Combination Immunotherapy  
Tech ID: 29677 / UC Case 2015-348-0

SUMMARY

UCLA researchers have developed a combination immunotherapy for lung cancer that functions by evoking anti-tumor immune responses in lung cancer patients.

BACKGROUND

Lung cancer is a challenging health problem, claiming more than 1.1 million deaths worldwide annually. Despite incredible medical progress, the long-term survival rate of lung cancer remains low due to the high risk of recurrence. Therefore, immunotherapy which harnesses the immune system to react against tumors can be an attractive approach with potential for long term anti-tumor benefit.

CCL21 (secondary lymphoid chemokine, SLC) is a lymphoid chemokine which, upon binding to the CCR7 gene receptor, functions as a chemo-attractant for mature dendritic, naïve, and memory T cells. PD-L1 (Programmed death receptor-ligand 1) decreases T cell receptor-mediated proliferation and cytokine production by interacting with PD1 (Programmed cell death protein 1). While CCL21 enhances cell-mediated immunity against tumor cells, the PD-L1/PD1 pathway plays a major role in immune evasion of tumor cells.

INNOVATION

Dr. Dubinett's group has previously developed an immunotherapy which evokes anti-tumor immune responses in lung cancer patients by intratumoral administration of dendritic cells expressing the CCR7 receptor ligand CCL21. Their recent clinical data shows that the efficacy of this immunotherapy is most prominent in patients with low tumor PD-1L expression level. This result indicates that blocking PD-1L/PD1 pathway in combination with the CCL21 therapy can be a very effective treatment for lung cancer.

APPLICATIONS

Immunotherapy for PD-1L-positive lung cancer patients.

ADVANTAGES

- CCL21 has anti-angiogenic activities in addition to its ability to reduce tumor burden
- The combination therapy improves the efficacy of the existing cancer immunotherapies
- The combination therapy may have therapeutic implications for other types of cancers

STATE OF DEVELOPMENT

A phase I clinical trial was carried out using intratumoral injection of CCL21 gene modified autologous dendritic cells in lung cancer. Results from the trial demonstrated that 1) anti-tumor specific immune responses are elicited and correlate with lower PD-L1 expression, and 2) cytotoxic CD8 T cell infiltration into the tumor is induced.

PATENT STATUS

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Additional Patents Pending

RELATED MATERIALS


RELATED CASES

2015-348-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- CCL21 And Checkpoint Inhibitors For The Treatment Of Cancer