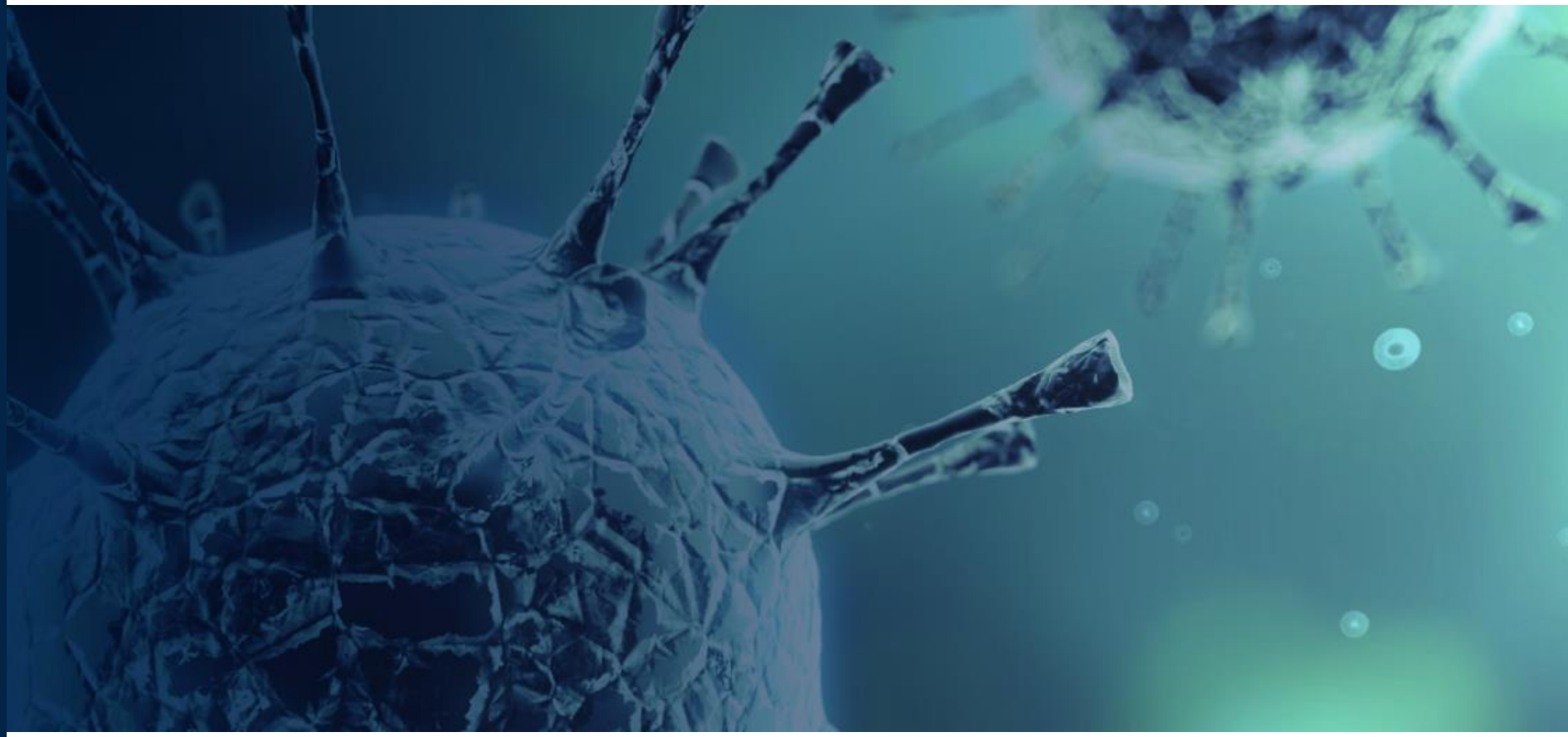
Autolus

Nasdaq: AUTL



38th Annual J.P. Morgan Healthcare Conference

January 2020

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Investment highlights

Broad clinical-stage pipeline

- 4 product candidates
- 4 hematological indications
- 1 solid tumor program

Multiple upcoming milestones

- AUTO1 long term follow up in aALL
- POC for AUTO3 in DLBCL
- POC for AUTO4 in PTCL

Proprietary manufacturing process

- Fully enclosed, semi-automated
- Designed to be economical at commercial scale
- Expanding to new US/UK facilities

Modular programming approach

- Enables rapid cycle of innovation
- 4 next generation versions of lead programs to enter clinical development in 2020
- Designed to address:
  - Targeting & control
  - Tumor defenses & microenvironment
  - GvHD & immune rejection (Allogeneic)
  - Manufacturing
- Portfolio of owned and in-licensed intellectual property; 85 patent families

Strong Fundamentals

- $229 million at September 30, 2019
- Worldwide rights retained for all programs
- Cash runway into H2 2021

