Annual conference EMSP

April 24–25, 2026
Berlin, Germany

From Diagnosis to Access: Data-Driven Solutions for MS, NMO and MOGAD

Building Fairer Future for Patients

#EMSP2026

emsp EUROPEAN MULTIPLE SCLEROSIS PLATFORM

dmsg Deutsche Multiple Sklerose Gesellschaft Bundesverband e.V.

Hot topic:
CAR T-cell therapy

Barbara Willekens
Antwerp University Hospital and University of Antwerp
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Disclosure statement

- I received travel support to attend conferences and meetings from Biogen, Sanofi-Genzyme, Merck, Neuraxpharm, Novartis, Roche, UCB, EAN, ECF, ECTRIMS, CMSC, MEDEN.
- I have acted as a consultant during scientific advisory boards and/or as speaker for Alexion, Almirall, Biogen, BMS-Celgene, Galapagos, Horizon, Immunic Therapeutics, Janssen, Merck, Novartis, Roche, Sandoz, Sanofi-Genzyme. I am Neuroimmunology Steering Committee Member for BMS. All fees were paid to UZA.
- I have received research and/or patient support grants and/or sponsoring for educational events from UZA Foundation, Belgian Charcot Foundation, Start2Cure Foundation, FWO Flanders, OJO, Horlait-Dapsens Medical Foundation, EJP-RD Networking Support Scheme, Queen Elisabeth Medical Foundation, National MS Society USA, Amgen, Biogen, Janssen, Sanofi-Genzyme, Novartis, Merck, Roche. All funds/grants were paid to UZA Foundation, UZA or UA.
- I am investigator in the BREAKFREE 2 trial
- BW serves as a co-chair of the EAN Coordinating Panel of Neuroscience/Translational Neurology, is management group member of the EAN Scientific Panel of Neuroimmunology, and is member of the medical advisory council of the MOG Project and the International Clinical Consortium of The Guthy-Jackson Foundation. These are non-remunerated and voluntary positions.

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- Basics of CAR T-cell therapy
- The promise of CAR T-cell therapy for AID and MS
- Clinical translation: case studies and early phase trials
- Key points to address

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ATMP

“Advanced Therapy Medicinal Products

are medicines for human use

that are based on genes, tissues or cells”

“They offer groundbreaking new opportunities for the treatment of disease and injury”

https://www.ema.europa.eu/en/human-regulatory-overview/advanced-therapy-medicinal-products-overview
Accessed on March 22, 2026

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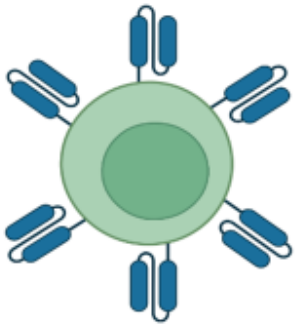
ATMP classification

EMA and Commission for Advanced Therapies

- Somatic cell therapy medicines
- Tissue engineered medicines
- **Gene therapy medicines**
- Combined ATMPs

