Orthotopic prostate tumor model – LNCaP (Z2)

Orthotopic tumor models

Implantation of tumor cells into the organ of origin (“orthotopically”) allows organotypical interaction between tumor cells and surrounding stroma. It has been shown that this interaction affects growth, differentiation, and drug sensitivity of tumor cells. Moreover, tumor cells can spread to metastatic sites in other organs, with specificities comparable to the human situation. However, it must be emphasized that in most orthotopically implanted in vivo models using typical immortalized cell lines metastasis occurs but is very heterogeneous and not detectable in all animals after implantation. ProQinase started working on more reliable in vivo models to address intentions aiming mainly at metastasis. Nevertheless, analysis of the primary tumors of orthotopically implanted cancer cells gives us a very prospective read out when testing a new compound.

LNCaP (Z2) cells (CPQ-268)

This androgen-dependent cell line originates from the left supraclavicular lymph node of a patient with confirmed diagnosis of metastatic prostate carcinoma (ATCC-No: CRL-1740). Because of a low take rate when implanted subcutaneously, we performed several rounds of in vivo subcloning isolating the here used LNCaP (Z2) cells, a subpopulation of LNCaP.

In order to detect the orthotopically implanted cells, a luciferase expressing cell pool was generated via transduction of a luciferase-neomycin construct and subsequent neomycin selection.

In vivo bioluminescence measurement

After surgery, the growth of the cells will be monitored via in vivo bioluminescence imaging (BLI). Using BLI, the animals are randomized into treatment groups according to apparent tumor sizes. Moreover, once treatment is initiated, effects on the total in vivo bioluminescence signal, and thus primary tumor and potential metastatic loci may be monitored.

Study example

Mice bearing orthotopically implanted LNCaP (Z2) tumors were treated with Taxotere.