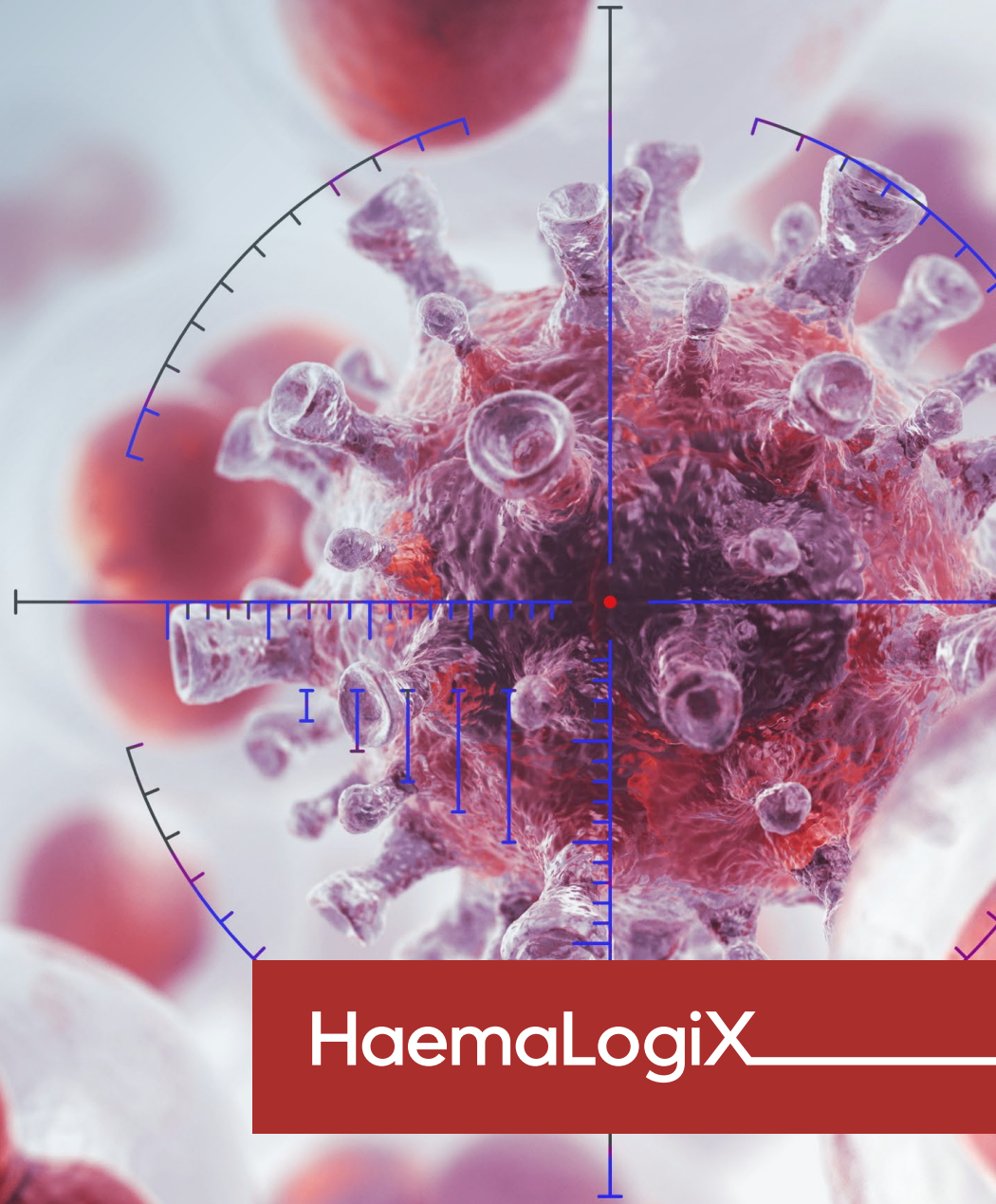


Asia Pacific Cell and Gene Therapy conference

Targeting Novel B-Cell Antigens with CAR T-Cells in Plasma Cell Malignancies

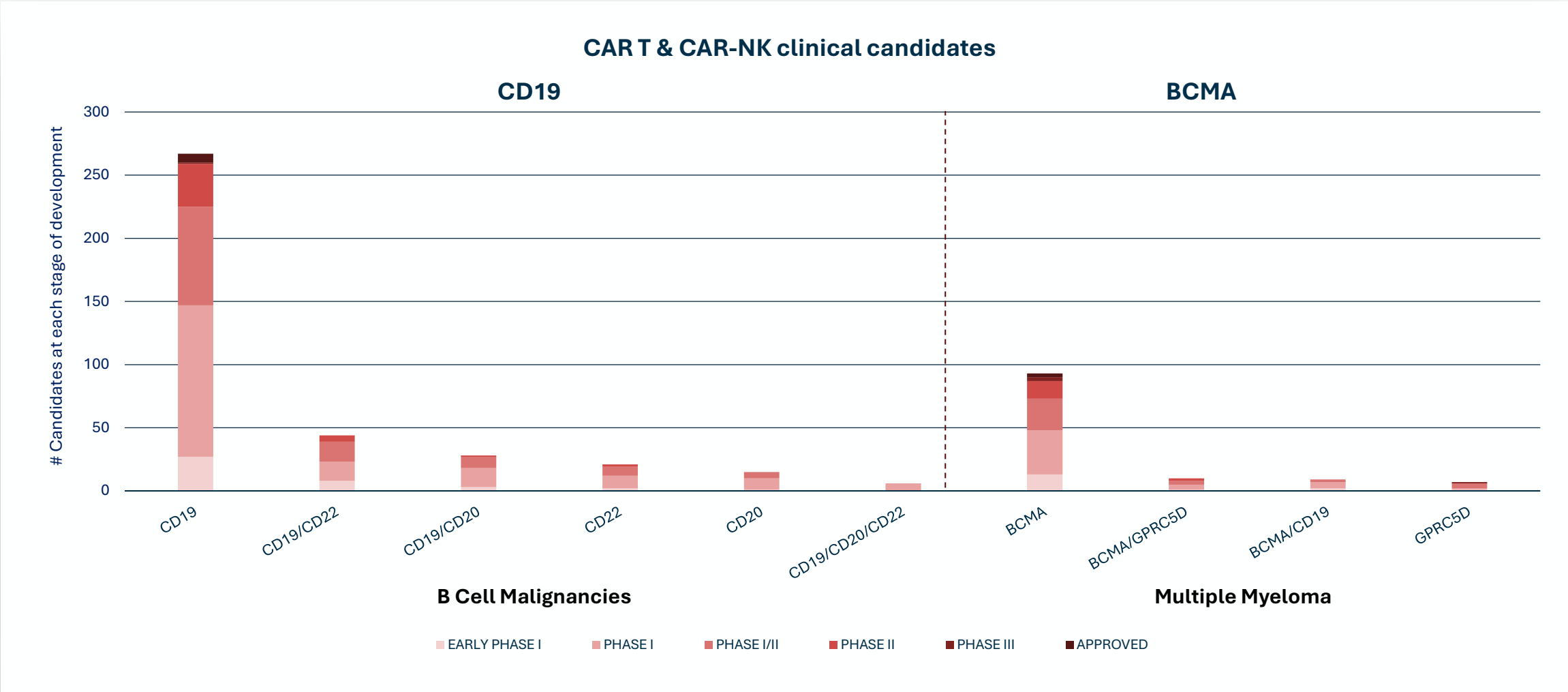
Dr Rosanne Dunn – Director and CSO, HaemaLogiX Ltd