Broad pipeline of clinical and next generation programs

Designed to address limitations of current T cell therapies

Product	Indication	Target	Preclinical	Phase 1/2	Phase 2/3
B Cell Malignancies					
AUTO1	Adult ALL	CD19	ALLCAR19		
AUTO1	Pediatric ALL	CD19	CARPALL		
AUTO1NG	ALL	CD19 & CD22			
AUTO3	DLBCL	CD19 & CD22	ALEXANDER		
AUTO3NG	DLBCL	CD19 & CD22			
Multiple Myeloma					
AUTO8	Multiple Myeloma	BCMA & CAR X			
T Cell Lymphoma					
AUTO4	TRBC1+ Peripheral TCL (LibrA T1)	TRBC1	LibrA T1		
AUTO5	TRBC2+ Peripheral TCL	TRBC2			
GD2+ Tumors					
AUTO6	Neuroblastoma	GD2	CRUK		
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2			
Prostate Cancer					
AUTO7	Prostate Cancer	Undisclosed			

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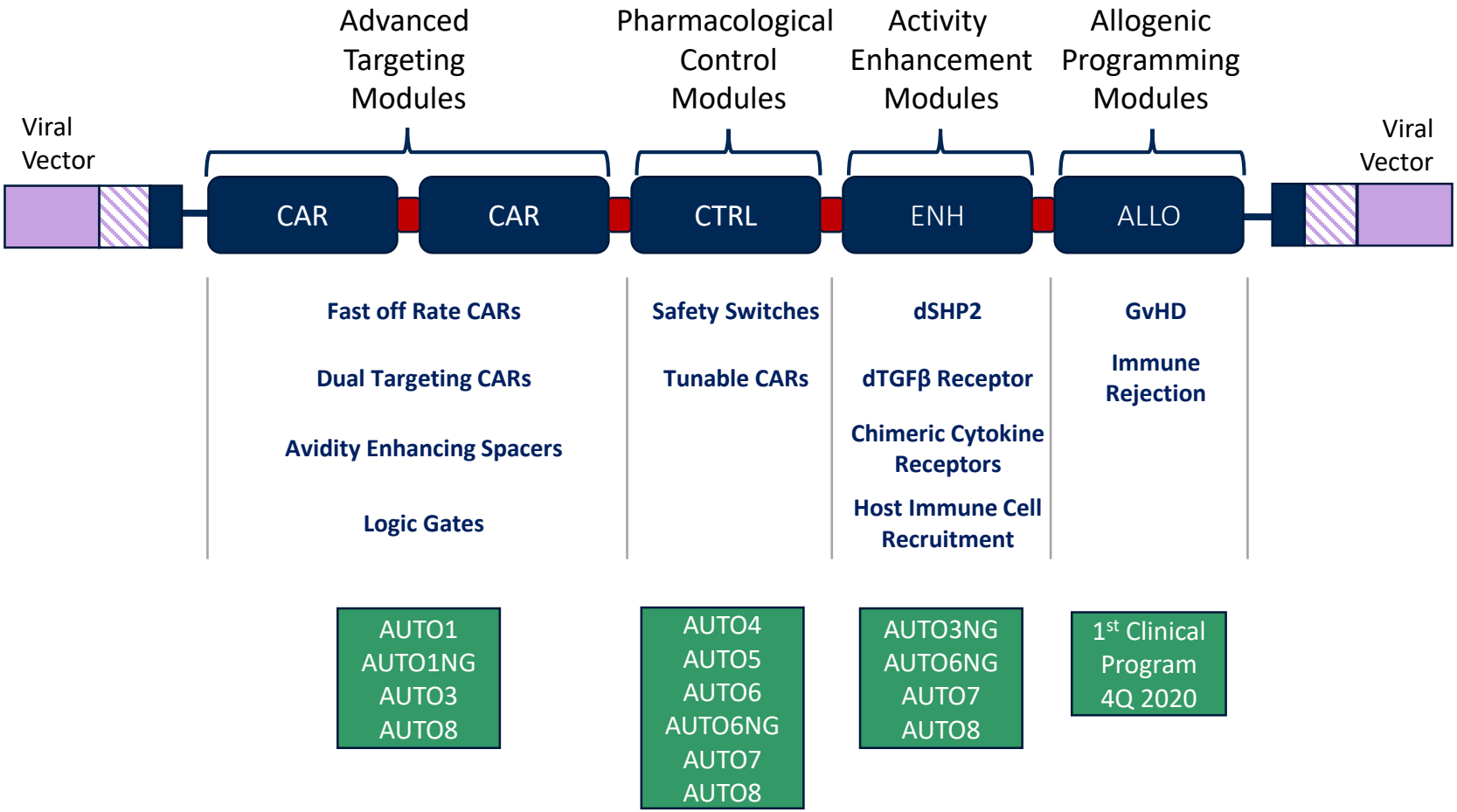
NG = Next Generation
SCLC = Small Cell Lung Cancer

Advanced T cell programming

Building on our core principles of modular innovation with protein-based cell programing



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Economical & scalable product delivery platform

Semi-automated and parallel processing

Clinical supply & commercial launch

- Multiple samples to be processed within the same environment
- CGT Catapult (UK)
- Global clinical supply since Q3 2019

Planned US commercial supply

- Collaboration with Alexandria Real Estate Partners (ARE)
- Fully scaled commercial site for cell process supply
- Planned capacity of 5,000 patients p.a.

