ImmunoTools *FlowISiAM* Award 2025

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Expansion of the *FlowISiAM* Concept for the Detection of Circulating PSA-Positive Macrophages as Specific Markers for Prostate Cancer

Introduction

Prostate cancer is the most common cancer among men in Germany, with approximately 65,820 new cases per year. Early detection plays a crucial role in patient prognosis. Currently, the prostate-specific antigen (PSA) test is the primary screening method. However, it has limitations in terms of sensitivity and specificity. Elevated PSA levels can also occur in benign prostate conditions, leading to unnecessary biopsies and overdiagnosis. Moreover, the PSA test can miss prostate cancer, creating a false sense of security.

Objective

This project aims to expand the *FlowISiAM* concept by integrating specific markers for prostate cancer. The focus is on identifying and quantifying circulating PSA-positive macrophages using flow cytometry. Previous studies have demonstrated that prostate cancer patients exhibit significantly higher levels of these cells in their blood compared to patients with benign prostate conditions. By incorporating these markers into the *FlowISiAM* method, diagnostic accuracy can be improved, thereby optimizing early prostate cancer detection.

Methodology

1. **Patient Cohort**: Recruitment of subjects suspected of having prostate cancer and control subjects with benign prostate conditions.
2. **Blood Collection**: Peripheral blood samples will be obtained for isolating mononuclear cells.
3. **Flow Cytometry**: Implementation of the extended *FlowISiAM* protocol for intracellular PSA staining in activated macrophages.
4. **Data Analysis**: Comparison of circulating PSA-positive macrophage frequencies between groups and statistical evaluation of diagnostic significance.

Significance and Future Prospects

Expanding the *FlowISiAM* concept with specific markers for prostate cancer has the potential to enhance early detection and reduce unnecessary biopsies. By improving the differentiation between malignant and benign prostate conditions, patient care can be optimized. In the long run, this method could serve as a complementary or alternative screening tool to the PSA test, making a valuable contribution to reducing prostate cancer mortality.

Collaboration with ImmunoTools and INVIGATE

ImmunoTools and INVIGATE will play a central role in this project by providing specific antibodies for flow cytometry and supporting the establishment of the extended *FlowISiAM* protocol. This collaboration will enable the development of customized solutions for detecting circulating PSA-positive macrophages and the continuous refinement of the methodology.

Access to Patient Cohorts

Access to suitable patient cohorts is ensured through our own urological practice and in collaborations with further urology clinics and practices. All subjects will be included in the study following informed consent, and strict adherence to ethical guidelines will be maintained.

This project addresses a relevant medical issue with high prevalence and offers promising perspectives for future diagnostics and research by expanding the *FlowISiAM* concept with specific markers for prostate cancer.

ImmunoTools *FlowISiAM* AWARD for
Ralf Herwig and **Khair Bux** includes
antibodies for *FlowISiAM*, know how transfer and protocol, support regarding selection of specific antibodies against specific biomarkers from INVIGATE, expert assistance in evaluating the results obtained, and integration into the ImmunoTools *FlowISiAM* network.

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