

CASE STUDY

A dendritic cell vaccine increases the breadth and diversity of melanoma neoantigen-specific T cells

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WHY IMMUNOSEQ?

immunoSEQ repertoire analysis allows identification and tracking of unique TCRB clones

The quantitative nature of the assay allows for evaluation of breadth and diversity of immune response

## BACKGROUND

Neoantigens can arise in melanoma when missense mutations result in amino acid substitutions. These neoantigens can elicit tumor-specific T cell immunity and may be leveraged for therapeutic purposes as personalized vaccines.

## AIM

Evaluate the ability of personalized dendritic cell vaccines utilizing neoantigens to induce tumor specific T-cell immunity in patients with advanced melanoma.

## METHODS

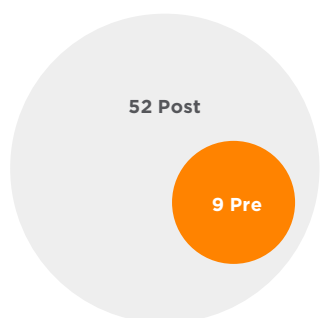
Genomic analysis of surgically excised tumors of three patients with stage III cutaneous melanoma was conducted to identify somatic mutations. These neoantigens, along with two control proteins, were incorporated into personalized dendritic cell vaccines for each patient. The immunoSEQ Assay was then used to evaluate the T-cell repertoire response to vaccination.

- 1 Stimulated, sorted, antigen specific CD8+ T cells pre vaccination → **immunoSEQ Service & Kit**
- 2 PBMCs pre vaccination → **immunoSEQ Service & Kit**
- 3 PBMCs post vaccination → **immunoSEQ Service & Kit**
- 4 Antigen specific CD8+ T-cell sequences identified and compared in pre and post vaccine PBMC samples using the immunoSEQ Analyzer

## RESULTS

Vaccination increased the frequency of pre-existing clones and induced new clones for all evaluated neoantigens.

**Patient 1: SEC24A P469L Clones**



**Patient 2: TKT R438W Clones**



**Patient 3: EXOC8 Q656P Clones**



## WHY IMMUNOSEQ?

immunoSEQ repertoire analysis allows identification and tracking of unique TCRB clones

The quantitative nature of the assay allows for evaluation of breadth and diversity of immune response

Number of single antigen specific CD8+ T cell clones present in pre and post vaccination PBMCs in three patients.

## CONCLUSIONS

Personalized neoantigen dendritic cell vaccination leads to increased diversity and frequency of tumor specific T-cells and warrants investigation as a feasible immunotherapy.