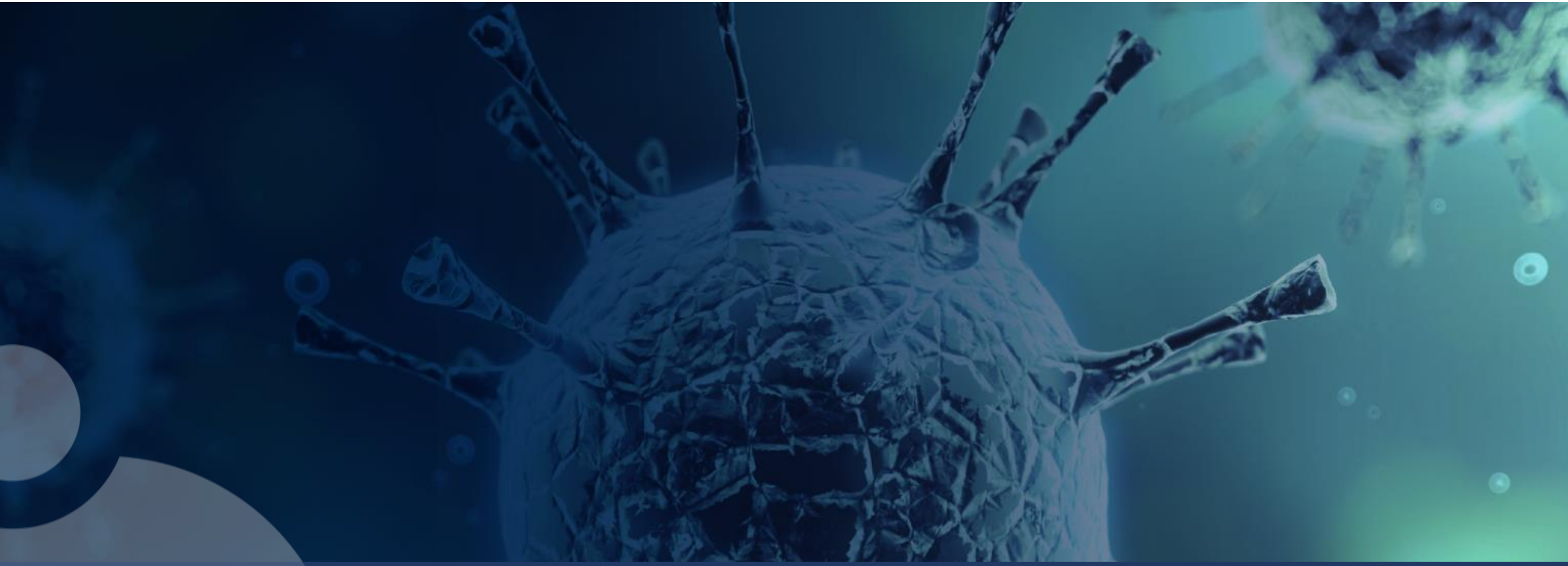
Autolus

Nasdaq: AUTL



Developing Next Generation Programmed T Cell Therapies

May 2021

Disclaimer

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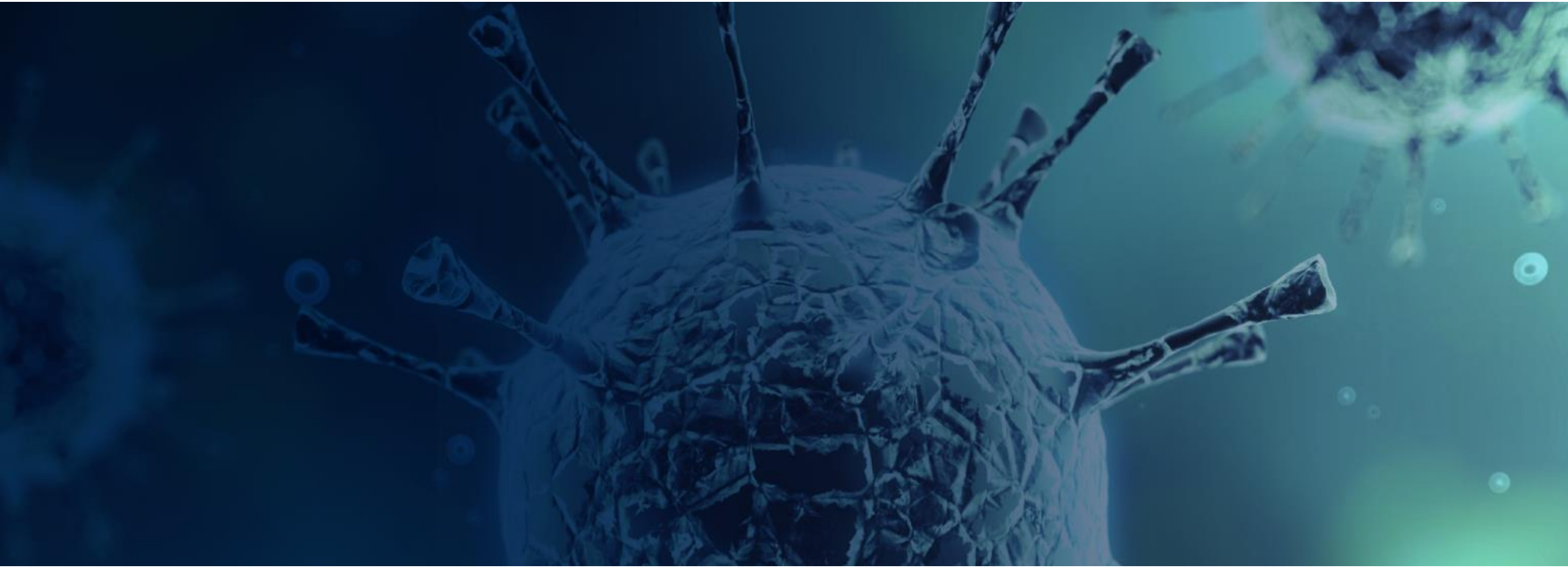


Lead Clinical Programs

Striving for best-in-class therapies

Driving value with potential best-in-class adult ALL program

Focusing on delivering AUTO1, a potentially transformational treatment for Adult Acute Lymphoblastic Leukemia (ALL), as well as exploring activity in additional B-cell malignancies

Full data for AUTO1 – AL-1 (FELIX) study in adult expected in 2022

AUTO1 data in PCNSL and NHL expected in Q4 2021, AUTO1/22 in pALL expected in Q4 2021

- Plan to partner AUTO3 ahead of progressing into next phase of development
- Additional value steps in T cell lymphoma and first solid tumor indication
- Broad preclinical pipeline of next generation programs expected to transition to clinical stage in 2021/2022
- Scalable, fully enclosed manufacturing platform

Broad pipeline of clinical programs

Designed to address limitations of current T cell therapies

PRODUCT	INDICATION	TARGET	PHASE 1/2	PIVOTAL*
AUTO1	Adult ALL	CD19	ALLCAR19	FELIX
AUTO1	NHL †	CD19	ALLCAR19	
AUTO1	PCNSL † †	CD19	CAROUSEL	
AUTO1/22	Pediatric ALL	CD19 & CD22	CARPALL	
AUTO3	DLBCL	CD19 & CD22	ALEXANDER	To be partnered
AUTO4	TRBC1+ Peripheral TCL	TRBC1	LibrA T1	

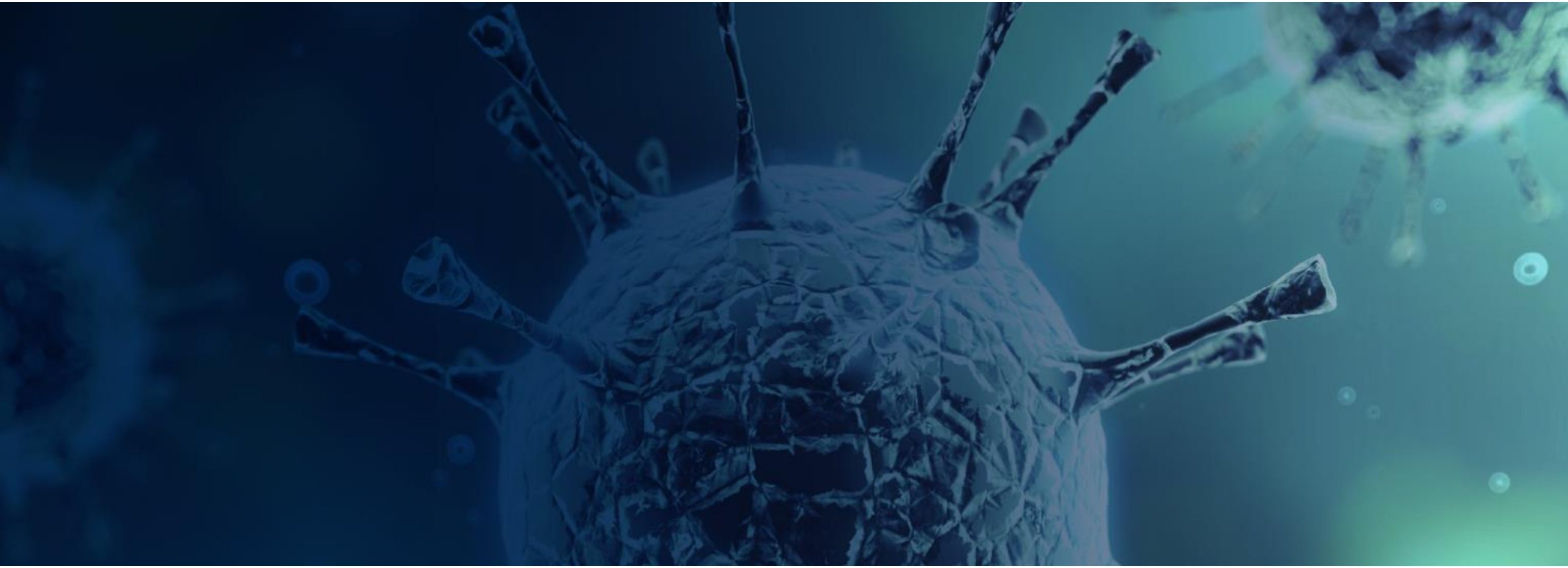
B Cell Malignancies

T Cell Lymphoma

*Subject to confirmation by regulatory authorities

† Non-Hodgkin lymphoma

† † PCNSL = Primary CNS Lymphoma



Adult Acute Lymphoblastic Leukemia

AUTO1— Potential as a standalone therapy

No approved CAR T therapy for adult ALL patients

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

Autolus

ALL is a significant opportunity

Up to **8,400*** new cases of adult ALL diagnosed yearly worldwide

Estimated R/R patients in US & EU **3,000** addressable patient population in last line setting