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Adult Acute Lymphoblastic Leukemia

Adult ALL is a significant commercial opportunity

- Potential market size in adult ALL
  - Up to 8,400 new cases of adult ALL diagnosed yearly worldwide
- 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
- No CAR T therapy currently approved in adult ALL
- Only approved redirected T cell therapy approved for adults generally is blinatumomab
- AUTO1 granted FDA orphan drug designation for ALL

Sources: Prevalence calculated using SEER and EUCAN and extrapolated using IMS; American Cancer Society

AUTO1 is designed for long term persistence and reduced high-grade CRS

Unmet need in adult ALL patients

- Generally more fragile, more co-morbidities, and less likely to tolerate toxicity
- Durable benefit in adult ALL will require long term pressure on the leukemia
- Often higher tumor burden in the bone marrow, increasing risk of toxicities

Current treatments

- Conventional CD19 CAR-Ts use identical high affinity CD19 binder (FMC63)
- A fast on-rate and a very slow off-rate may lead to over-activation and high-grade CRS

AUTO1

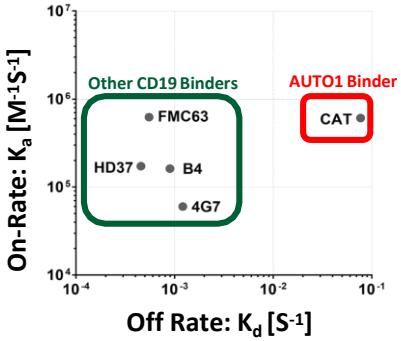
- Designed to reduce severe CRS (≥G3) through the introduction of a proprietary optimized CD19 CAR with a lower affinity and a fast off rate
- Engages efficiently with cancer cells, delivering a kill, but disengages rapidly like a normal T cell

AUTO1 shows enhanced activity vs FMC63 CARs

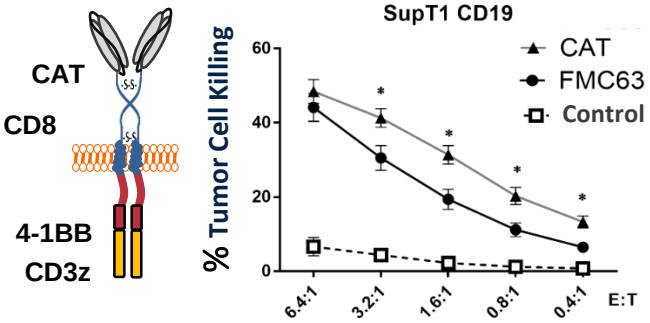
Preclinical data show higher cytotoxicity and proliferation

- AUTO1 (CAT) binder with lower affinity for CD19
- Half-life of target interaction very short compared to Kymriah® (FMC63) binder*:
  - AUTO1 = 9.8 seconds
  - Kymriah® = 21 minutes

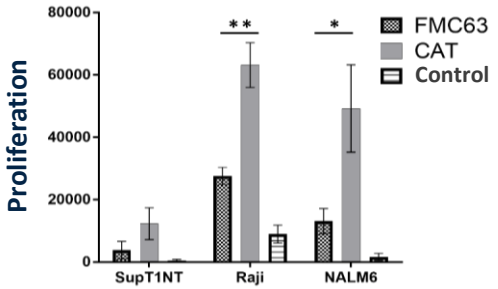
Fast Off-Rate



Enhanced Cytotoxicity

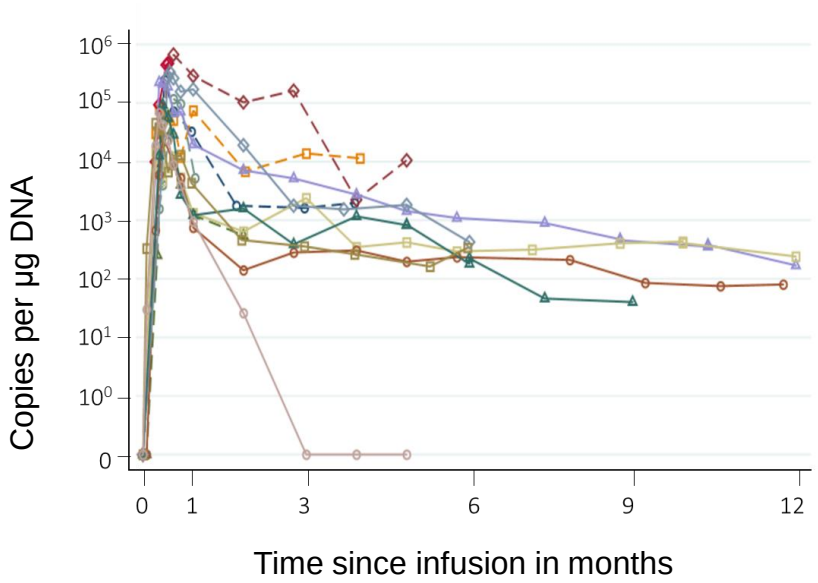


Enhanced Proliferation



*Similar binders are used in Yescarta® and JCAR-017
Amrolia et al., (2019) Nature Medicine.

