Cancer is the result of an accumulation of several genetic and environmental factors promoting tumor growth and therefore, sometimes only a quite small fraction of the patients derive benefit from new, targeted drugs. This is, to a large extent, due to the molecular differences between tumors of the same classification.

To be able to identify the optimal treatment for each individual patient, improved translational research approaches are required.

Human tumor xenografts, directly derived from patient cancer tissue are much closer to the clinic as cell culture. Xenografts allow testing novel antitumour agents in a fast and standardised manner and providing sufficient tumor tissue, even post treatment, for the search of corresponding predictive biomarkers.

We established a relevant number of human colon carcinoma xenograft models to perform such a preclinical biomarker study. 240 primary colon carcinoma tissue samples were collected over two years by a network of 4 clinics. Tumor pieces were transplanted onto immunodeficient mice immediately after surgery. A panel of 148 stably passagable colon cancer xenografts could be established as permanent tumor models with a high coincidence with the original tumor regarding histology and genome-wide gene expression profiling.

In ongoing experiments these models are subjected to an extensive characterization and integrated data analysis, including gene expression analysis, sequencing for mutations, and determination of response to classical as well as novel targeted compounds. Interim analysis of available results determines the following response rates: Oxaliplatin 7%, Cetuximab 25%, and Avastin 3%.