Pioneering the development of immunotherapies for patients with blood cancers and b-cell disorders



HaemaLogiX

Haematological malignancies

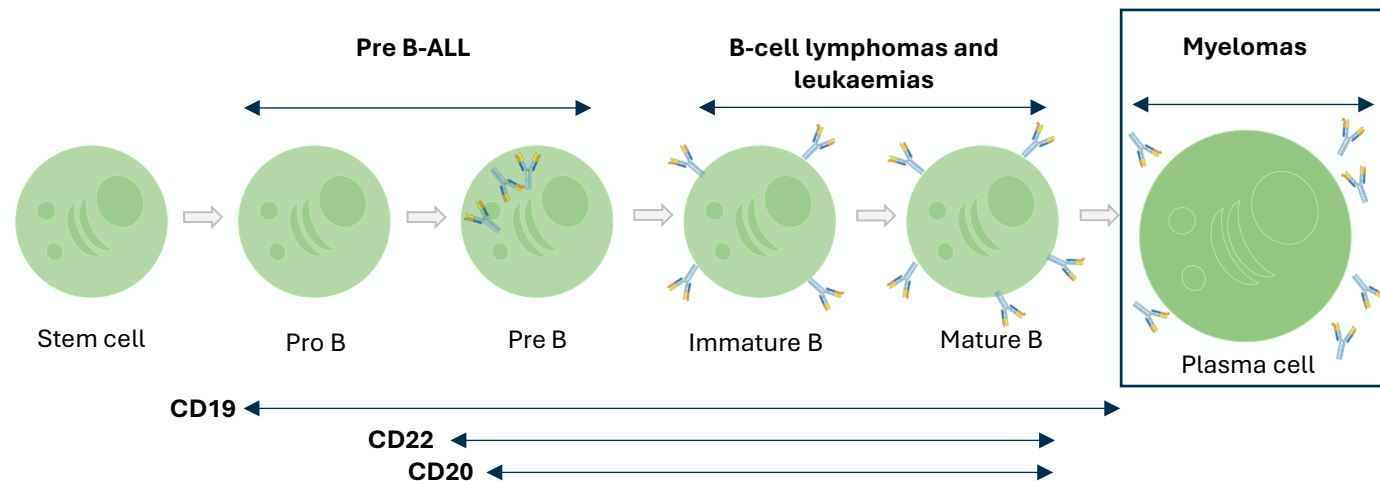


Reference: www.clinicaltrials.gov, August 2025

CAR T cells have been approved for treatment in haematological malignancies

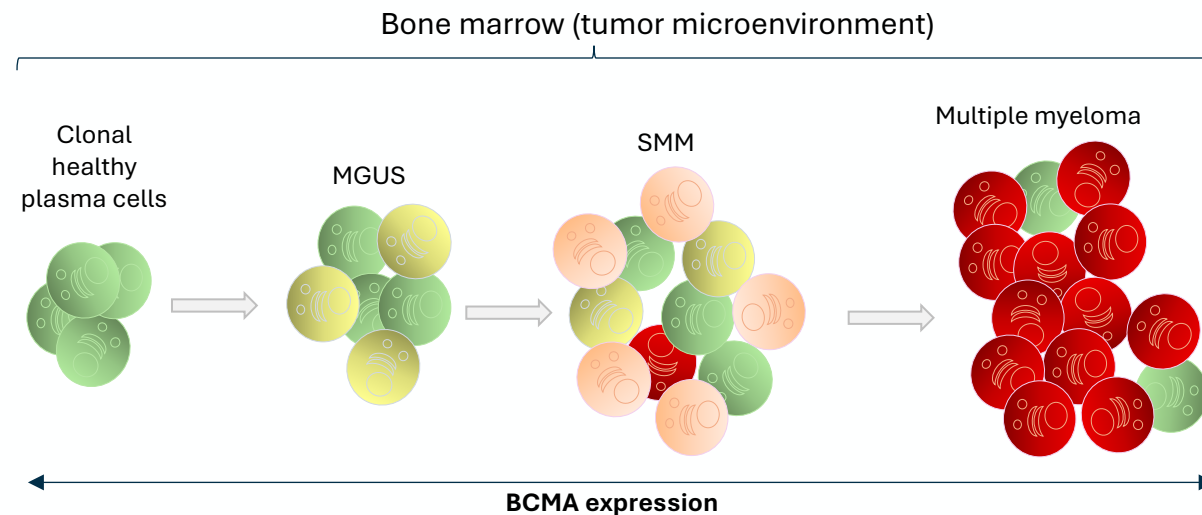
- CD19 expression on normal or myeloma plasma cells is variable