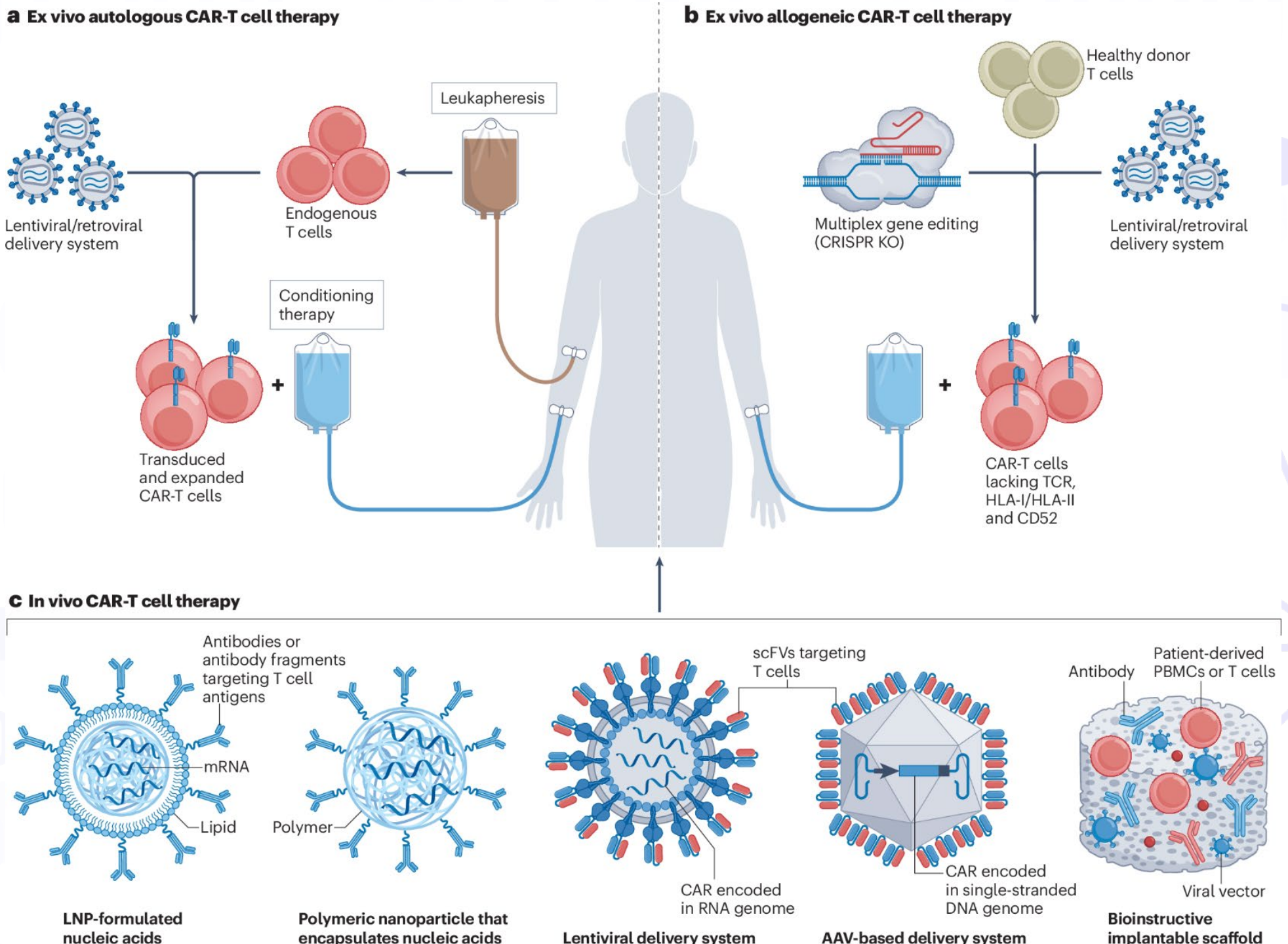


Regulation (EC) No 1394/2007 on ATMPs provides the definitions of 'tissue-engineering product' and combined 'ATMP'.

Part IV of Annex I to Directive 2001/83/EC provides the definitions for 'gene-therapy medicinal product' and 'somatic cell-therapy medicinal product'.