Robust AUTO1 expansion and persistence in Adult ALL patients support potential for sustained responses



PK analysis		
Parameters	AUTO1[1]	Kymriah[2]
Patient numbers	13	52
AUC (0 to 28) (copies/ug DNA)		
Geometric mean	634,719	342,732
Half life (days)		
Median	26.3	14.2
Maximum CAR T Level (copies/ug DNA)		
Geometric mean	111,239	47,988

1 Roddie et al., (2019) ASH presentation
2 Mueller et al., (2017) Blood

- Prolonged CAR T cell persistence was observed
  - 14 of 16 patients at last follow up
- Manageable safety profile, despite high disease burden and heavily pre-treated patients

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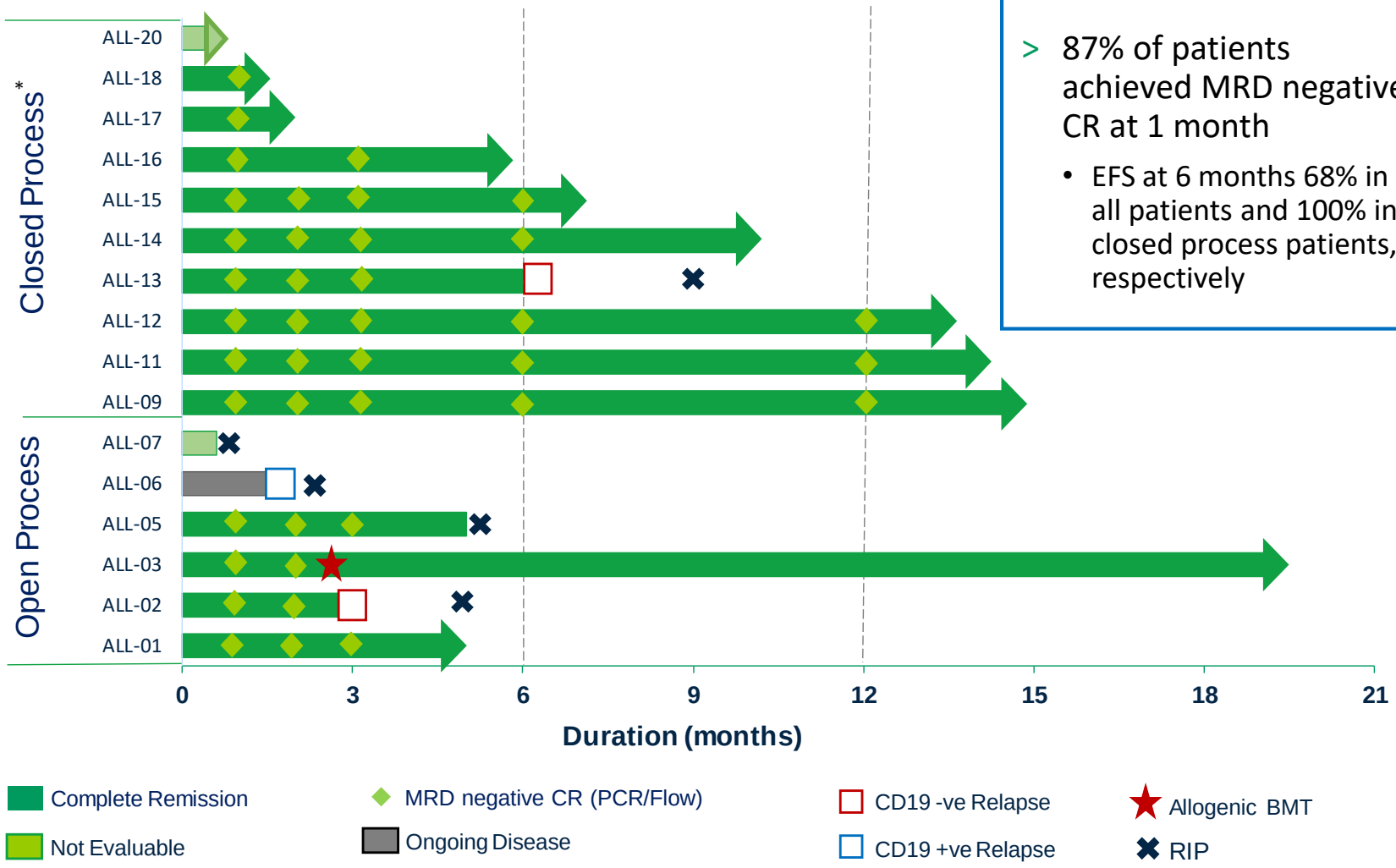
Although the Company believes these observations from the CARPALL and ALLCAR trials are promising, no definitive conclusions regarding safety or effectiveness can be drawn between these trials and the others shown given the investigational stage of AUTO1, the small study size, differing study designs between the various trials, as well as other factors.

