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   2021G003

2. Title
   Effects of Smoking on Glycan Structure of Immune Checkpoint Molecules and Verification of Their Usefulness as Biomarkers

3. Period
   2021-2023

4. Summary

   Despite the breakthrough of Immune Checkpoint Inhibitors (ICIs) in cancer treatment, efficacy is limited to about 20% of patients. Identifying biomarkers to predict this efficacy is crucial for personalized therapy. Our study focused on glycan modifications of the PD-L1 molecule, particularly the impact of smoking, and its correlation with ICI efficacy. We identified three lectins specific to PD-L1 glycans, with Lectin A showing high expression in tumor tissues. Analysis of patient peripheral blood revealed distinct lectins for soluble PD-L1 in lung and colorectal cancer. Various cancer cell lines indicated that driver gene mutations affect PD-L1 glycosylation. These findings suggest new biomarkers for predicting ICI treatment success, marking a significant step towards personalized cancer therapy.

   Immune Checkpoint Inhibitors (ICIs) have significantly advanced cancer treatment, yet their effectiveness is limited to about 20% of patients. Identifying biomarkers to predict this efficacy is crucial for personalized therapy. Our study focused on glycan modifications of the PD-L1 molecule, particularly the impact of smoking, and its correlation with ICI efficacy. We identified three lectins specific to PD-L1 glycans, with Lectin A showing high expression in tumor tissues. Analysis of patient peripheral blood revealed distinct lectins for soluble PD-L1 in lung and colorectal cancer. Various cancer cell lines indicated that driver gene mutations affect PD-L1 glycosylation. These findings suggest new biomarkers for predicting ICI treatment success, marking a significant step towards personalized cancer therapy. Further analysis is underway using patient samples to correlate these glycosylation patterns with ICI effects. Although smoking's impact on PD-L1 glycosylation was investigated, no significant influence was found. This research contributes to the understanding of cancer biology and the pursuit of precision medicine, potentially revolutionizing the approach to cancer treatment and patient care.