Universal CAR T-cell therapy addresses key challenges of autologous CAR T, including high cost, time-consuming, personalized manufacturing and manufacturing failure risks.

CT0596 is an allogeneic BCMA CAR T-cell product, which also targets NKG2A to resist host NK cell rejection, and is engineered with triple gene knockout of TRAC, B2M, and NKG2A to mitigate graft-versus-host disease (GVHD), host immune rejection, and increase anti-tumor activities, respectively.

Herein, we report preliminary safety, efficacy, and PK profile of CT0596 at recommended dose level, i.e. 4.5 10^8 CAR^+ T cells.

- Eligibility:
  - ✓ Patients with **relapsed/refractory multiple myeloma** (R/R MM) had received at least 3 prior lines of therapy. Patients with **primary plasma cell leukemia** (R/R pPCL) had received at least 1 prior line of therapy.
  - ✓ Patients must have measurable disease.
- Lymphodepletion regimen: fludarabine (30 mg/m²) and cyclophosphamide (500 mg/m²) for 3 consecutive days
- Dose levels (i3+3 escalating scheme): 1.5 10^8, 3.0 10^8, 4.5 10^8 and 6.0 10^8 CAR^+ T cells.

Age, median (range), years	64.5 (49, 70)
Male, n(%)	7 (87.5)
Years since diagnosis, median (range)	2.3 (1.3, 5.9)
Primary Diagnosis, n (%)	
R/R MM	6 (75.0)
R/R PCL	2 (25.0)
Type of Immunoglobulin at Initial Diagnosis, n (%)	
IgG	3 (37.5)
IgA	2 (25.0)
κ Light Chain	3 (37.5)
ISS Stage, n(%)	
II	1 (12.5)

At the recommended dose level, CT0596 demonstrated a manageable safety profile with no unexpected toxicities and promising efficacy in heavily pretreated patients with R/R MM and pPCL. Pharmacokinetic data supported robust in vivo expansion of CT0596. These preliminary results warrant further dose expansion and clinical development of CT0596.