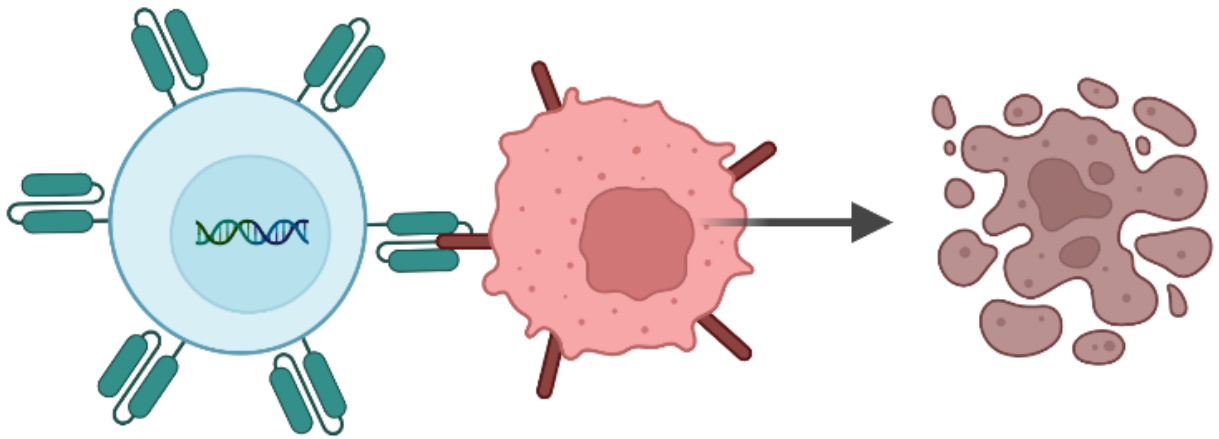
Created in https://BioRender.com

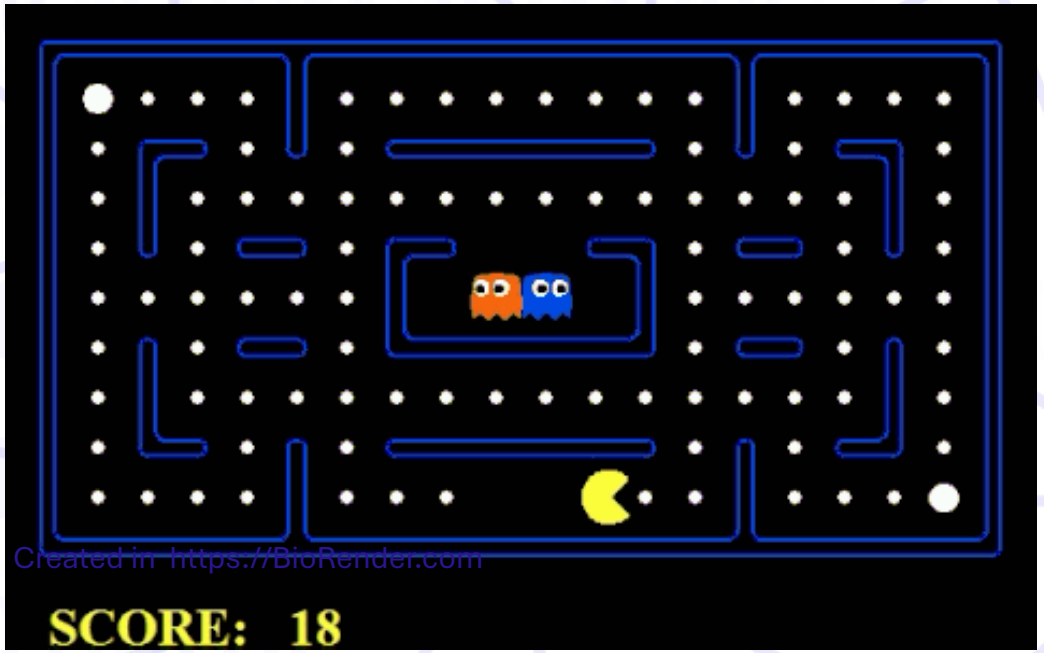
Using CAR T-cells to treat diseases



Li et al.
Nat Rev Immunol 2025

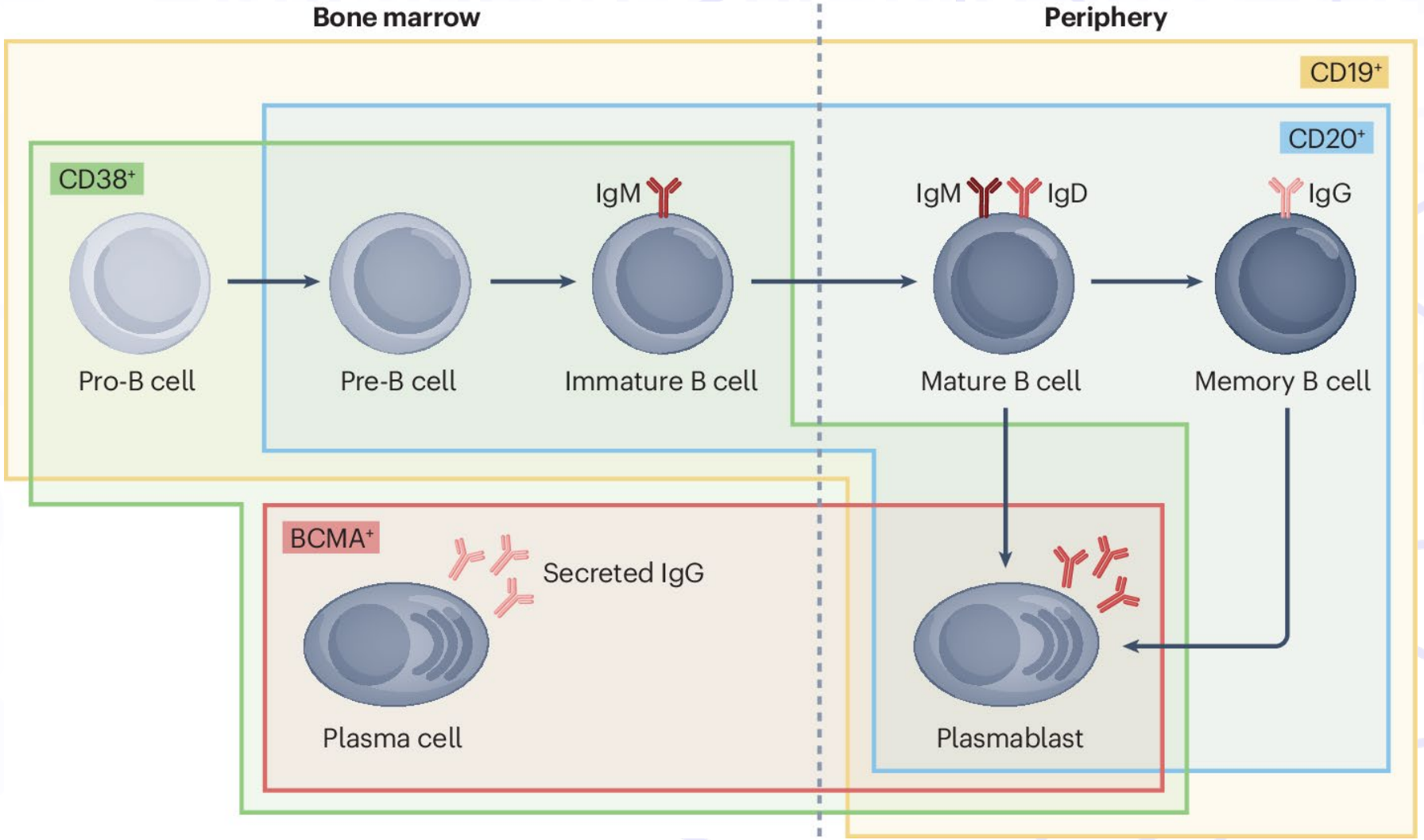
CAR T-cells work like Pacman





From: Pac-Man turns 45 - Science Museum Blog; **accessed on April 16, 2026**

Target antigens in B-cell mediated diseases



Chung et al; Nat Rev Immunol 2024

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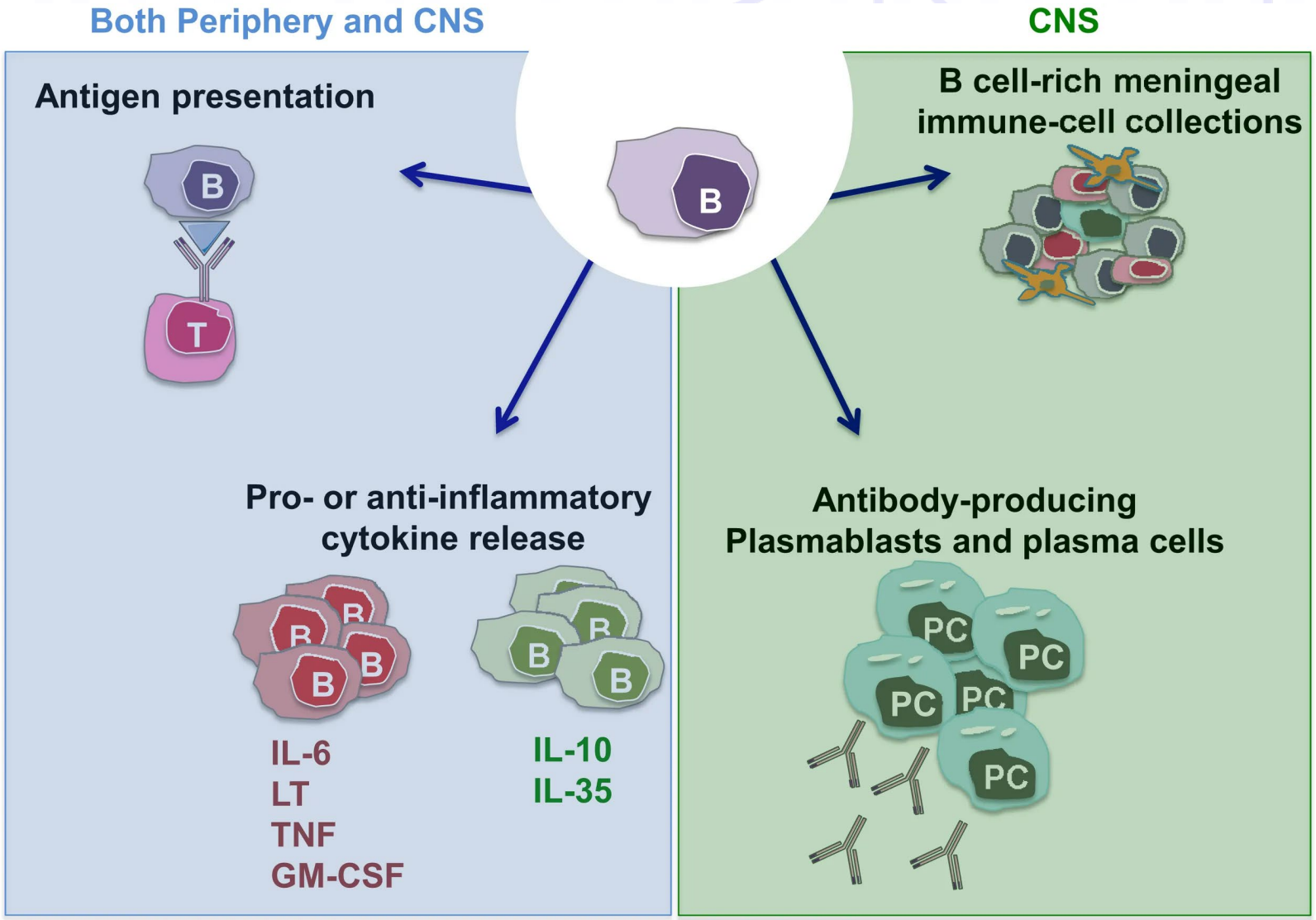
First-in-human study of CAR T cell therapy published in 2022

ARTICLES
https://doi.org/10.1038/s41591-022-02017-5
nature medicine

Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus

Andreas Mackensen[1,2,8], Fabian Müller[1,2,8], Dimitrios Mougiakakos[1,2,3,8], Sebastian Böltz[2,4], Artur Wilhelm[2,4], Michael Aigner[1,2], Simon Völkl[1,2], David Simon[2,4], Arnd Kleyer[2,4], Luis Munoz[2,4], Sascha Kretschmann[1,2], Soraya Kharboutli[1,2], Regina Gary[1,2], Hannah Reimann[1,2], Wolf Rösler[1,2], Stefan Uderhardt[2,4], Holger Bang[5], Martin Herrmann[2,4], Arif Bülent Ekici[6], Christian Buettner[6], Katharina Marie Habenicht[7], Thomas H. Winkler[7], Gerhard Krönke[2,4,8] and Georg Schett[2,4,8] ✉