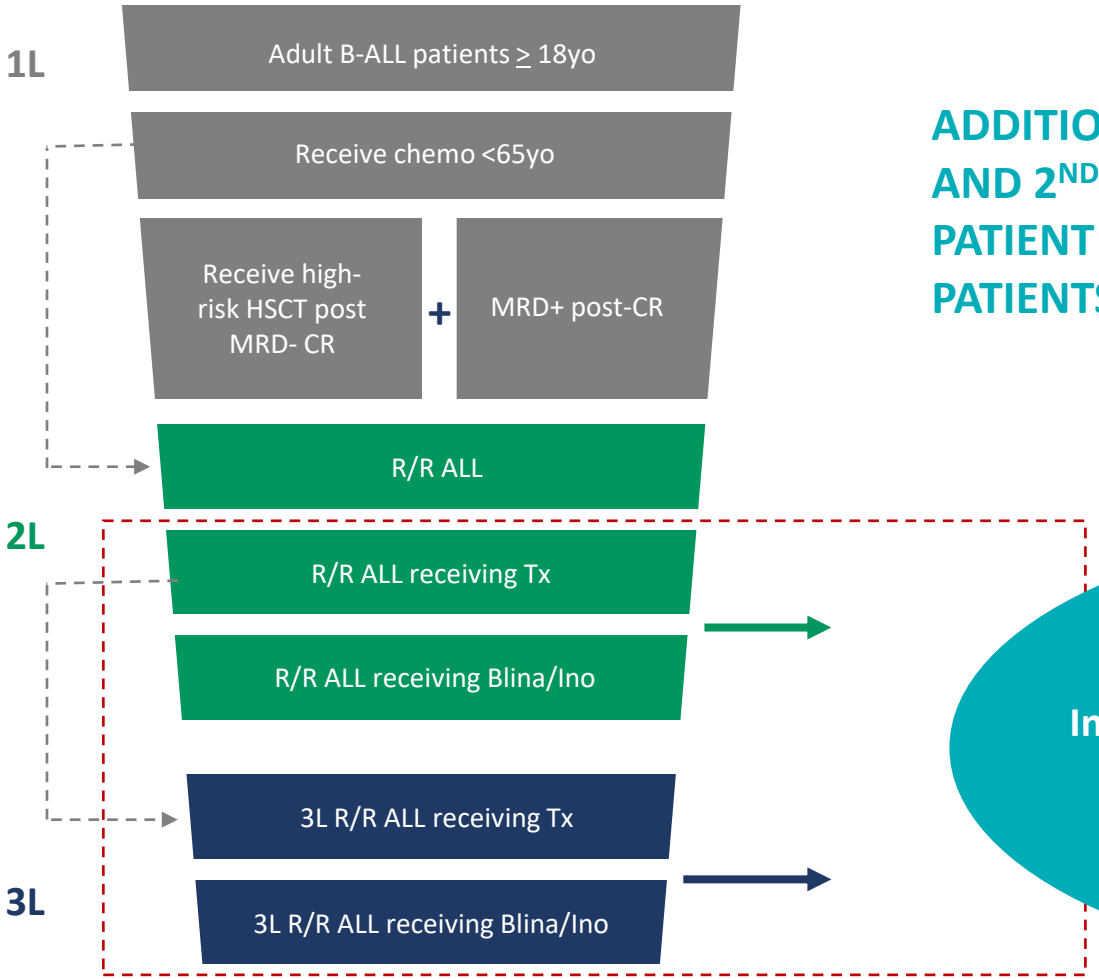
HIGH UNMET MEDICAL NEED

- Combination chemotherapy enables 90% of adult ALL patients to experience CR, but only 30% to 40% will achieve long-term remission
- Median overall survival is < 1 year in r/r ALL
- Only redirected T cell therapy for adult patients is blinatumomab
- CAR T therapies are highly active, but require subsequent allograft to achieve durability
- Patients are generally more fragile with co-morbidities, yet CAR T toxicities in this setting have been notable with high incidences of severe CRS and cases of fatal CRS and neurotoxicity
- High medical need spans from front line consolidation of high risk patients to refractory and relapsed patients in 2L and 3L

FDA GRANTED ORPHAN DRUG DESIGNATION FOR AUTO1 IN ALL

*SEER and EUCAN estimates (respectively) for US and EU epi

Adult ALL is a promising commercial opportunity with limited competition



ADDITIONAL POTENTIAL FOR AUTO1 TO MOVE TO 1ST AND 2ND LINES **, WHICH INCREASES THE ADDRESSABLE PATIENT POPULATION TO APPROX. 5,000 ADULT ALL PATIENTS

Initial Market Opportunity in 2L+ R/R aALL
~3000 patients in US/EU/JP

*Company estimate, based on US, EU5 and Japan
**Subject to successful clinical progress

Key features of a successful CAR T Cell Therapy for adult ALL

AUTO1 is uniquely placed to address current limitations of therapy

Challenge	Product Property	CAR T Feature	Benefit
Fast proliferating disease	Very high level of anti-leukemic activity	Rapid CAR T mediated kill and high level of CAR T expansion	High response rates
Almost stem cell like nature of leukemic cells	Sustain long term pressure on leukemia	Long CAR T persistence	Durable responses
Poor patient condition	Good tolerability	Minimize high grade CRS and NT	Manageable AE profile

AUTO1 has potential for transformational outcomes in adult ALL

Data presented at ASH 2020, with a data cut-off date November 12, 2020

- High level of sustained CRs, achieved without subsequent stem cell transplant
- Durability of remissions highly encouraging
  – Across all treated patients, event free survival (EFS) at six and 12 months was 69% and 52%, respectively
- AUTO1 well tolerated, despite heavily pre-treated patients with high disease burden
  – No patients experienced ≥ Grade 3 cytokine release syndrome (CRS) as of data cut-off date
- Ph1b/2 potential pivotal study underway, expect full data in 2022
  – Escalating COVID-19 pandemic is continuing to impact study conduct
- Adult ALL represents a sizeable market opportunity addressable with limited commercial footprint

AUTO1 is well tolerated, even in patients with high disease burden

CRS (Lee Criteria)	Neurotoxicity (ICANS*)	≥ Grade 3 Neutropenia
○ CRS (any) in 10/20 ○ Grade 2 in 7/20 ○ ≥ Grade 3 CRS in 0/20	○ ICANS (any) in 4/20 ○ Grade 2 in 1/20 ○ Grade 3 in 3/20	○ 7/20 preceded treatment ○ 8/17 at D28, most resolving by Month 2-3

Cytokine Release Syndrome (CRS)

- 50% developed CRS G1 and G2, all patients who developed G2 CRS had high disease burden B-ALL
- No high grade CRS observed
- Tocilizumab was used in 7/20 patients (35%)

Neurotoxicity (ICANS)

- ICANS was reported in 4/20 patients: all had ≥ 50% blasts; all cases were preceded by CRS
- 3/4 cases resolved to G1 in <24h with steroids, 1/4 cases resolved to G1 in 72h with steroids

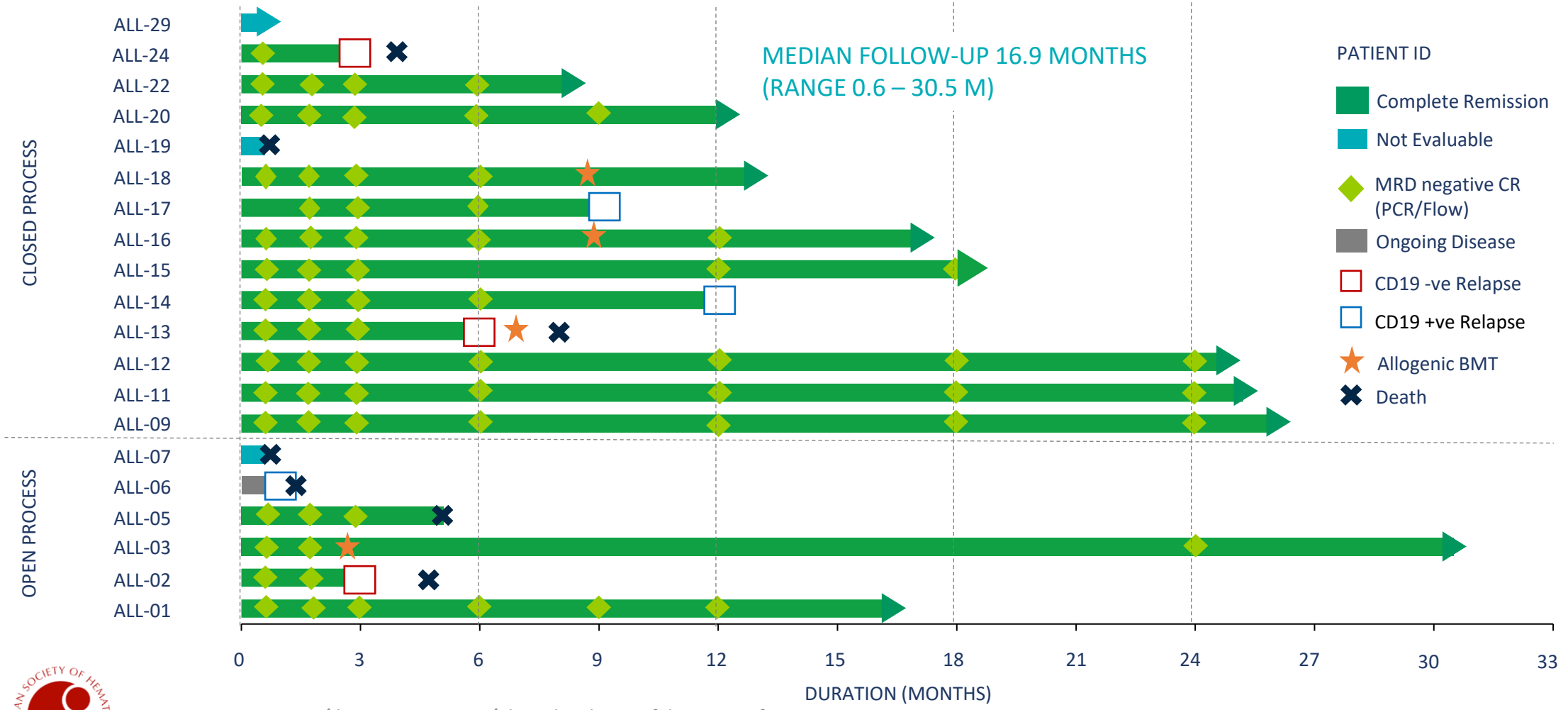
7/20 patients died on study:

- 2/20 died from progressive B-ALL and 1 died post-progression from allo-transplant-related complications (VOD/sepsis)
- 4/20 died from infection: 2 due to invasive fungal, 1 MDR-pseudomonas, 1 of COVID-19

* Immune Effector Cell Associated Neurotoxicity Syndrome CRS & NT will be graded using the ASTCT/ASBMT Consensus Grading (Lee et al. 2019)

