Autolus

Developing Next Generation Programmed T Cell Therapies

May 2022

Disclaimer

These slides contain forward-looking statements within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are statements that are not historical facts, and in some cases can be identified by terms such as "may," "will," "could," "expects," "plans," "anticipates," and "believes." These statements include, but are not limited to, statements regarding Autolus' development of the obe-cel program; the future clinical development, efficacy, safety and therapeutic potential of its product candidates, including progress, expectations as to the reporting of data, conduct and timing and potential future clinical activity and milestones; expectations regarding the initiation, design and reporting of data from clinical trials; expectations regarding regulatory approval process for any product candidates; the collaboration between Autolus and Blackstone; the discovery, development and potential commercialization of potential product candidates including obe-cel using Autolus' technology and under the collaboration agreement; the therapeutic potential for Autolus in next generation product developments of obe-cel in B-cell malignancies; the potential and timing to receive milestone payments and pay royalties under the strategic collaboration; and the Company's anticipated cash runway. Any forward-looking statements are based on management's current views and assumptions and involve risks and uncertainties that could cause actual results, performance, or events to differ materially from those expressed or implied in such statements. These risks and uncertainties include, but are not limited to, the risks that Autolus' preclinical or clinical programs do not advance or result in approved products on a timely or cost effective basis or at all; the results of early clinical trials are not always being predictive of future results; the cost, timing and results of clinical trials; that many product candidates do not become approved drugs on a timely or cost effective basis or at all; the ability to enroll patients in clinical trials; possible safety and efficacy concerns; and the impact of the ongoing COVID-19 pandemic on Autolus' business. For a discussion of other risks and uncertainties, and other important factors, any of which could cause Autolus' actual results to differ from those contained in the forward-looking statements, see the section titled "Risk Factors" in Autolus' Annual Report on Form 20-F filed with the Securities and Exchange Commission on March 10, 2022, as well as discussions of potential risks, uncertainties, and other important factors in Autolus' subsequent filings with the Securities and Exchange Commission. All information in this presentation is as of the date of the release, and Autolus undertakes no obligation to publicly update any forward-looking statement, whether as a result of new information, future events, or otherwise, except as required by law. You should, therefore, not rely on these forward-looking statements as representing the Company's views as of any date subsequent to the date of this presentation.

Autolus Overview

Building a fully integrated CAR T company

Best-in-class lead asset

- Lead product obe-cel potentially best-in-class for relapsed/ refractory adult acute lymphoblastic leukemia (ALL)
- Phase 2 FELIX ALL initial data expected H2 22
- Updated exploratory data in NHL from Phase 1 studies expected in 2022

Pipeline

- Pipeline built on modular innovation addressing cancers with limited treatment options
- AUTO1/22 in paediatric ALL
- AUTO4 /5 in T cell lymphoma
- AUTO6NG in neuroblastoma
- AUTO8 in multiple myeloma

Scalable manufacturing

- In house cell manufacturing for clinical trial conduct
- Commercial fit-for-purpose cell manufacturing facility under construction with planned annual capacity of 2000 patient products

Collaboration

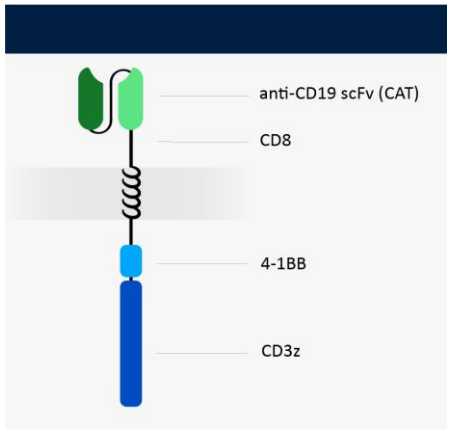
- Collaboration with Blackstone Life Sciences to develop obe-cel in adult ALL
- Moderna granted exclusive license for binders to up to four IO targets
- Pipeline programs not partnered

LEAD CLINICAL PROGRAM

obe-cel

A standalone, potentially best-in-class CD19 CAR T cell therapy

obe-cel has a unique mechanism of action



CAT binder with lower affinity for CD19

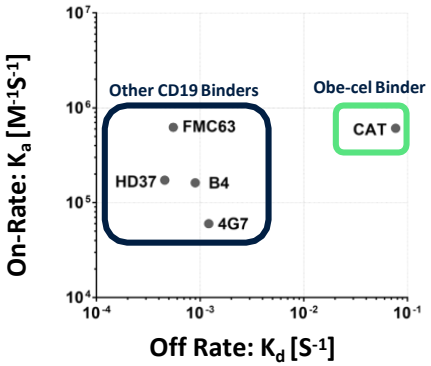
Improved potency, reduced toxicity

Avoids over-activation of CAR T cells
-> Reduced toxicities

Increased CAR T peak expansion
-> Improved persistence

Avoids exhaustion of CAR T cells
-> Improved engraftment
-> Improved persistence

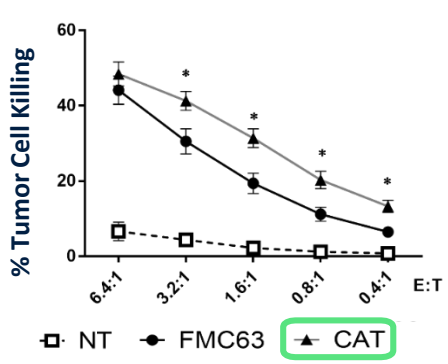
Fast off-rate

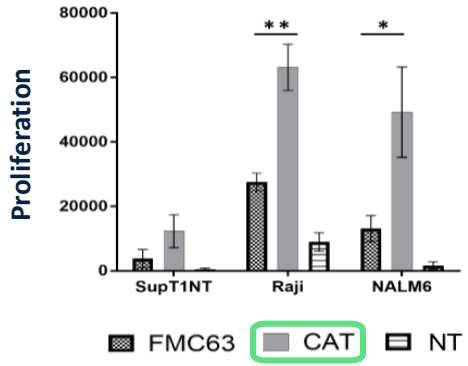


obe-cel has lower CD19 affinity and shorter half-life of interaction compared to binders used in approved products

