BACKGROUND
Neoantigens derived from cancer-specific mutations are currently being utilized as targets in personalized cancer vaccine treatments. Here, we characterize the neoantigen-specific reactivity and clinical response in five patients treated with an AI generated personalized therapeutic cancer vaccine (EVX-01) in the ongoing melanoma single-arm open-label multi-center phase II trial (NCT05309421).

METHODS
The proprietary PIONEER™ AI platform for the identification and selection of tumour-specific neoantigens was used to design a personalized peptide cancer vaccine (EVX-01) for each patient. Patients initiated treatment with anti-PD1 therapy (pembrolizumab) prior to EVX-01 and will receive up to 18 cycles. EVX-01 neoantigen vaccine (IM) was initiated at week 12; 6 priming immunizations 2-weekly and 4 booster immunizations at later time points. Blood samples were collected before, during and after EVX-01. Peripheral blood mononuclear cells (PBMCs) were isolated to assess for T-cell immunogenicity after in vitro stimulation with the vaccine neoantigens (IFNγ ELISpot and intracellular cytokine staining). Serum circulating tumor DNA will be monitored longitudinally (Illumina NovaSeq).

RESULTS
Five patients were included in this trial update. Immune analysis demonstrated EVX-01 induced neoantigen specific T-cell responses in all patients and that the responses were mediated by activated CD4+ and CD8+ T cells. Prior to EVX-01 dosing and following 12 weeks of pembrolizumab, one patient (#4) presented with Progressive Disease (RECIST 1.1 criteria). Following EVX-01 administration, patient #4 had a reduction in tumor size starting at week 24 and with further reduction at subsequent visits. Immune analysis revealed neoantigen-specific immune responses being induced 2 weeks after 3 immunizations and a further increase in response magnitude after all 6 immunizations. RECIST response data for the remaining patients will be available at the time of presentation.

The combination of EVX-01 and anti-PD1 appeared safe and well tolerated with only grade 1 ADRs related to EVX-01.

Trial Registration NCT05309421

REFERENCE