

# Rapid Diagnostic Platform for Stratifying Cancer Patients with Immunoresponsive ‘Cold’ Tumors via TGF $\beta$ Signaling and DNA Damage Response

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## TECHNOLOGY DESCRIPTION

UCSF researchers have developed a novel diagnostic technology that uses transcriptomic scoring to stratify cancer patients based on TGF $\beta$  signaling and DNA damage response (DDR) status, enabling personalized therapy decisions. By identifying tumors with compromised TGF $\beta$  signaling—linked to error-prone DNA repair and immune-poor microenvironments—this assay leverages the Balt score, derived from gene signatures reporting TGF $\beta$ -DDR interactions, to predict responsiveness to checkpoint inhibitors (ICI) and genotoxic therapies like chemotherapy or radiotherapy. Validated in murine models and human clinical data, the assay is poised for integration into clinical trials and offers key advantages, including reduced toxicity from ineffective treatments, optimized therapy selection to improve survival rates, and minimized healthcare costs. This diagnostic platform has the potential to transform oncology care by guiding therapy selection across multiple cancer types, supporting biotech innovation, and opening new pathways for immunotherapy development.

## RELATED MATERIALS

- [Identification of a conserved subset of cold tumors responsive to immune checkpoint blockade. PMID: PMC11887281 DOI: 10.1136/jitc-2024-010528 - 03/06/2025](#)

## PATENT STATUS

Patent Pending

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## OTHER INFORMATION

### KEYWORDS

Transcriptomic scoring for cancer stratification, TGF $\beta$  signaling and DNA damage response diagnostic, Predictive assay for checkpoint inhibitor (ICI) therapy, Personalized oncology diagnostics platform, Immunotherapy and genotoxic therapy optimization

### CATEGORIZED AS

- **Medical**
  - Diagnostics
  - Disease: Cancer

### RELATED CASES

2023-160-0

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