Responses are durable without need for transplant

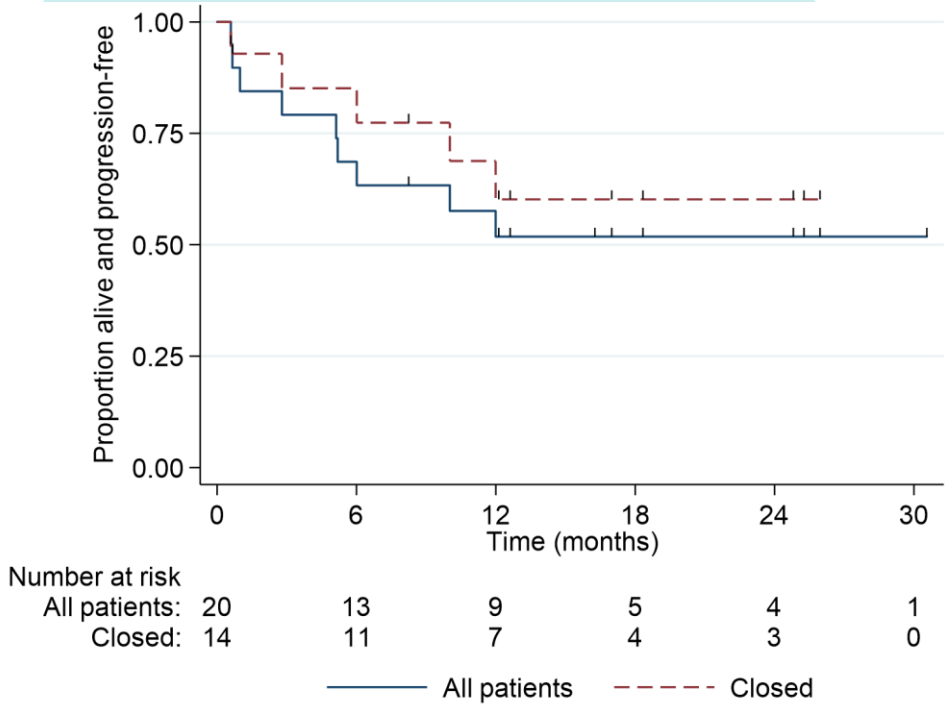
MRD negative CRs ongoing past 24 months observed



MRD < 10^{-4} by PCR or < 5 x 10^{-4} based on limits of detection of assay

Data Cut-off 12-Nov-2020, Evaluable = All patients with at least M1 follow-up or death prior to Month 1

Event-free survival of 52% at 12 months supports AUTO1's unique profile



		All patients Est [95% CI]	Closed process† Est [95% CI]
	N*	19	13
	ORR	84%	92%
	MRD Neg CR	84%	92%
DOR			
	Median	Not reached	Not reached
	6 months	81% [52%, 94%]	83% [48%, 96%]
	12 months	68% [39%, 85%]	65% [31%, 85%]
EFS			
	Median	Not reached	Not reached
	6 months	69% [43%, 85%]	85% [52%, 96%]
	12 months	52% [28%, 71%]	60% [29%, 81%]
OS			
	Median	Not reached	Not reached
	6 months	68% [43%, 84%]	85% [51%, 96%]
	12 months	63% [37%, 80%]	76% [43%, 92%]

*N = All patients with at least M1 follow-up or RIP prior to Month 1
† Closed process is the anticipated commercial manufacturing process
Event = death or morphological relapse
DOR, EFS and OS data are preliminary considering the small n

AUTO1 has potential as a standalone therapy

A cross study comparison of AUTO1 vs current standard of care

	AUTO1[1]	Standard of Care	
	All patients	Blinatumomab[2]	Inotuzumab[3]
Patient Numbers	19	271	109
CR/ CRi Rate	84%	44%	80.7%
EFS 6m ***(EFS 12m)***	69% ***(52%)***	31%	mPFS 5m
CRS ≥ Grade 3†	0%	3%	0%
Neurotox ≥ Grade 3†	15%*	13%	0%
Other notable toxicities			14% Hepatic VoD

- Observed in patients with > 50% tumor burden

1. Roddie et al., ASH 2020

2. Kantarjian et al., 2017/ USPI (product label)

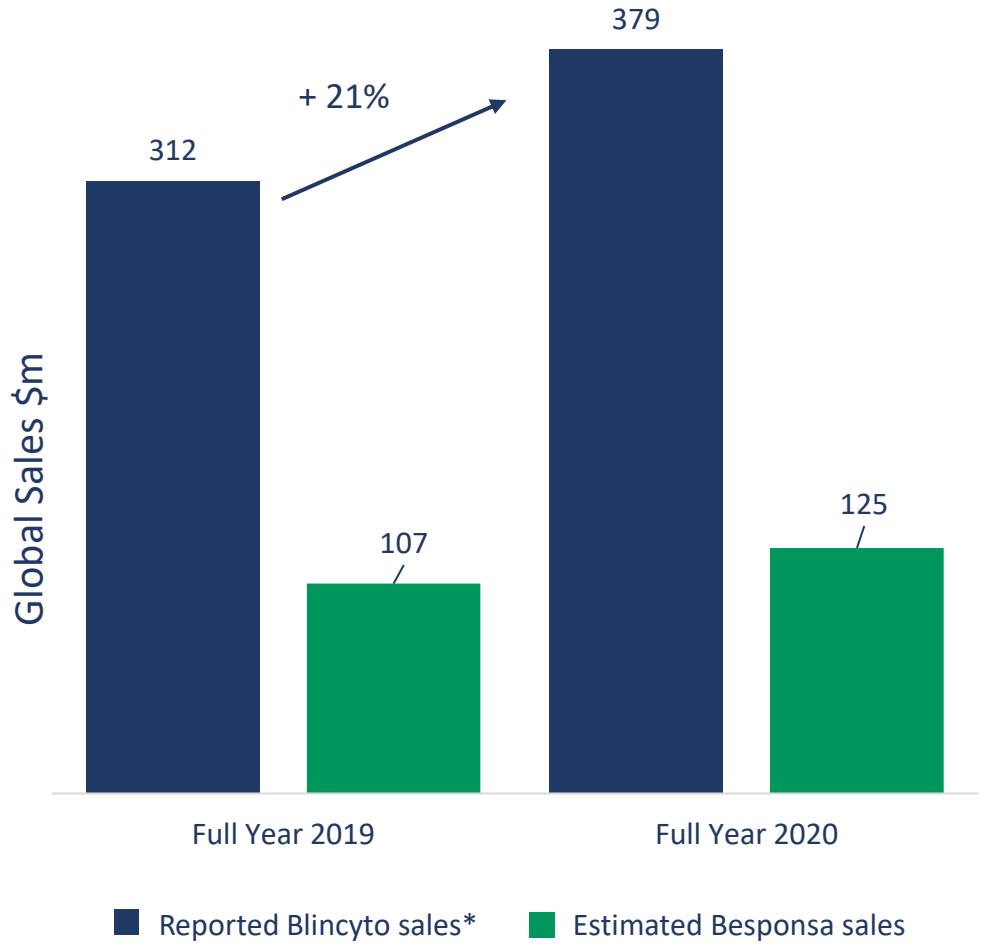
3. Kantarjian et al., 2016/ USPI (product label)

†20 patients evaluable for safety

- Approximately 50% of blinatumomab and inotuzumab patients received subsequent HSCT
- Veno-Occlusive Disease (VoD) during treatment and following subsequent HSCT, with the latter causing a higher post-HSCT non-relapse mortality rate, has limited inotuzumab uptake

AUTO1 could launch into an expanding market

Benefitting from a potentially superior clinical profile



*As per Amgen quarterly SEC filings

- Blincyto sales price estimated to be $178k± (based on 2 cycles) resulting in approx. 2,100 commercial patients (of which approx. 85% are >18 years **)
- Growth attributed by Amgen* to broader uptake and expansion in community settings, continued strong growth at 29% y-o-y for Q4
- Kymriah is priced at $475k in pediatric ALL. Breyanzi (lisocabtagene maraleucel) is priced at $410k in DLBCL±±.
- Breyanzi and other CAR T cell therapies are expanding delivery center footprint
- Tecartus (brexucabtagene autoleucel) is expected to establish CAR T use in adult ALL
- AUTO1 expected to have a superior clinical profile
  - Has potential to be the only curative therapy with tolerability profile to take advantage of expanding delivery footprint

** Komodo Health 2015 – 2020
± https://www.medscape.com/viewarticle/836879
± ± Bristol Myers finally wins FDA approval for cancer cell therapy | BioPharma Dive

Preliminary Ph1 data supports development as a standalone therapy

AUTO1 is the first Autolus program to move into a pivotal program

Pivotal program, FELIX, in adult ALL enrolling with full data targeted in 2022

CTA approved by the MHRA in January 2020 and US IND accepted by the FDA in April 2020

- Ph1b run-in component, prior to single arm Ph2 pivotal study
- 100 relapsed/refractory adult ALL patients
- Primary endpoint: Overall Complete Response Rate (CR/CRi)
- Secondary endpoints: include MRD-negative CR EFS and DoR

Capitalizing on the unique profile of AUTO1 in adult ALL

Exploration of AUTO1 activity in additional B-Cell malignancies

PRODUCT	INDICATION	TARGET	PHASE 1	PHASE 1B/2
AUTO1	Adult ALL	CD19	**ALLCAR19**	**FELIX**
AUTO1	iNHL & CLL	CD19	**ALLCAR19 ext.**	
AUTO1	Primary CNS Lymphoma*	CD19	**CAROUSEL**	
AUTO1/22	Pediatric ALL	CD19 & CD22	**CARPALL ext.**	

OPPORTUNITY TO PURSUE IN EARLIER LINES OF THERAPY AND INDICATIONS OF ADULT ALL

*Primary CNS lymphoma annual incidence approx.1400 cases in the US.

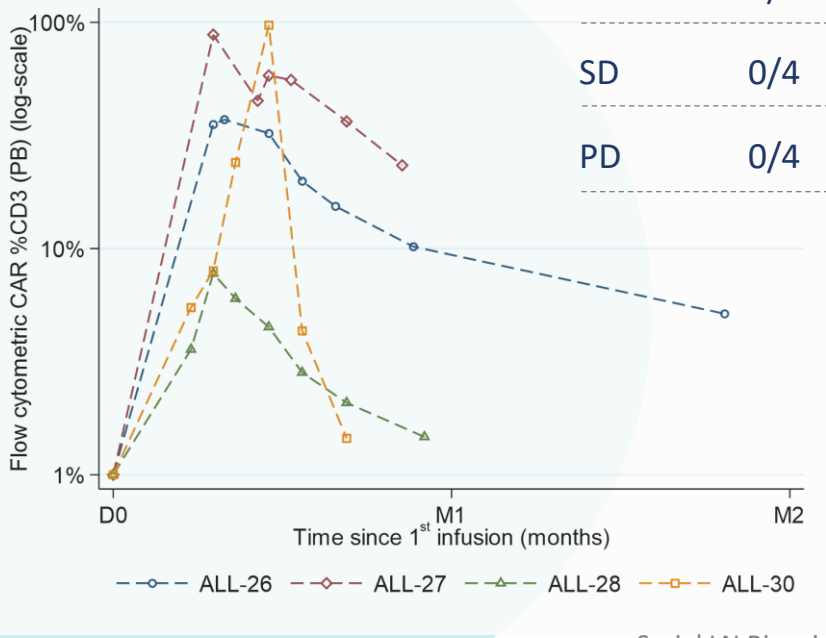
Initial data suggest encouraging signals in other B cell malignancies

