PDC*lung01: An innovative therapeutic cancer vaccine induces specific immune responses in combination with anti-PD-1 treatment in patients with non-small cell lung cancer

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Off-the-shelf plasmacytoid dendritic cell-based product

- PDC*lung01 (AMP) is a therapeutic cancer vaccine based on an irradiated plasmacytoid dendritic cell line loaded with HLA-A*02:01-restricted peptides (NY-ESO-1, MAGE-A3, MAGE-A4, Multi-MAGE-A, MUC1, Survivin and Melan-A) able to prime and expand peptide-specific CD8+ T cells in vitro and in vivo.
- PDC*lung01 was shown to expand antitumor CD8+ T-cells from PBMC of patients with melanoma or NSCLC and to be synergistic with anti-Programmed Cell Death (PD) (Pembrolizumab®; Charles, Oncolimmunol 2020; Lenogue, Vaccines 2021; Hannani, Int. J. Mol. Sci. 2023).

Overview of the immunomonitoring workflow

- Several immune parameters were monitored in the bloodstream at different times before and after vaccination using assays developed by the sponsor: leukocyte count and determination of peptide-specific CD8+ T cells for which a limit of quantification (LOQ) was defined to better assess changes in cell expansion: 0.005% for Melan-A, MAGE-A3 and Survivin, and 0.0005% for other specificities.
- The results of immune assessment of Cohorts A1, A2, B1 and B2 (n=19 patients) are presented here.

Basal frequencies of circulating antigen-specific CD8+ T-cells

- The basal frequencies of antigen-specific CD8+ T-cells for Cohorts A (left) and B (right) were similar. The proportions of T-cells specific for targeted tumor antigens were generally under the Limit of Quantification (LOQ, grey zone). By contrast, control viral antigen-specific T-cells (EBV or Fluc) were well detected.

Expansion of circulating tumor antigen-specific CD8+ T-cells following PDC*lung01 treatment

- A patient was considered positive when the percentage of circulating CD8+ T cells specific for any of the PDC*lung01 peptides increased twofold between baseline and V7, V8 or V9.

Positive patients and correlation with clinical activity

- At baseline, patients from all cohorts displayed lower naive cells and a more heterogeneous cell pattern than healthy donors (HD). Naive cells were defined as CD3⁺CD4⁺CD8⁻, cells and effector cells comprised Central Memory, Effector Memory and Terminal-differentiated Effector Memory cells.