CAR T cells targeting CD19 in B cell malignancies

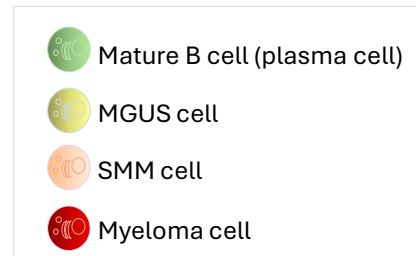


CAR T cells have been approved for treatment in haematological malignancies

CAR T cells targeting BCMA on malignant plasma cells in myeloma



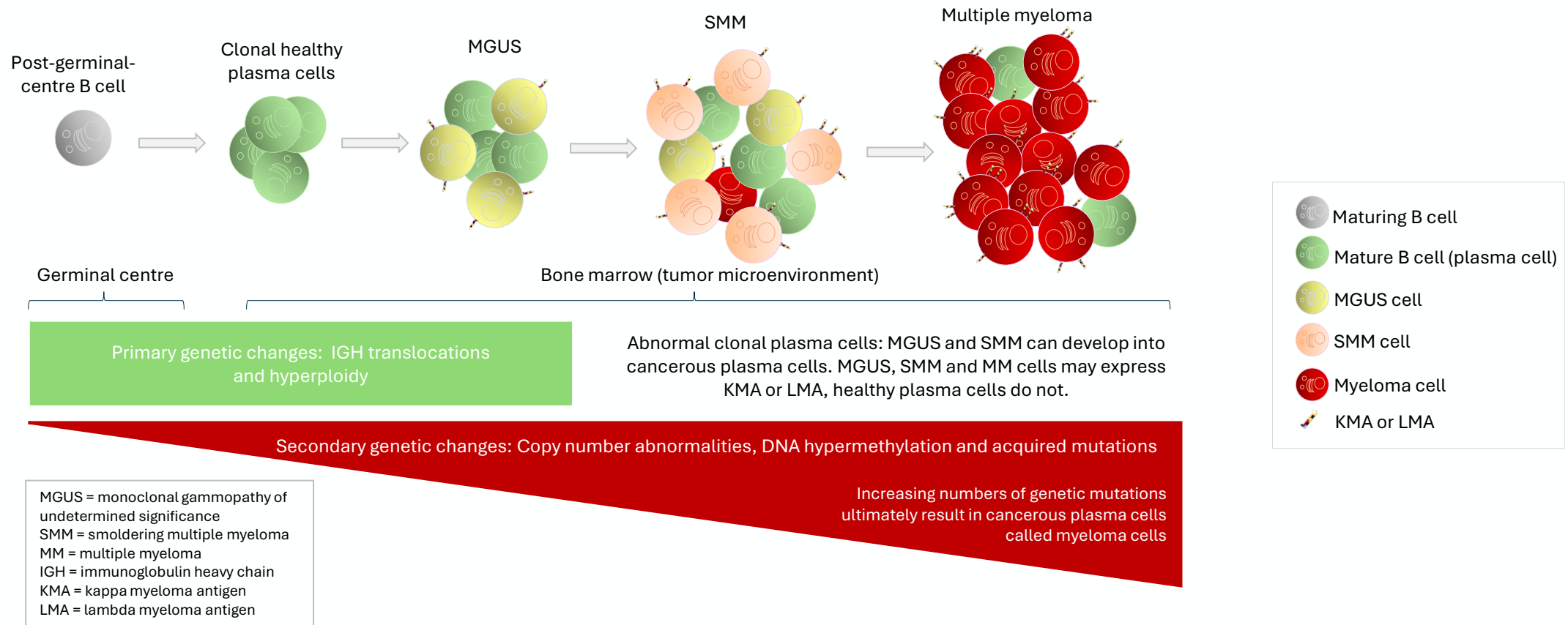
Abnormal clonal plasma cells: MGUS and SMM can develop into cancerous plasma cells



MGUS = monoclonal gammopathy of undetermined significance
SMM = smoldering multiple myeloma
MM = multiple myeloma

- BCMA is highly expressed on normal plasmablasts as well as **normal and malignant plasma cells** in the bone marrow
- BCMA is present on plasma cells throughout the progression from premalignant forms of myeloma

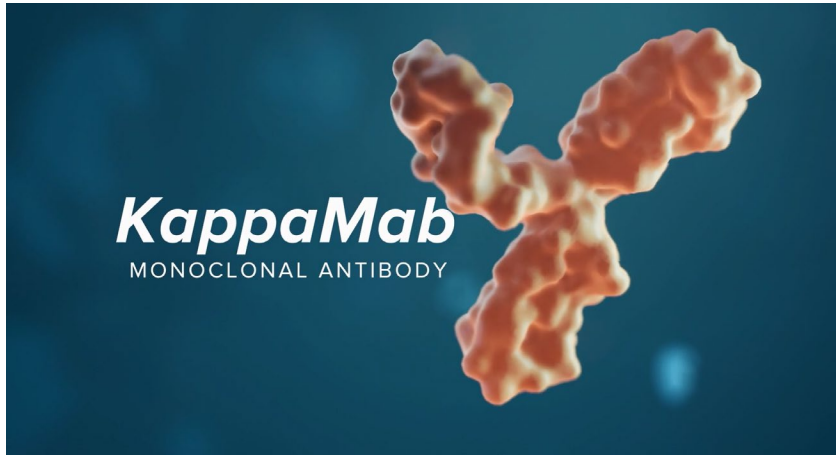
KMA and LMA are expressed on plasma cells associated with myeloma disease progression – they are not expressed on normal plasma cells



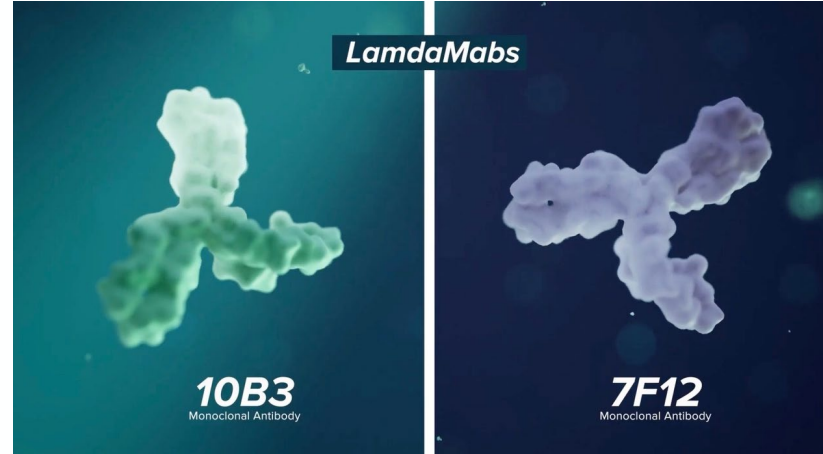
Novel monoclonal antibodies that specifically target KMA and LMA