ALLCAR19 Study extension Cohort 1: Extending to Indolent NHL

TOXICITY

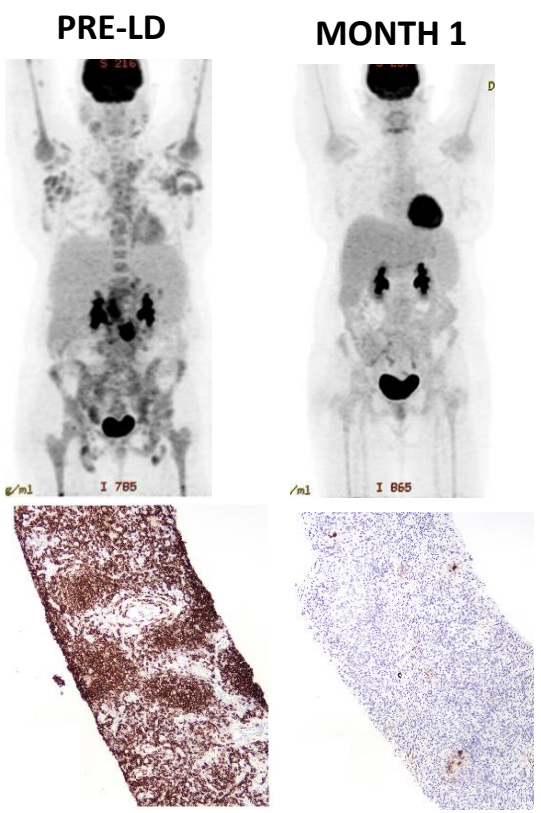
	N = 4
CRS	
Any grade	3/4
≥ Grade 2	0/4
Neurotoxicity (ICANS)	
Any grade	0/4
≥ Grade 3 Neutropenia	
Day -6	0/4
Day 28	0/4

ENGRAFTMENT



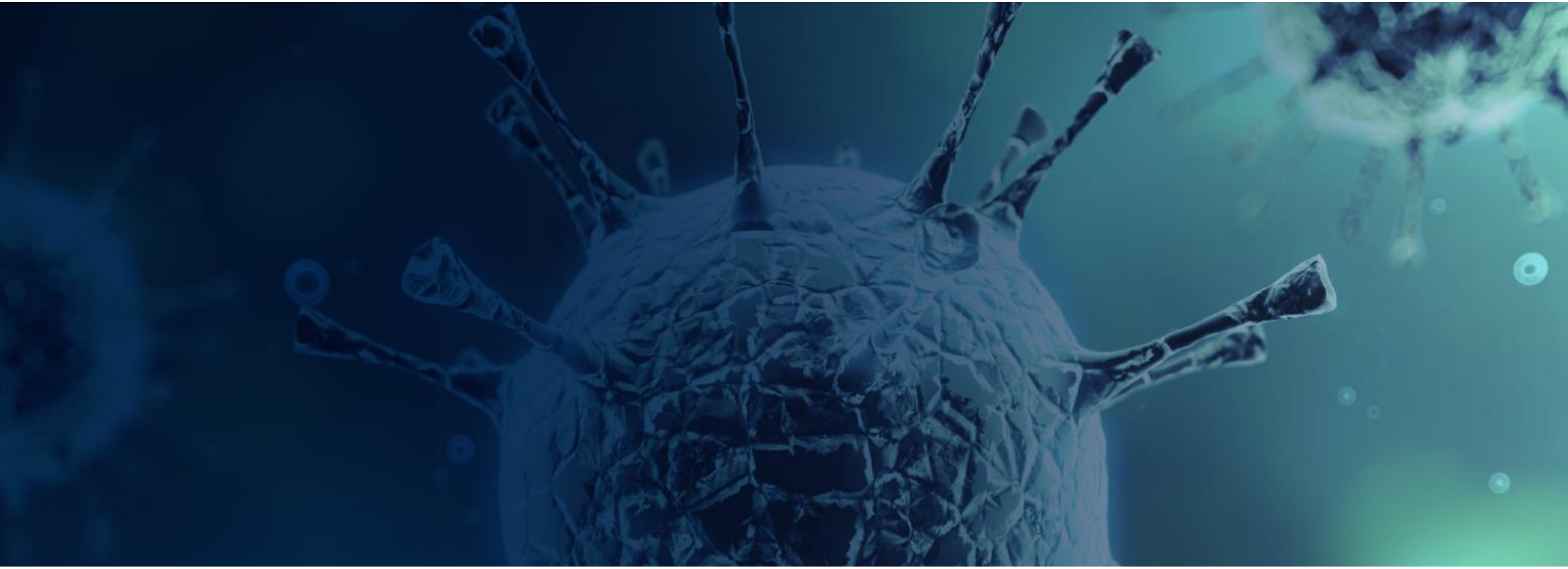
RESPONSES BASED ON LUGANO CRITERIA AND IHC (CD20)

	N = 4
CMR	4/4
PR	0/4
SD	0/4
PD	0/4



Serial LN Biopsies, CD20 by IHC, Dr Teresa Marafioti, UCL

Autolus



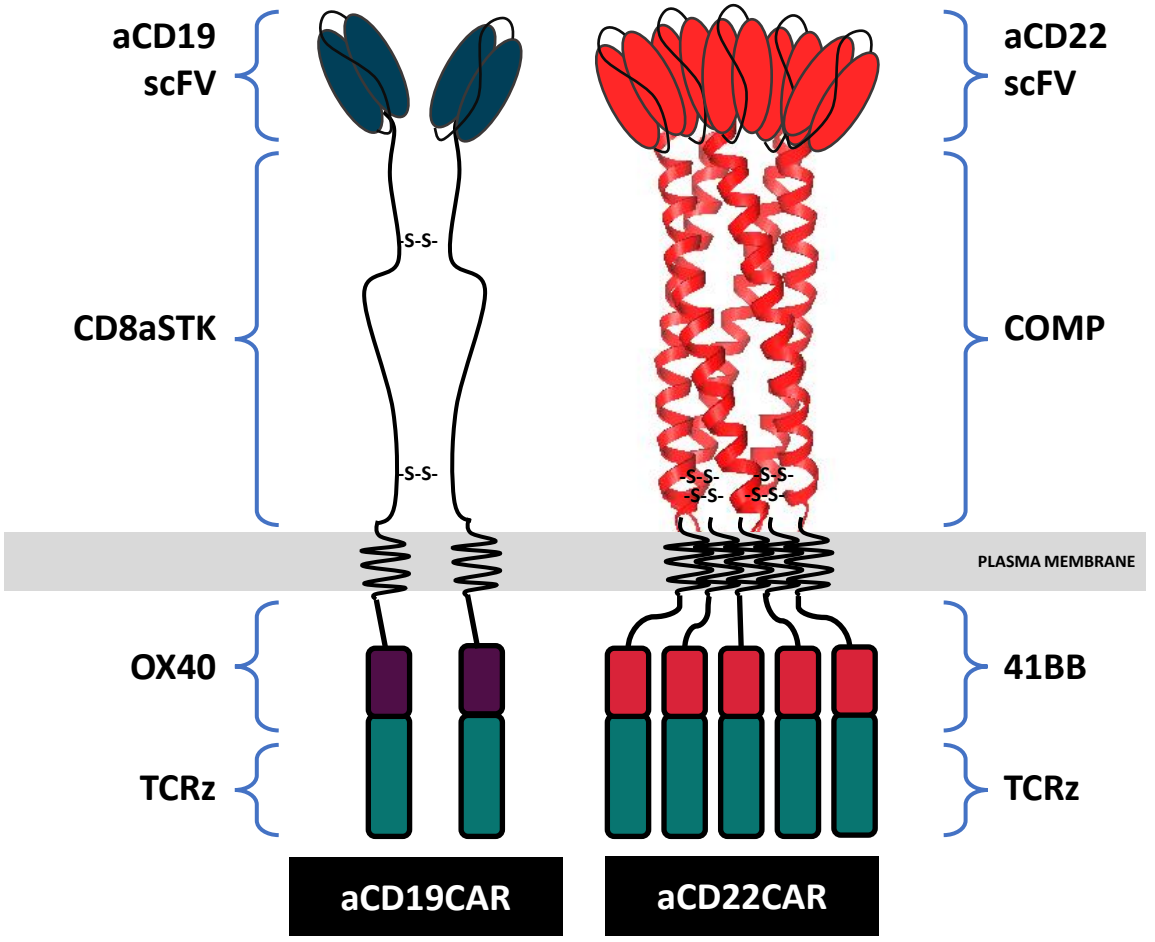
Diffuse Large B Cell Lymphoma

AUTO3 — tailored for DLBCL

AUTO3: First CD19 and CD22 targeting bicistronic CAR

Gamma Retroviral-Based Vector with RD114 Pseudotype

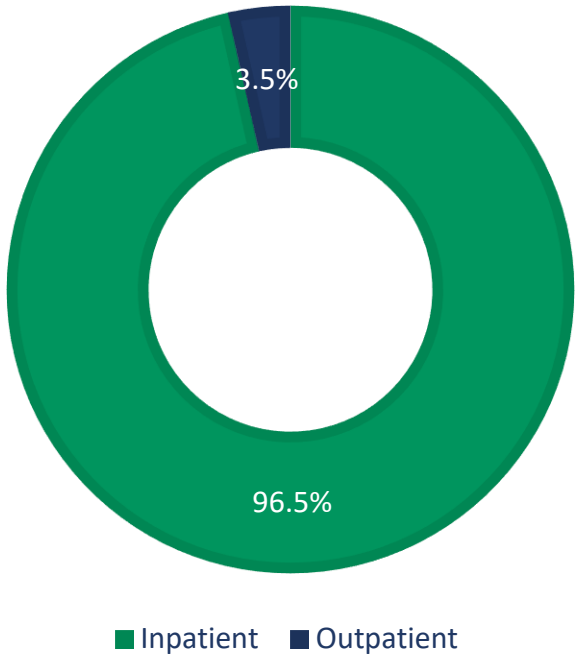
- AUTO3 is designed to achieve a high level of clinical activity, favourable safety profile and low rate of relapses due to CD19 antigen loss
- Design features:
  - Dual antigen targeting
  - Two independent CARs delivered in single retroviral vector
  - Humanized binders
  - CD22 CAR with novel pentameric spacer
  - OX40/41BB costimulatory domains designed to improve persistence
  - Independently target CD19 and CD22



DLBCL: approved CAR Ts are unable to penetrate outpatient setting

Creates significant opportunity for AUTO3 with potential to go where patients are treated

PERCENTAGE OF PATIENTS WHO CURRENTLY RECEIVE A CAR T IN OUTPATIENT OR INPATIENT SETTING



- 90% of DLBCL patients in the US are treated outside of a center of excellence (CoE) or in out-patient setting
- 97% of patients receive approved CAR Ts as inpatients in CoEs * because of
  - the high rate of severity of toxicities and
  - the need for intensive patient management
- In the Outreach study**, 63% of patients treated with liso-cel in an outpatient setting required hospitalization
- AUTO3 is designed to have best-in-class safety profile potentially best suited for outpatient use

