nature reviews drug discovery

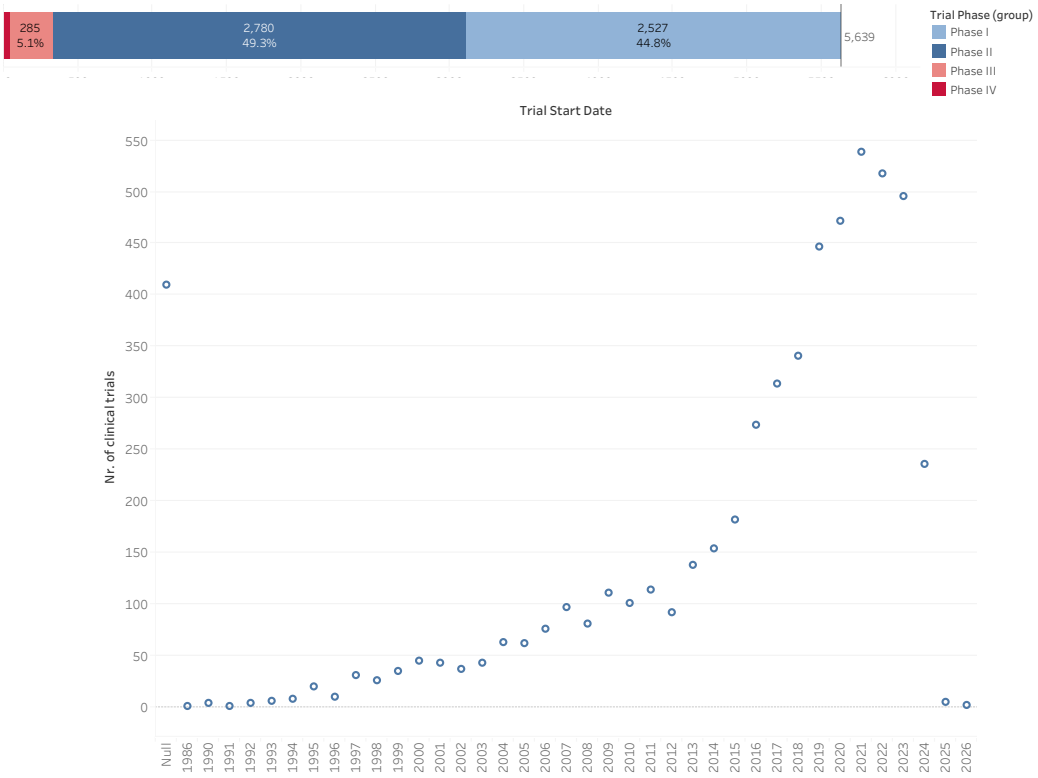
https://doi.org/10.1038/d41573-024-00094-4

Supplementary information

The changing landscape of cancer cell therapies: clinical trials and real-world data

In the format provided by the authors and unedited

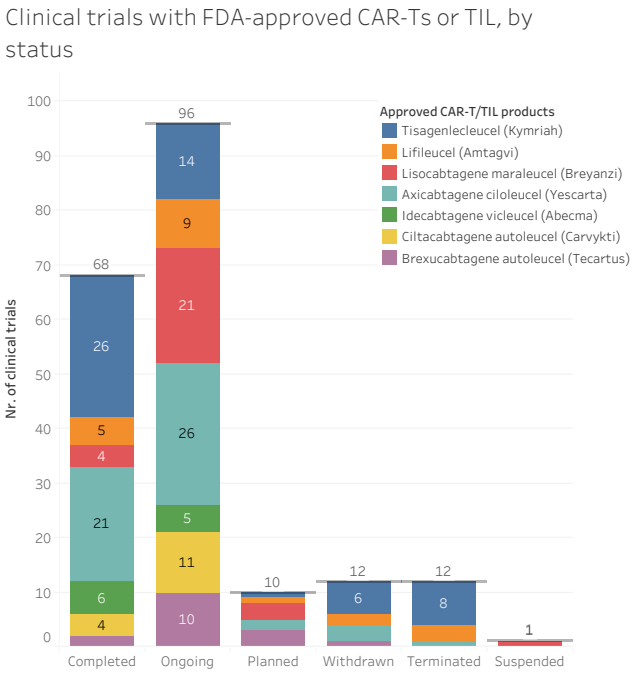
Supplementary Figure 1: Global landscape of cell therapy clinical trials: 5,639 interventional trials in record (data cut-off: March 2024).



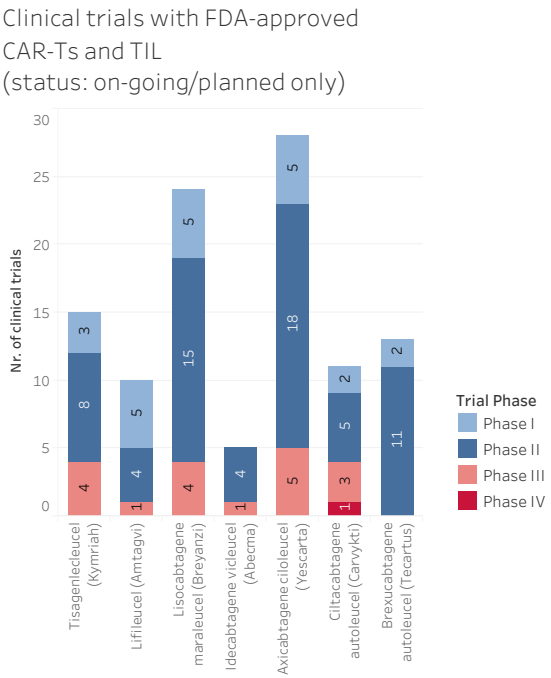
Supplementary Figure 2: Global landscape of cell therapy clinical trials: 2,692 unique cell therapy products in record (data cut-off: March 2024).

