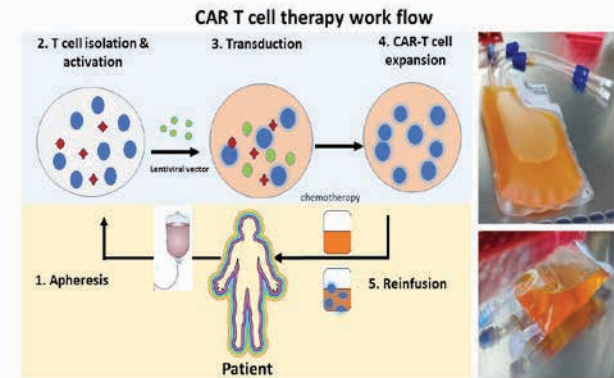


CAR-T Cell Therapy (Gene Therapy) to Cure Cancer



Problem Statement: Cancer is deadly and is growing increasingly aggressive over the decades, claiming the lives of adults and children globally. Today, 2.25 million people per year are affected by different cancers. The majority of available cancer therapies prolong life by a few months only. A new technology, called CAR-T cell therapy (a type of gene therapy), was developed to cure cancer. This technology platform showed remarkable success in curing relapsed or refractory r/r B cell malignancies, including B-ALL, DLBCL, FL. However, the treatment is exorbitantly costly, approximately USD 400,000-500,000 (INR 3-3.5 crores) for each patient. In India, this technology is not yet available at any price. As a result, the majority of the patients resort to palliation and inevitably die.

Uniqueness of the Solution: The team has developed an in-house, robust and affordable CAR-T platform to treat blood cancers. This project is a first in India and

provides end-to-end indigenous solutions for gene therapy in a GMP compliant process and infrastructure. IIT Bombay's novel CAR-T cell product is patented and has undergone extensive pre-clinical characterisation and scale-up. Since the entire process flow, from R&D to first-in-human clinical trials, is wholly indigenous, successful translation at a fraction of the cost ($1/_{10}$ th of the cost of therapy available outside the country) is possible.

Current Status of Technology: The team's first CAR-T cell product for certain types of leukaemia and lymphoma is currently under the first-in-human clinical trials in India. After pre-clinical characterisation, the team has developed scalable processes as per the industry and cGMP standards for manufacturing CAR-T cells for use in patients.

Societal Impact: CAR-T cell therapy is unavailable in India and is exorbitantly costly outside. This CAR-T cell therapy, being indigenous, would be available

for most patients in India. The expected price would be in the range of stem cell transplant costs in the country, approximately INR 30 lakhs per patient.

Patent(s): Filed

Relevant Industries: Biomedical Technology, Cell Transfer Therapy.

Faculty: Prof. Rahul Purwar, Biosciences & Bioengineering.