

Docket #: S20-439

Cell-free method to predict responses to CAR-T cell therapies and screen for biomarkers

Chimeric antigen receptor (CAR) T-cells targeting CD19 (or CAR19 T-cells) are an emerging, active therapy for patients with lymphomas. Despite high response rates to therapy, most patients will ultimately have disease progression after CAR19 T-cell therapy. Identifying patients who will have favorable outcomes, versus unfavorable outcomes, after CAR19 T-cell therapies, remains a critical challenge. Inventors at Stanford developed a method to utilize cell-free DNA from the blood plasma of a patient to track DNA from both the tumor and the CAR T-cells themselves. Using this liquid biopsy methodology enables improved prediction of patient responses to CAR19 T-cell therapy. Additionally, the inventors discovered mutations in key genes which predict for poor outcomes to CAR19 therapy. While methods exist to track tumor DNA from cell-free DNA, this is the first method to track engineered T-cell DNA from the blood plasma.

Applications

- CAR-T therapy development and patient monitoring
- Identifying favorable patient candidates for treatment
- Screening tool for favorable biomarkers

Advantages

- Only cell-free method to track CAR-T cells from blood plasma
- Only known DNA-sequencing method to identify specific patients at risk for treatment failure after CAR19 T-cell therapy
- Screening and detection combination research tool

Publications

- Sworder, Brian J et al. "[Determinants of resistance to engineered T cell therapies targeting CD19 in large B cell lymphomas.](#)" Cancer cell vol. 41,1 (2023): 210-225.e5.

Patents

- Published Application: [WO2022081584](#)
- Published Application: [20230383361](#)

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