A first in class immunotherapy platform

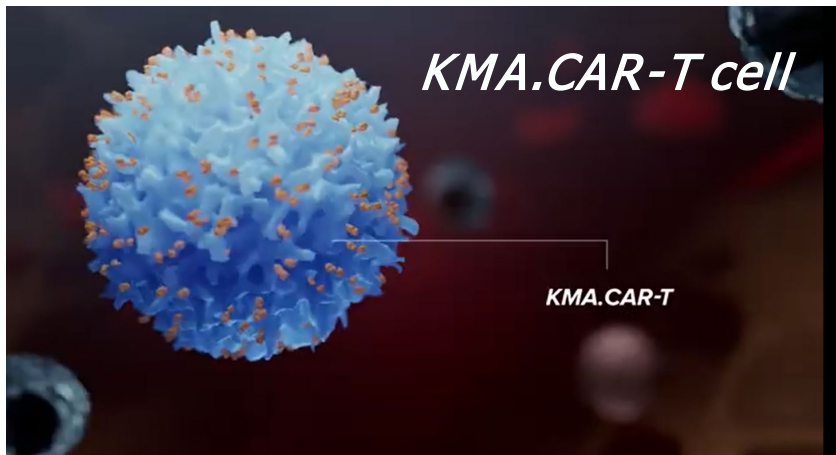
KappaMab



LambdaMabs



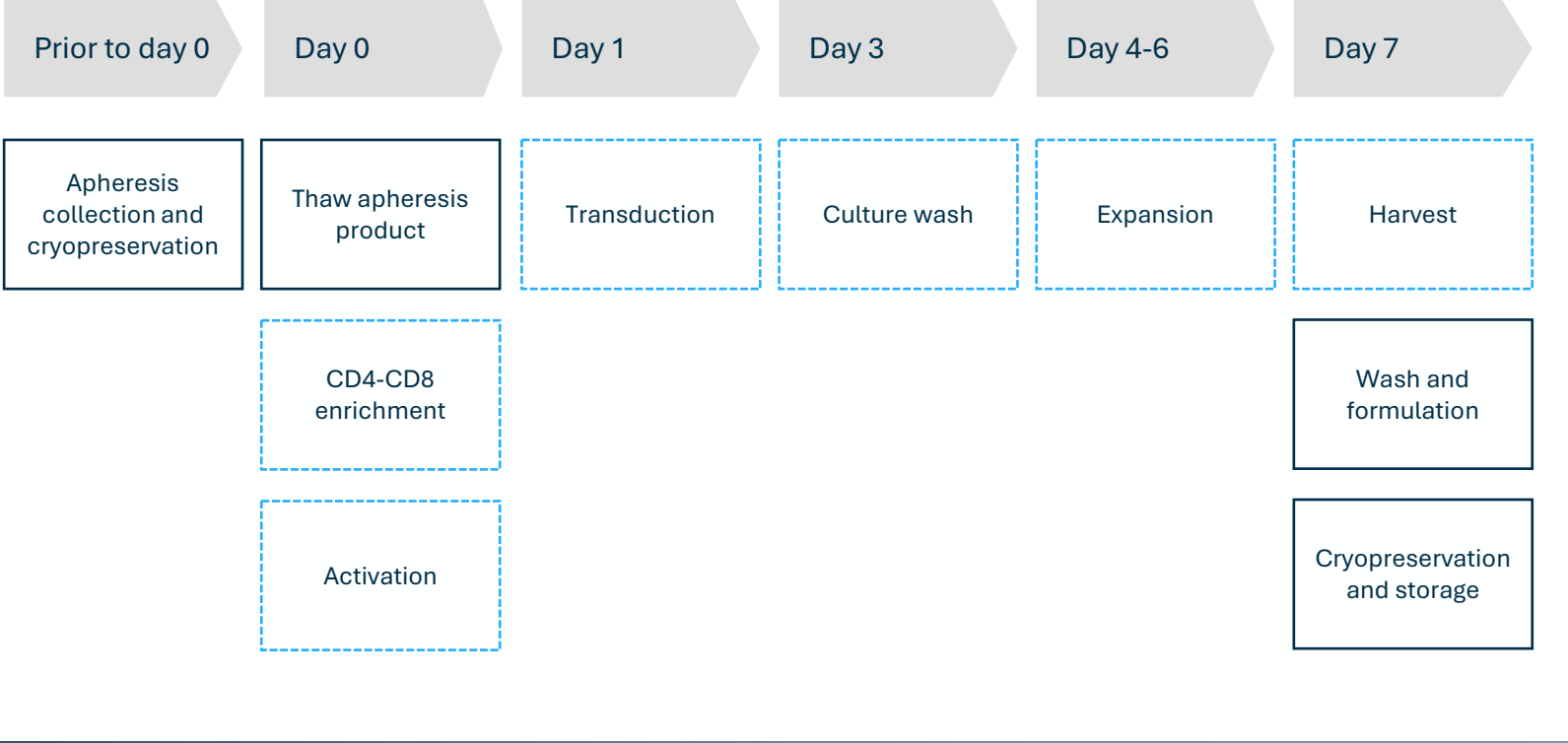
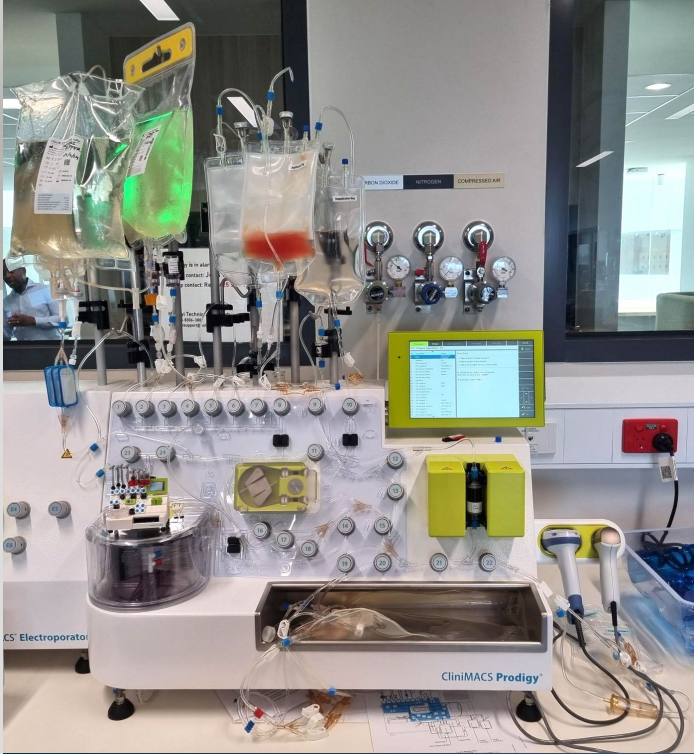
KMA.CAR-T cell



