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MAGAZINE NOTES

NexCAR19 and India's Move Into Gene-Based Cancer Therapy

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SCIENCE & TECH

GS3

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NexCAR19 and India's Move Into Gene-Based Cancer Therapy

 **Science Reporter** Chapter 2 · 3 min read ·

Feature analysis for Science Reporter July 2026, built from verified scientific reporting.

India has long been called the pharmacy of the world for its generic medicines, but the more consequential shift is the country's entry into **advanced cell-and-gene therapy**. The anchor case is **NexCAR19**, India's first indigenous **CAR-T cell therapy**, developed by **ImmunoACT**, a company incubated at **IIT Bombay**, in partnership with the **Tata Memorial Centre**, and approved by the Central Drugs Standard Control Organisation (**CDSCO**). It matters for aspirants because it fuses biotechnology, public health economics and self-reliance in a single, testable story.

WHY IN NEWS

CAR-T therapies developed abroad can cost several crore rupees per patient, putting them out of reach for almost all Indian families. NexCAR19 was designed as a **made-in-India** answer at a small fraction of that price, and 2026 has seen the therapy expand across Indian hospitals along with a broader national push into genomics and gene therapy. This turns a laboratory achievement into a question of access, which is exactly the kind of science-and-society link UPSC favours.

WHAT CAR-T THERAPY ACTUALLY DOES

CAR-T stands for **Chimeric Antigen Receptor T-cell** therapy. It is a form of **living-cell medicine**: instead of a chemical drug, the treatment is the patient's own re-engineered immune cells.

STEP	WHAT HAPPENS
1. Collection	T-cells (a type of white blood cell) are drawn from the patient's blood
2. Gene insertion	A lentiviral vector delivers a CAR gene into the T-cells in the laboratory
3. Recognition	The new receptor lets the T-cells lock onto the CD19 protein on cancerous B-cells
4. Expansion	The engineered cells are multiplied to therapeutic numbers
5. Infusion	The CAR-T cells are returned to the patient, where they hunt and destroy cancer cells

NexCAR19 is approved for certain **relapsed or refractory B-cell cancers**, including some non-Hodgkin lymphomas and B-cell acute lymphoblastic leukaemia, where standard chemotherapy has failed. Because the therapy is built from a patient's own cells, it is a form of **personalised medicine**, and because it edits the cell's genetic instructions, it sits squarely within **gene therapy**.

THE WIDER GENOMICS PUSH

NexCAR19 is one node in a larger national effort. India has run large-scale **genome-sequencing** programmes to map genetic variation across its population, which supports research into inherited and rare diseases, and dedicated cell-and-gene-therapy manufacturing facilities have come up to move such treatments from trials to the clinic. The bottleneck is no longer only the science; it is **manufacturing at scale, cold-chain logistics, trained clinicians and reimbursement**, since even a low-cost CAR-T dose is expensive for most households.

UPSC RELEVANCE

Prelims angle: Remember that NexCAR19 is India's first indigenous CAR-T therapy, developed by ImmunoACT (IIT Bombay) with the Tata Memorial Centre, approved by CDSCO, and that it uses a lentiviral vector to target the CD19 antigen. Note the difference between CAR-T (a cell-based therapy) and conventional small-molecule drugs.

Mains angle (GS3): NexCAR19 shows how public-funded incubation, an academic hospital and a start-up can together produce a frontier therapeutic at a globally disruptive price. **Way forward:** protect this pipeline with sustained R and D funding, expand accredited manufacturing so waiting lists shrink, and build insurance and government-scheme coverage so that indigenous cost advantages actually reach patients rather than staying an achievement on paper.

FACTS CORNER - KNOWLEDGE PEDIA

NEXCAR19:

India's first indigenous CAR-T cell therapy; approved by CDSCO

Developed by ImmunoACT (incubated at IIT Bombay) with Tata Memorial Centre

Targets the CD19 protein on B-cells using a lentiviral vector

CONCEPTS:

CAR-T: patient's own T-cells are gene-edited to attack cancer, a form of living-cell and gene therapy

Indication: certain relapsed or refractory B-cell blood cancers

Supported by the Department of Biotechnology and BIRAC

Sources: [Science Reporter / CSIR-NIScPR](#), [India Science, Technology and Innovation Portal](#)



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