Pneumoconiosis Compensation Fund Board (PCFB) Research Grant

For project:

"Gamma-delta T cells as immunotherapy against mesothelioma"

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Aims: To determine the effectiveness of gamma-delta T cells in mesothelioma (MPM) cell and mice models

Background: Gamma-delta T cells selectively eliminate tumor cells and show low reactivity towards normal cells, making them a good candidate for cancer immunotherapy. The above cells have been shown to work on kidney cancer in literature and nasopharyngeal cancer by the preliminary work of the research institution.

Methodology:

Cell studies

1. Co-culture assay of gamma-delta T cells with MPM cells.
2. Measure the expression of stimulatory BTN3A1 and inhibitory PD-L1/2 proteins in MPM cells by flow cytometry.
3. Antibody blocking assays (PD-L1, granzyme B and Fas).
4. Determine the motility of gamma-delta T cell by live-cell imaging.

Mice studies

1. Establish mice xenograft model for MPM.
2. Determine the migration and motility ability of gamma-delta T cells to MPM.
3. Determine the tumor killing effect of gamma-delta T cells in mice with/without PD-L1 blocking.

Impact:

1. Established a MPM mice model for preclinical therapeutic testing.
2. Provided evidence that gamma-delta T cells are a potential immunotherapy to MPM.

Result and Conclusion:

1. Gamma-delta T cells could retard MPM development and PD-L1 blocking could enhance cancer killing ability of these cells in the cell model.
2. Gamma-delta T cells could migrate and infiltrate into MPM and also inhibit the growth of MPM in the mice model.