Chimeric Antigen Receptor (CAR)-T Cell Immunotherapy

Pathways & Key Molecular Targets

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**Chimeric Antigen Receptor (CAR)-T Cell Immunotherapy**

**CAR Structure:**

1st generation CARs only contain a CD3 ζeta domain while 2nd and 3rd generation CARs have one.

**CAR-T Manufacturing & Administration:**

1. Leukapheresis
2. CAR-T activation/
3. CAR-T cell expansion
4. Lymphodepletion
5. CAR-T cell infusion

**CAR-T Cell Killing:**

- Cytotoxic CD8+ CAR-T cell
- CD4+ CAR-T cell

**PATHWAYS & KEY MOLECULAR TARGETS**

- **PD-1 KO**
- **CD19 CTL019**
- **CD19 JCAR017**
- **BCMA BCMA-CAR-T**
- **CD22 CAR-T-22**

**Results:**

- **Leukemia (adult)**
  - CR 81%
  - RFS 59%
  - PFS 50%
  - ORR 100%

- **Leukemia (pediatric)**
  - CR 93%
  - RFS 57%
  - PFS 29%
  - ORR 57%

- **B-cell Chronic Lymphocytic Leukemia**
  - CR 73%
  - RFS 37%
  - PFS 29%
  - ORR 76%

- **B-cell Acute Lymphoblastic Leukemia**
  - CR 81%
  - RFS 40%
  - PFS 29%
  - ORR 78%

- **Multiple Myeloma**
  - CR 57%
  - RFS 37%
  - PFS 29%
  - ORR 76%

**Key targets for CAR-T cell therapy and established clinical results**

- **TCR KOMHC KO**
- **CRS**
- **Neurotoxicity**
- **Exhaustion-resistant CAR-T, and universal "off-the-shelf" CAR-T.**

**Cytokines (CD4/CD8; 4-1BB)**