High level of response and durability

10/15 (67%) evaluable patients remain disease-free[1]



> 87% of patients achieved MRD negative CR at 1 month
>
> - EFS at 6 months 68% in all patients and 100% in closed process patients, respectively

Roddie et al., (2019) ASH presentation

[1]Median 11 months follow up (range 0.5 – 21m)

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

Data cutoff 25-Nov-2019, Evaluable = All patients with at least M1 follow-up or RIP prior to Month 1.

*Commercial manufacturing process

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Relapsed/refractory aALL clinical data

AUTO1 may be best-in-class redirected T cell therapy

		[2]AUTO1	
	[1]Blincyto	All patients	Closed Process[3]
Patient Numbers	271	16	9
CR Rate	42%	87%	100%
EFS 6m	31%	68%	100%
CRS ≥ Grade 3	3%	0%*	0%
Neurotox ≥ Grade 3	13%	19%‡	12%‡

* One patient had G3 CRS by UPenn Criteria, per protocol assessment
‡ All three patients had > 50% tumor burden
Data cutoff 25-Nov-2019

[1]Kantarjian et al., 2017
[2]Roddie et al., ASH 2019 presentation
[3]Commerical manufacturing process

- AUTO1 preliminary data suggests manageable safety profile and a high level of clinical activity

Although the Company believes these observations from the CARPALL and ALLCAR trials are promising, no definitive conclusions regarding safety or effectiveness can be drawn between these trials and the others shown given the investigational stage of AUTO1, the small study size, differing study designs between the various trials, as well as other factors.

Data is consistent between pediatric and adult cohorts

	CARPALL Cohort 1	ALL CAR All Patients	ALLCAR Closed Process*
Evaluable Patients	14	15	9
CR Rate	86%	87%	100%
EFS	6m: 71% (39% to 88%)	6m: 68% (33%, 87%)	6m: 100% (-,-)
CRS ≥ Grade 3‡	0%	0%#	0%
Neurotox ≥ Grade 3	7%##	19% (3/16)	12% (1/9)

*Commercial manufacturing process
‡ Graded as per Lee criteria
# One patient had G3 CRS by UPenn Criteria, per protocol assessment
Deemed more consistent with fludarabine than CAR-associated neurotox

CARPALL Highlights

- 12/14 (86%) patients in cohort 1 achieved molecular CR; in cohort 2, 7/7 (100%) patients treated using the closed process achieved molecular CR
- 6 /12 responding patients remain in molecular complete remission, first patients reaching 36 months
- 12 month EFS is 54%, no relapses observed after 12 months
- 5 of 6 relapsing patients had CD19 loss at time of relapse

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AUTO1 in aALL - Potential for best-in-class profile

First Autolus program to move to late stage development

Potential pivotal study in adult ALL:

- CTA filed in UK in Nov, 2019 US IND to be filed in Q1 2020
- Single arm study
- 100 relapsed / refractory adult ALL patients
- Primary endpoint: overall complete response rate (CR/CRi)
- Secondary endpoints include MRD-negative CR EFS and DoR
- BLA filing targeted for Q4 2021

Pediatric ALL – Focus on AUTO1/AUTO1NG

AUTO3 data support dual antigen targeting hypothesis

- Development in pediatric ALL will focus on AUTO1 and AUTO1NG, building on the long-term persistence observed with AUTO1 in pALL
- Key driver for relapse with AUTO1 is CD19 antigen loss
- Dual-targeting AUTO1NG with CD19 CAR of AUTO1 and a novel CD22 CAR planned to enter clinical testing in H1 2020

Diffuse Large B Cell Lymphoma (DLBCL)

DLBCL is a large commercial opportunity

- Potential market size in DLBCL
  - Approx. 24,000 patients diagnosed in the US every year*
- Aggressive and rapidly advancing cancer
  - Most common type of Non-Hodgkin Lymphoma
  - High dose chemotherapy + mAb leads to remission in about 50-60% of patients
- Two approved CAR T products (Yescarta® and Kymriah®)

*Source: American Cancer Society

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AUTO3: CD19 and CD22 targeting bicistronic CAR

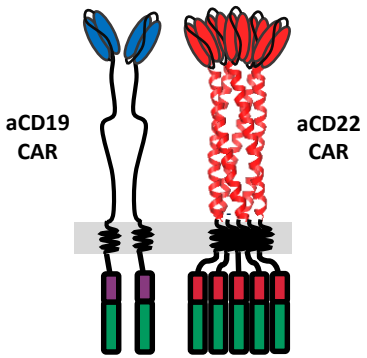
Approach designed to address antigen escape & PDL-1 mediated inhibition

Rationale

- CD19 CARs are highly active in r/r DLBCL
- Unmet need remains with CD19 CAR T Cell Therapy
  - 29-37% durable CRR in DLBCL[1,2]. The potential causes for relapse include:
    - PD-L1 upregulation[3] which contributes to CAR T exhaustion
    - CD19 antigen loss[4]
  - Rate of severe (grade ≥3) cytokine release syndrome (CRS 13-22%) and neurotoxicity (NT 12-28%)[2,4]