Source: Komodo Health, ASCO 2020: 8037
* Center of Excellence
**Initial results from the Outreach Study, ASH 2020

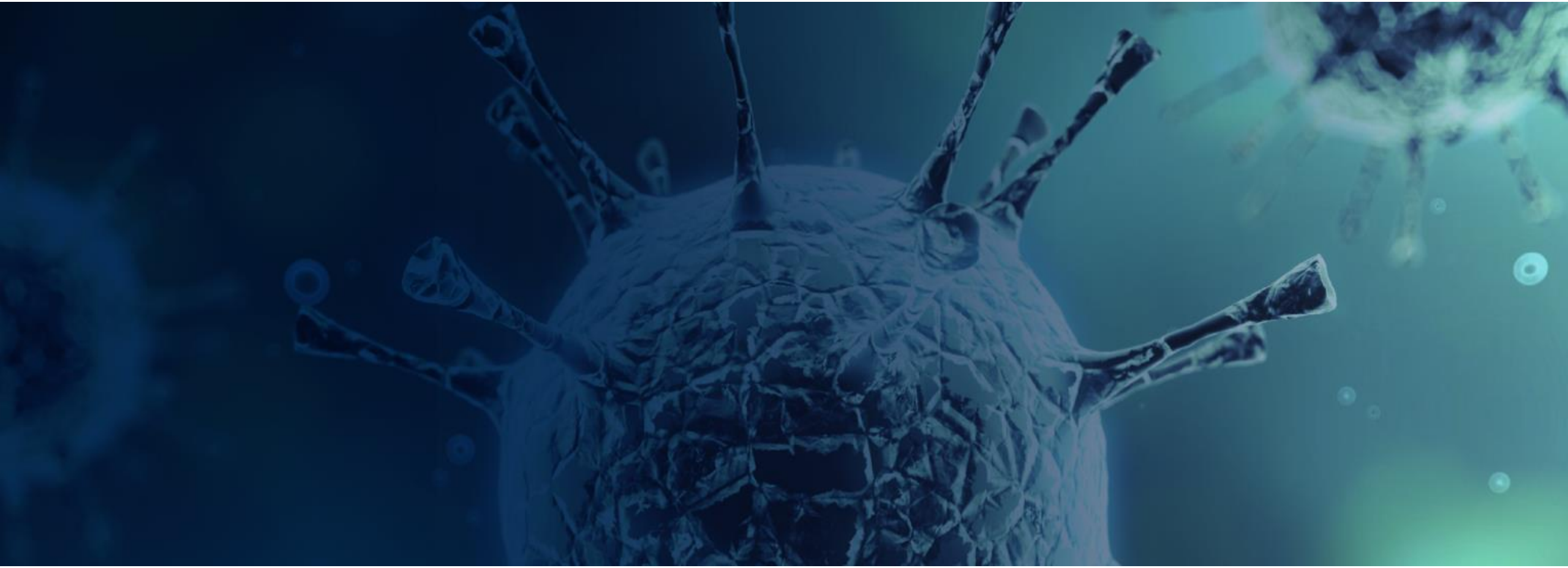
AUTO3 continues to show differentiated product profile in DLBCL

Data presented at ASH 2020, with data cut-off date of October 30, 2020

- Key Phase 1 observations:
  - High level of complete remissions (CR) of 51% overall
  - At the highest dose level of 450M cells the CR rate was 73%
  - Very low levels of high-grade CRS and neurotoxicity
  - AUTO3 administration together with the pembrolizumab dosing regimens (D-1 and D14/D35/D56) were well tolerated
  - Among the five patients who achieved a CR having received 3 doses of pembrolizumab, none had progressed as of the data cut-off date
  - Demonstrated feasibility to administer AUTO3 in outpatient setting

- Potential path forward for development of AUTO3
  - Phase 2 designs under evaluation:
    - 3L r/r DLBCL setting
    - 2L/3L transplant ineligible DLBCL setting
  - Planned Phase 2 dosing regimen
    - Dose range of 150M to 450M cells, as patients benefitted from therapy at 150M, 300M and 450M cell dose levels
    - 3 doses of pembrolizumab with a schedule of D-1, D28, D56
  - Implement manufacturing process enhancements (incl. stable cell line for vector manufacturing)

COMPANY INTENDS TO PARTNER AUTO3, AHEAD OF PROGRESSING INTO THE NEXT PHASE OF DEVELOPMENT



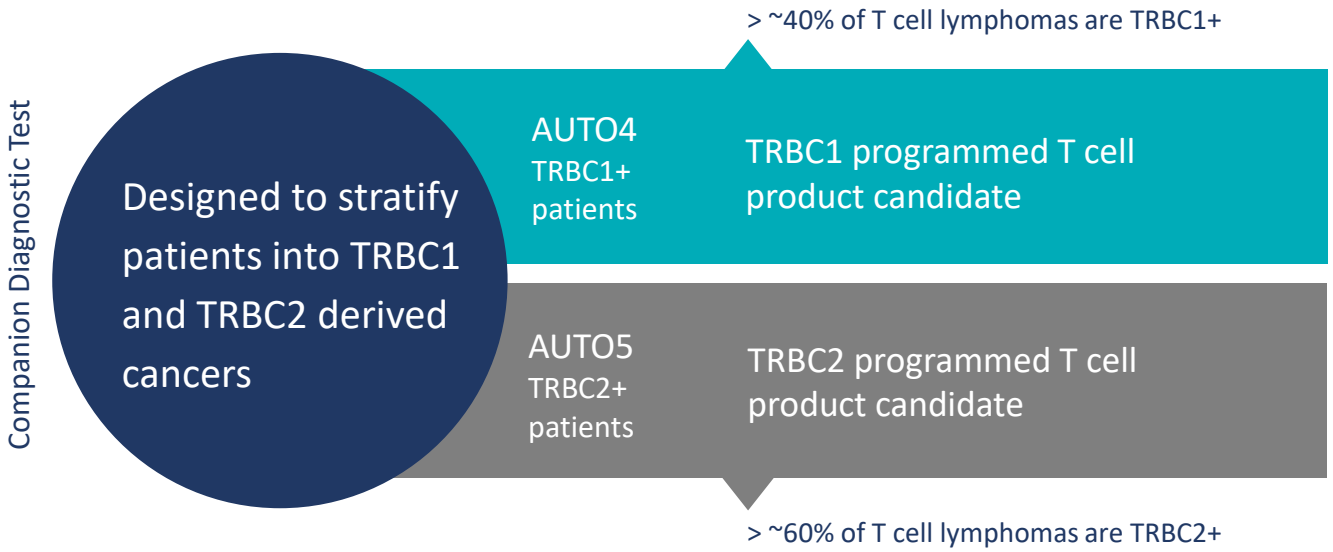
T Cell Lymphoma

AUTO4 and AUTO 5 — tailored for T Cell Lymphoma

T Cell Lymphoma

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

AUTOLUS USES THREE KEY ELEMENTS TO ADDRESS T CELL LYMPHOMAS—AUTO4, AUTO5 AND A COMPANION DIAGNOSTIC TEST



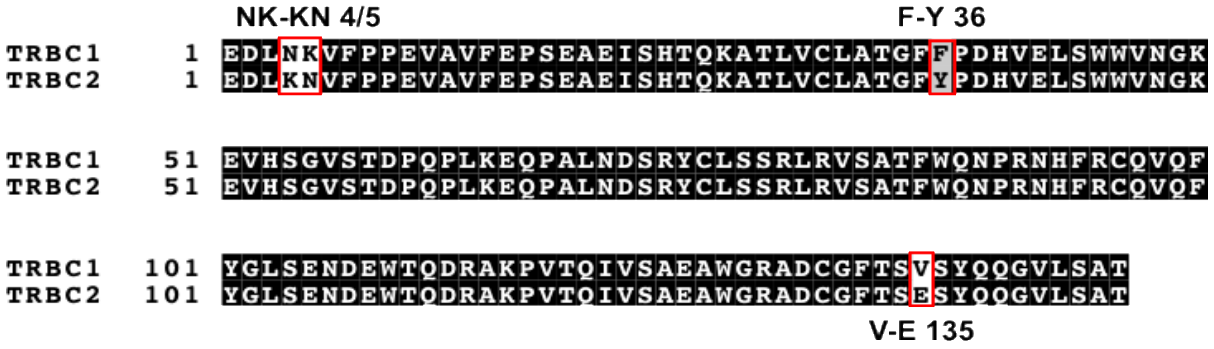
- T cell lymphoma is an aggressive disease with a very poor prognosis for patients
- Median 5 yrs OS: 32%
- Standard of care is variable and often based on high-dose chemotherapy and stem cell transplants
- A large portion of T cell lymphoma patients are refractory to or relapse following treatment with standard therapies
- T cell lymphomas have not, so far, benefited from advances in immunotherapeutic approaches
- AUTO4 Phase 1 interim data expected in H2 2021
- AUTO5 to enter Phase 1 study in H2 2021