Role of B cells in MS pathogenesis



Michel et al, Front Immunol 2015

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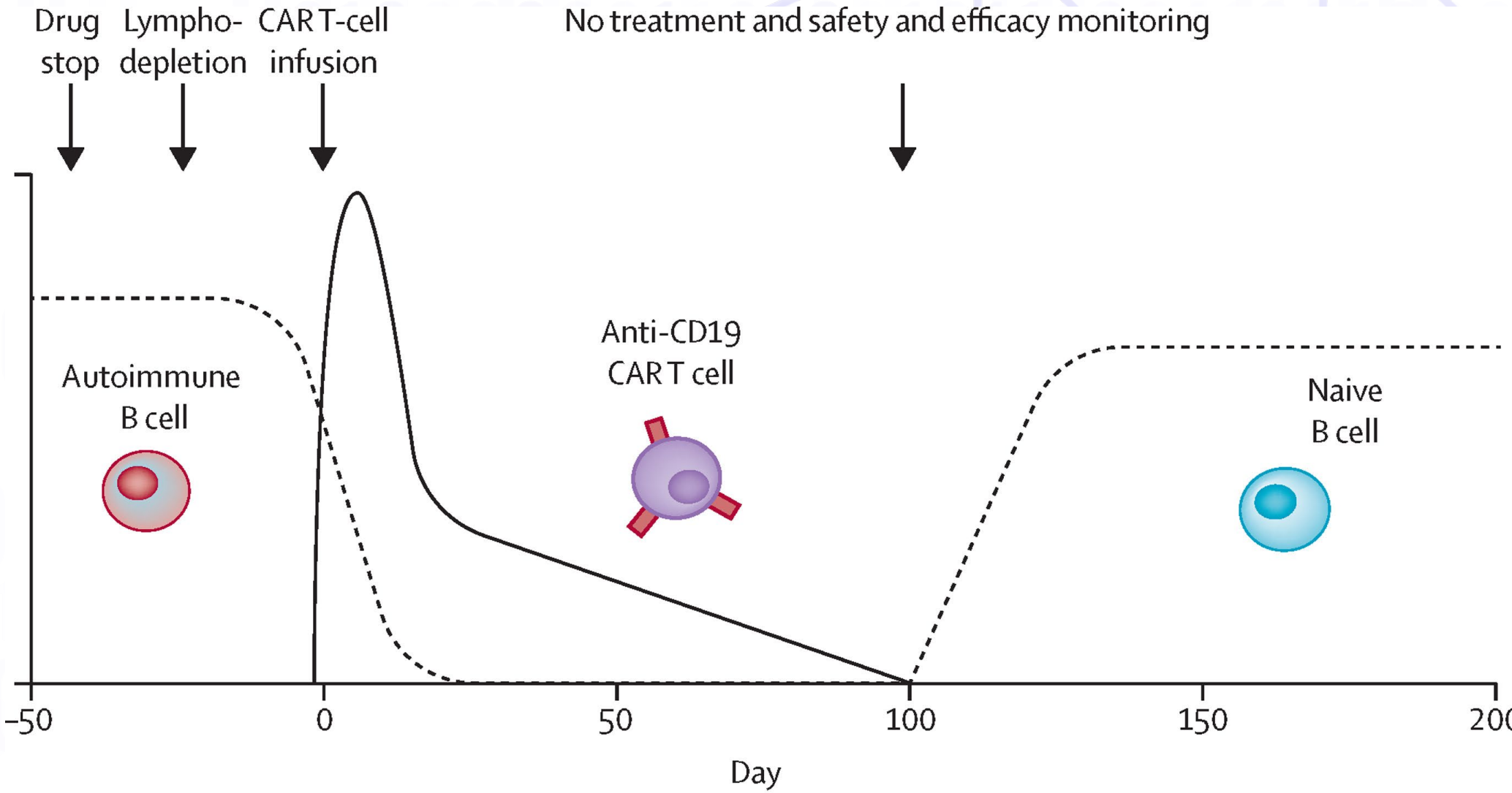
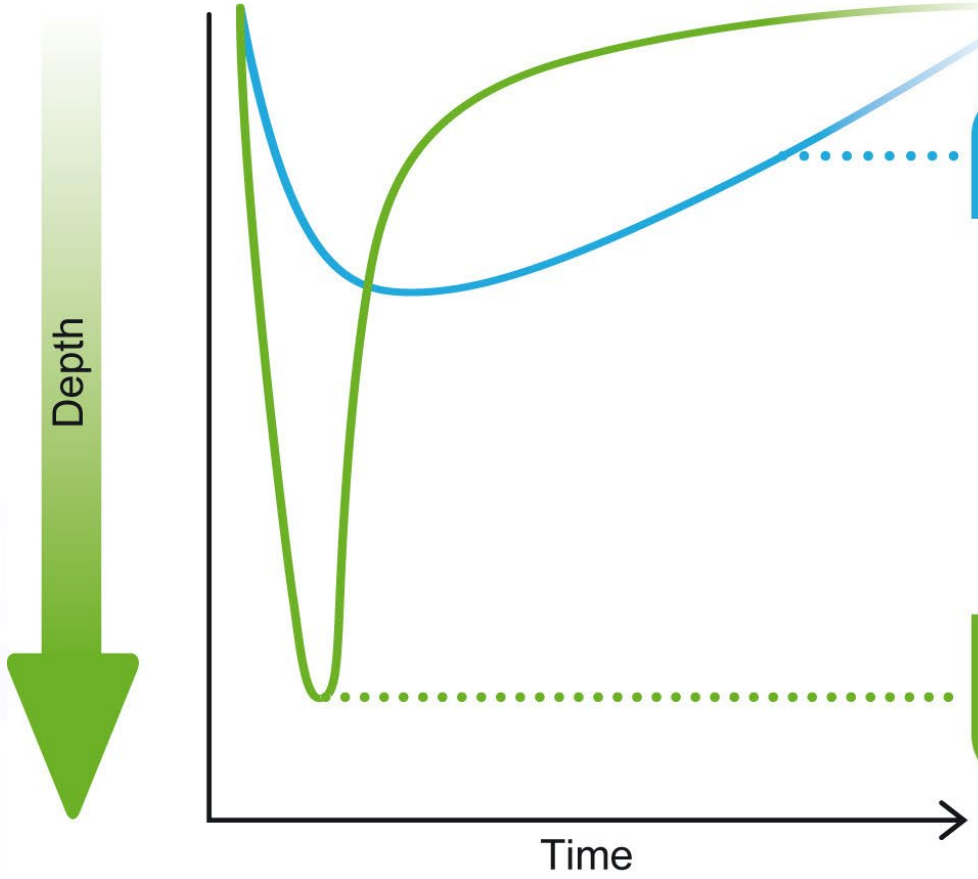
B lymphocytes after CAR T-cell therapy



Schett et al; The Lancet, 2023

Potential for durable remission by fast, deep, tissue B cell depletion



	Efficacy	Dosage	Required immunosuppressants
Monoclonal antibodies	Moderate/ limited	Chronic/repetitive administration	Yes/concurrent immunomodulation
Anti-CD19 CAR T-cell therapy	Sustained over months	Single infusion	None