Hypothesis

- Simultaneous targeting of CD19 and CD22 reducing the probability of antigen escape mechanism
- Prevent early PD1/PDL1 related CAR T cell exhaustion by adding pembrolizumab to the preconditioning regimen



[1]Locke F et al Lancet Oncol 2019
[2]Schuster S et al NEJM 2019
[3]Neelapu S et al ASCO 2018
[4]Neelapu S et al NEJM 2017

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AUTO3: Adverse events of special interest

Manageable safety profile alone and in combination with pembrolizumab

	50 x10^6 AUTO3 no pem (n=4)	50 x10^6 AUTO3 D14 pem (n=3)	150 x10^6 AUTO3 D14 pem (n=4)	450 x10^6 AUTO3 D14 pem (n=4)	450 x10^6 AUTO3 D-1 pem (n=1)	Total (n=16)
All grades CRS	1	0	2	1	1	5 (31.3%)
≥ G3 CRS	0	0[1]	0	0	0	0
All grades NT	1	0	0	0	0	1 (6.3%)
≥ G3 NT	1	0	0	0	0	1 (6.3%)

[1] 1 patient who had no CRS with primary infusion, developed G3 CRS (severe hypoxia) with re-treatment 1 year later which happened in a setting of no CAR T expansion and significant disease burden in lung that had been treated with radiation

- With primary infusion
  - No grade 2 or higher CRS[2]
  - No ICU admission for CRS management
  - Only 1 patient received tociluzumab for CRS
- Only 1 case of grade 3 NT resolved quickly with steroids

[2] CRS grading as per Lee et al., *Blood* 2014

Ardeshna et al., ASH 2019

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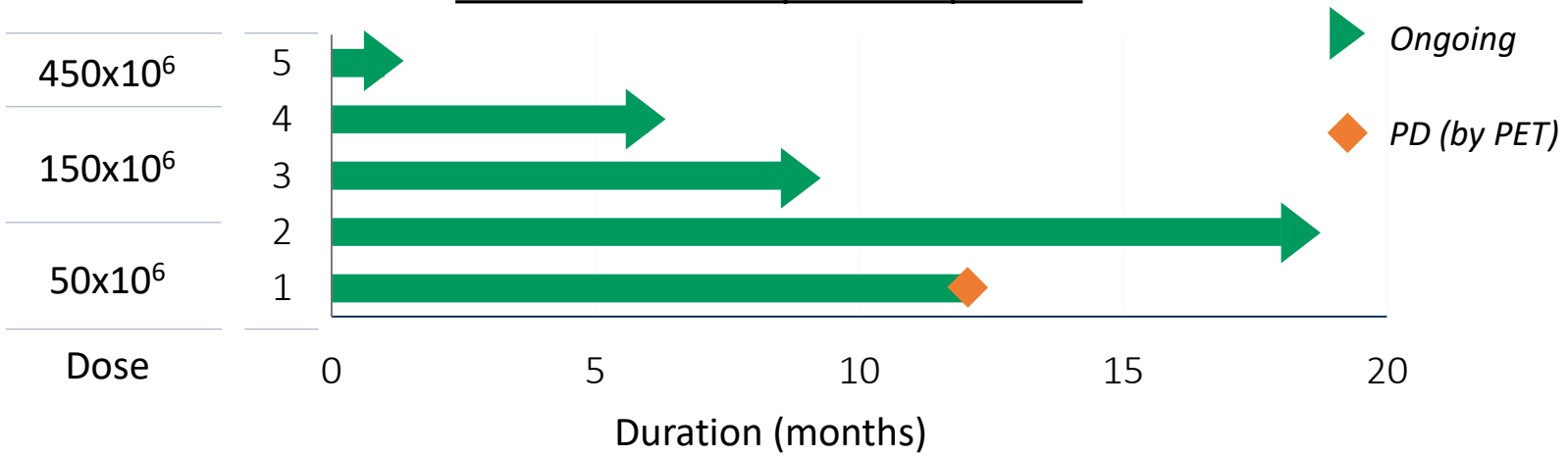
Preliminary efficacy of AUTO3 in DLBCL

Overview of responding patients

	50 x10^6 No Pem N=4	50 x10^6 D14 Pem N=3	150 x10^6 D14 Pem N=4	450 x10^6 D14 Pem N=4	450 x10^6 D-1 Pem N=1
CR	1	1	2	1	n/a
PR	1	1	0	1	n/a
NE	0	1	0	1 (too early)	1 (too early)

Overview of complete responses



4 out of 5 (80%) CRs ongoing

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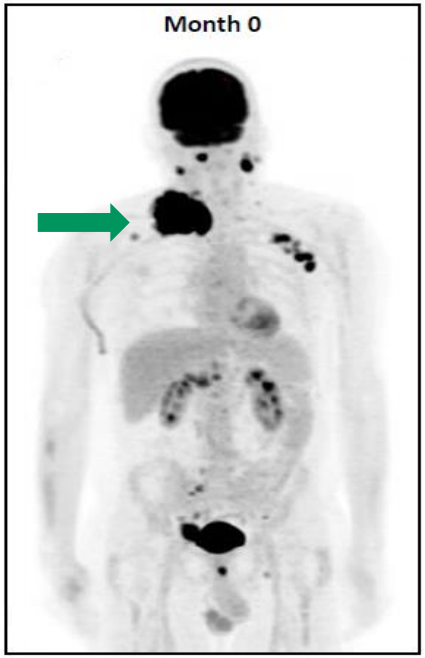
* Per Lugano criteria; CR: complete response; PR: partial response; NE: not evaluable; PD: progressive disease, Data for patients with 4 weeks efficacy follow-up . In evaluable patients, overall response rate of 57% with CR rate of 36%

