

TP22: Development and validation of a gene expression assay as prognostic and predictive biomarker in prostate cancer bone metastases

Scientific staff

Verena-Wilbeth Sailer, Prof. Dr. med., principal investigator

Alireza Saraji, Post-Doc

Janine Stegmann-Frehse, lab technician

Project description

This project aims to develop a tissue-based biomarker to evaluate molecular changes in bone metastases from prostate cancer rather than in the primary tumor to predict prognosis or response to –targeted– therapy. This assay could be of benefit for these patients as it might guide therapy as well as surveillance strategy. In this research project, we will apply a gene expression assay to robustly detect differentially expressed candidate genes and patterns of pathway regulation in archival formalin-fixed, paraffin embedded (FFPE) bone metastases from prostate cancer patients. Data generated in this proposed research project will enhance our knowledge of the transcriptome of prostate cancer bone metastases, its response to systemic treatment and its microenvironment within the bone niche. It will provide a meaningful bidirectional translational benefit both for the patient and the researcher. We will develop and validate a gene expression assay that can act as a biomarker either on its own or in conjunction with traditional clinical or tissue-based parameters. In addition, we will show, that robust gene expression analysis is feasible from FFPE tissue from bone metastases thus facilitating further research in other tumor types that are prone to bone metastases.

Expertise

We have extensive experience regarding whole-exome sequencing and RNA sequencing from prostate cancer bone metastases and have developed and published a protocol for utilizing fresh bone biopsies for these analyses. Moreover, we have identified a set of 96 genes implicated in prostate cancer progression, that can be evaluated by a custom-built NanoString assay. Our department provides all technical equipment and scientific expertise in collaboration with other scientists for initial gene expression analysis and subsequent validation experiments. An already established collaboration with the department of urology will help validating the clinical usefulness of the planned assay.

Project-related publications

Sailer V, Schiffman MH, Kossai M, Cyrta J, Beg S, Sullivan B, Pua BB, Lee KS, Talenfeld AD, Nanus DM, Tagawa ST, Robinson BD, Rao RA, Pauli C, Bareja R, Beltran LS, Sigaras A, Eng KW, Elemento O, Sboner A, Rubin MA, Beltran H, Mosquera JM.

Bone biopsy protocol for advanced prostate cancer in the era of precision medicine.

Cancer. 2018 Mar 1;124(5):1008-1015.