- obe-cel = 9.8 seconds
- Kymriah® = 21 minutes

Enhanced cytotoxicity and proliferation



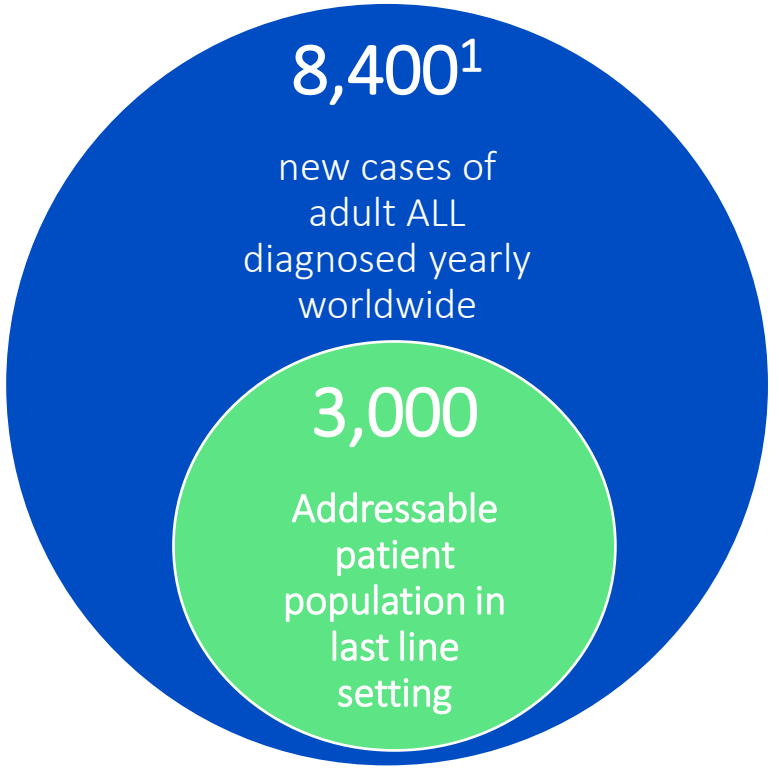


Ghorashian S, Pule MA, Amrolia P et al. *Nature Medicine* 2019

obe-cel for adult Acute Lymphoblastic Leukemia (ALL): high unmet need

Successful therapy requires high level of activity and sustained persistence paired with good tolerability

- Median overall survival is < 1 year in r/r adult ALL
- Combination chemotherapy enables 90% of adult ALL patients to experience Complete Response (CR)
  - Only 30% to 40% achieve long-term remission
- Current T cell therapies for adult patients are Blincyto® and Tecartus™
  - Therapies are highly active, but require subsequent allograft to achieve durability
  - Notable toxicity with high incidences of severe CRS and cases of fatal neurotoxicity
- Opportunity to expand the addressable patient population in earlier lines of therapy



NOTES

1. SEER and EUCAN estimates (respectively) for US and EU epi

obe-cel is a potentially transformational therapy for adult ALL

Unique CAR T design drives differentiated product profile

- Unique mechanism of action built on a fast off-rate from CD19 target antigen
- High Overall Response Rate (ORR) across all patient populations evaluated[1]
- Sustained morphological Event Free Survival (EFS) of 46% with a median follow-up of 29.3 months[2]
- Long term CAR T persistence drives durability of effect
- Favorable safety profile:
  - No high-grade Cytokine Release Syndrome (CRS)
  - Limited immune effector cell-associated neurotoxicity syndrome (ICANS)

obe-cel

Orphan Drug designation by FDA for B-ALL

Orphan Medical Product designation by EMA in ALL

RMAT designation by FDA in R/R B-ALL

Prime designation by EMA in R/R B-ALL

ILAP designation by MHRA in Adult R/R B-ALL

NOTES
1. FELIX study
2. ALLCAR19 study

obe-cel shows consistent clinical profile across three clinical studies

Data from 3 studies - range of ages and patient conditions

- obe-cel has a favourable safety profile with no high-grade CRS and limited ICANS

	CARPALL #1 Peds ALL	ALLCAR19 #2 Adult ALL	FELIX 1b #3 Adult ALL
n	14	20	16
ORR (CR & CRi) (95% CI)	86% (57%, 98%)	85% (62%, 97%)	75% (48%, 93%)
CRS [1] ≥ Grade 3	0%	0%	0%
CRS [1] any grade	93%	55%	56%
Neurotox [2] ≥ Grade 3	7%	15%	6%
Neurotox [2] any Grade	50%	20%	13%
Median Age	9	42	42
Bone marrow blast >20% at LD	21%	60%	75%
Bone marrow blast <5% at LD	71%	35%	25%
Prior blinatumomab	7%	25%	56%

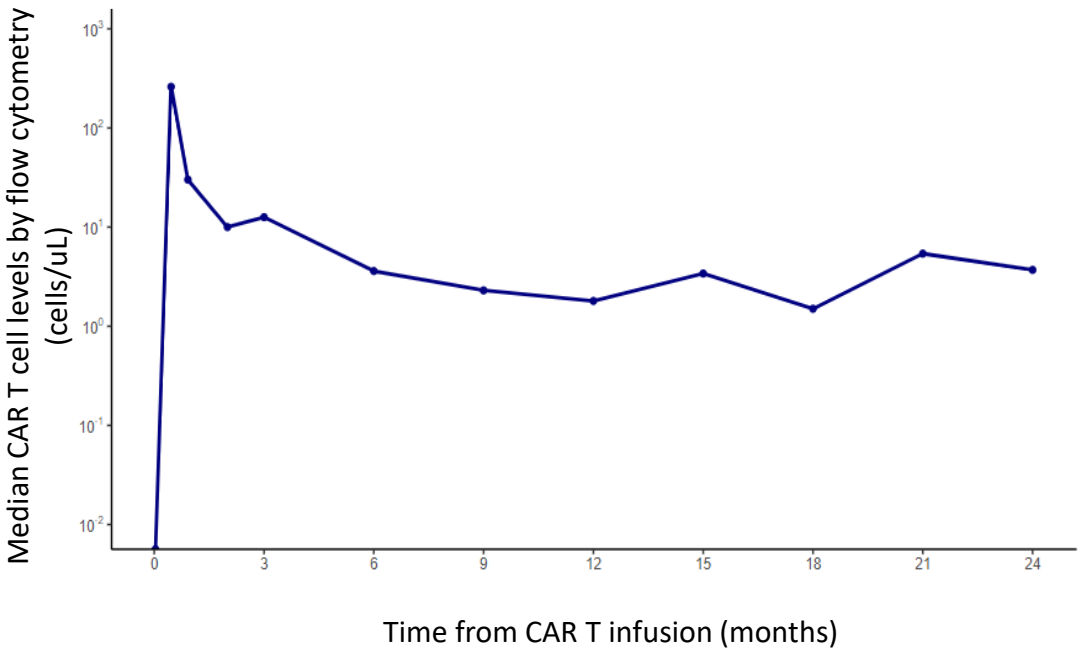
[1] CRS grading based on Lee et al (2014) for CARPALL and ALLCAR19, and ASTCT grading (Lee et al 2019) for FELIX
[2] Neurotoxicity grading based on CTCAE v4.03 for CARPALL and ALLCAR19, and ASTCT ICANS grading (Lee et al 2019) for FELIX

#1 Ghorashian et al. Nature Medicine 2019
#2 Roddie et al. J Clin Oncol, 2021
#3 Culshaw et al, ASH 2021, abstract #477