Unique targeting of TRBC1 & TRBC2 opens new therapeutic approach

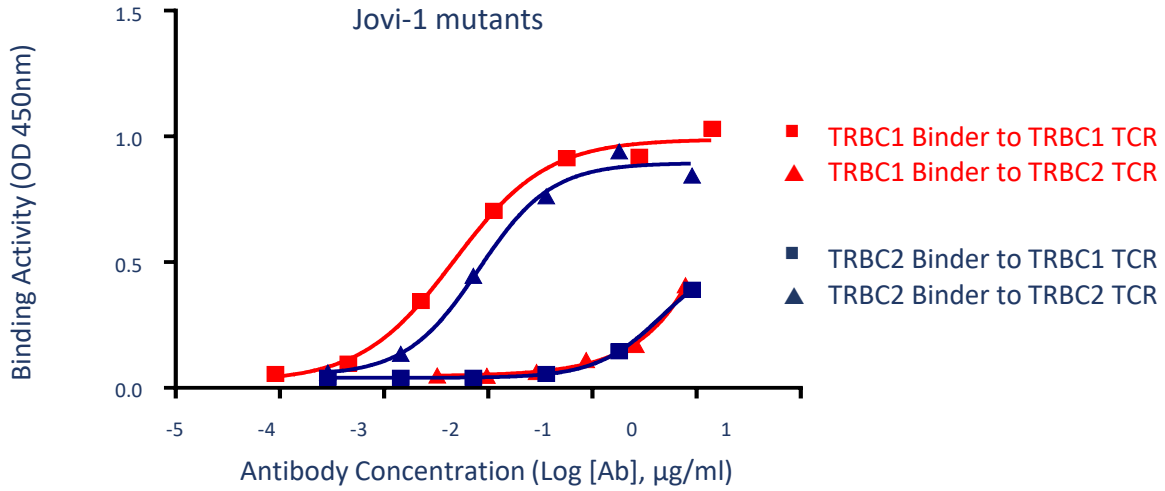
AUTO4/5 in Peripheral T Cell Lymphoma

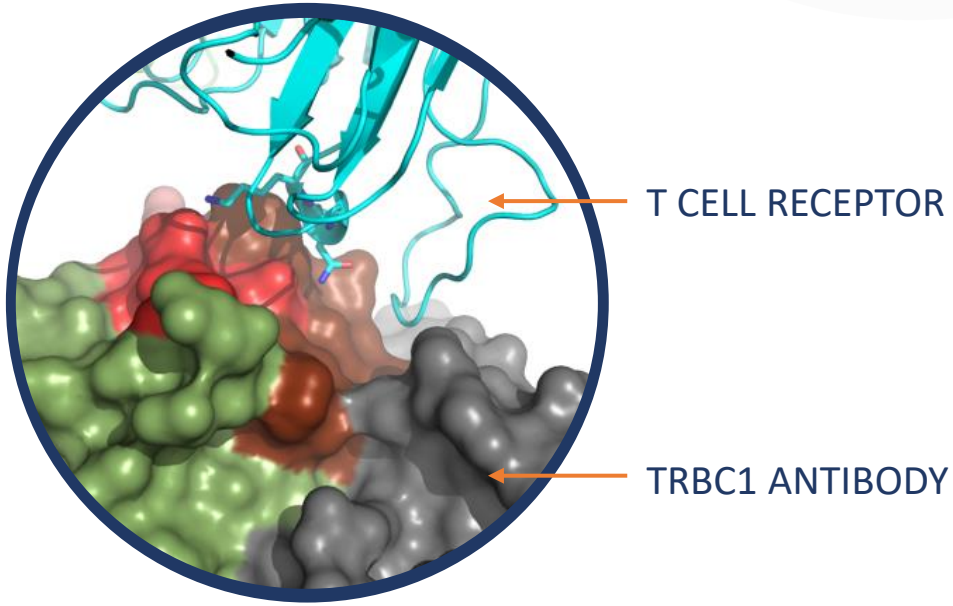
Autolus

DIFFERENCES BETWEEN TRBC1 AND TRBC2 ARE SMALL



ANTIBODY BINDING DATA





- AUTO4 clinical study, LibrA T1, in progress
- AUTO5 in late preclinical development
- Preclinical study package demonstrating selective binding and anti-tumor activity of TRBC1 and TRBC2 CARs *in vitro* and *in vivo*

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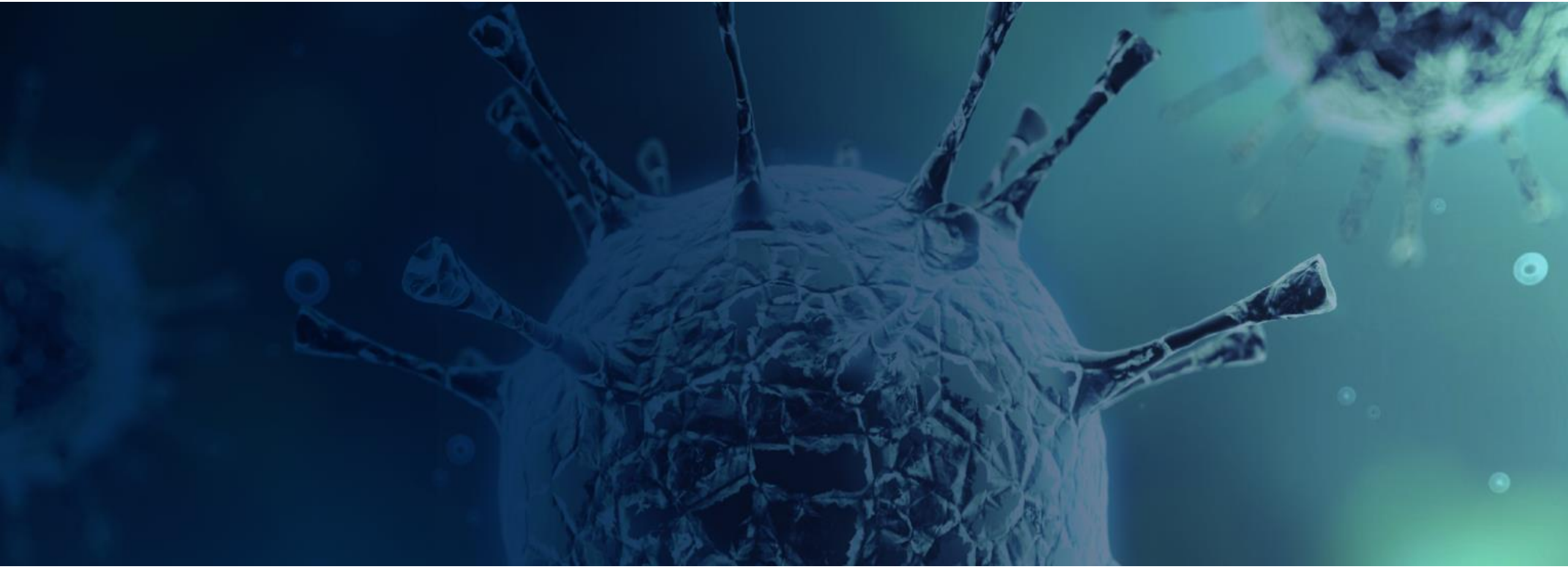
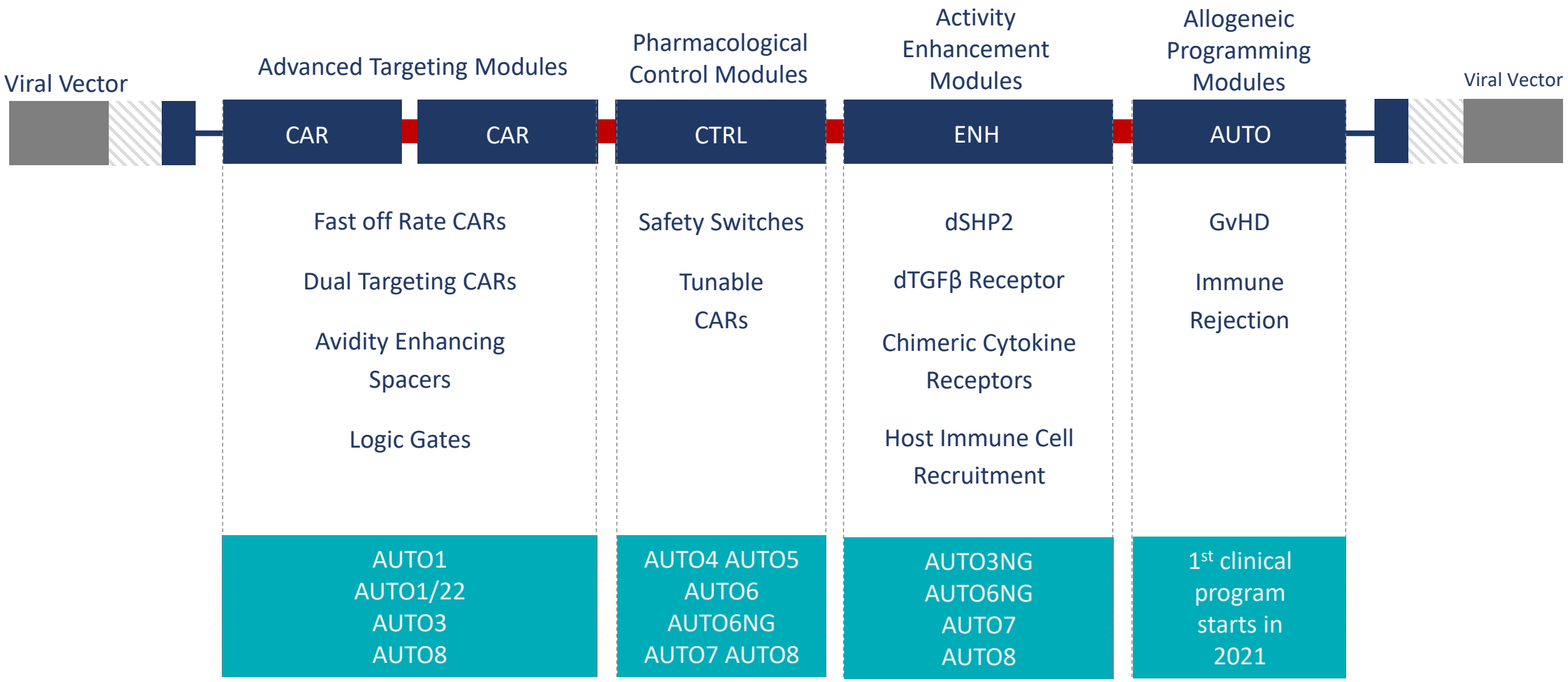


Pipeline

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



Broad pipeline of next generation programs

Designed to address limitations of current T cell therapies

PRODUCT	INDICATION	TARGET	PRECLINICAL	PHASE 1*
AUTO1/22	Pediatric ALL	CD19 & CD22		Started Q4 2020
AUTO5	TRBC2+ Peripheral TCL	TRBC2		H2 2021
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2		H2 2021
AUTO7	Prostate Cancer	PSMA		H1 2022
AUTO8	Multiple Myeloma	BCMA & CAR X		mid 2021

B Cell Malignancies T Cell Lymphoma GD2+ Tumors Prostate Cancer Multiple Myeloma

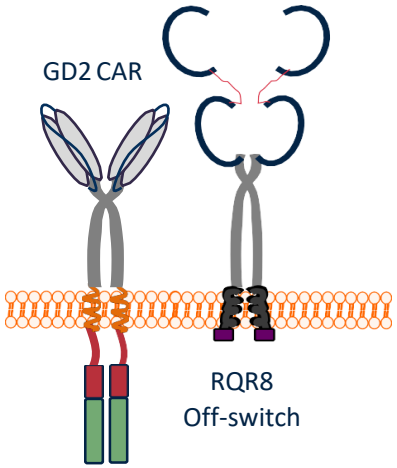
*Planned Trial Initiations

NG = Next Generation, SCLC = Small Cell Lung Cancer

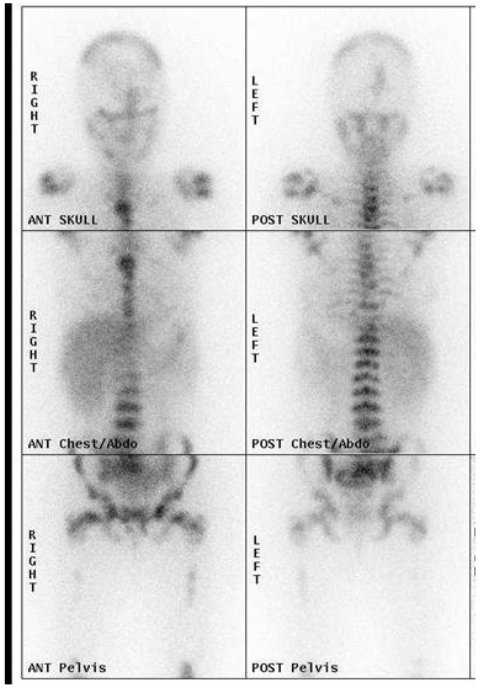
AUTO6 designed to deliver anti-tumor activity without neurotoxicity

