The road to purified hematopoietic stem cell transplants is paved with antibodies.

Journal: Curr Opin Immunol

Publication Year: 2012

Authors: Aaron C Logan, Irving L Weissman, Judith A Shizuru

PubMed link: 22939368

Funding Grants: Purified allogeneic hematopoietic stem cells as a platform for tolerance induction , A monoclonal antibody that depletes blood stem cells and enables chemotherapy free transplants

Public Summary:
Hematopoietic progenitor cell replacement therapy remains a surprisingly unrefined process. In general, unmanipulated bone marrow or mobilized peripheral blood (MPB) grafts which carry potentially harmful passenger cells are administered after treating recipients with high-dose chemotherapy and/or radiotherapy to eradicate malignant disease, eliminate immunologic barriers to allogeneic cell engraftment, and to 'make space' for rare donor stem cells within the stem cell niche. The sequalae of such treatments are substantial, including direct organ toxicity and nonspecific inflammation that contribute to the development of graft-versus-host disease (GVHD) and poor immune reconstitution. Passenger tumor cells that contaminate autologous hematopoietic grafts may contribute to relapse post-transplant. Use of antibodies to rid grafts of unwanted cell populations, and to eliminate or minimize the need for nonspecifically cytotoxic therapies used to condition transplant recipients, will dramatically improve the safety profile of allogeneic and gene-modified autologous hematopoietic stem cell therapies.

Scientific Abstract:
Hematopoietic progenitor cell replacement therapy remains a surprisingly unrefined process. In general, unmanipulated bone marrow or mobilized peripheral blood (MPB) grafts which carry potentially harmful passenger cells are administered after treating recipients with high-dose chemotherapy and/or radiotherapy to eradicate malignant disease, eliminate immunologic barriers to allogeneic cell engraftment, and to 'make space' for rare donor stem cells within the stem cell niche. The sequalae of such treatments are substantial, including direct organ toxicity and nonspecific inflammation that contribute to the development of graft-versus-host disease (GVHD) and poor immune reconstitution. Passenger tumor cells that contaminate autologous hematopoietic grafts may contribute to relapse post-transplant. Use of antibodies to rid grafts of unwanted cell populations, and to eliminate or minimize the need for nonspecifically cytotoxic therapies used to condition transplant recipients, will dramatically improve the safety profile of allogeneic and gene-modified autologous hematopoietic stem cell therapies.