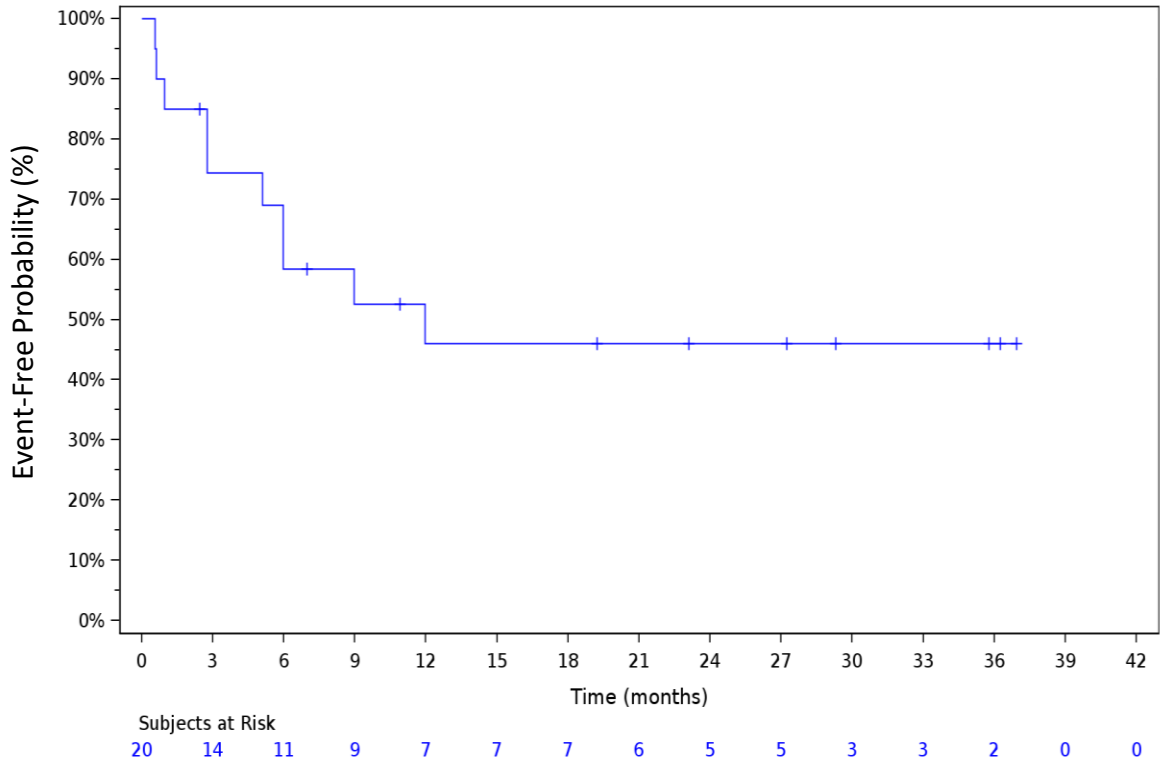
obe-cel shows sustained event-free survival beyond 30 months

Long term CAR T persistence drives durability of effect

Median CAR T cell levels in peripheral blood



ALLCAR19 Event-Free Survival



Median (range) follow-up time: 29.3 months (range 0.6 – 41.5)
Median (95% CI) EFS: 12 months [2.8, NE]
EFS starting from Month 12 going forward: 46% (95% CI [23%, 67%])

Data cut for ALLCAR19 study: 15-OCT-2021;
Patients were received SCT post obe-cel infusion are censored at date of SCT

Unmet medical need in r/r adult ALL despite approved agents

Current standard of care and recently approved agents in r/r adult ALL

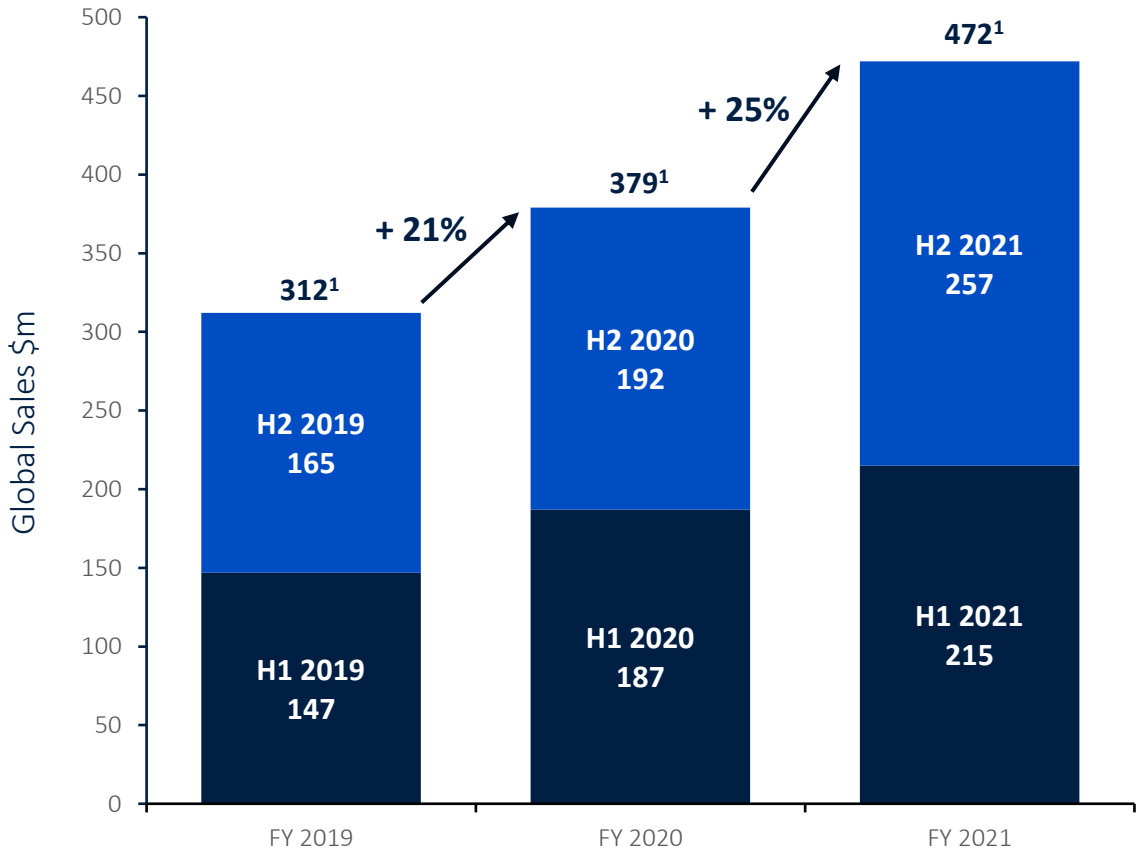
	Standard of Care		Recently FDA approved
	Blincyto[1]	Besponsa[2]	Tecartus[3]
N	271	109	54
ORR	44%	81%	65%
EFS/PFS	31% @ 6m ~10% @ 18m	~45% @ 6m ~20% @ 18m	~65% @ 6m ~25% @ 18m
median DoR	7.3m	4.6m	13.6m
median OS	7.7m	7.7m	18.2m
CRS ≥ Grade 3	5%	Not reported	26%
Neurotox any Grade	65%	Not reported	87%
Neurotox ≥ Grade 3	13%	Not reported	35%
Subsequent SCT post treatment	24%	41%	18%
Other notable observations	NA	14% Hepatic VoD	40% vasopressor use

1. Kantarjian et al., 2017/ USPI (product label) 2. Kantarjian et al., 2016/ USPI (product label) 3. Shah et al. Lancet 2021/ USPI (product label)
The estimates of EFS/PFS are read from the KM curves. The efficacy data in ZUMA-3 are based on the modified ITT population while the blinatumomab and inotuzumab data are based on the ITT population.

obe-cel could launch into an expanding ALL market

Blincyto®, current market leader, shows annual revenue growth of 25%

Reported Blincyto® sales[1]



