

INTERFERON-GAMMA TREATMENT TO IMPROVE EFFICACY OF HEMATOPOIETIC STEM CELL TRANSPLANTATION FOR AML AND OTHER CANCER

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Technology Description

Researchers at Washington University in St. Louis have discovered that interferon-gamma treatment could potentially prevent relapse after hematopoietic stem cell transplantation (HCT) treatment by making the cancer cells more visible to the donor immune cells. This technology is based on studies of acute myeloid leukemia (AML) and could possibly be extended to other hematological cancer.

In HCT, newly transplanted donor cells fight the patients' cancer cells through an immune-mediated "graft versus leukemia" effect. Currently, many patients with AML undergo HCT but it often fails. To help increase the HCT success rate, the inventors studied patients who relapsed after HCT. They found that the cancer cells in about half of these patients avoided detection by the HCT because the cancer cells had reduced gene expression for MHC class II. Interferon-gamma can reverse this effect. It can restore MHC class II expression in cancer cells and make them susceptible to the graft vs. leukemia effects. This technology provides a new therapeutic approach to improve the efficacy of HCT treatment of AML or any hematological cancer that exhibits lower MHC class II expression.

Stage of Research: The inventors have shown that Interferon gamma treatment led to robust upregulation of MHC class II in AML cells from relapsed patients and restored their ability to stimulate donor T cells in vitro. They are continuing to validate and develop this approach.

Applications:

- **Conditioning treatment for AML and other cancers** – IFN-gamma treatment to restore sensitivity of cancer cells to HCT or other immune attack

Key Advantages:

- **Unmet medical need** – potential to improve efficacy for HCT therapy and thereby increase survival rate for AML and other hematological cancer

Publications:

- Christopher MJ, Petti AA, Rettig MP, Miller CA, Chendamarai E, Duncavage EJ, Klco JM, Helton NM, O'Laughlin M, Fronick CC, Fulton RS, Wilson RK, Wartman LD, Welch JS, Heath SE, Baty JD, Payton JE, Graubert TA, Link DC, Walter MJ, Westervelt P, Ley TJ, DiPersio JF. [Immune Escape of Relapsed AML Cells after Allogeneic Transplantation](#). *N Engl J Med*. 2018 Dec 13;379(24):2330-2341.
- **Evangelou Strait, J.** [Relapsed leukemia flies under immune system's radar](#). *The Source*- a Washington University in St. Louis publication. 2018, Oct. 31.

Patents: [Methods and compositions for treatment of cancer](#) (U.S. Patent Application, Publication No. US20200237817)

Related Web Links: [Dr. Christopher profile](#); [Dr. DiPersio profile](#); [Dr. Ley profile](#); [Dr. Petti profile](#); [Dr. Rettig profile](#)