IMPROVING PRODUCTION OF RETROVIRAL VECTOR FROM PG13 CELLS FOR T CELL THERAPY

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Adoptive T-Cell therapy is a growing field for cancer treatment using the patient's immune system to battle the cancer cells. Tumor specific T cells are either isolated from a tumor or created by modifying the T cells and after expansion are administered to the patient. The modifications include adding specific T cell receptors (TCR) or chimeric antigen receptors (CAR) by way of retroviral vector, lentiviral vector, or other method. One method is to use PG13 cells, which are derivatives of NIH3T3 mouse fibroblasts, to stably produce a retroviral vector that is used to transduce the T cell. PG13 cells are anchorage dependent cells that grow in roller bottles or cell factories to produce the viral vector and recently in a fixed bed bioreactor. To improve the production of the viral vector we explore the possibility of its production using PG13 cells grown on microcarriers in a bioreactor. Microcarriers are small, approximately 100-300 µm, charged beads that support the attachment of the cells and are suspended in the growth media in the bioreactor that provide controlled growth conditions. In this way parameters, such as oxygen concentration, pH, and nutrient are monitored and controlled. The result is higher cell concentration and consequently virus titer. There was no effect on the specific virus titer or the efficacy of the vector in transducing t cells indicating that using microcarriers in a bioreactor is a good method for scaling up stable production of gamma retroviral vector in PG13 cells.