CRs achieved in high risk patients without significant toxicities

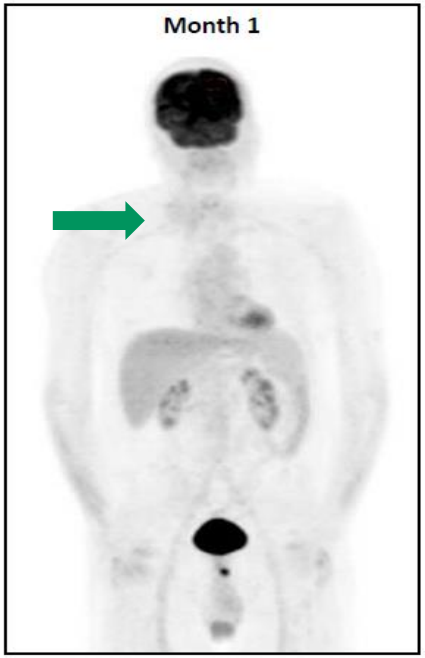
Examples of ongoing CRs

PATIENT A

Pre-CAR T-cells



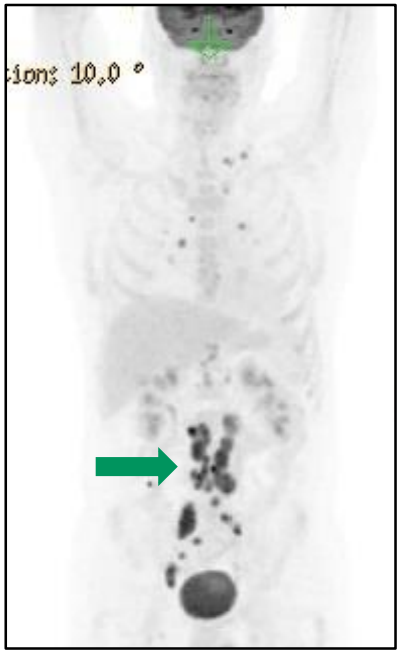
Post-CAR T-cells



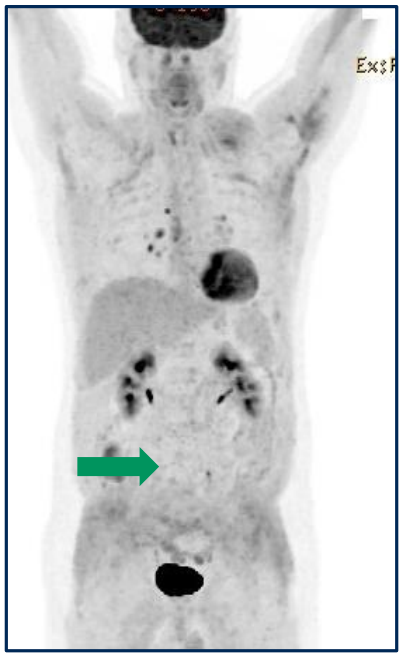
Dose: 50 x 10^6
DLBCL: ABC, Primary refractory & refractory to RCHOP/RICE/RESHAP
No CRS or NT
CR duration 18 months+

PATIENT B

Pre-CAR T-cells



Post-CAR T-cells



Dose: 150 x 10^6
tDLBCL from FL: R/R, 8 lines of prior therapy
G1 CRS, no NT
CR duration 9 months +

