Open-label, dose-escalation, phase I/II study to assess the safety, tolerability, immunogenicity and preliminary clinical activity of the therapeutic cancer vaccine PDC*lung01 with or without anti-Programmed Death-1 (PD-1) treatment in patients with non-small-cell lung cancer (NSCLC)

**Background and rationale**

- Anti-PD-1/anti-hLA antibodies are the cornerstone of treatment for advanced NSCLC; however, a substantial number of patients do not benefit from PD-1 blockade when used in monotherapy.
- Boosting antitumor cytolytic CD8+ T cells presents a promising approach to potentiate their efficacy.
- PDC*lung01 is a therapeutic cancer vaccine consisting of an attenuated plasmid-encoded dendritic cell line (POC*line), loaded with HLA-A*02:01 restricted peptides (POC*vac).
- The 6 selected peptides are encoded by antigens expressed in NSCLC: Melan-A, MAGE-A3, MAGE-A4, MUC1, EBV lytic antigens and EBV LMP-1.
- POC*line is a professional antigen presenting cell able to prime and expand peptide-specific CD8+ T cells in vitro and in vivo in synergy with anti-hLA antibodies [Lenogue 2021; Plumas, 2022].
- Boosting antitumor cytotoxic CD8+ T cells represents a promising or high dose (A2) of IMP as single agent following standard of care; Resected stage II/IIIA in adjuvant setting treated with low dose (A1) route for 6 consecutive doses.

**Methods**

- Open-label, multicenter, dose-escalation phase III study with PDC*lung01 administered weekly by subcutaneous and intravenous route for 6 consecutive doses.
- Two dose levels: 14 X 10^6 cells (Low Dose) and 14 X 10^6 cells (High Dose) with or without pembrolizumab.
- NSCLC patients positive for HLA-A2 or at pre-screening are enrolled in 4 centers.
- Reserved stage ECOG or in adequate status treated with low dose (A1) or high dose (A2) of single agents or combination following standard of care.
- Stage IV NSCLC with measurable disease, PD-L1 tumour proportion score 5% and viable tumor tissue available, treatment with low dose (B1) or high dose (B2) of IMP in combination to pembrolizumab.
- Study evaluates safety, tolerability and immune responses in patients exposed or not to concomitant chemo for 6 cycles.
- We report here on the first 3 cohorts (A1/2/B1) that have completed.

**Study flow chart**

- At day 0-6 of (14 May 2022), cohorts A1/A2/B1 were completed, cohort B2 is ongoing.

**Demographics**

- All demographics and baseline characteristics were similar in A1 and A2 except for the rate of epoetin use.

**Safety overview**

- Treatment summary adverse events per patient for all patients treated with PDC*lung01.
- Treatment emergent adverse events listed in the table below.
- All patients had at least 1 adverse event (AE).
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**Results**

- Best change from baseline per investigator for B1 cohort.
- One patient had time of SD in target lesions in PD (not mentioned) baseline.
- Change in target lesions over time

**Conclusions**

- Treatment with the therapeutic cancer vaccine PDC*lung01 is feasible with an acceptable safety profile.
- The immunogenicity is defined as a change in stage 3 in the percentage of circulating peptide-specific CD8+ T cells for any of the POC*line peptides between baseline and 7/18 or 19.