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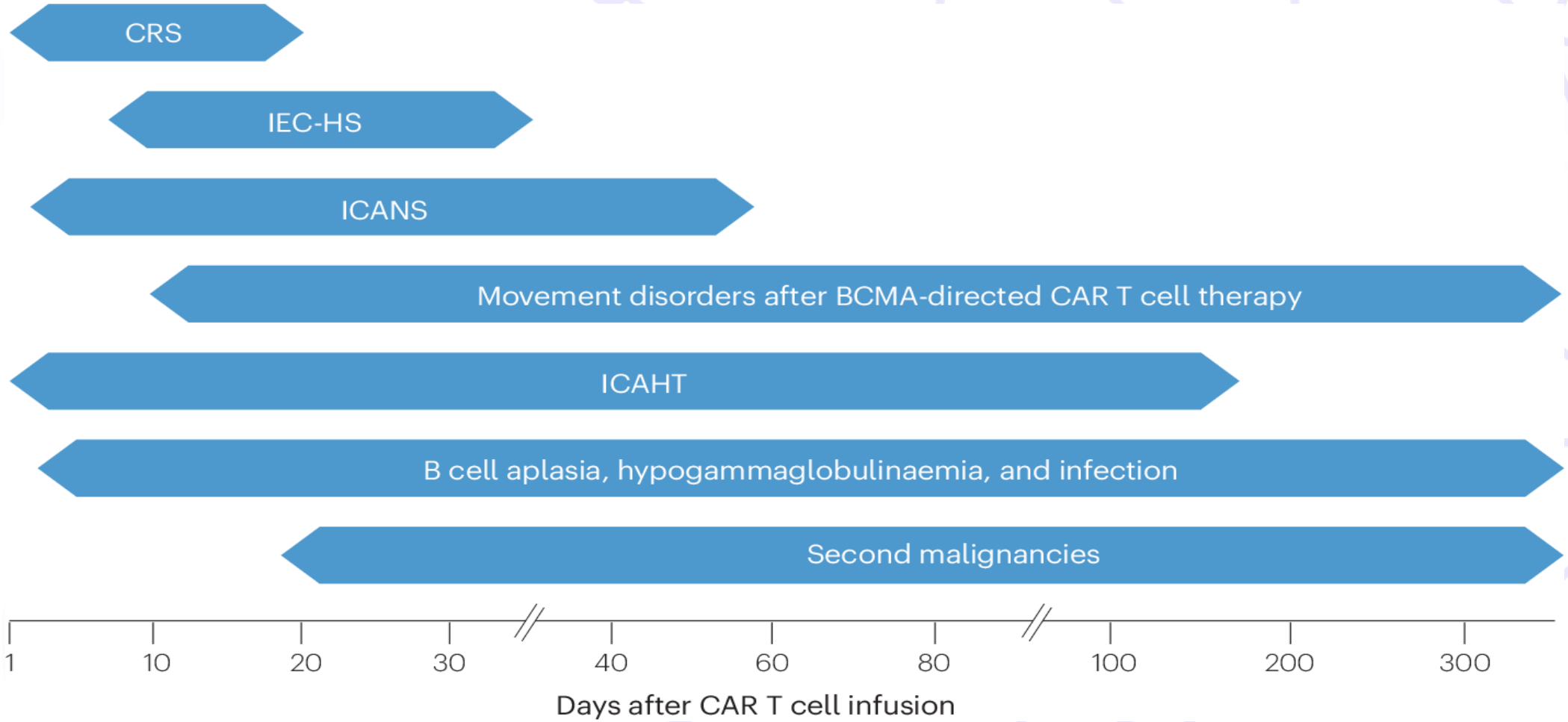
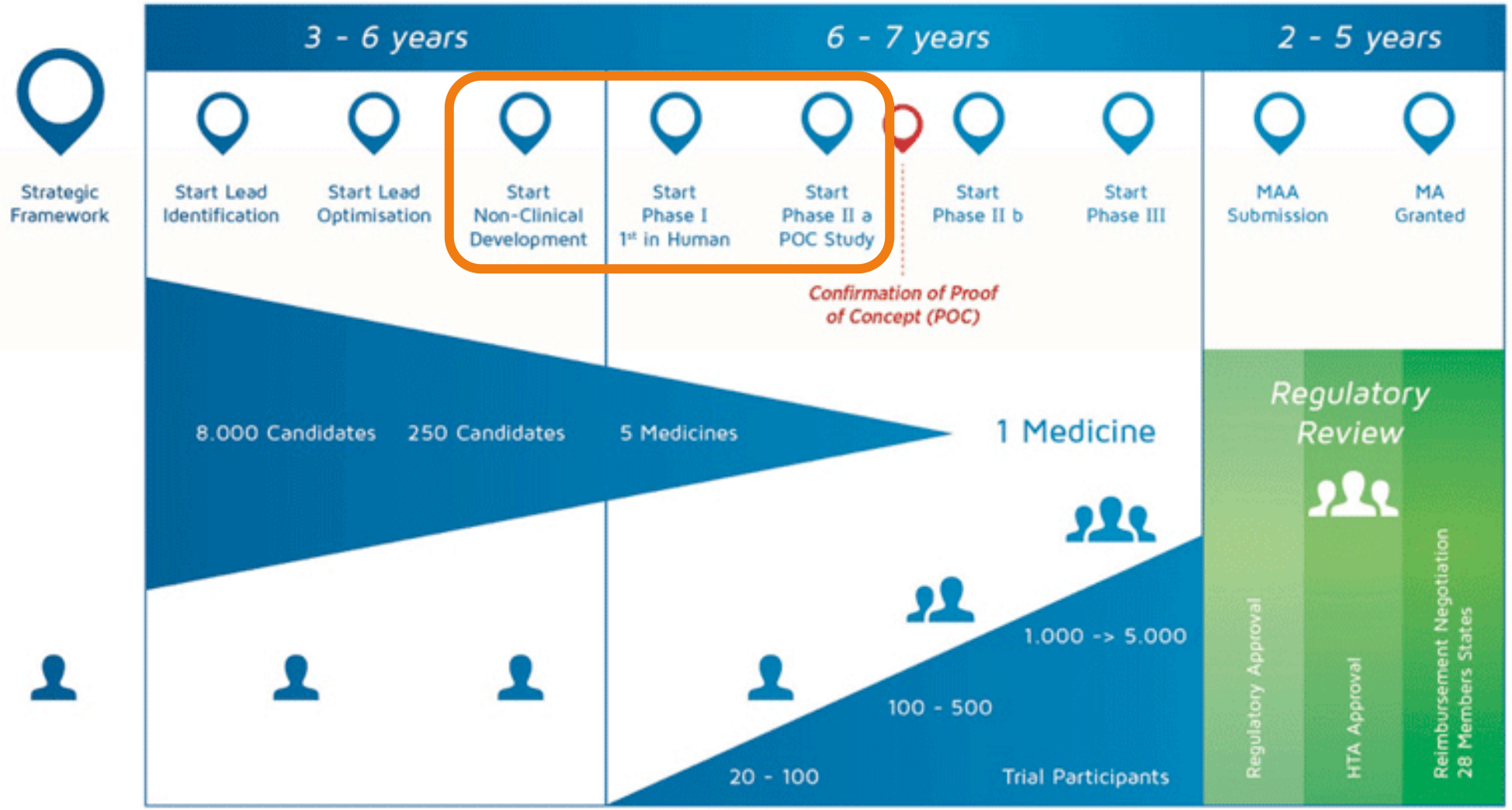
Schett, Immunity 2024

