

We Claim:

1. Use of a T cell product comprising autologous T cells expressing an anti-CD19 chimeric antigen receptor (CAR) in the preparation of a medicament for treating a cancer selected from the group consisting of Waldenstrom Macroglobulinemia, Richter Transformation, Burkitt Lymphoma, and Hairy Cell Leukemia in a subject, wherein, wherein the subject is to receive bridging therapy after leukapheresis and before conditioning/lymphodepleting chemotherapy.
2. The use of claim 1, wherein the cancer is refractory to, or has relapsed following, one or more of chemotherapy, radiotherapy, immunotherapy, an autologous stem cell transplant, or any combination thereof.
3. The use of claim 1 or 2, wherein the bridging therapy is completed ≥ 7 days or 5 half-lives before a conditioning chemotherapy.
4. The use of any one of claims 1 to 3, wherein the subject is to receive a lymphodepleting chemotherapy regimen of cyclophosphamide 500 mg/m² intravenously and fludarabine 30 mg/m² intravenously, both to be given on each of the fifth, fourth, and third days before T cell infusion.
5. The use of any one of claims 1 to 4, wherein the cancer is Richter Transformation and the bridging therapy is selected from the group consisting of Rituximab, Cyclophosphamide, Hydroxydaunorubicin hydrochloride, vincristine, and Prednisone (R-CHOP); Dose Adjusted Etoposide, Prednisone, Vincristine, Cyclophosphamide, Doxorubicin, and Rituximab (DA-EPOCH-R); Bruton Tyrosine Kinase inhibitor (BTKi) (BTKi) $\pm$ VTX-2337; dexamethasone; and irradiation.
6. The use of any one of claims 1 to 4, wherein the cancer is Burkitt Lymphoma and the bridging therapy is selected from the group consisting of Rituximab, Ifosfamide, Carboplatin, and Etoposide (R-ICE); Dose Adjusted Etoposide, Prednisone, Vincristine, Cyclophosphamide, Doxorubicin, and Rituximab (DA-EPOCH-R); Rituximab, Gemcitabine, and Oxaliplatin (R-GEMOX); cyclophosphamide, vincristine sulfate, doxorubicin hydrochloride, and dexamethasone (HyperCVAD); dexamethasone; and irradiation.

7. The use of any one of claims 1 to 4, wherein the cancer is Waldenstrom Macroglobulinemia and the bridging therapy is ibrutinib.
8. The use of any one of claims 1 to 7, wherein the T cell product comprises CD4⁺ and CD8⁺ CAR T cells that are prepared from peripheral blood mononuclear cells (PBMCs) by positive enrichment and consequent partial or complete depletion of circulating cancer cells.
9. The use of claim 8, wherein the PBMC are enriched for T cells by positive selection for CD4⁺ and CD8⁺ cells, activated with anti-CD3 and anti-CD28 antibodies in the presence of IL-2, and then transduced with a replication-incompetent viral vector containing FMC63-28Z CAR, a chimeric antigen receptor (CAR) comprising an anti-CD19 single-chain variable fragment (scFv), CD28 and CD3-zeta domains.
10. The use of claims 8 or 9, wherein the T cell product comprises fewer cancer cells than a T cell product comprising T cells from a leukapheresis-derived product that has not been positively selected for CD4⁺ and CD8⁺ T cells.
11. The use of any one of claims 8 to 10, wherein the T cell product has other superior product attributes relative to a T cell product comprising T cells from a leukapheresis-derived product that have not been positively selected/enriched for CD4⁺ and CD8⁺ T cells.
12. The use of claim 11, wherein the superior product attributes are selected from increased percentage of CD45⁺CCR7⁺ (naïve-like) T cells, decreased percentage of differentiated T cells, increased percentage of CD3⁺ cells, decreased IFN-gamma production, decreased percentage of CD3⁻ cells.
13. The use of any one of claims 1-12, wherein the subject is to be administered one or more doses of 1.8×10^6 , 1.9×10^6 , or 2×10^6 CAR positive viable T cells per kg body weight, with a maximum of 2×10^8 CAR positive viable T cells (for patients 100 kg and above).
14. The use of any one of claims 1 through 13, wherein the subject is to be monitored for signs and symptoms of cytokine release syndrome (CRS) and neurologic toxicity after T cell administration.

15. The use of claim 14, wherein the subject is to be monitored daily for at least seven days following infusion for signs and symptoms of CRS and neurologic toxicity.
16. The use of claim 15 wherein the subject is to be monitored daily for four weeks.
17. The use of any one of claims 14-16, wherein the signs or symptoms associated with CRS include fever, chills, fatigue, tachycardia, nausea, hypoxia, and hypotension and the signs or symptoms associated with neurologic events include encephalopathy, seizures, changes in level of consciousness, speech disorders, tremors, and confusion.