- Blincyto® sales price estimated to be $178k[3] (for 2 cycles) supporting approx. >2,000 commercial adult ALL patients, growing at a rate of 25%
- Kymriah® is priced at $475k in pediatric ALL. Breyanzi® is priced at $410k in DLBCL[4]. Tecartus™ is priced at $399k for adult ALL.
- Breyanzi® and other CAR T cell therapies are expanding delivery center footprint
- Tecartus™ is expected to establish CAR T use in adult ALL
- obe-cel has the potential to be best-in-class curative therapy expanding use beyond academic transplant centers

NOTES

1. As per Amgen quarterly SEC filings
2. H2 2021 is not yet reported, this is just an extrapolation based on H1 2021 reported sales
3. https://www.medscape.com/viewarticle/836879
4. Bristol Myers finally wins FDA approval for cancer cell therapy | BioPharma Dive – Komodo Health 2015 – 2020

Next steps: obe-cel initial data (FELIX) expected in H2 2022

obe-cel is the first Autolus program to move into a pivotal program: full data in H1 2023

FELIX 19

Pivotal Phase 2 trial in adult ALL ongoing since mid 2021 with sites in UK, Spain and US

Up to 100 relapsed/refractory adult ALL patients

Phase 1b run-in component, prior to single arm Phase 2 potential pivotal trial

Pre-determined futility analysis passed in Q1 2022

H2 2022
Initial data

Primary endpoint: overall complete response rate (CR/Cri)

H1 2023
Full data

Secondary endpoints: include MRD-negative CR, EFS and DoR

Building obe-cel into a franchise

Deep value program with broad applicability

Capitalising on the obe-cel profile in additional indications

Unique profile allows applicability in a broad range of indications

Clinical data supports differentiated product profile

- High degree of activity and persistence -> drives long term outcomes
- Best-in-class safety profile -> will drive adoption of obe-cel in all clinical settings
- Initial NHL data is consistent with this profile

Solid foundation for onward development

PRODUCT	INDICATION	TARGET	STUDY NAME	PHASE
obe-cel	Adult ALL	CD19	FELIX	Pivotal
obe-cel	B-NHL & CLL	CD19	ALLCAR19*	Phase 1
obe-cel	Primary CNS Lymphoma	CD19	CAROUSEL*	Phase 1
AUTO1/22	Pediatric ALL	CD19 & CD22	CARPALL*	Phase 1

B Cell Malignancies

* Collaboration with UCL

B-cell Non-Hodgkin Lymphoma: Favorable tolerability profile reproduced

- Consistent safety profile for obe-cel across indications tested
  - No ICANS
  - No high grade CRS

Adverse Events of Special Interest

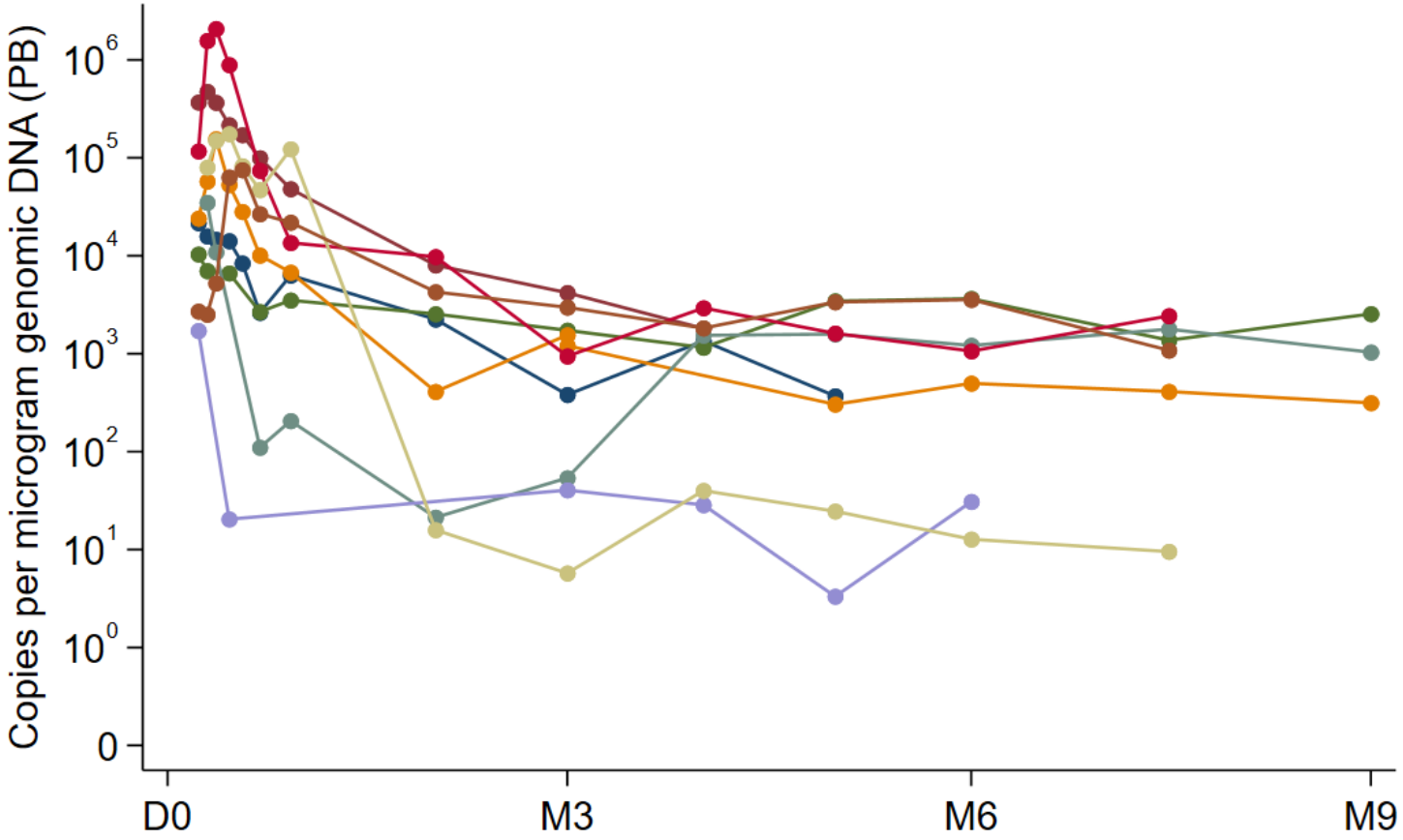
Event N = 16 patients	All Grades n (%)	Grade 1 n (%)	Grade 2 n (%)	Grade 3 n (%)	Grade 4 n (%)
CRS*	9 (56%)	6 (38%)	3 (19%)	0	0
ICANS	0	0	0	0	0
Event N = 16 patients	All Grades n (%)	Grade 1 n (%)	Grade 2 n (%)	Grade 3 n (%)	Grade 4 n (%)

*CRS grading by Lee et al 2018
Data cut: 15-OCT-2021

Data cut: 15-OCT-2021

obe-cel shows excellent T cell expansion and engraftment

ALLCAR19 – B-NHL Patients



Cmax (CAR transgene per ug gDNA)	
n	9
Mean	336234
CV%	50.2%
Time to Cmax (Days)	
n	9
Median	9
Range	7-17
Time last measurable in Blood (Days)	
n	9
Median	228
Range	122-274

CAR, chimeric antigen receptor; VCN, vector copy number; qPCR, quantitative polymerase chain reaction, CV% , coefficient of variation