LMA.CAR-T cell



Product Method of Manufacture

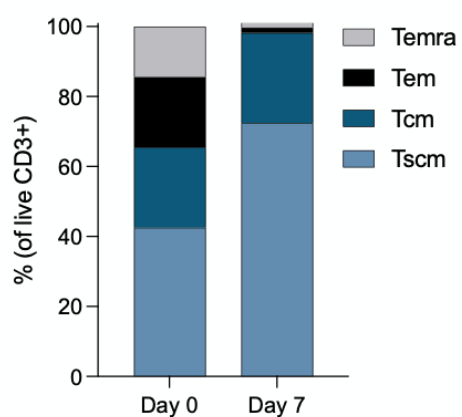
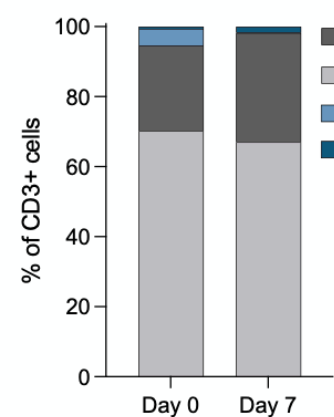
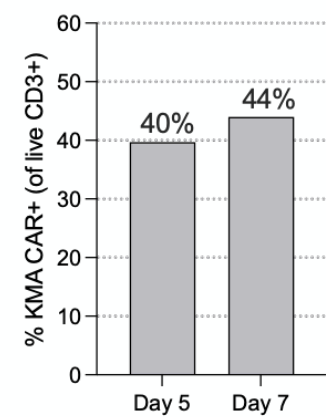
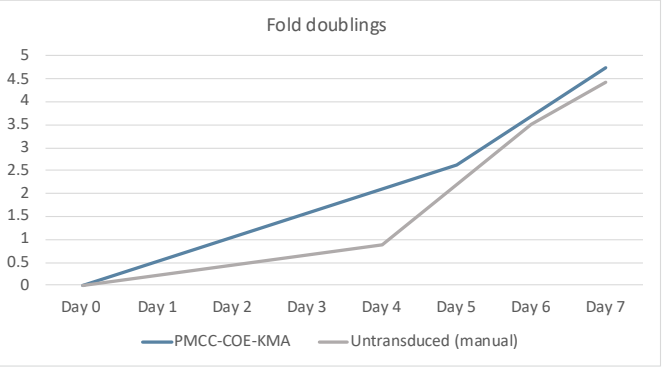
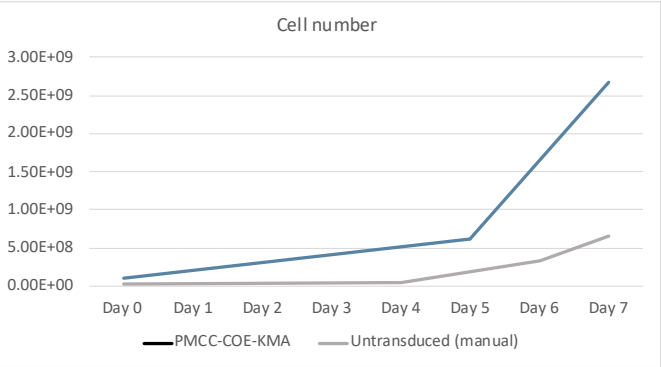


Seven-day manufacture using a closed system – Miltenyi CliniMACS Prodigy

 Steps performed using CliniMACS Prodigy

KMA CAR-T Cell Product *in vitro*

Expansion kinetics, cell numbers and phenotype

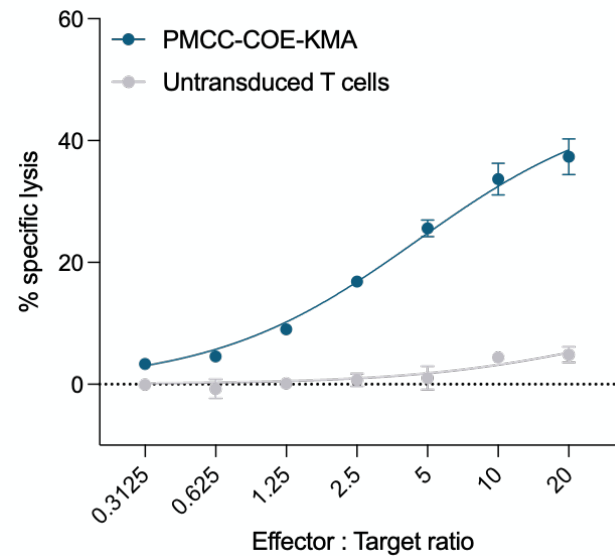


*MOI 0.3, vector copy number = 2.6

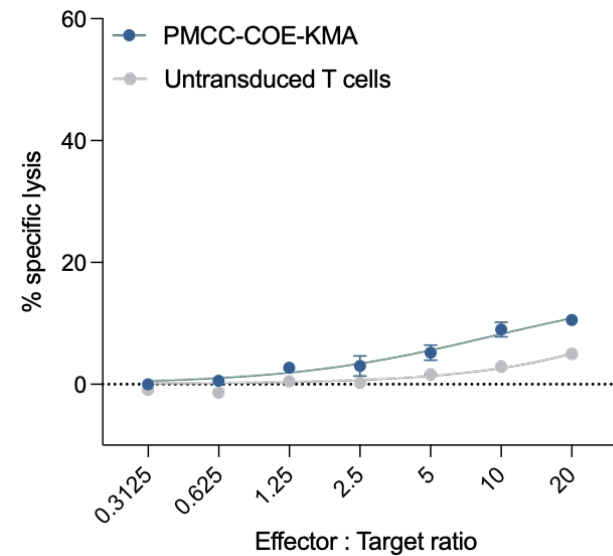
KMA CAR-T Cell Product *in vitro*

On target activity (cytotoxicity) and potency (cytokine release)

