CD3/CD28 costimuled and expanded cord blood T lymphocytes can be primed by killed leukemic cells to generate cytotoxic lymphocytes (CTL) available for adoptive immunotherapy against leukemia

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Inventor(s)

- Szabolcs, Paul

College

School of Medicine (SOM)

For more information please contact

Mullins, Alexandria "Alex"

alex.mullins@duke.edu

Value Proposition

Allogenic hematopoietic cell transplant (bone marrow or stem cell transplantation) is a therapy method used on hematology-related cancers and various autoimmune diseases. This therapy method has proven to be widely successful and one of the few curative methods against hematologic malignancies. However, graft-versus-host disease (GVHD) is the most serious complication of allogenic hematopoietic cell transplants that occurs in up to 50% of patients. To alleviate GVHD, donor leukocyte infusions (DLI) that contains re-stimulated T lymphocytes, has shown improvement in GVDH, viral infections, and lymphoma treatments. Despite this, DLI infusions are limited since they require leukocyte from the same hematopoietic cell transplant donor. An alternative source of T lymphocytes can be found in cord blood, but these T-cells are antigen inexperienced and will only provide limited protection. Therefore, there is an unmet need in the clinic for further therapies to provide hematopoietic cell transplant recipients better protection from GVHD and immune deficiency complications.

Technology

To alleviate allogenic hematopoietic cell transplant complications via leukocyte infusions, Dr. Szabolcs developed a novel method of isolating cord blood T-cells and stimulating them for increased proliferation and activation. The propagation of the naïve T-cells occurs by stimulation with interleukins 7, 12, or 15 alone or in combination of each cytokine. Additionally, anti-CD3 and anti-CD8 antibodies are further added. The combination of the mentioned cytokines and anti-CD antibodies are responsible of inducing proliferation of cord blood T-cells and activation against cancer cell antigens. Lymphopenia (low T-lymphocyte number) is often observed in patients whom underwent hematopoietic cell transplantation and the increased proliferation of the cord blood T-cells is important to alleviate this issue.

Advantages

- Method of isolating T-cells from cord blood and increasing their activation and stimulation ex vivo.
- Novel method to prevent and treat graft-versus-host disease.
- Novel method to use stimulated T-cells against relapsed leukemia.