Supplementary Figure 3:

A.

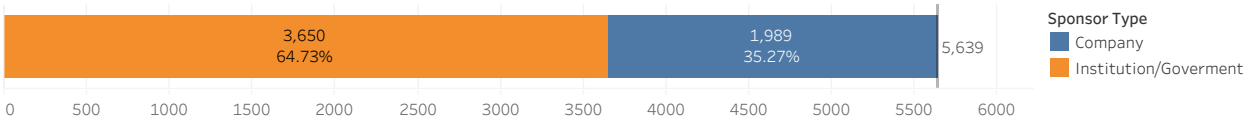


B.

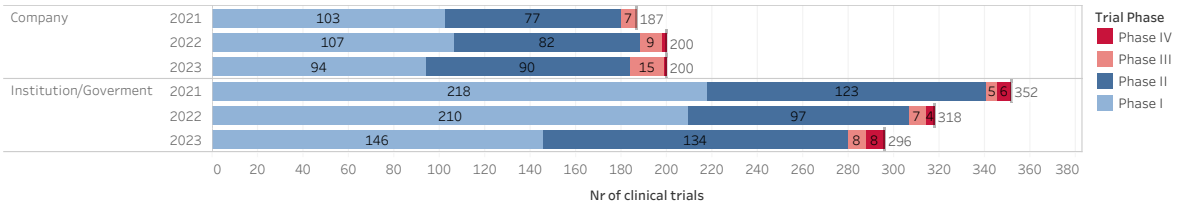


Supplementary Figure 4:

A. Cell therapy trials by sponsor type.

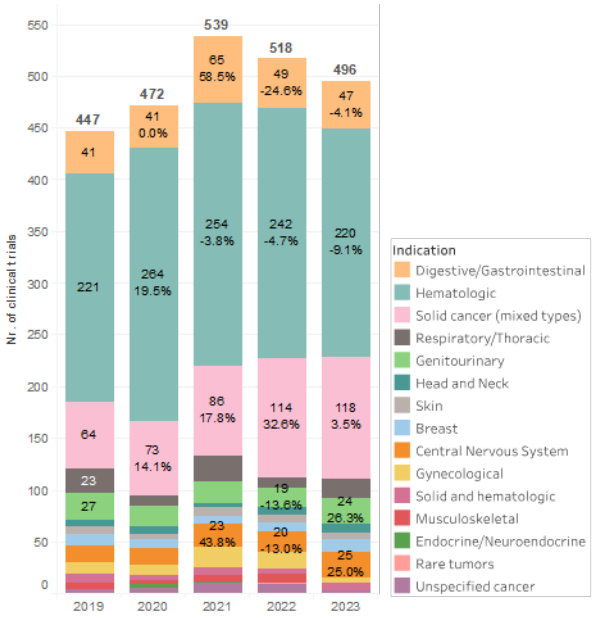


B. Cell therapy trials, by phase, sponsor type, and trial start year.

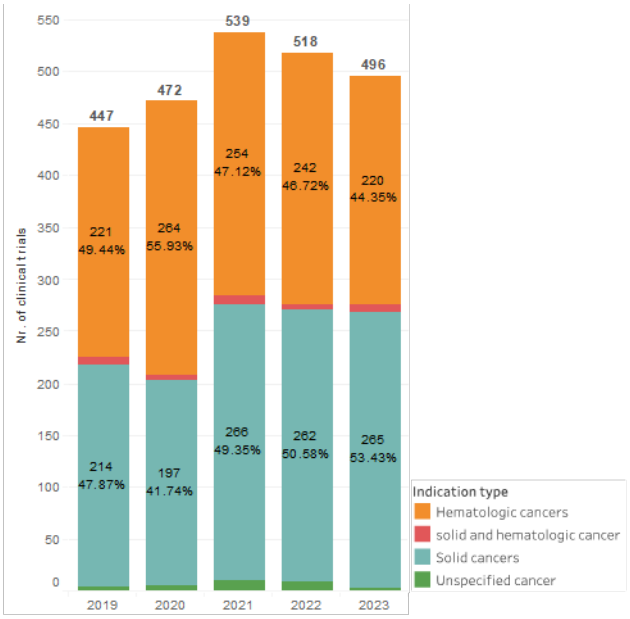


Supplementary Figure 5:

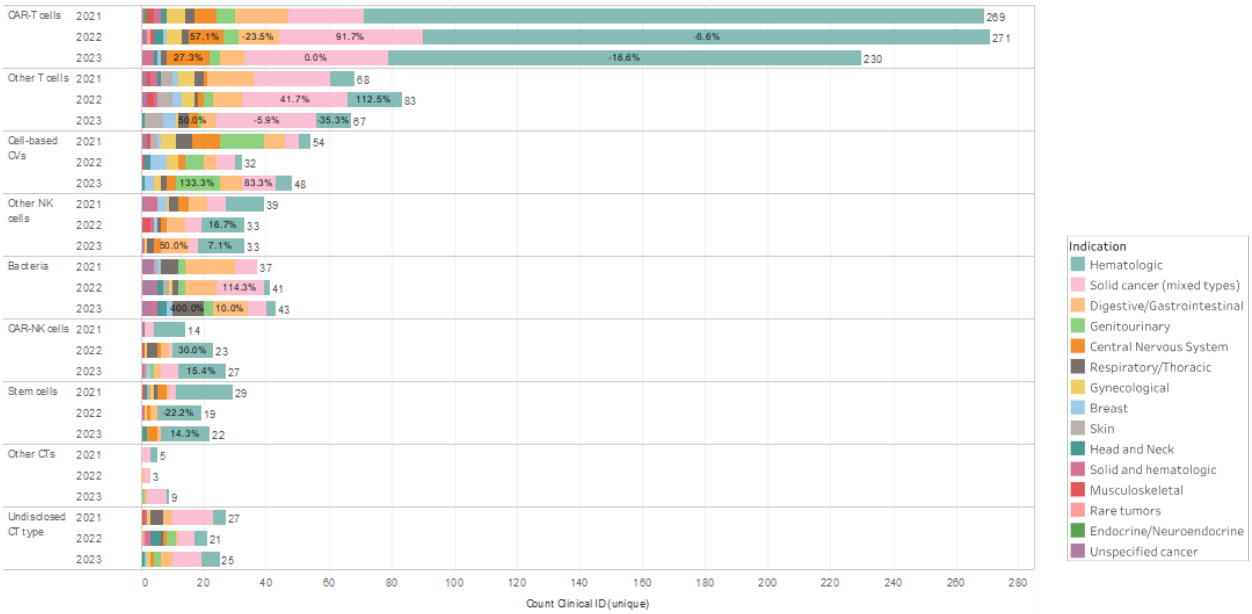
A. Cell therapy trials by trial start year and indication (% indicates year-to-year growth)



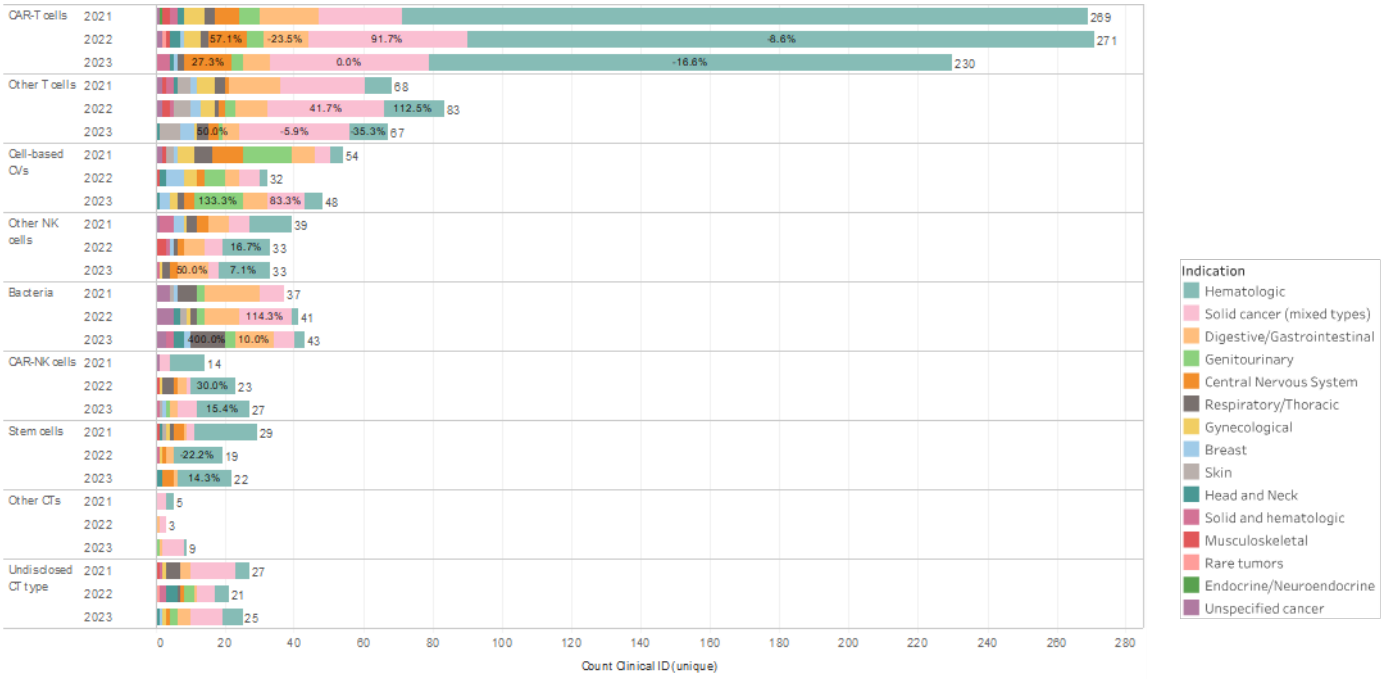
B. Cell therapy trials by trial start year and indication type (% indicates percentage of total, per year)



Supplementary Figure 6: Cell therapy modalities in oncology clinical trials by indication type and trial start date (% indicates year-to-year growth)

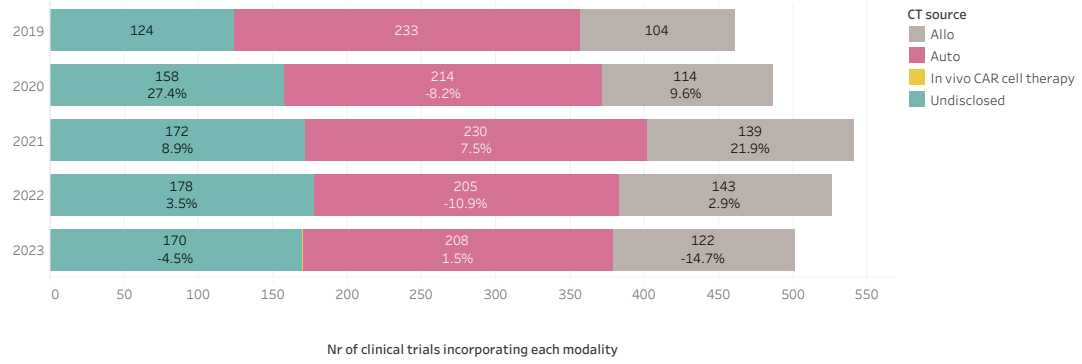


Supplementary Figure 7: Cell therapy modalities in oncology clinical trials by tumor type and trial start date (% indicates year-to-year growth).

