brecise

BRECISE USE CASE #2:
The PCAI ImmunoScore Biomarker – Predicting Response to Neoadjuvant Therapy in High-Risk Prostate Cancer

Introduction

Prostate cancer varies widely in its behavior, making treatment decisions particularly complex for men diagnosed with high-risk localized prostate cancer. One emerging strategy in oncology is neoadjuvant therapy, where patients receive androgen receptor signaling inhibitors (ARSIs) before radical prostatectomy (prostate surgery). This approach has the potential to shrink tumors and improve long-term outcomes, but not all patients respond effectively to ARSI therapy.

As part of BRECISE, researchers aim to validate the PCAI ImmunoScore biomarker, designed to predict which patients are most likely to benefit from ARSI therapy before surgery. This predictive tool could help improve treatment selection, reduce unnecessary side effects, and optimize patient outcomes.

How Will the PCAI ImmunoScore Work?

The PCAI ImmunoScore is a gene expression-based biomarker that analyzes immune system activity and androgen receptor signaling in prostate cancer tissue. By utilizing RNA sequencing, researchers aim to determine whether a patient is likely to achieve a strong response to neoadjuvant ARSI therapy before surgery.

This biomarker is expected to enable:

- Stratification of patients into responders and non-responders, allowing for more personalized treatment approaches.
- Avoidance of unnecessary ARSI therapy in patients unlikely to benefit, preventing treatment-related side effects.
- Identification of alternative treatment strategies for non-responders, ensuring that patients receive the most effective interventions.

Why is This Important?

- Prevents Unnecessary Treatment – Patients unlikely to benefit from ARSI therapy can avoid its side effects and high costs.
- Guides Personalized Therapy – Helps doctors make data-driven, individualized treatment decisions.
- Improves Long-Term Outcomes – By selecting the right patients for ARSI therapy, BRECISE aims to enhance survival rates and treatment success.

Next Steps in BRECISE

The PCAI ImmunoScore biomarker will be clinically validated in the PARIS-BIO study, a proof-of-concept trial within BRECISE. This study will:

- Recruit 100 prospective patients and compare findings with 100 historic control patients who received standard-of-care treatment.
- Assess the ability of PCAI ImmunoScore to predict response to neoadjuvant ADT+Darolutamide, guiding treatment selection.
- Analyze genomic and transcriptomic tumor data to refine biomarker models and explore new therapeutic strategies.
- Support ex vivo patient-derived tumor testing, enabling precision oncology approaches for non-responders.

By integrating genomic analysis, AI-driven biomarker modeling, and clinical validation, BRECISE aims to establish PCAI ImmunoScore as a decision-support tool for high-risk prostate cancer, setting a new standard for personalized neoadjuvant therapy.

innovative health initiative

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