Universidad de Navarra

Máster en Investigación Biomédica
Facultad de Ciencias

Research Project Proposal
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Project Nº 27

Title: Engineering T-cells with retrovirus vectors able to express an immunomodulatory antibody for cancer therapy

Department/ Laboratory Program of Gene Therapy and Regulation of Gene Expression / Program of Immunology and Immunotherapy, Center for Applied Medical Research (CIMA)

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Summary

Many tumors can be recognized by the immune system due to the fact that cancer cells can express specific tumor antigens. However, tumor specific T-cells are often not effective due to mechanisms used by the tumor to counteract their activity. For example, many tumor cells overexpress PD-L1, which by binding to PD-1 expressed on the surface of activated T-cells, inhibits their function. This interaction can be blocked by the use of monoclonal antibodies (mAbs) against PD-L1 or PD-1. In the present project we propose to develop a new strategy to enhance antitumor immune responses based on engineering tumor specific T-cells to express an anti-PD-L1 mAb. These T-cells would be able to block the inhibition mediated by PD-L1 and promote stronger antitumor responses.

For that purpose the following partial objectives are proposed:

- Construction and production of a retroviral vector able to express an mAb against PD-L1
- Engineering tumor-specific T-cell lines to express the anti-PD-L1 mAb
- Testing expression and functionality of the recombinant anti-PD-L1 mAb in vitro.
- Testing the antitumoral activity of engineered T-cells in tumor animal models

The project will involve the use of many different techniques, including Molecular Biology, cell culture, virus production, analysis of protein expression, immunological techniques, animal models of cancer, monitorization of immune responses etc.

References

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