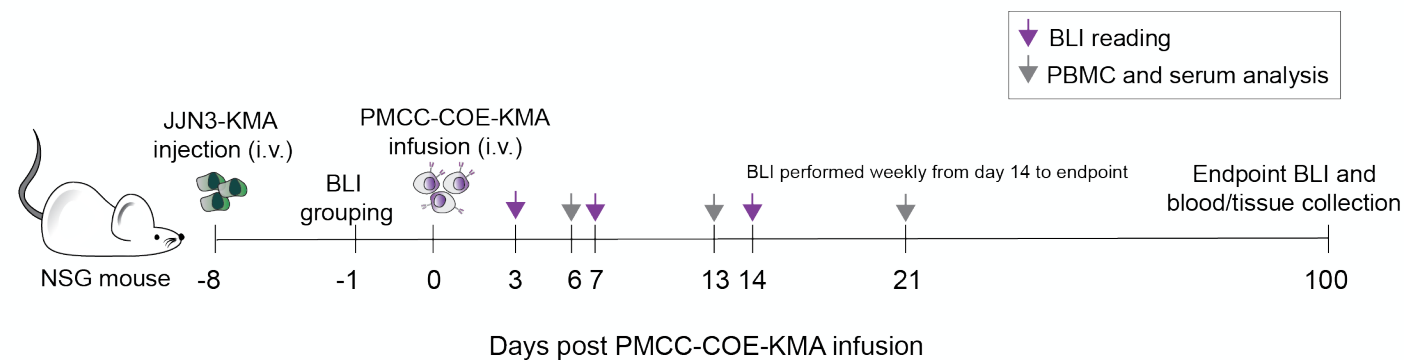
JJN3-KMA+ targets



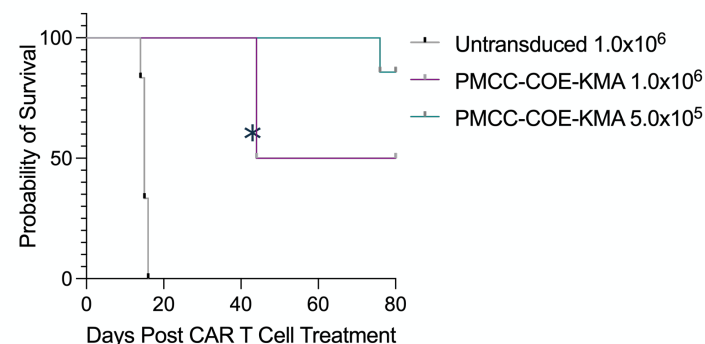
JJN3-KMA knock out targets



KMA CAR-T Cell Activity *in vivo*

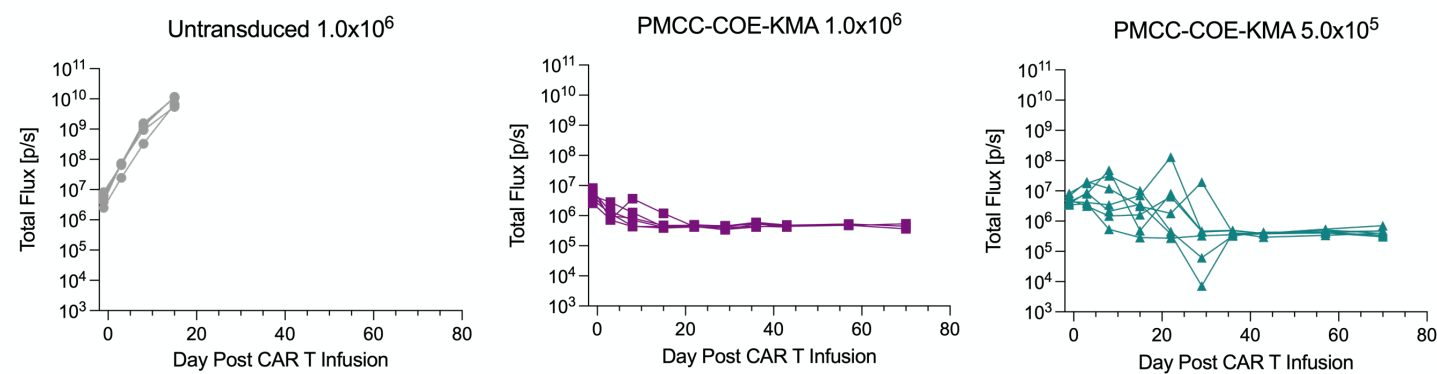


Survival



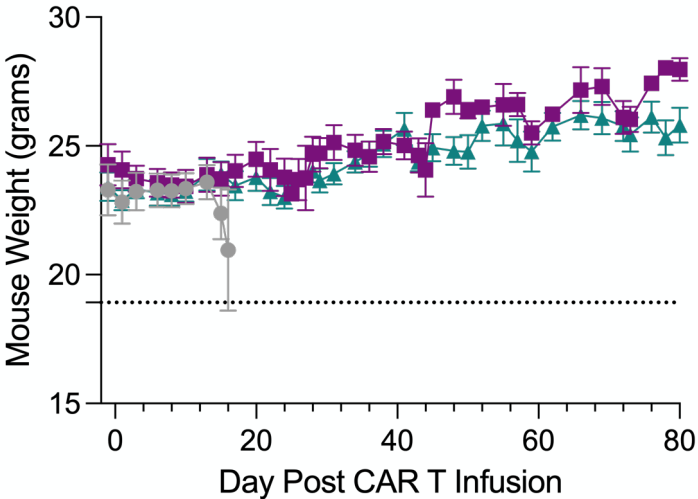
* These mice were culled due to GVHD, no evidence of disease