Data cut: 15-OCT-2021

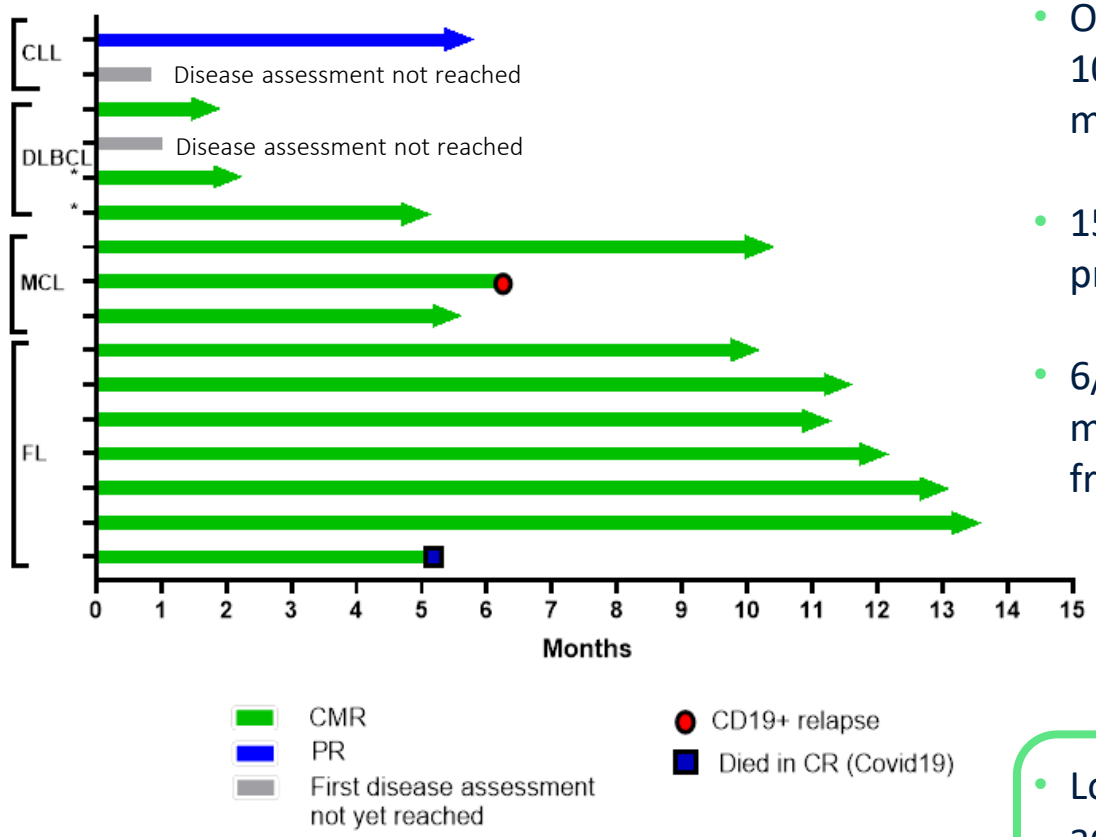
obe-cel shows encouraging efficacy and duration of response in NHL/CLL

Long term persistence of obe-cel demonstrated by qPCR

	N (%)
Follicular Lymphoma	7 (100%)
CR + PR	7 (100%)
CR	
DLBCL	
CR + PR	3 (100%)
CR	3 (100%)
Pending	1
MCL	
CR + PR	3 (100%)
CR	3 (100%)
CLL/SLL	
CR + PR	1 PR (BM MRD-neg.)
	1
Pending	
Non-Response	0
Relapse	1 (MCL at 6 mos)

Median (Range) Follow-Up Time:

- FL/DLBCL: 11.8 Months (Range 2.0-14.2)
- MCL/CLL: 7.4 Months (Range 1.1-14.8)



- Out of 14 patients evaluable for efficacy, 100% ORR and 13/14 (93%) in complete metabolic response
- 15/16 patients are ongoing without disease progression
- 6/7 FL patients in CR for more than 10 months (10-14 months), 1 patient died in CR from COVID

- Longer-term follow up and enrollment of additional patients ongoing, with update at European Hematology Congress (EHA), June 2022

DLBCL* = transformed follicular lymphoma

Data cut: 15-OCT-2021

AUTO1 in B-NHL, CLL/SLL: EHA abstract

Data cut: 8 February 2022

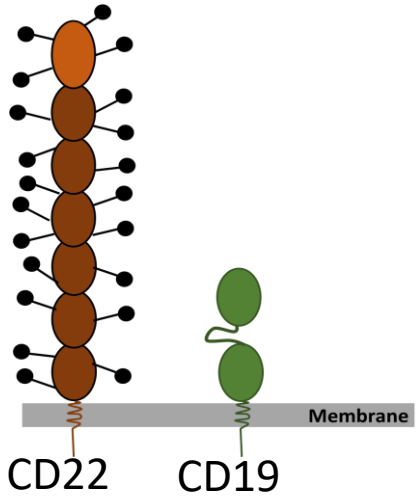
- 19 patients had been infused with AUTO1; 10 with low grade NHL, 6 with DLBCL, 3 with CLL
- Patients treated had received a median of 3 prior lines of treatment
- Grade 1 CRS was reported in 6/19 and Grade 2 CRS in 3/19
- No ICANS was observed in the B-NHL and CLL cohorts
- In the low grade-NHL and DCBCL cohorts, 10/10 and 4/5 evaluable patients respectively were in CMR post-treatment.
- Responses were ongoing in 9/10 low grade-NHL at 12 months and in 4/4 DLBCL at months 1,3,3 and 6.
- In the CLL cohort, 2/3 evaluable patients achieved MRD negative remission in the bone marrow with residual small volume lymph nodes by CT at 6 and 3 months of follow up respectively
- AUTO1 demonstrated a tolerable safety profile in patients with r/r B-NHL and CLL despite high disease burden. Early data shows excellent complete remission rates and excellent CAR engraftment/expansion

AUTO1/22: Pediatric Acute Lymphoblastic Leukemia

CD19 negative antigen escape is a common cause of treatment failure

- obe-cel (AUTO1) in relapsed / refractory pediatric ALL is highly active and has a favourable safety profile - CARPALL study[#1,2]
- Medical need in pediatric ALL is to minimize rates of antigen-loss–driven relapses and improve long-term outcomes – points to need for a dual targeting CAR-T
- CD22 is challenging to target with a CAR as it is a rigid bulky molecule, expressed at a low density and can be downregulated further in response to CD22 targeting[#3]
- AUTO1/22 is a next generation program that builds on obe-cel and adds a highly potent CD22 CAR, capable of targeting low levels of CD22
- AUTO1/22 is being evaluated in pediatric patients and data will be presented at EHA, June 2022

CARPALL Study	
n	14
CR Rate	86%
EFS 12m	52% (95% CI, 16% to 72%)
No. of CD19 negative relapses	5/6
CRS ≥ G3	0%



#1 NCT02443831 #2 Ghorashian et al., Nat Med 2019 #3 Shah et al., JCO 2020, Spiegel et al., Nat Med 2021