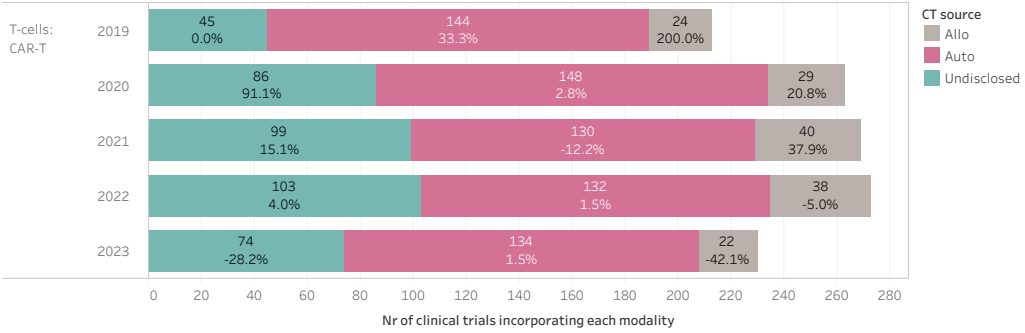


Supplementary Figure 8:

A. Cell therapy trials by trial start year and cell source (% indicates year-to-year growth)

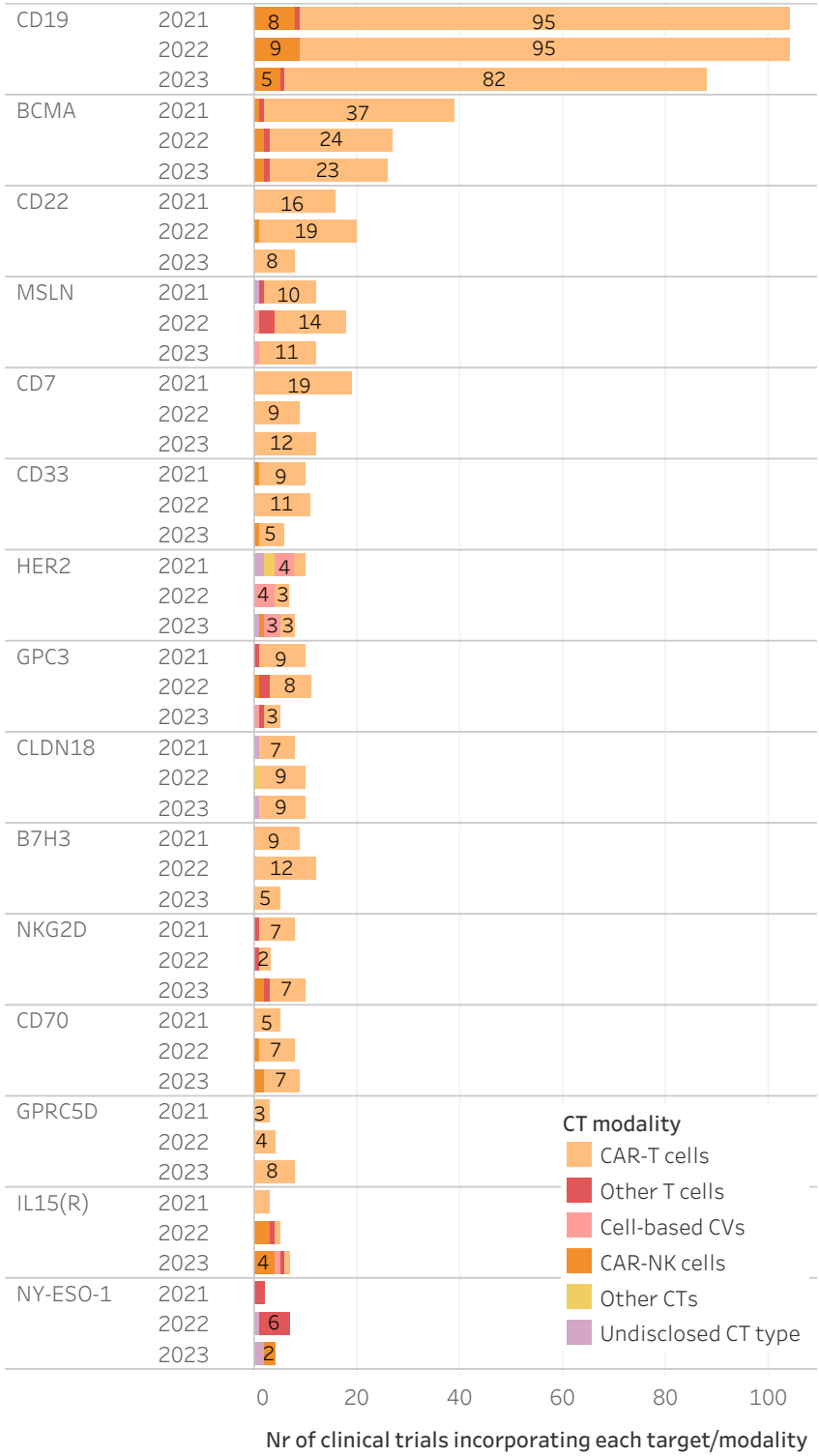


B. CAR-T cell therapy trials by trial start year and cell source (% indicates year-to-year growth)



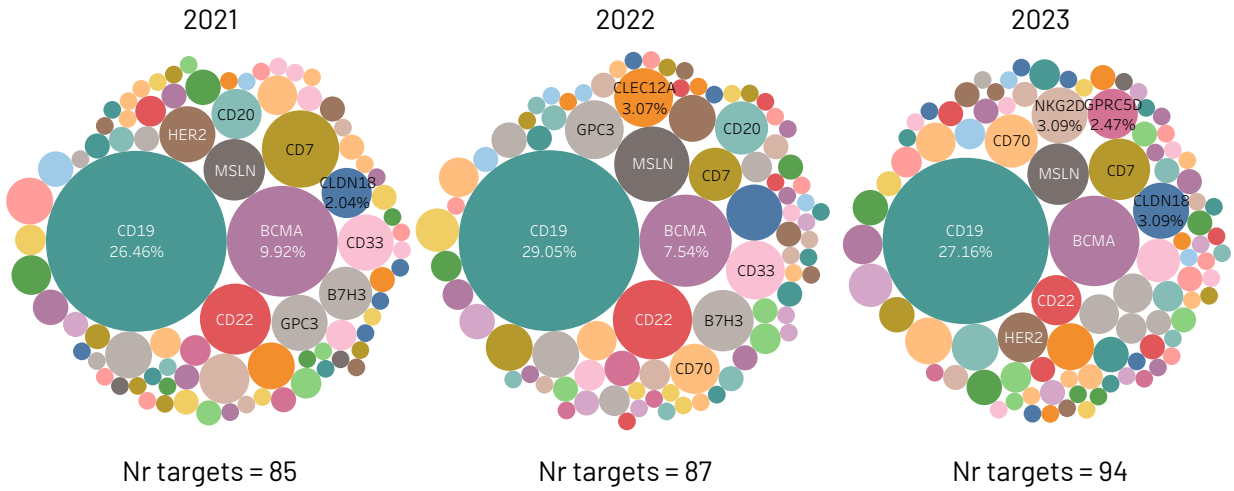
Supplementary Figure 9: Top 15 targets of cell therapy modalities in oncology clinical trials by trial start date.

		Nr. Clinical Trials	Year-over-year difference
CD19	2021	104	
	2022	104	0.0%
	2023	88	-15.4%
BCMA	2021	39	
	2022	27	-30.8%
	2023	26	-3.7%
CD22	2021	16	