Tumour burden



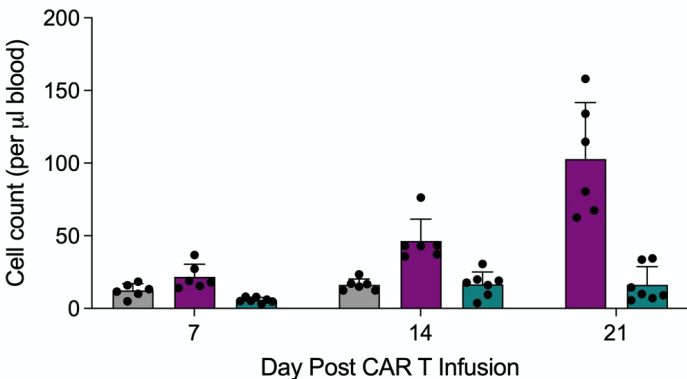
KMA CAR-T Cell Activity *in vivo*

Weight measurements



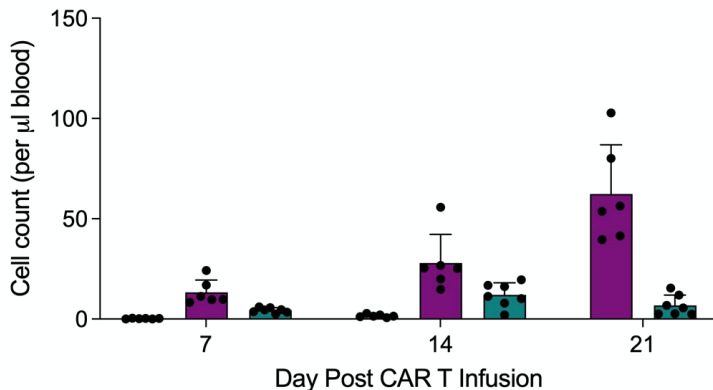
- Untransduced 1.0x10⁶
- PMCC-COE-KMA 1.0x10⁶
- PMCC-COE-KMA 5.0x10⁵

T Cell expansion



- Untransduced 1.0x10⁶
- PMCC-COE-KMA 1.0x10⁶
- PMCC-COE-KMA 5.0x10⁵

CAR T-Cell expansion



- Untransduced 1.0x10⁶
- PMCC-COE-KMA 1.0x10⁶
- PMCC-COE-KMA 5.0x10⁵

Phase I Trial of KMA CAR T-Cells

KOALA:

A Phase I Study of Autologous Chimeric Antigen Receptor (CAR) T cells targeting the **K**appa **M**yeloma **A**ntigen (KMA) in Kappa Restricted Multiple Myeloma Patients with Relapsed/Refractory Disease

PI: Dr Mark Dowling; **co-investigator:** Prof Simon Harrison

Primary objective: to evaluate the safety of inter-patient dose escalation of autologous T cells that are genetically modified to express CARs targeting the KMA, which is present on the surface of malignant plasma cells in patients with kappa restricted multiple myeloma.

Secondary objectives: (1) To evaluate the persistence of autologous anti-KMA CAR-T cells, (2) To determine the overall response rate (ORR) to anti- KMA CAR-T cells based on IMWG criteria

Sample size: 6-12 patients

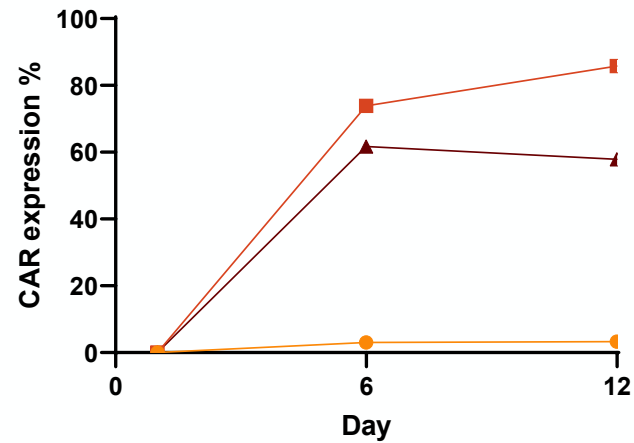
Recruitment: opening Q4-25/Q1-26; accrual 12-18 months



