

IL-12 Immunotherapy for the Treatment of Cancer

Overview of Technology:

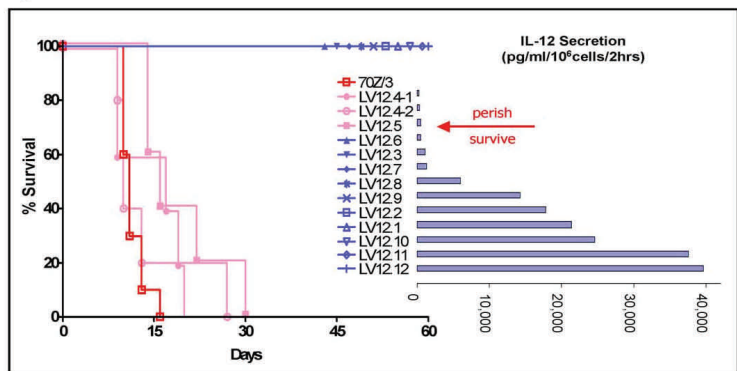
Immunotherapies are currently being developed as novel approaches to the treatment of cancer. These approaches are based on the concept that cancer cells express antigens that can be targeted by the immune system. However, despite the presence of these antigens, tumors are not typically readily recognized and eliminated by the host—resulting in cancer development and progression. Interleukin-12 (IL-12) is a cytokine that has multiple effects on the immune system. Direct injection of IL-12 has previously shown some effectiveness in the treatment of leukemia in animal models, however human trials with this approach have not proven successful.

Research at UHN has demonstrated that IL-12 delivered via transduced leukemia cells has a powerful anti-cancer effect. In this method, an IL-12 gene is inserted in leukemia cells via a viral vector. Cells that produce high levels of IL-12 are then selected and re-introduced to the subject. A key finding of this research is that a remarkably small number of IL-12 producing cells are required for effective therapy provided that transduced cells producing high levels of IL-12 are first selected. Additionally, problematic immune dampening observed with previous efforts to use IL-12 therapeutically was not observed. Extensive testing in a mouse acute lymphoblastic leukemia (ALL) model has demonstrated a potent and long-lasting anti-cancer effect of IL-12 delivered by this method.

Successful transduction of primary leukemia blast cells from Acute Myeloid Leukemia (AML) patients has also been demonstrated. Additionally, the successful transduction of several AML cell lines as well as a Chronic Myeloid Leukemia (CML) cell line has been performed. Together these findings provide the potential for a therapy that will be broadly applicable in the treatment of leukemias.

The patent filing for this technology includes claims that are not limited to a particular gene-delivery system—allowing for the potential use of this technology with various vectors or other gene-delivery systems.

Figure 3:



Interleukin-12 LV transduction of ALL cells leads to protection of challenged mice. (From Labbe A, et al. Jun. 28, 2008 J Cell Mol Med)

Related Publication:

Labbe A, Nelles M, Walia J, Jia L, Furlonger C, Nonaka T, Medin JA, Paige CJ. IL-12 Immunotherapy of Murine Leukemia: Comparison of Systemic Versus Gene Modified Cell Therapy. 6-28-08, J Cell Mol Med.

Patent:

US12/598,899, Europe (EP08748251.9) - Patents pending

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UHN Reference # - 8062