

# A Signature Disfavors T Cell-Mediated Cytolysis for Predicting Survival and Immunotherapy Effect in Head and Neck Cancer

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Published 04/02/2023

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Zongwei Huang<sup>1</sup>, Ying Li<sup>1</sup>, Sufang Qiu<sup>1</sup>, Sunqin Cai<sup>2</sup>

1. Radiation Oncology, Clinical Oncology School of Fujian Medical University, Fujian Cancer Hospital, Fujian, CHN 2. Radiation Oncology, Fujian Provincial Key Laboratory of Translational Cancer Medicine, Fuzhou, CHN

**Corresponding author:** Zongwei Huang, 757197315@qq.com**Categories:** Radiation Oncology, Oncology**Keywords:** immunotherapy, head and neck cancer**How to cite this abstract**

Huang Z, Li Y, Qiu S, et al. (April 02, 2023) A Signature Disfavors T Cell-Mediated Cytolysis for Predicting Survival and Immunotherapy Effect in Head and Neck Cancer. *Cureus* 15(4): a914

## Abstract

**Objectives:**

The T cell-based cancer therapies provided effective treatment in several cancer patients. However, several patients with high T cells infiltration may suffer a limited response to immunotherapy. Our aim was to establish a signature that reflects the resistance of cancer cells to T cell killing for treatment decision-making and prognosis in head and neck cancer (HNC).

**Methods:**

We used publically expression data from HNC samples from The Cancer Genome Atlas (TCGA) to stratify patients according to a signature of inducible tumor-expressed genes that disfavor T cell-mediated cytolysis (iD\_CTL). Kaplan-Meier analysis was employed to explore the survival outcomes and the immune landscape in tumor microenvironment was also evaluated through Immuno-Oncology Biological Research (IOBR). We also used the IMvigor210 cohort to verify the predictive value of iD\_CTL signature about immunotherapy effect.

**Results:**

iD\_CTLH represented a poorer prognosis and was validated in four HNC cohort from Gene Expression Omnibus (GEO). Enrichment analysis revealed that iD\_CTLH was significant enrichment of Epithelial mesenchymal transition, TGF beta signaling, Angiogenesis. Meanwhile, iD\_CTLH was significantly associated with the tumor microenvironment. iD\_CTL is characterized by high TAM, MDSC, T-cell exhaustion, and T-cell regulatory, as well as high Pan\_F\_TBRs and PPAGs. In addition, iD\_CTLH values of patients with poor immunotherapy response showed an increasing trend in the IMvigor210 cohort. And patients with higher iD\_CTL scores had worse prognoses.

**Conclusion(s):**

Our findings might contribute to further understanding of iD\_CTL in the prognosis of HNC and provide novel and reliable biomarkers for immunotherapy.