	2022	20	25.0%
	2023	8	-60.0%
MSLN	2021	12	
	2022	18	50.0%
	2023	12	-33.3%
CD7	2021	19	
	2022	9	-52.6%
	2023	12	33.3%
CD33	2021	10	
	2022	11	10.0%
	2023	6	-45.5%
HER2	2021	10	
	2022	7	-30.0%
	2023	8	14.3%
GPC3	2021	10	
	2022	11	10.0%
	2023	5	-54.5%
CLDN18	2021	8	
	2022	10	25.0%
	2023	10	0.0%
B7H3	2021	9	
	2022	12	33.3%
	2023	5	-58.3%
NKG2D	2021	8	
	2022	3	-62.5%
	2023	10	233.3%
CD70	2021	5	
	2022	8	60.0%
	2023	9	12.5%
GPRC5D	2021	3	
	2022	4	33.3%
	2023	8	100.0%
IL15(R)	2021	3	
	2022	5	66.7%
	2023	7	40.0%
NY-ESO-1	2021	2	
	2022	7	250.0%
	2023	4	-42.9%



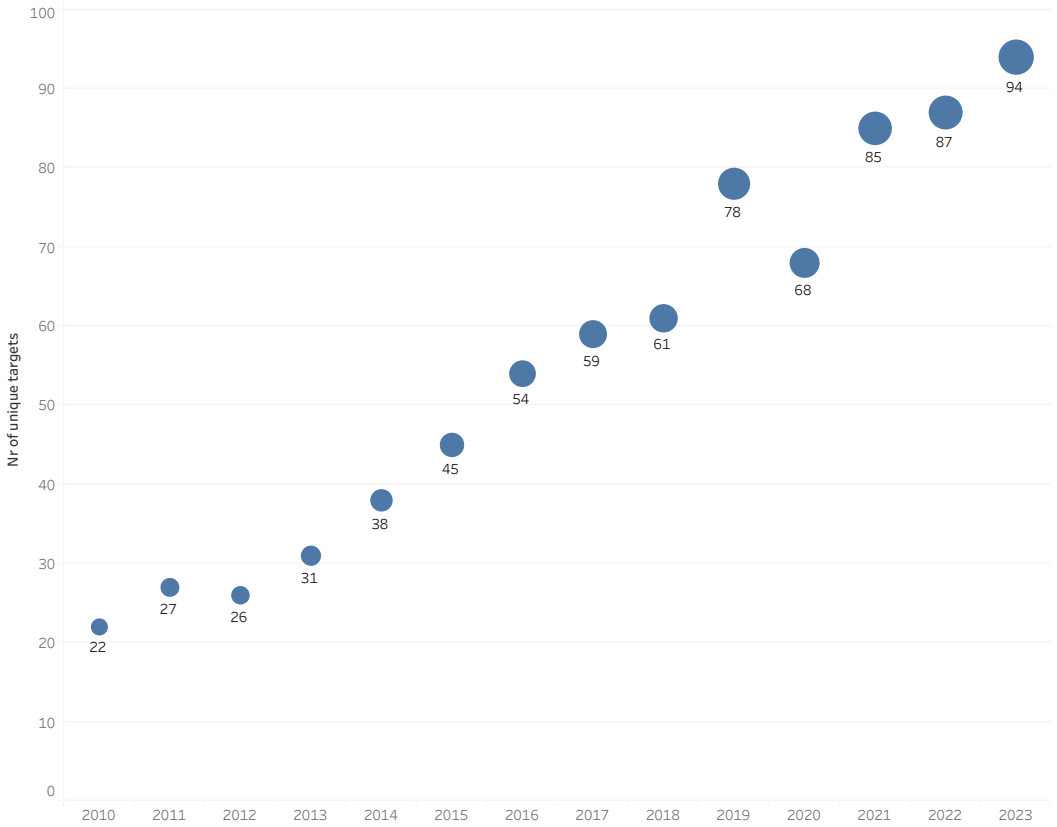
Supplementary Figure 10:

A. Targets of cell therapies, by trial start year.

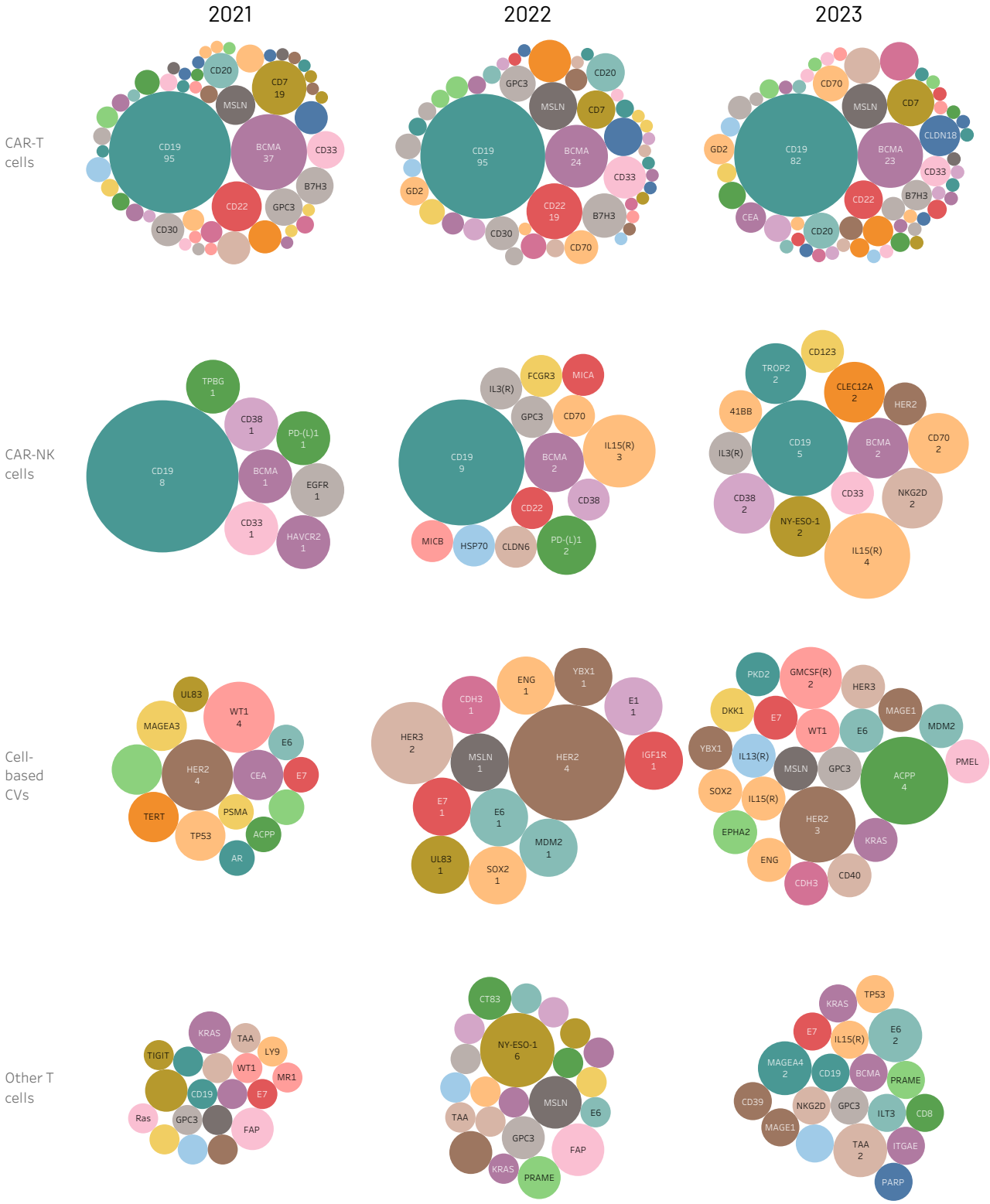


Nr targets = 85 Nr targets = 87 Nr targets = 94

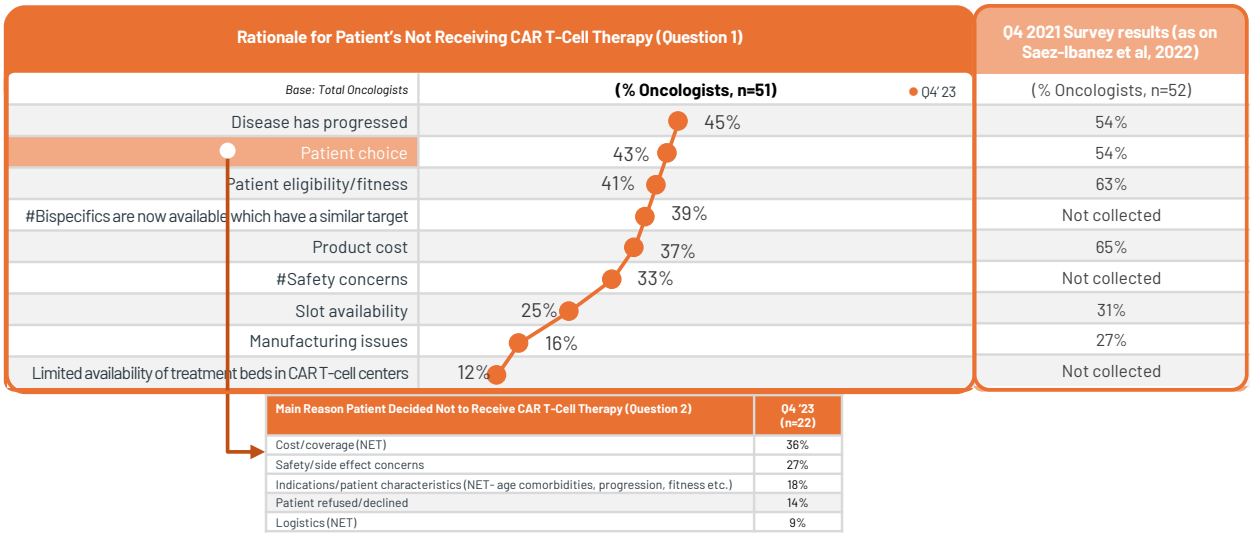
B. Number of different cell therapy targets in oncology clinical trials, by trial start date (2010-2023 only).



Supplementary Figure 11: Targets of main cell therapy modalities in oncology clinical trials, by clinical trial start year.



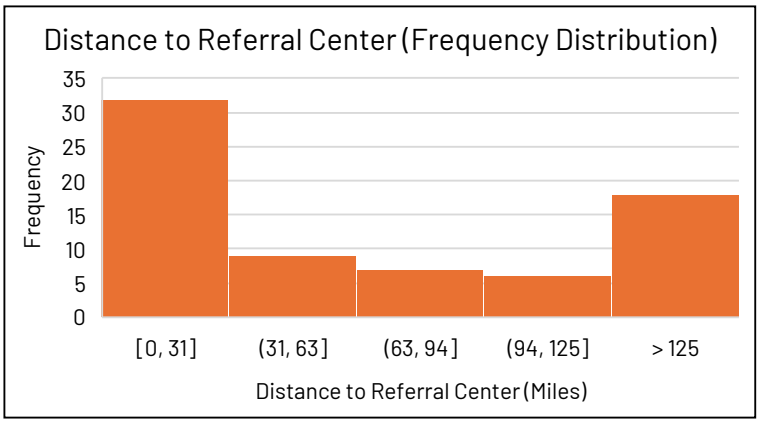
Supplementary Figure 12: IQVIA CAR-T Cell Center Insights – Q4 2023 Survey.



