

Pediatric Leukemia Research Program and Transplant and Cell Therapy Division LLU Cancer Center

Abstract

Despite recent advances in the treatment of blood cancer, it remains critical to identify factors associated with poor outcomes barriers to achieve cure especially as they affect disproportionately underprivileged minority population, such as the population we serve here at Loma Linda Health. At Loma Linda University Cancer Center and through multi-institutional collaboration, our research group discovered several predictors of response to cancer treatment that can also be used as new targets for therapy. These new discoveries are not only applicable disproportionately to the prevalent minority population we serve but also to general population.

Bone marrow transplant is a corner stone in treating blood cancer, however, the availability of suitable matched donors' limits its applicability especially to minority population. Furthermore, the associated collateral toxicities of aggressive chemotherapy of such treatment are major hindrances for its applicability to the general population.

Blood and marrow graft engineering and targeted cell therapy (e.g., CAR-T cells) are newer approaches to overcome these obstacles. Graft manipulation overcomes the barrier of matched donor availability and targeted cell therapy delivers precision medicine that attacks the cancer cells and minimize off target collateral toxicity that affects non-malignant cells, such novel approaches are effective for treatment of patients that were considered incurable in the past.

The process of graft engineering and generation of targeted cell therapy requires very specialized and advanced specific laboratory capabilities. Loma Linda University Cancer Center, as a leader in cancer care and research, established the new Division of Transplant and Cell Therapy and is building a state-of-the-art Transplant and Cell therapy (TCT) and Good Manufacturing Practices(GMP) laboratory to be able to provide such novel therapies.

The impact of such advanced laboratory extends beyond providing modern cancer therapy not only to blood cancer but also to solid tumors as well as beyond cancer treatment e.g., gene therapy, solid organs transplant and regenerative medicine applications. Additionally, the new TCT/GMP lab is pivotal toward LLU comprehensive Cancer Center designation and plays a multi-disciplinary role in progressing translational cellular therapy from bench to bedside.

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