An Improved Method to Separate and Expand Antigen-Specific T Cells

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Technology description

Summary

Stem cell transplants can be used to treat patients with leukemia or other disorders. Transplanted donor T cells (lymphocytes) exert strong alloimmune graft versus leukemia and other anti-tumor effects however they can also cause potentially lethal graft versus host disease (GVHD), requiring post-transplant immunosuppression. Such immunosuppression may place patients at a greater risk of contracting potentially fatal cytmegalovirus infection further reducing their capacity to be cured of their malignant disease.
The transfer of T lymphocytes specific for leukemia cells or micro-organism antigens can be useful since therapeutic immune effects would be enhanced while GVHD reactions would not be induced. Currently available methods for isolating and expanding antigen-specific T cells including selection using HLA tetramers, magnetic beads binding to activation markers or laborious limiting dilution techniques are unreliable, poorly reproducible, expensive and impede clinical progress.
The present invention relates to methods for selecting and expanding antigen specific T-cells that recognize a pre selected target antigen, to purified populations of antigen-specific T cells that recognize a pre selected target antigen and to therapeutic uses of antigen-specific T cells that recognize a pre selected target antigen. Potential applications include treatment of cytomegalovirus, Epstein-Barr virus and adenovirus reactivation following stem cell transplantation or organ transplantation, prevention and treatment of leukemic relapse after transplantation or chemotherapy using autologous expanded T cells, and selective depletion of alloreactive T cells from transplants which may produce GVHD.

Institution

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