

## SCIENTIFIC ABSTRACT

Replication incompetent, recombination incompetent retroviral vectors (G1Na and LNL6) will be used to mark autologous peripheral blood and marrow cells removed and stored at the time of cytogenetic remission or re-induction of chronic phase in Philadelphia chromosome positive CML patients who have developed blast crisis or accelerated phase and have been reinduced into chronic phase following Daunomycin, high-dose Ara-C, and GM-CSF therapy. This study will also compare the relative efficiency of the peripheral blood and marrow to generate hematopoietic recovery after transplantation. We estimate that between  $0.6$  and  $2 \times 10^6$  CD34 positive cells/kg will be infused and that between 600 and 2000 leukemia cells will be marked with NEO in the autologous cells used for transplant. It is not known how many CML blastic leukemia cells are present in the systemic circulation following induction of the chronic phase or a cytogenetic remission by Daunomycin, high-dose Ara-C, and GM-CSF, but a significant number of patients are in cytogenetic remission (7). We will look for the number of NEO-marked cells using a methylcellulose late progenitor colony culture system and a PCR assay for the NEO gene used previously (5). In the CML cells under analysis, the percent of these NEO-marked cells which are leukemic can be determined by a PCR assay for the bcr-abl mRNA positive CML cells (5). These studies will clarify if relapse arises from the leukemic CML blast cells present in the autologous cells infused after TBI, VP-16, and cytoxan (if polyclonal CML NEO-marked blastic cells appear at the time of relapse), or if residual systemic disease contributes to relapse (if none of the CML leukemic blasts at the time of relapse contain the NEO gene). These studies will help us evaluate purging and selection of peripheral blood or marrow as a source of stem cells for transplant.