AUTO1/22: EHA abstract

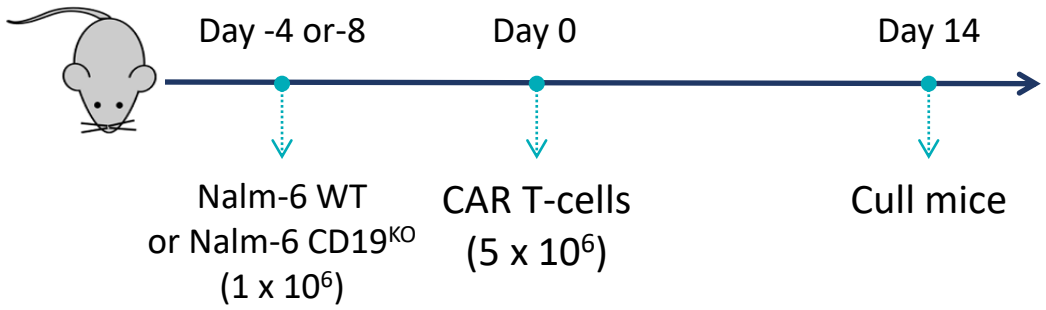
Data cut: 8 February 2022

- 10 pediatric ALL patients have been treated with AUTO1/22 and 8 are evaluable with >1 month follow-up
- 5 of 8 patients had relapsed post allogeneic SCT
  - 4 had received prior Blincyto
  - 3 had relapsed after prior Kymriah
- CRS occurred in 7/8 patients (grade 1 n=2, grade 2 n=5), but severe CRS was not seen
- 7 of 8 evaluable patients achieved MRD negative CR at 1 month post infusion
- Overall, at a median follow up of 4.8 months, 5/8 patients remain in MRD negative CR at last follow up
- The study results demonstrate that dual CD19/22 targeting CAR T cells generated by co-transduction show an acceptable safety profile, with robust expansion/persistence and early efficacy in a heavily pre-treated cohort

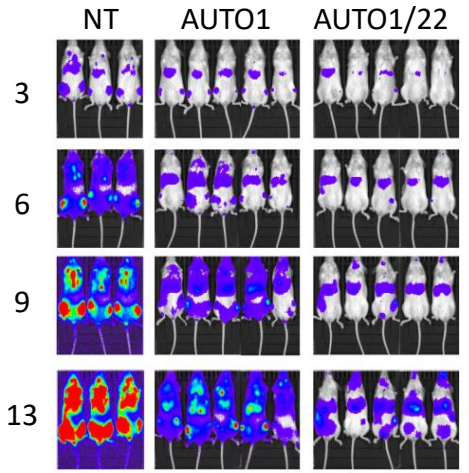
AUTO1/22: enhanced in vivo anti-tumor efficacy

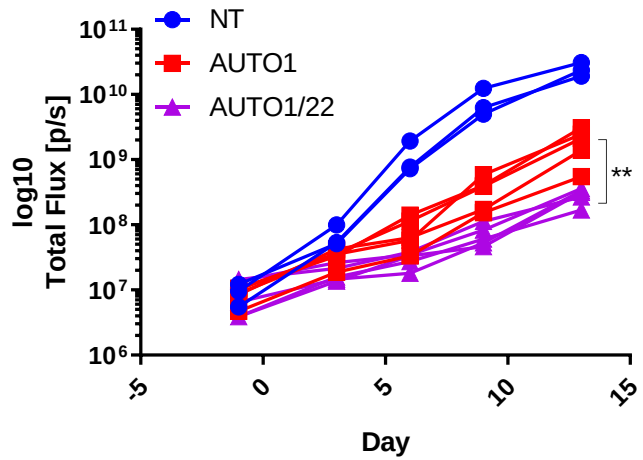
Dual targeting of CD19 and CD22 addresses CD19-negative target cells and enhances overall activity

NSG

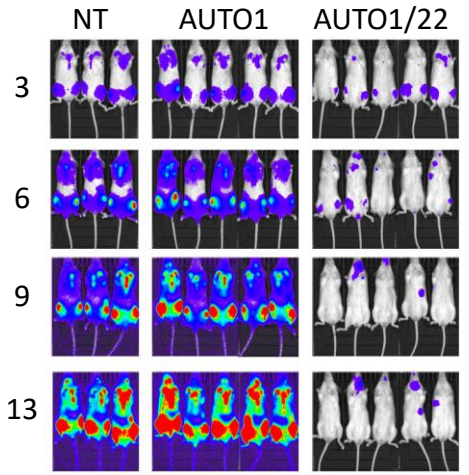


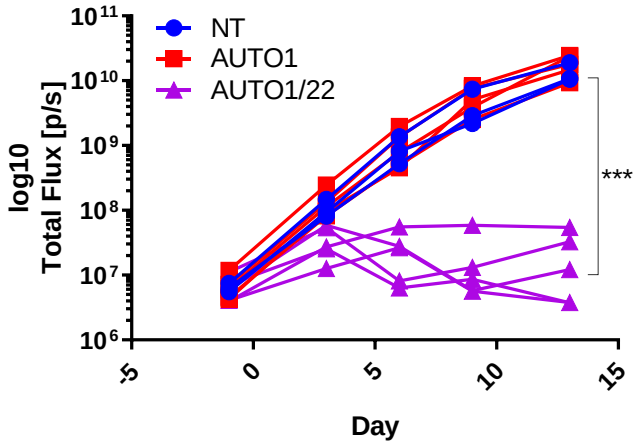
Nalm-6 WT





Nalm-6 CD19^{KO}





AUTO1 in Primary CNS Lymphoma: EHA abstract

Data cut: 14 February 2022

- 6 patients with r/r PCNSL were enrolled where the median prior lines of treatment was 2
- 5 patients were infused with IV AUTO1 and 1 patient with intraventricular AUTO1
- Following CAR T infusion, grade 1 and 2 CRS affected 1 and 3 patients respectively and any grade ICANS was observed in 2 patients with 2 grade 3 events
- AUTO1 engraftment and response was evaluable in 4 patients at 1 month following iv infusion
- 2 of 4 patients had no measurable disease at 2 and 6 months of follow up respectively
- AUTO1 showed encouraging remission rates and excellent CAR T engraftment/expansion in the blood and CSF
- Intraventricular administration was well-tolerated and showed that AUTO1 has activity via that route in a patient who failed IV therapy

Summary and next steps for obe-cel

Building a franchise through broad applicability

- Favorable and consistent safety profile demonstrated in a number of indications
- Encouraging efficacy and duration in small patient numbers

