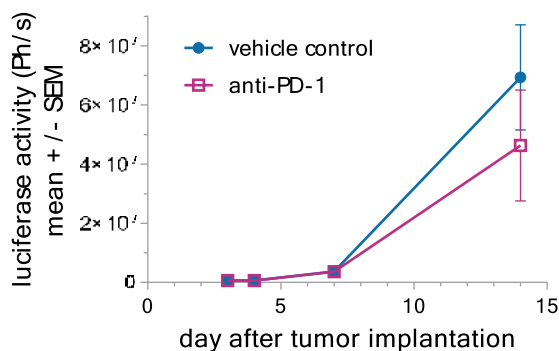
Figure 1: 4T1 metastases growth after treatment with anti PD-1 monitored by in vivo bioluminescence imaging
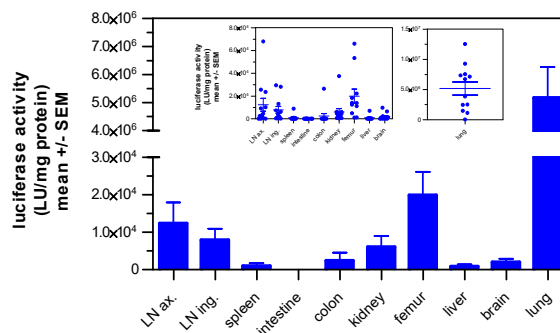
Figure 2: Detection of 4T1 metastases in different organs monitored by ex vivo luciferase measurement

➢ Quality assurance

- Routine authentication of tumor cell lines by STR profiling
- Mycoplasma testing of implanted tumor cells by PCR just prior to implantation
- Routine health monitoring of sentinel animals (according to FELASA guide lines)
- Animal work according to the 5R rules (reduce, refine, replace, responsible, remember)

Note: Graphs depicted are derived from study examples. Each study is a biological system of its own and subject to intrinsic variation.