Combining multimodal biomarkers as an immunogram to guide immunotherapy use: A Proof of Concept

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Background

Our recent understanding of the immune contribution to fight cancer has deeply modified the standard of care of cancer patients. However, immunotherapies by immune checkpoint inhibitors (ICI) anti-POI/PD1/L1 are less effective for some high incidence indications like colorectal cancer (CRC). Here, the heterogeneity as well as the relatively low degree of patient response to those immunotherapies have highlighted that factors, present in the tumor microenvironment (TME), may limit or boost the efficacy of treatment. In this context, the comprehensive assessment of these factors could be key to stratify patients and allow the selection of the optimal treatment.

In order to help clinical researchers and biopharmaceutical companies to measure the immune contribution to drug efficacy, HalioDx has developed the Cancer Immunogram1,2. Our multi-parameter approach encompassing a unique range of immune scoring assays is based on the analysis and the understanding of the immune contexture of tumors and offers a personalized and dynamic “fingerprint” of tumor-immune system interaction.

Methods

Tumor Characteristics

- **ID SEQUENCING**
  - TMB
  - T Cell Exhaus

- **IMMUNOSCORE®CR IC**
  - PD-L1 +
  - CD8+

- **IMMUNOSCORE®CR TL**
  - Immune Cell Infiltration

Cytotoxic Response

- **ID SEQUENCING**
  - CD8 T cell density and

- **IMMUNOSCORE®CR IC**
  - PD-L1/CD8

Immunosuppression

- **ID SEQUENCING**
  - CD4+FOXP3+

- **IMMUNOSCORE®CR SC**
  - Tumor Characteris

Relevance of Immunogram vs Approved single Biomarker

- **T Cell Clonality** assessed by targeted sequencing (IO SEQUENCING, HalioDx).

Conclusions and Perspectives

Here, we provide a Proof of Concept for the Cancer Immunogram in the context of CRC by combining the following technologies and biomarkers: ID Sequencing (TMB, MSI, T Cell Clonality), IMMUNOSCORE®CR TL (Immune Cell Infiltration), IMMUNOSCORE®CR IC (PD-L1/CD8), IMMUNOSCORE®CR SC (T-Cell Exhaustion Panel, MDSC Panel and Treg Panel).

We show that the Cancer Immunogram identifies patient specific patterns which might improve the prediction of the response to therapy. Based on the model proposed by Galon J. et al2,3, the Cancer Immunogram can guide primary and/or additional therapies aiming at restoring the full potential of patient’s immune response.

We believe that the Cancer Immunogram will help researchers and clinicians to personalize treatments in order to improve patients’ outcome and response to cancer treatment.

In perspective, it will be important to implement the Cancer Immunogram in randomized clinical trials for multiple indications.