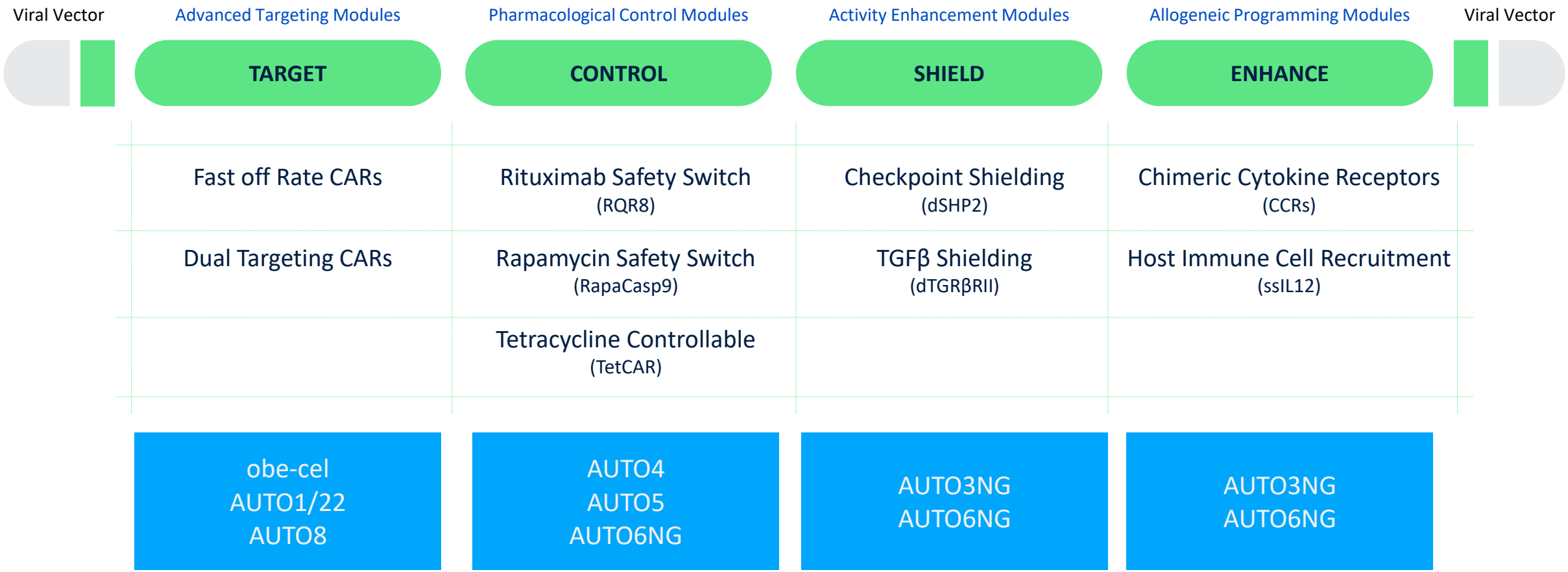
- Longer-term follow up and enrolment of additional patients ongoing, with updates at European Hematology Congress (EHA), June 2022:
  - DLBCL and CLL – Phase 1 data (ALLCAR19 trial)
  - Primary CNS Lymphoma – Phase 1 data (CAROUSEL trial)
  - Pediatric ALL – Phase 1 data (CARPALL trial)

Pipeline

A broad portfolio of next generation modular T cell therapies

A broad toolkit which is core to our strategy of modular innovation

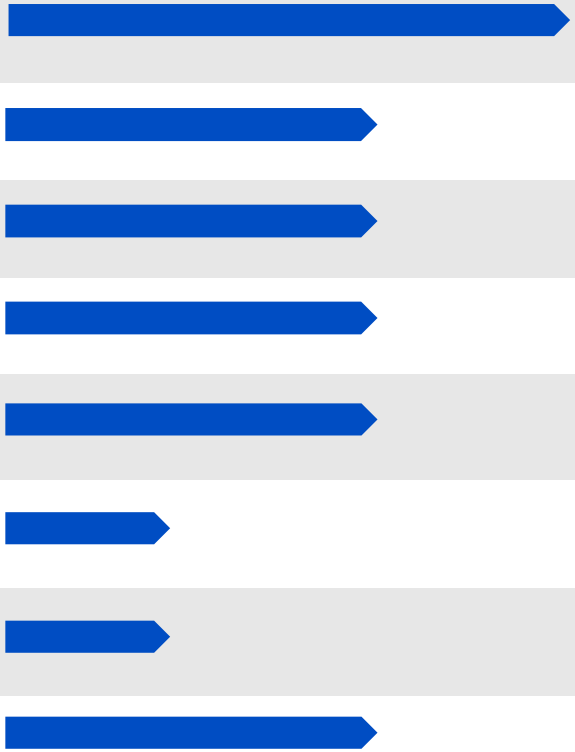
Advanced T cell programming



Pipeline

Designed to address limitations of current T cell therapies

PRODUCT	INDICATION	TARGET	STUDY	PRE CLINICAL	PHASE 1	PHASE 2/ PIVOTAL	BLA
obe-cel	Adult ALL	CD19	FELIX				
obe-cel	B-NHL & CLL	CD19	ALLCAR19 Ext*				
obe-cel	Primary CNS Lymphoma	CD19	CAROUSEL*				
AUTO1/22	Pediatric ALL	CD19 & CD22	CARPALL*				
AUTO4	TRBC1+ Peripheral TCL	TRBC1	LibrA T1				
AUTO5	TRBC2+ Peripheral TCL	TRBC2					
AUTO6NG	Neuroblastoma; Other tumour types	GD2					
AUTO8	Multiple Myeloma	BCMA & CD19	MCARTY*				

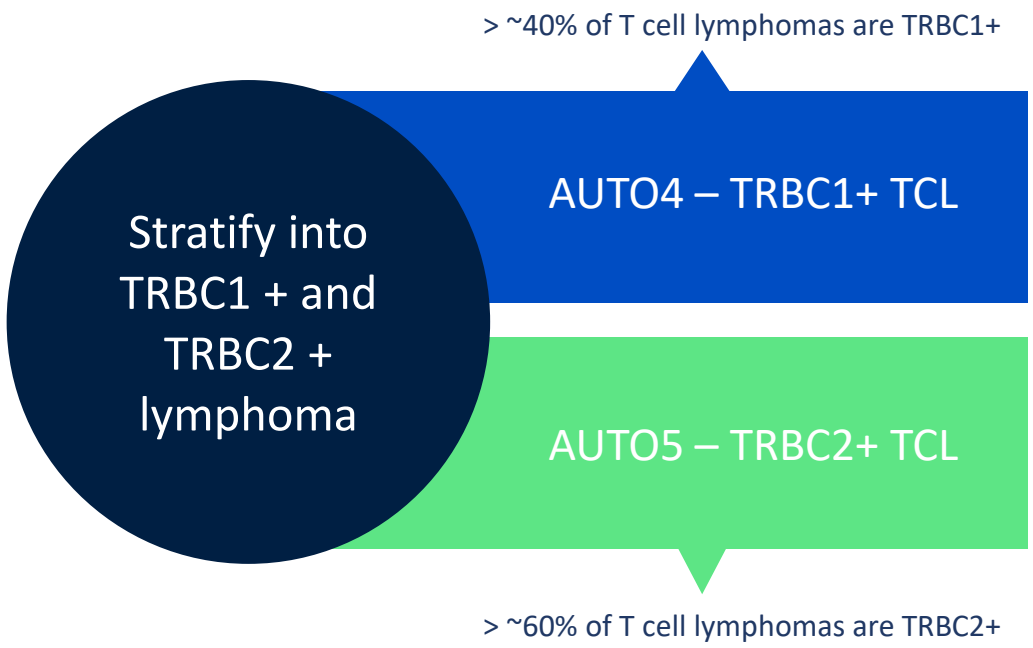


*Collaboration with UCL

AUTO4: T Cell Lymphoma

No standard of care after first relapse and no T cell therapy approved

Three key elements to address T cell lymphomas: AUTO4, AUTO5 and a companion diagnostic test