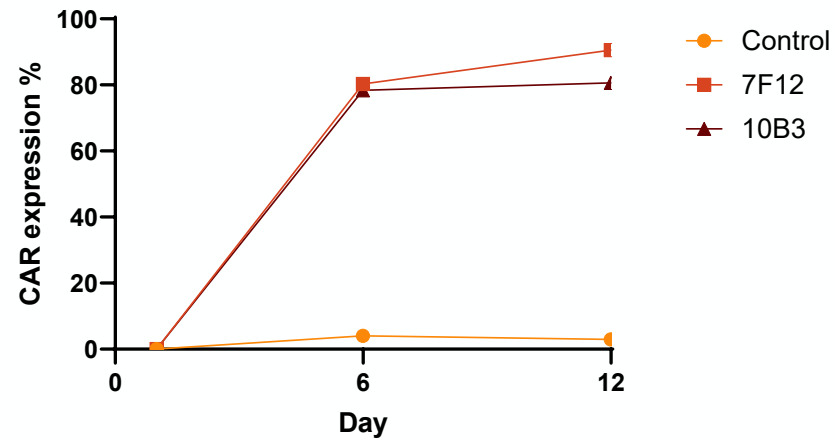
LMA CAR-T Cell Product *in vitro*

Expansion kinetics at MOI 2.5 CellVec lentivirus

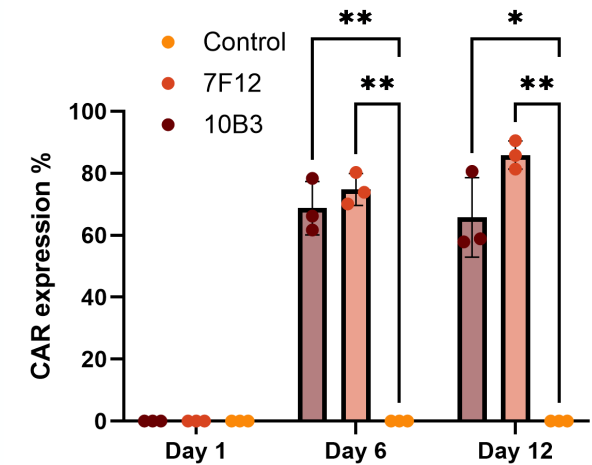
CAR expression - donor 16



CAR expression - donor 30



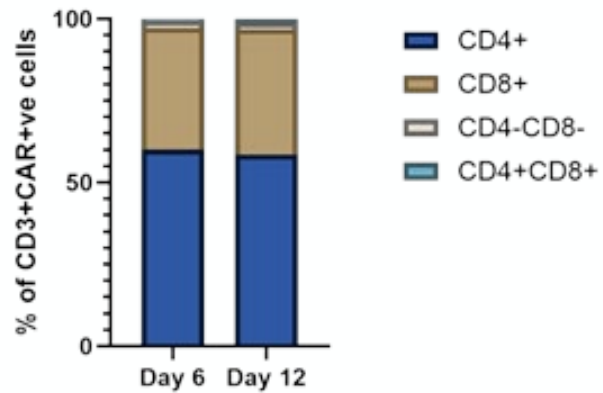
CAR expression all donors



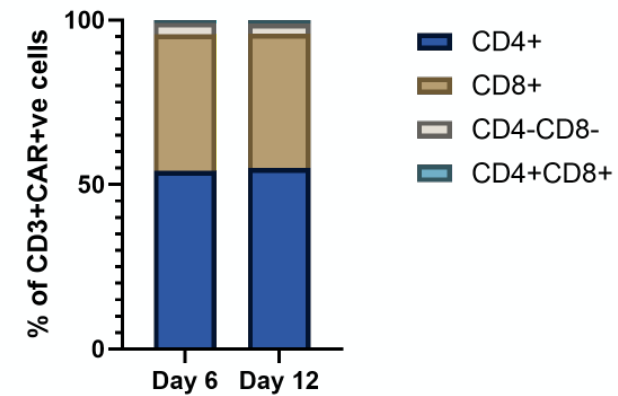
LMA CAR-T Cell Product *in vitro*

CD4 and CD8 CAR expression detected with monoclonal anti-G4S linker antibody

7F12 CD4 CD8 expression



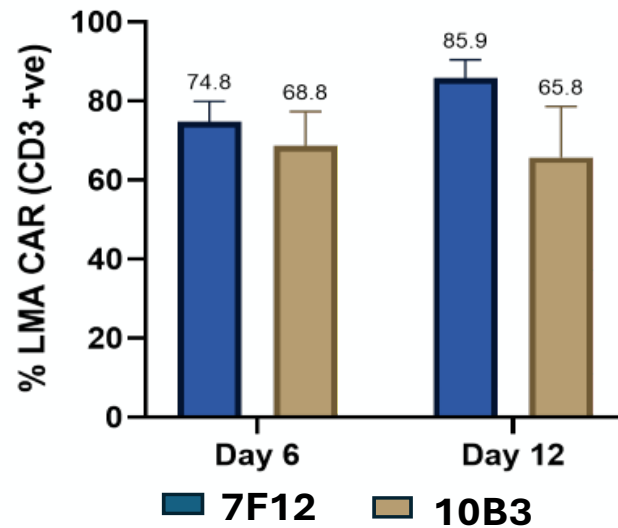
10B3 CD4 CD8 expression



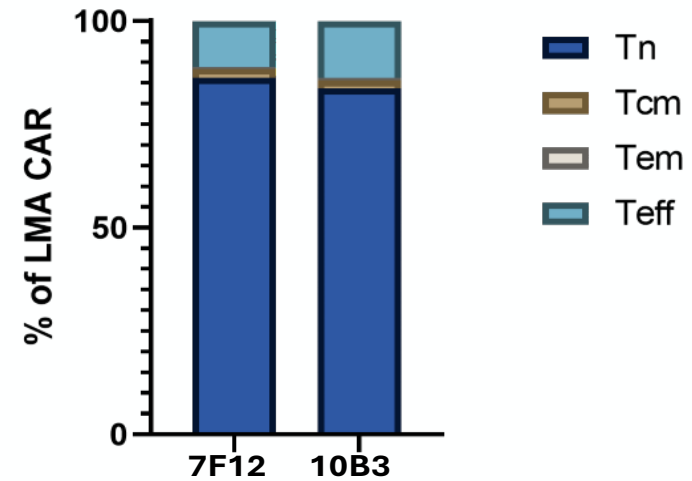
LMA CAR-T Cell Product *in vitro*

LMA CAR-T cell expression and phenotype

CAR expression all donors



Day 12 memory all donors



Key collaborations

By partnering with world-class biopharmaceutical manufacturers and research institutions, HaemaLogiX anticipates high-quality production, scalability, and regulatory compliance as it progresses through clinical trials



- ✓ HaemaLogiX uses the CellVec lentiviral vector technology platform for the development of our CAR-T cell pipeline. Their lentiviral vector platform consistently produces improved yields and high process consistency.
- ✓ GMP-compatible molecular expression helper plasmids, which have been developed and validated in-house for lentiviral vector manufacture
- ✓ Third generation, self-inactivating lentiviral vector designed in-house for efficient transgene expression



- ✓ HaemaLogiX has collaborated with Peter Mac to support the clinical development and manufacturing of its KMA.CAR-T therapy
- ✓ Peter Mac's CAR-T facility is one of the leading TGA-certified CAR-T manufacturing sites in Australia
- ✓ Peter Mac has extensive expertise in CAR-T manufacturing, development, pre-clinical research, and clinical translation



- ✓ In March 2025, HaemaLogiX entered into a research agreement with Immuneel Therapeutics, a leading immuno-oncology company
- ✓ This agreement will enable the Company to leverage Immuneel's capabilities in cell therapy innovation and manufacturing
- ✓ The research will explore HaemaLogiX's KappaMab antibody with Immuneel's proprietary cell therapy manufacturing technology, with the goal of delivering access to high-quality, affordable and scalable CAR-T cell therapies

Acknowledgements

KMA.CAR-T cell development

KMA.CAR T cell development

**Centre of Excellence in Cellular Immunotherapy,
Peter MacCallum Cancer Centre**

(with funding from the Commonwealth and the Foundation)

Manufacturing partner

Cell Therapies Pty Ltd

Leadership Team

Director - Prof Simon Harrison

Chief Scientist - A/Prof Jane Oliaro

Program Operations Director - Dr Gretchen Poortinga

Translation Laboratory Team

Dr Jessica Li

Dr Rebecca Abbott

Dr Patrick Constantinescu

Susan Jackson

Antariksh Das

Project Management: Theresa Connor



LMA.CAR-T cell development

Dr Kavitha Gowrishankar MSc PhD

Senior lecturer, School of Medical Sciences (SOMS), Faculty of Medicine and Health
The University of Sydney

Lead Advanced Cellular Therapeutics lab | Children's Cancer Research Unit
The Children's Hospital Westmead, SCHN

Dr Amanda (Rui) Tan PhD

Production and Translational Scientist

Advanced Cellular Therapeutics lab | Children's Cancer Research Unit
The Children's Hospital Westmead, SCHN

HaemaLogiX Project Management: Halley Hilton



A person wearing a white lab coat and blue nitrile gloves is using a microscope. They are holding a glass slide with a blood smear, which shows a red blood cell. The background is a blurred laboratory setting.

— Thank you

See more at
www.haemalogix.com

HaemaLogiX