OncoTherapy Science, Inc.
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Announcement of the presentation of results for exploratory study of peptide vaccine S-588410 at European Society for Medical Oncology 2019 Congress

OncoTherapy Science, Inc. (President & CEO: Kyoko Fujiya; hereinafter, "OncoTherapy") announces that results for exploratory study of peptide vaccine S-588410 were reported by a poster presentation entitled "Induction of tumor-infiltrating functional CD8 positive cells and PD-L1 expression in esophageal cancer by S-588410" at European Society for Medical Oncology 2019 Congress (ESMO2019), Barcelona, Spain, on 30th September 2019 (local time).
This presentation included the results of collaborative research between OncoTherapy and Shionogi & Co., Ltd.

S-588410 is cancer peptide vaccine licensed out from OncoTherapy to Shionogi & Co., Ltd. It composed of five HLA-A*24:02 restricted peptides derived from five cancer-testis antigens: DEPDC1, MPHOSPH1, URLC10, CDCA1 and KOC1. To evaluate the effect of S-588410 on CD8 positive (+) T-lymphocytes and PD-L1 expression, tumor tissue and blood in pre- and post-vaccination were collected from esophageal cancer patients. After S-588410 vaccination, peptide-specific CTLs were induced and the densities of CD8+ cells and PD-L1 cells were higher than those before vaccination. Furthermore, TCR repertoire analysis* revealed that the TCR of peptide-specific CTLs were also detected in the tumor infiltrating T cells.
These results suggest that the combination of S-588410 with anti-PD-1/PD-L1 antibody is expected to be more effective than monotherapy.
*TCR repertoire analysis was conducted in collaborative research between OncoTherapy and Shionogi & Co., Ltd.

[Summary of the presentation]
The aim of this study is evaluating the effects of S-588410 on CD8 positive (+) T-lymphocytes in both blood and tumor tissue and PD-L1 expression in tumor tissue, by comparing of the specimens from before and after vaccination.
Total 15 HLA-A*24:02-positive patients (pts) with esophageal cancer were enrolled in this study. Peptide-specific cytotoxic T lymphocytes (CTL) were induced in all pts after vaccination. Multifunctional CD8+ T cells in PBMC were increased in 7 out of 12 pts and

maintained in the other pts after vaccination. Immunohistochemical analysis demonstrated that the densities of CD8+, CD8+GranzymeB+, CD8+PD1+ and PD-L1+ cell in tumor tissue after vaccination were higher than those before vaccination. Furthermore, in 6 out of 7 pts, TCRs identified from peptide-specific CTLs were detected from both tumor tissue and PBMC after vaccination. These results suggest that the combination therapy of S-588410 with anti-PD-1 / PD-L1 antibody has the possibility of generating a synergistic effect.