Question 1. If there are patients who were initially considered for CAR T-Cell therapy but did not receive it finally, what were the reasons for that? Please select all that apply.
Question 2. Can you please share the main reason that patients decide not to receive CAR T-Cell therapy?
Source: CAR T-Cell Monitor – Center Insights

#New option added
Survey fielded January 1 - January 23, 2024

Supplementary Figure 13



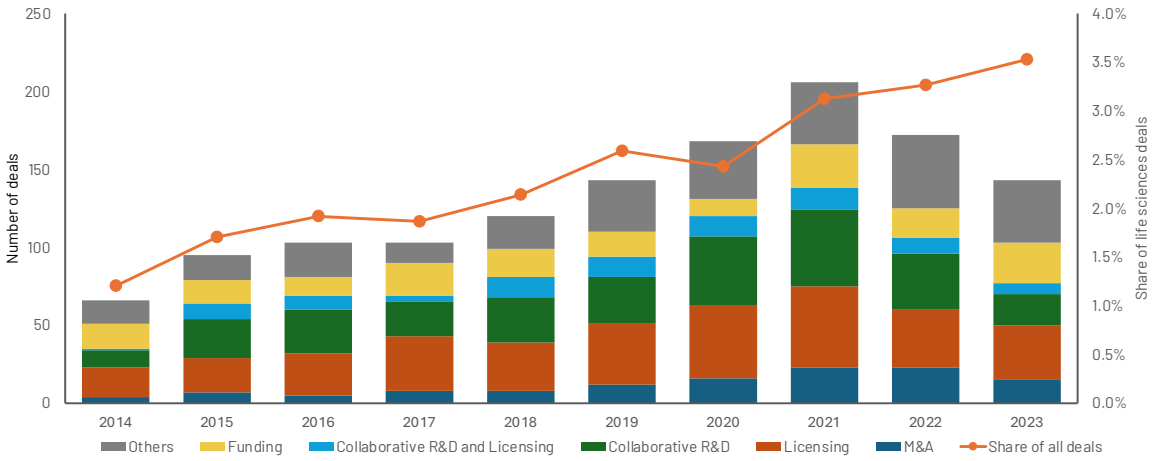
Number of US CAR-T centers by year

Year	Nr. of center in USA	Year-over-year growth
2023	198	+ 9.39 %
2022	181	+11.04 %
2021	163	+19.85 %
2020	136	+21.42 %
2019	112	+27.27 %
2018	88	