Flipside: toxicities



Brudno et al, Nat Rev Clin Oncol, 2024

Where do we stand today?



Adapted from: Discovery and development of medicines - EUPATI Toolbox, accessed on April 17, 2026

Cases and early trials in NMOSD and MOGAD

ARTICLE OPEN

Anti-BCMA CAR T-cell therapy CT103A in relapsed or refractory AQP4-IgG seropositive neuromyelitis optica spectrum disorders: phase 1 trial interim results

Chuan Qin[1,2], Dai-Shi Tian[1,2], Luo-Qi Zhou[1,2], Ke Shang[1,2], Liang Huang[3], Ming-Hao Dong[1,2], Yun-Fan You[1,2], Jun Xiao[1,2], Ying Xiong[4], Wen Wang[5], Hao Pang[5], Jing-Jing Guo[5], Song-Bai Cai[5], Di Wang[3], Chun-Rui Li[3], Min Zhang[1,2], Bi-Tao Bu[1,2] and Wei Wang[1,2]✉

CLINICAL/SCIENTIFIC NOTE | August 6, 2024 |

CD19-Directed CAR T-Cells in a Patient With Refractory MOGAD

Clinical and Immunologic Follow-Up for 1 Year

Cases and early trials in MS

Case Report

CD19-targeted chimeric antigen receptor T cell therapy in two patients with multiple sclerosis

Felix Fischbach,[1,6] Johanna Richter,[2,6] Lena Kristina Pfeffer,[1,6] Boris Fehse,[2] Susanna Carolina Berger,[2] Stefanie Reinhardt,[1] Jens Kuhle,[3] Anita Badbaran,[2] Kristin Rathje,[2] Nico Gagelmann,[2] Dominic Borie,[4] Johan Seibel,[5] Francis Ayuk,[2] Manuel A. Friese,[1] Christoph Heesen,[1,*] and Nicolaus Kröger[2,7,*]

Short article

Cell

Anti-BCMA CAR-T therapy in patients with progressive multiple sclerosis

Graphical abstract

Authors

Chuan Qin (秦川), Ming-Hao Dong (董明皓), Luo-Qi Zhou, ..., Chun-Rui Li, Dai-Shi Tian (田代实), Wei Wang (王伟)

