ImmunoTools *special* Award 2018

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The role of circulating immune-cell subpopulations in Prostate Cancer

Prostate cancer (PC) is the second most common cancer among men. Biomarkers play a major role in diagnosis, prognosis and prediction of cancer and have emerged as essential tools for treatment, assessment and monitoring, since the heterogeneity of the disease and the diversity of treatments have given rise to a need for a personalized approach. The role of the immune system in the fight against cancer is known, and Immunotherapy is a promising treatment for prostate cancer, including advanced or recurrent forms of the disease. Moreover, different types of cancer treatment (e.g. Chemotherapy, Hormone Treatment) can elicit different responses from the body's immune system.

For the present project, samples from our biobank of Peripheral Blood Mononuclear Cells (PBMCs) from PC patients (n=150) will be analyzed. PC patients have been enrolled, from 6/2014 to 5/2018, to this combined retrospective/prospective study. We have collected samples from three distinct groups of well characterized patients i.e. patients under active surveillance, patients initially diagnosed with localized PC (LPCa) and accordingly treated, and PC patients already metastatic at first diagnosis (MPCa), thus representative of different disease stages. All patients had received standard medical treatment for their condition and were prospectively followed-up at scheduled time points. The aim of this study is to correlate the clinical outcome (Progression-Free Survival (PFS), time to BioChemical Recurrence (BCR), Castration Resistance (CR) and Metastasis (M), as well as Overall Survival (OS)) of these patients according to their established clinicopathological characteristics, with their immune profile, as defined by the different circulating immune-cell subpopulations. Taking into account the heterogeneity and the complexity of patients' immune system, it is of great interest to investigate immunological parameters for the evaluation of the immune response during cancer evolution. ImmunoTools antibodies will contribute to the identification and sorting of immune-cell subpopulations (T cells subsets, B cells, Natural Killer-NK subpopulations, monocytes/macrophages, Dendritic Cells, T-regulatory cells-Tregs, Myeloid Derived Suppressor Cells-MDSCs) in our patients' samples.

The majority of studies, so far, focus on the frequencies of immune subpopulations ($CD8^+$, MDSCs, Tregs) in patients with metastatic disease. The main objective of the present study is to investigate the relation of the immune cell composition in the peripheral blood of PC patients with the evolution of the disease, as reflected by the distinct patient cohorts investigated. The results of the analyses will possibly reveal new sensitive and reliable biomarkers of early prognosis of clinical response among the three different groups of patients.