- T cell lymphoma is an aggressive disease with a very poor prognosis for patients
- Median 5 yrs OS: 32%
- Standard of care is variable and often based on high-dose chemotherapy and stem cell transplants
- A large portion of T cell lymphoma patients are refractory to or relapsed following treatment with standard therapies
- T cell lymphomas have not, so far, benefited from advances in immunotherapeutic approaches
- AUTO4 Phase 1 interim data at EHA, June 2022

AUTO4: EHA abstract

Data cut: 9 February 2022

- 9 patients screened for r/r TRBC1+ peripheral T-cell lymphoma have been treated with AUTO4

- After lymphodepletion with Flu/Cy
  - 3 patients received 25 x 106 CAR T cells
  - 2 patients received 75 x 106 CAR T cells
  - 1 patient received 225 x 106 CAR T cells
  - 3 patients received 450 x 106 CAR T cells

- AUTO4 demonstrated a tolerable safety profile, with no patient experiencing any dose limiting toxicities, and no neurotoxicity/ICANS
  - Three patients experienced CRS (1 patient Grade 1, 1 patient Grade 2 and 1 patient Grade 3)

- Of the 9 patients treated, 5 patients had achieved complete metabolic responses (CMR) by PET-CT at Month 1, 1 patient remains with a PR 6 months post AUTO4 infusion, and 3 patients did not respond

- All 3 patients at the highest dose level achieved a CMR at Month 1

Manufacturing

Manufacturing operations

First UK CAR T commercial facility expected to be ready for GMP operations in mid 2023

- Highly experienced team running manufacturing operations and supporting new facility build
- 70,000 ft^2 commercial facility under construction in Stevenage
  - Commercial Cell capacity of 2,000+ B/yr with option to increase
  - Vector capacity for clinical activities
  - In process and release QC - automation to drive V2D to < 20 Days
- The Stevenage facility supports retention of key staff and build of critical mass for US and EU expansion

Blackstone Collaboration

Blackstone Life Sciences to invest up to $250m to develop obe-cel in adult ALL

Investment of $100m in equity and up to $150 million in product financing

- Blackstone agreed to purchase $100 million of Autolus' American Depositary Shares (ADS') in a private placement, priced at market
- Blackstone also committed to invest up to $150 million in product financing to support obe-cel development and preparation for commercialization
  - $50 million paid upon closing of the transaction
  - Remainder payable based on achievement of certain development and regulatory milestones
- Blackstone received a warrant to purchase up to $24 million worth of Autolus ADSs at an exercise price premium to market
- Autolus to pay Blackstone a capped single digit royalty plus milestone payments based on net sales of obe-cel
- Transaction provides runway into 2024[1]

NOTES

1. Assuming all milestones received

Summary

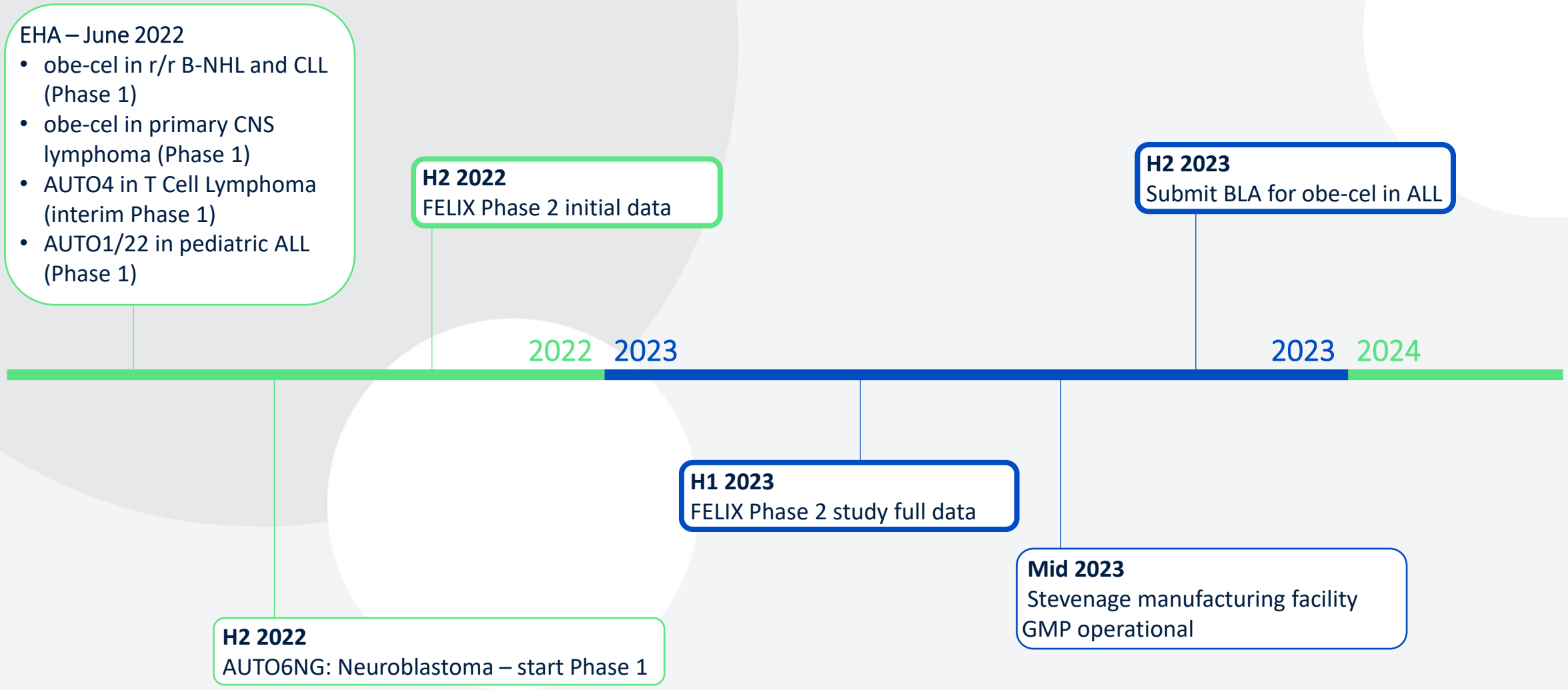
Multiple catalysts in H2 2022

Autolus poised for potential value inflection

obe-cel pivotal data in adult ALL in 2022

- obe-cel
  - FELIX Phase 2 study in adult ALL ongoing; initial data expected in H2 2022 and full data in H1 2023
  - Evaluation in r/r B-NHL and CLL ongoing; next data update at the EHA Congress in June
  - Evaluation in Primary CNS Lymphoma ongoing; initial Phase 1 data (CAROUSEL study) at EHA in June
- AUTO1/22
  - AUTO1/22 Phase 1 (CARPALL) initial data in Pediatric ALL to be presented as an oral at EHA in June
  - Longer term follow-up data in H2 2022
- AUTO4 /AUTO5
  - AUTO4 Phase 1 (LibrA T1) initial data in Peripheral T cell lymphoma to be presented as an oral at EHA in June
- Pipeline transitioning to Phase 1 in 2022
  - AUTO8 Phase 1 study has started
  - AUTO6NG in Neuroblastoma – start Phase 1 H2 2022
- Cash balance at March 31, 2022, $268.6 million

Autolus key newsflow timeline



Autolus

Thank you