Promab Biotechnologies’ CAR-T new product development programs are being designed for pre-clinical and future clinical applications.

CAR-T cells can be used for:
1. Compound screening
2. Antibody screening
3. Co-stimulatory and activation domain comparison
4. Personalized medicine and donor variations for CAR-T screening
5. Checkpoint inhibitors
6. Safety switches and regulators of CAR-T functions
7. Pre-clinical in vivo models
8. Treg and T memory cells in CAR-T setting
9. CAR-T signaling, tumor microenvironment
10. Proof of concept studies for clinical trials

The structure of CAR from Promab
CD19 and CD22 proteins are often overexpressed in leukemia and lymphoma. Both CAR-T cells are used for targeting these hematological diseases. CAR-T cells targeting both antigens is developed to target these antigens simultaneously.

CD19-22 CAR construct

Figure 1. CAR-T cells expressing the above constructs are available from Promab targeting CD19 and CD22 antigens. ScFv means single chain variable fragment. These CAR-T cells are generated with CD19-CD22-4-1BB-CD3 zeta CAR construct.

To date, Promab has generated 2nd generation CAR and CAR controls (as shown in Figure 1). Promab has also generated CAR-T cells and CAR-NK (Natural Killer) effector cells against cancer target cells that show excellent functionality, including dose-dependent and target cell-specific cytotoxic activity.

These CAR-T cells can be tested with target cells in cytotoxic assays and used for testing modulators of immune checkpoint inhibitors (PD-1, CTLA-4 pathways), activators of immune response, or small molecules affecting T-cell or T-reg activity.
Figure 2. FACS analysis with human FAB antibody detects CD22 CAR and FACS with CD19ScFv (FMC63, available from ProMab) shows expression of CD19-CAR.

Figure 3. Top panel: RTCA cytotoxicity activity of effector CD19-CD22-4-1BB-CD3-CAR-T cells against Hela-CD19 target cells. This shows killing of CD19-positive target cells by CD19-CD22-CAR-T cells. Lower panel: RTCA cytotoxicity activity of effector CD22-4-1BB-CD3-CAR-T cells against CHO-CD22 target cells available from Promab. This shows killing of CD22-positive cells by CD19-CD22-CAR-T cells. Effector cells: Target cells ratio=10:1.
Figure 4. RTCA cytotoxicity activity of effector CD19-CD22-4-1BB-CD3-CAR-T cells against Raji target cells.