

# CELL THERAPY WORKFLOW

## INTEGRATED SOLUTIONS FROM COLLECTION TO DELIVERY

The journey of the patient from vein-to-vein is a complex process that requires a multitude of products, instrumentation, equipment and regulatory compliant infrastructure. The CAR T cell therapy journey begins with harvesting blood from a sick patient, isolating and activating the appropriate T cell population, and then modifying these cells to express a chimeric antigen receptor.

When the cell engineering and processing is complete, a rigorous characterization and quality control process begins to ensure patient safety and efficacy. This expansive process requires a sample tracking system mechanism for traceability and logistical infrastructure to maintain functional integrity of the living drug product. The final step in the process is delivery of this most valuable product directly to the patient.

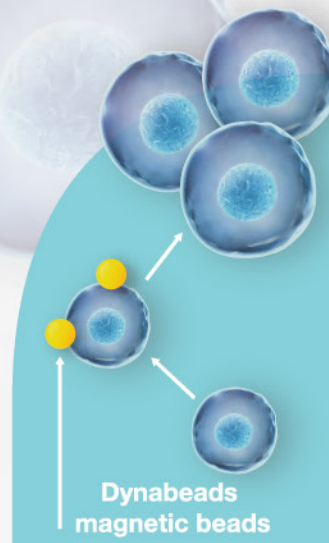
### Beginning of patient journey



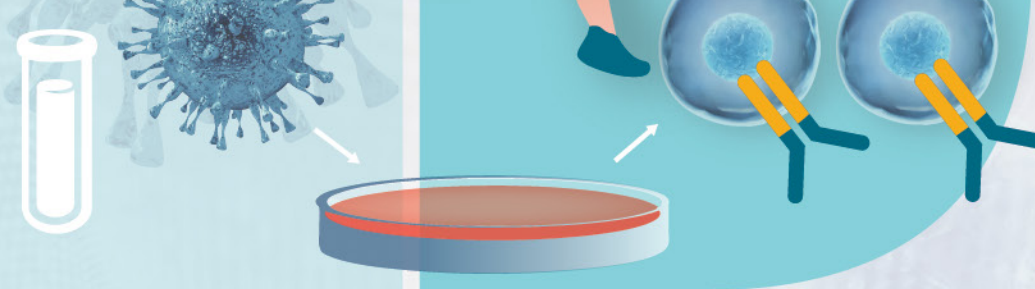
#### Collection & Tracking

- Apheresis
- Supply/cold chain logistics

# 1



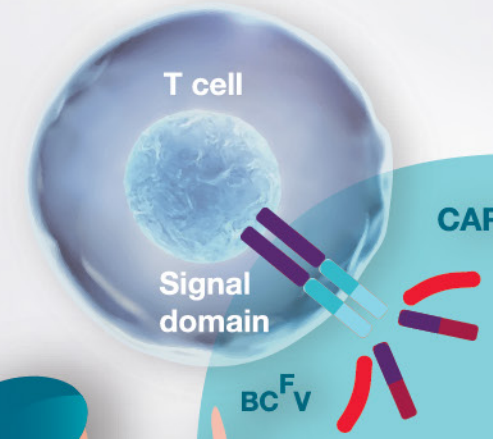
# 2



#### Cell isolation & Engineering

- Closed, modular cell processing systems
- Bead-based cell isolation and activation
- Single-use platforms
- Viral and nonviral gene delivery solutions
- CRISPR and TALEN genome editing technologies

#### CAR T cell



# 3

#### Cell Expansion

- Customizable media, reagents and supplements
- Closed modular cell processing systems
- Scalable single use platforms
- Specialized laboratory equipment
- Bioprocess automation and control platforms
- cGMP chemicals and process liquids

# 4



#### Characterization & Cryopreservation

- Identity, purity and potency assays
- Contamination and process related impurity detection
- Genomic, proteomic and cellular analytical tools
- Cryopreservation solutions



# 5



#### Supply chain & Logistics

- Supply/cold chain logistics
- Clinical trial support
- Global distribution

### End of patient journey