AUTO6: GD2-targeted programmed T cell therapy in neuroblastoma

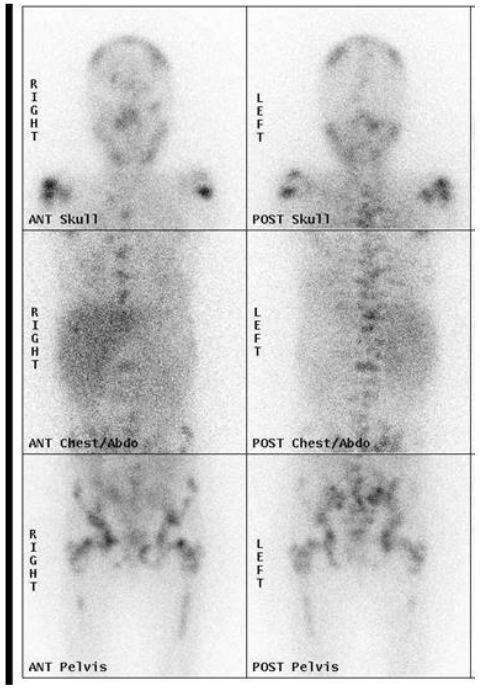
- Programmed T cell product candidate:
  - New binder design
    - Minimize on-target, off-tumor toxicity
    - Humanized to reduce immunogenicity
  - RQR8 safety switch
- Ph1 trial in r/r neuroblastoma conducted by CRUK in collaboration with UCL, findings provide evidence that AUTO6 induces clinical activity without inducing on-target off-tumor toxicity*



DAY 0



DAY 28



MIBG: iodine-123-meta-iodobenzylguanidine

*K. Straathof et al, 25 Nov 2020, Science Translational Medicine, Vol. 12, Issue 571

Modular approach designed to enhance AUTO6NG for solid tumor environment

Next generation programs powered by our proprietary technology toolbox

GD2 CAR

To provide anti-tumor activity and potential to help address neurotoxicity and pain syndrome

dSHP2

To overcome multiple checkpoint pathways

dnTGFβRII Receptor

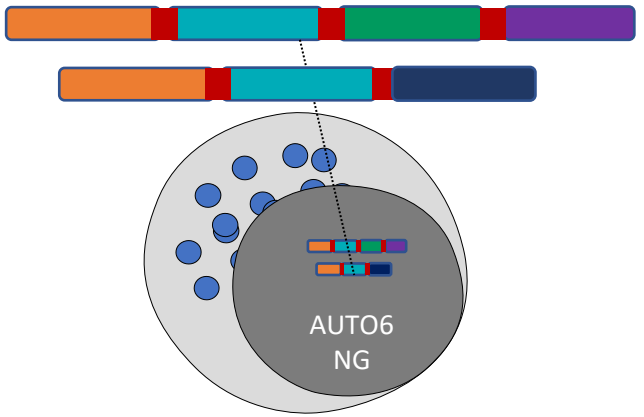
To overcome inhibitory effect of TGFβ in microenvironment

AUTO6

SAFETY SWITCH
To eliminate the therapy in the event of unexpected toxicities

Cytokine Signal

IL7 CCR chimeric protein designed to improve CAR T cell persistence



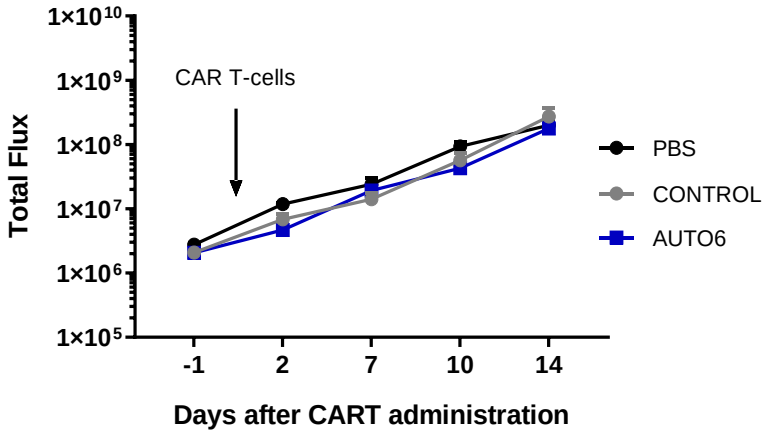
AUTO6NG:

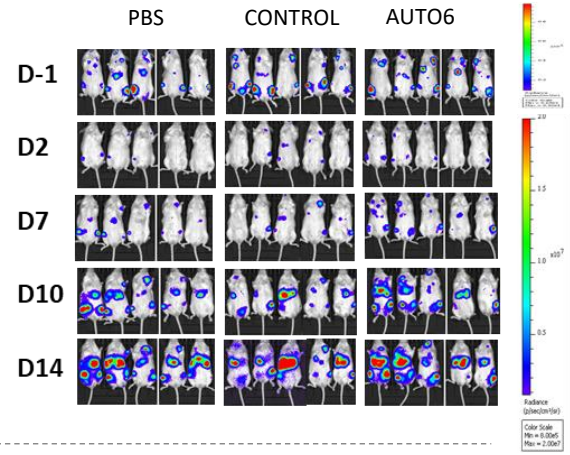
- Utilizes GD2 CAR from AUTO6, and is further enhanced to address persistence, control and tumor defenses
- Targeting neuroblastoma, osteosarcoma, melanoma and small cell lung cancer amongst others

AUTO6NG exhibits potent anti-tumor activity in preclinical model

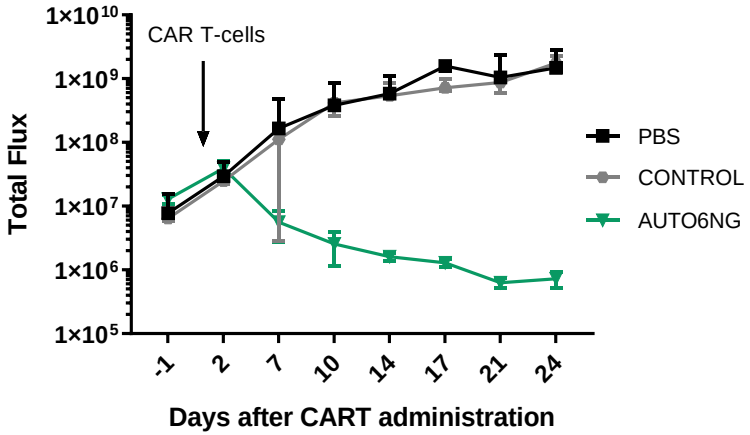
Extends survival in challenging in vivo model

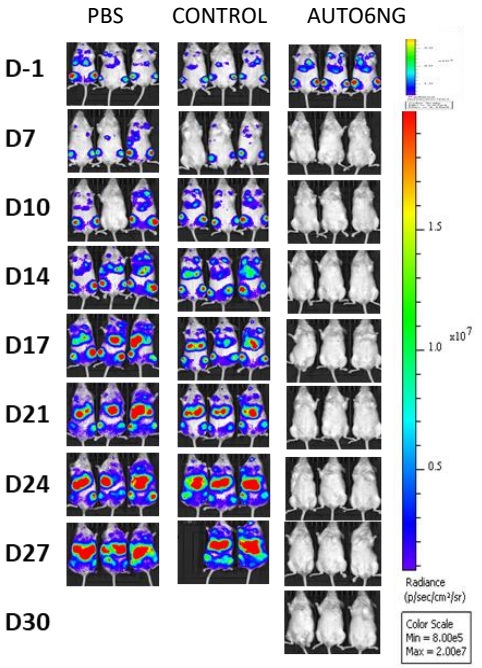
AUTO6





AUTO6NG

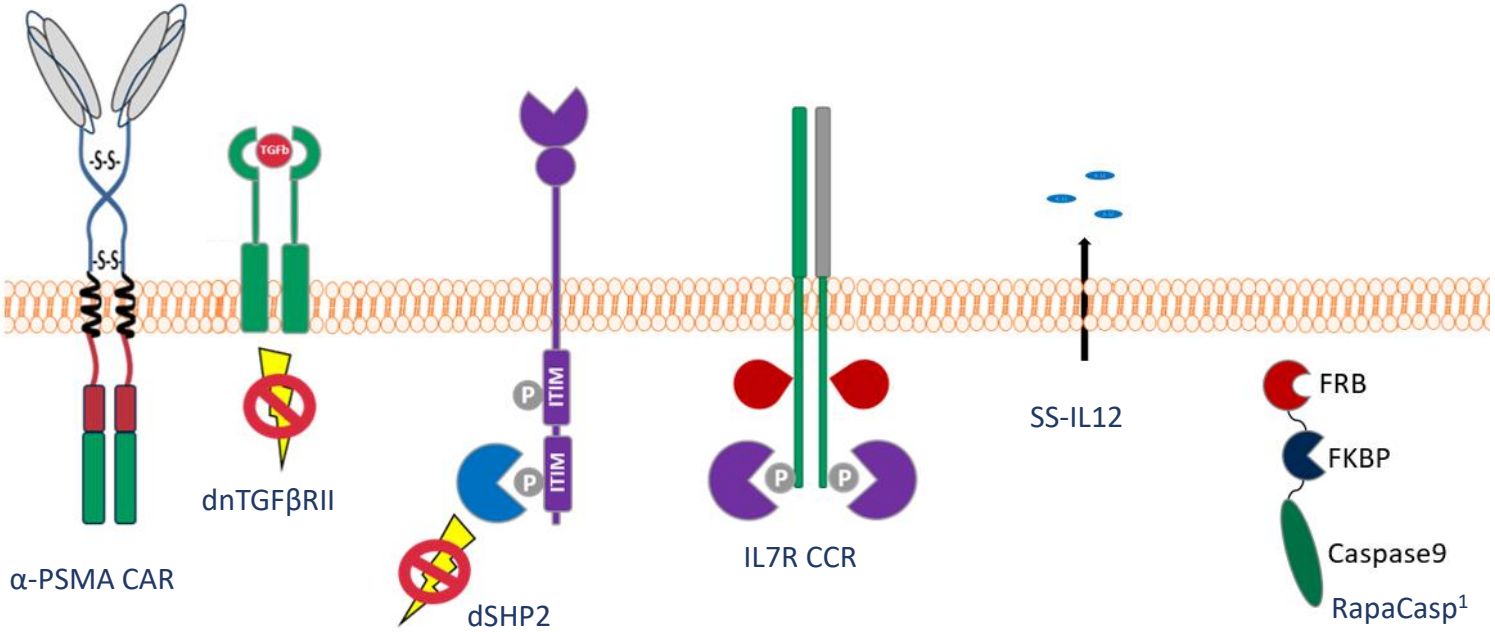




Achkova, D., et al SITC 2019 (abstract)

AUTO7 is designed to tackle the complex solid tumor environment

Anti-PSMA humanized CAR T cell for improved persistence and resistance in Prostate Cancer