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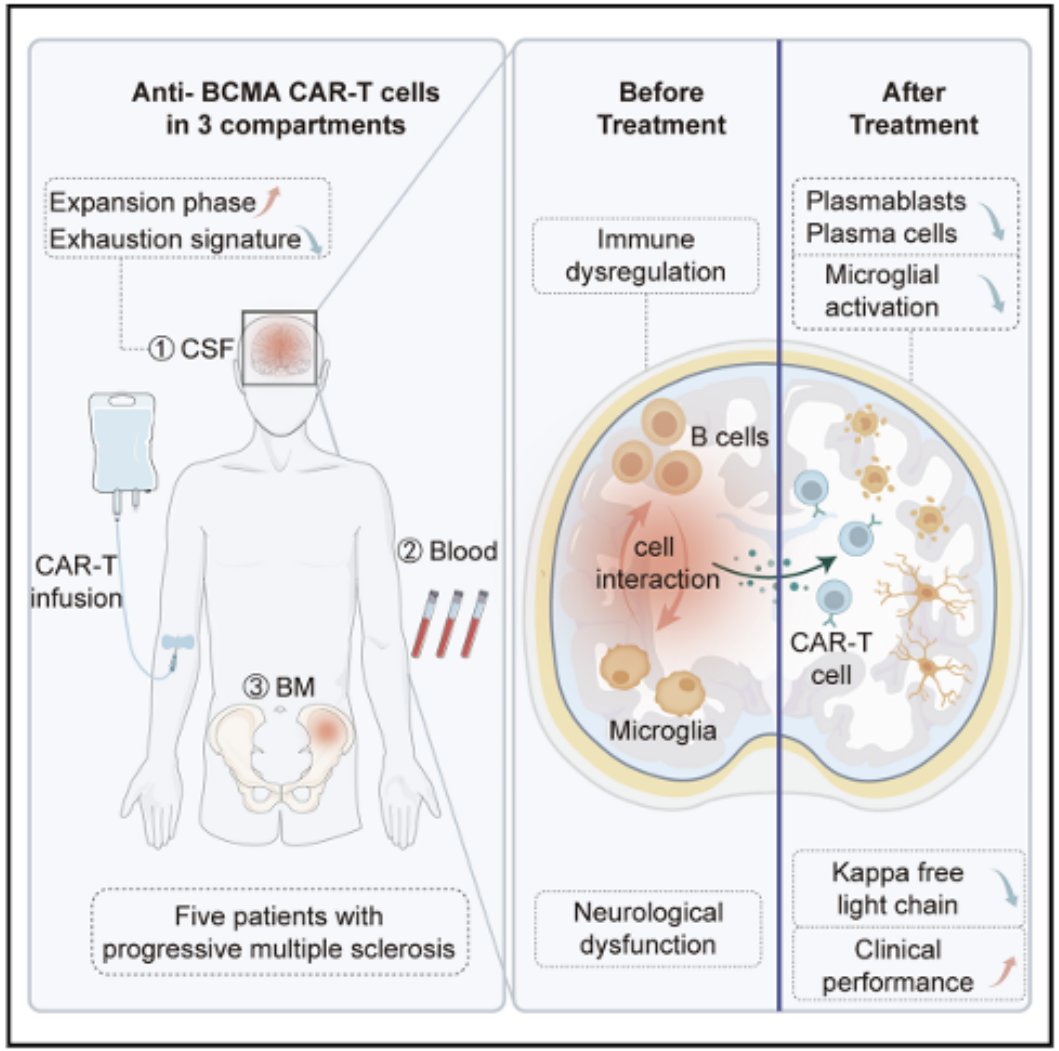
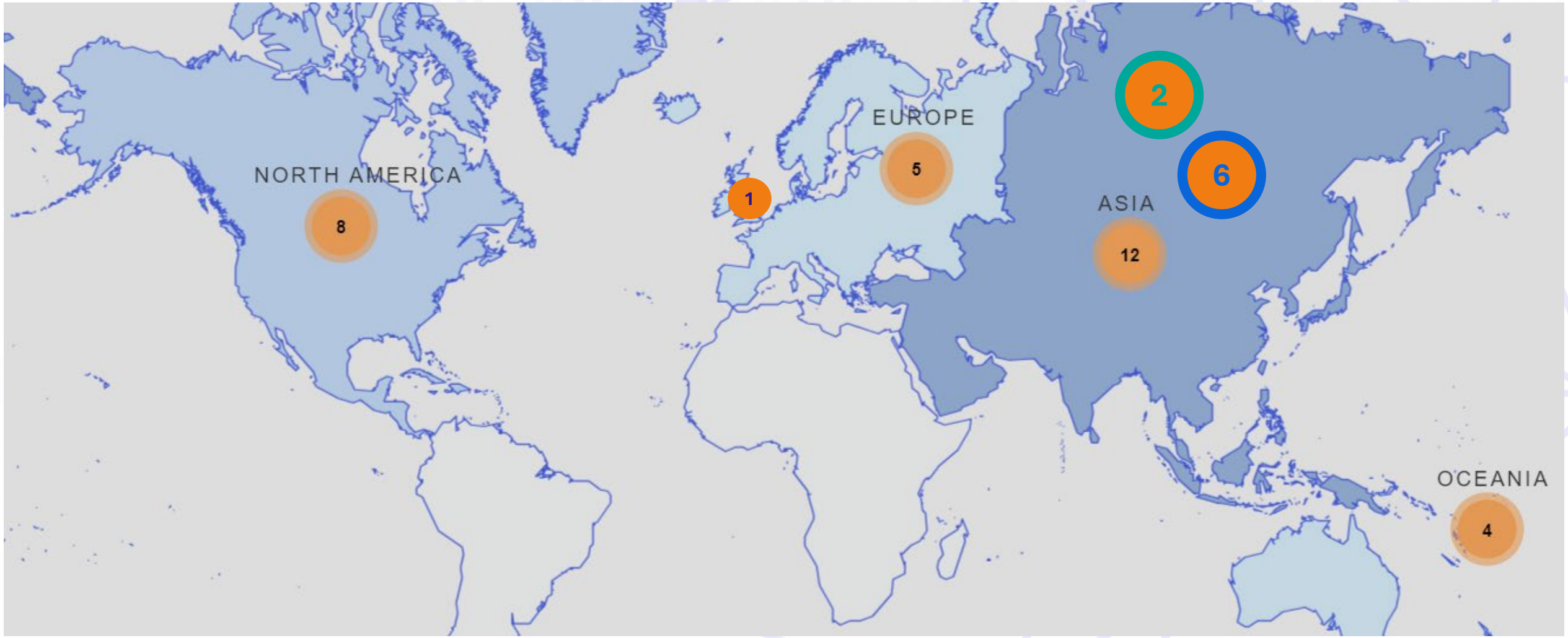
BCMA CAR T-cell therapy in progressive MS

- Five progressive MS patients were treated with anti-BCMA CAR-T therapy
- Plasma cell depletion in the CNS was demonstrated
- CAR-T cells showed prolonged expansion and reduced exhaustion in CSF
- Decrease of microglial activation in CSF post-treatment



Qin et al., Cell 2025

Map of CAR T trials in MS, NMOSD, MOGAD



Created with Clinical trials gov search on April 17, 2026; manually added UK trial (UCL, Autolus) and NMOSD and MOGAD trials; disclaimer: may not be complete

Key points to address

Highly promising treatment for B cell-mediated diseases, including MS

- ✓Better definitions of durable remission (“cures”)
- ✓Patient population, identification of those most likely to respond
- ✓Characterize safety and efficacy, retreatment, long-term FU
- ✓Choice of the target antigen, cellular source, auto vs allo
- ✓Non-viral methods for transduction, ex-vivo vs in-vivo
- ✓Phase III trial design
- ✓Optimizing logistics and manufacturing, decrease cost

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Start2Cure
EJP-RD
UZA Foundation

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Thank you!

Some info