Question: What CAR T-Cell treatment center do you refer your patients to? Use the hierarchical list below to select the facility/institution or select "Other" if you cannot locate it.
Source: CAR T-Cell Monitor – Referral Insights

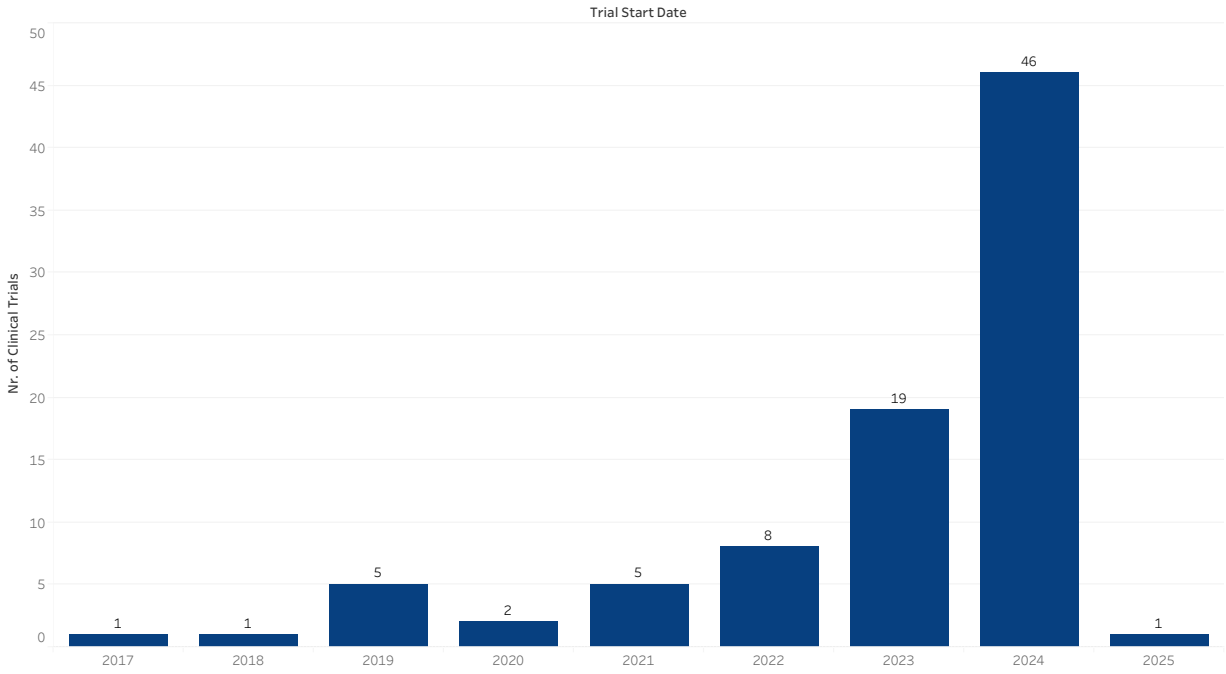
Survey fielded January 3 - January 24, 2024

Supplementary Figure 14: Number of oncology cell therapy deals by type and share of all life sciences deals, 2014-2023.



- Source: IQVIA Pharma Deals, IQVIA Institute, Jan 2024.
- Notes: Funding deals are those where no additional collaboration or licensing occurs and are deals where money is provided by an independent organization, frequently government institutions, academic institutions, or research consortium. Deals are those including cell and gene therapies but may additionally include other modalities.

Supplementary Figure 15: Clinical trials testing gene-modified cell therapies in autoimmune disorders, by trial start date (Source: GlobalData, May 2024).



Supplementary Methods:

Dataset and analysis

The data on cell therapy in oncology clinical trials were collected from GlobalData's Trial Database and subsequently curated by Cancer Research Institute (CRI) based on CRI IO Analytics definition of different immunotherapy types and drug target information. The data cut-off is March 2024. Cell therapy trials in autoimmune disorders were sourced from GlobalData's Trial Database with cut-off date of May 2024.

Cell therapies were classified into 9 main modalities based on the cell type and mechanisms of action being leveraged: (1) CAR-T cells, (2) Other T cells, (3) Cell-based Cancer Vaccines, (4) CAR-NK cells, (5) Other NK cells, (6) Bacteria, (7) Stem cells, (8) Other cell types and (9) Undisclosed cell therapy type. The "Other T cells" category has been further divided into subcategories attending to available information of these assets: Gama/delta TCR T-cells, TCR T-cells, Tumor Infiltrating Lymphocytes (TILs) and Other/Unspecified T-cells.

Cancer type classification by body location/system was done following the National Cancer Institute guidelines: https://www.cancer.gov/types/by-body-location

Real-world data on barriers to CAR-T cell treatment was obtained from IQVIA proprietary database "CAR T-Cell Monitor" (Center Insights and Referral Insights). This database provides insights on the patient journey from the referring oncologists to the advanced treatment centers that administer these therapies. This global syndicated study provides quantitative data on key touchpoints along this continuum. The U.S. data sources are quarterly primary research (Treatment module: n=51 Oncologists, Referring module: n=100 Oncologists) and publicly available data (sales, pricing, centers). In Supplementary Figure 12, Q4 2023 Survey data was compared with Q4 2021 Survey results presented in https://doi.org/10.1038/d41573-022-00095-1, which were collected by IQVIA using comparable methods.

Data on oncology cell therapy deals between 2014 and 2023 was obtained from IQVIA proprietary database "IQVIA Pharma Deals" as of January 2024.

Analyses, tables and graphical representations were done by using Tableau, except for tables and graphical representations in Supplementary Figure 12, 13 and 14, which were generated with Power Point.