PSMA CAR	dnTGFβRII	dSHP2	Cytokine signal	Immune Adjuvant	Safety Switch
Targeting of PSMA expressing tumor cells	Truncated TGFβRII receptor to shield inhibitory effect of TGFβ	Truncated SHP2 to block checkpoint inhibition	Cytokine signal to overcome minimal co-stimulation	Secretion of IL-12 cytokine to promote host immune activation	To terminate therapy in the event of unexpected toxicities

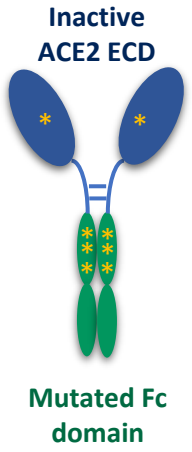
MODULES DELIVERED USING GAMMA-RETROVIRAL VECTOR

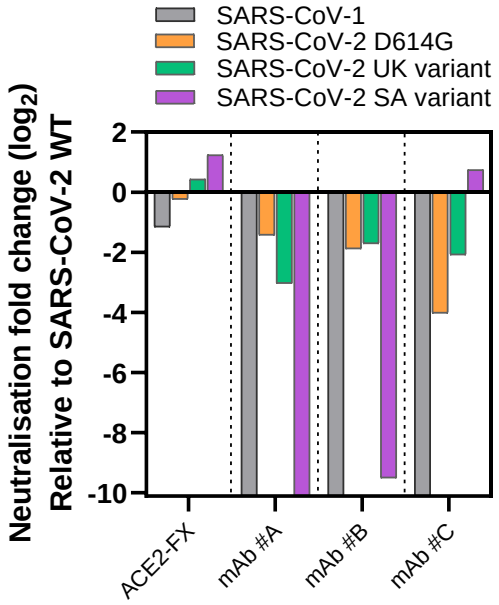
Stavrou M et sl. Mol Ther 2018

Prostate Cancer—specifically metastatic castration resistant prostate cancer

Autolus ACE2 fusion soluble receptor decoy

Partnerable COVID project with potential universal application for SARS-COV virus family





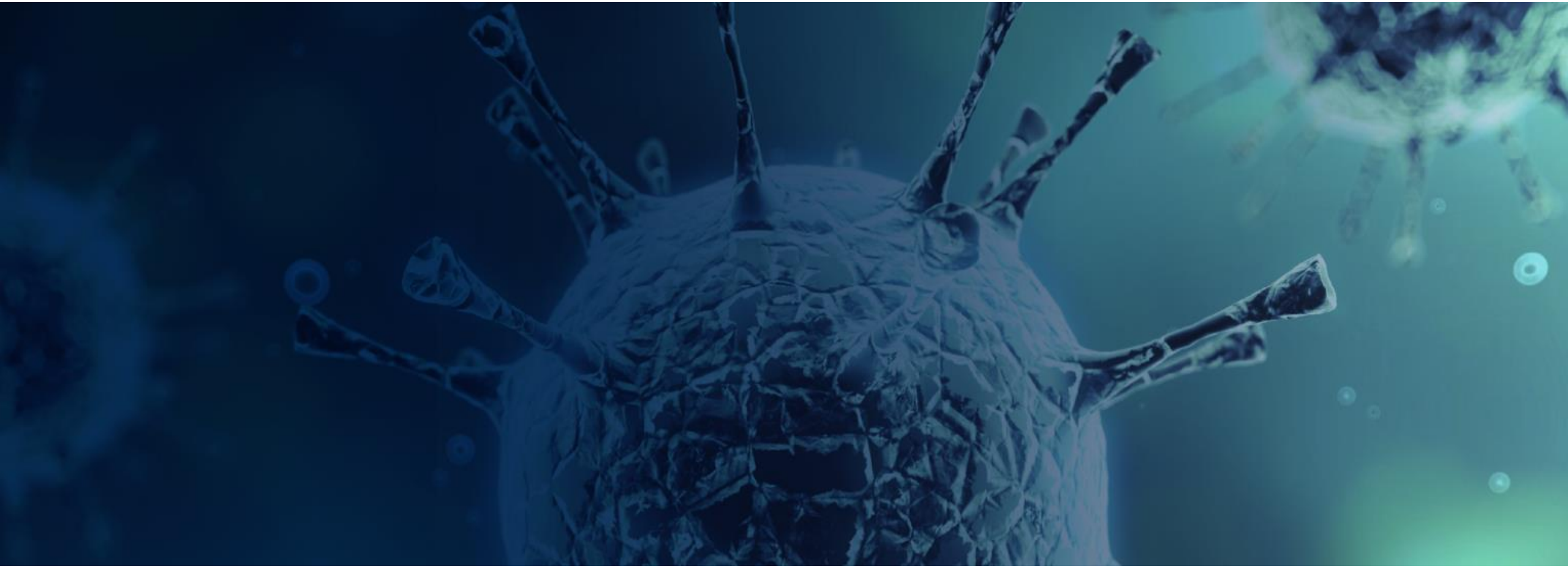
ACE2-Fx: Universal SARS-COV inhibition

- ACE2 Fx achieves viral neutralization by acting as a decoy receptor for the spike protein of SARS-CoV-1&2 and reducing its binding to target cells
- ACE2 catalytic domain mutated to inhibit activity on renin/angiotensin axis and mutated Fc domain provides extended half life without engaging FcRc
- Universally applicable protection without need for determination of the specific viral sub-variant
- Does not drive mutational drift

SARS-COV2 Challenges in a Post-vaccine World

- Patients with B cell malignancies or patients suffering from immune suppression will require access to effective passive immunization against SARS-COV2
- Mutational drift of SARS-COV2 will reduce effectiveness of both vaccines and mAbs
- What is needed is a universally applicable passive immunization to support patients with immune suppression and to minimize healthcare resources impact of new SARS-COV variants while vaccines are being adapted to them

Autolus



Next Steps

Multiple clinical milestones anticipated through 2021/2022

PRODUCT	INDICATION	TARGET	PHASE	NEXT MILESTONE
AUTO1	Adult ALL	CD19	Pivotal*	Phase 1 long-term follow up, AL-1 data in 2022
AUTO1 /22	Pediatric ALL	CD19/CD22	Phase 1	Started Phase 1 Q4 2020, data in Q4 2021
AUTO1	B-NHL	CD19	Phase 1	Started Phase 1 Q3 2020, data updates 2021
AUTO1	PCNSL	CD19	Phase 1	Start Phase 1 Q1 2021
AUTO3	DLBCL	CD19/CD22	Phase 1	Phase 1 long-term follow up, intend to partner
AUTO4	TRBC1+ Peripheral TCL	TRBC1+ Peripheral TCL	Phase 1	Phase 1 interim data H2 2021
AUTO5	TRBC2+ Peripheral TCL	TRBC2+ Peripheral TCL	Preclinical	Start Phase 1 H2 2021
AUTO6 NG	Neuroblastoma; Osteosarcoma; SCLC	GD2	Preclinical	Start Phase 1 H2 2021
AUTO7	Prostate	PSMA	Preclinical	Start Phase 1 H1 2022
AUTO8	Multiple Myeloma	BCMA/CAR-X	Preclinical	Start Phase 1 study mid 2021
ALLO Program	Undisclosed	Undisclosed	Preclinical	Start Phase 2021

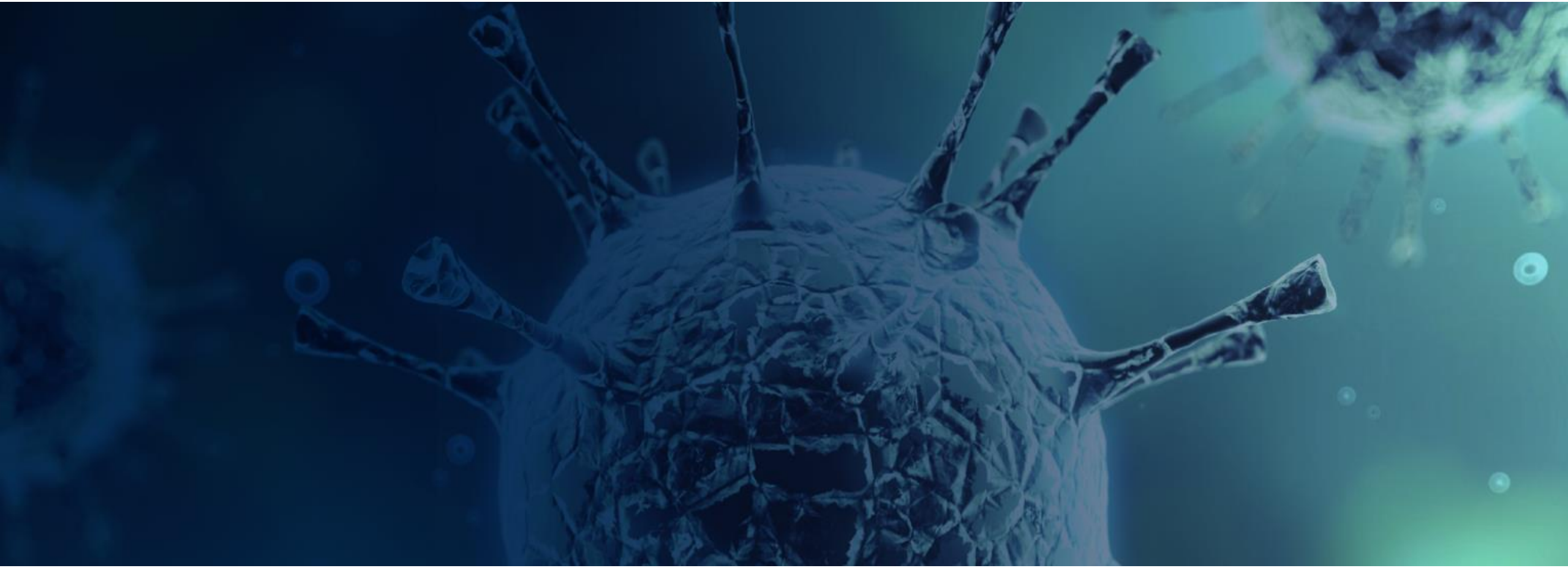
*Subject to confirmation by regulatory authorities.

B Cell Malignancies T Cell Lymphoma Solid Tumors Multiple Myeloma Allogenic

Autolus poised for potential value inflection

- AUTO1 and AUTO1/22
  - Currently enrolling Autolus' first Phase 1b/2 potential pivotal program (FELIX) in adult ALL. Data expected in 2022
  - Pediatric ALL—AUTO1/22 Phase 1 study started in Dec 2020, first data expected for ASH in Q4 2021
  - ALLCAR study extension in iNHL and CLL ongoing, data updates to be released at EHA and at ASH in 2021
  - Opportunity to develop AUTO1 in Primary CNS Lymphoma, CAROUSEL study start planned for H1 2021
- AUTO3
  - Company plans to seek a partner for the AUTO3 program, prior to further development
- AUTO4
  - Phase 1 interim data expected at ASH in 2021
- Multiple Next Generation development candidates entering clinical development in 2021
- Cash balance at Mar 31, 2021, was approx. $239 million which provides a cash runway in the first half 2023

Autolus



Thank you