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AUTO3 in DLBCL

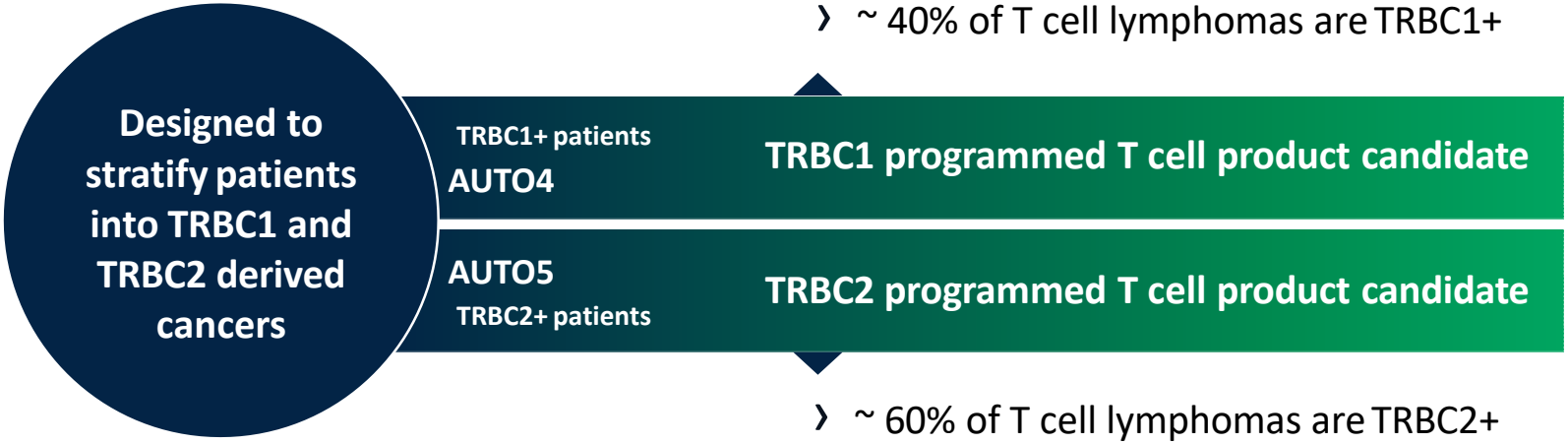
Early data encouraging – full read-out expected in mid-2020

- AUTO3 product was successfully made for all patients
  - Products manufactured at Cell and Gene Therapy Catapult at Stevenage in the UK for US and EU use
- 0% severe CRS and 1/14 (7%) severe NT with primary infusion
- 4/5 CRs ongoing
- Pembrolizumab on D-1 x single dose is being evaluated
- Decision for triggering Phase 2 initiation planned for mid 2020

Addressing T cell lymphomas

No standard of care after first relapse - patient prognosis is poor

Companion Diagnostic Test



› ~ 40% of T cell lymphomas are TRBC1+

› ~ 60% of T cell lymphomas are TRBC2+

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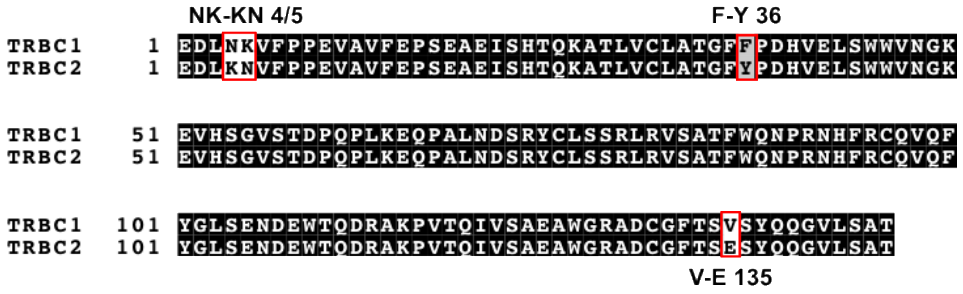
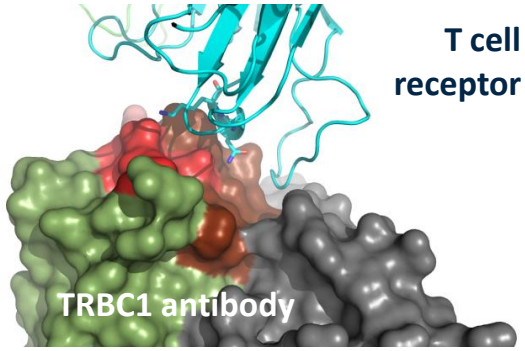
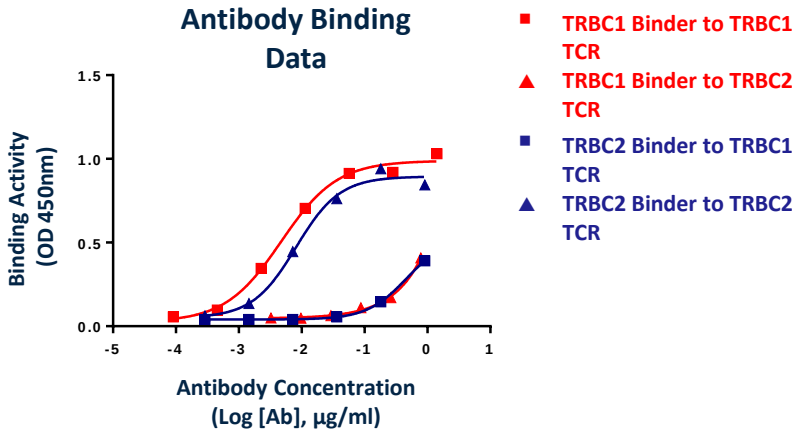
AUTO4/5 in Peripheral T Cell Lymphoma

Unique targeting of TRBC1 and TRBC2 opens new therapeutic approach

Differences between TRBC1 and TRBC2 are small







- Patient enrolment on AUTO4 Phase 1 study ongoing
- Expect to present initial AUTO4 Phase 1 data H2 2020
- AUTO5 Phase 1 decision based on AUTO4 data
- Companion diagnostic development continuing in sync with overall timeline

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AUTO6: GD2-targeted programmed T cell therapy

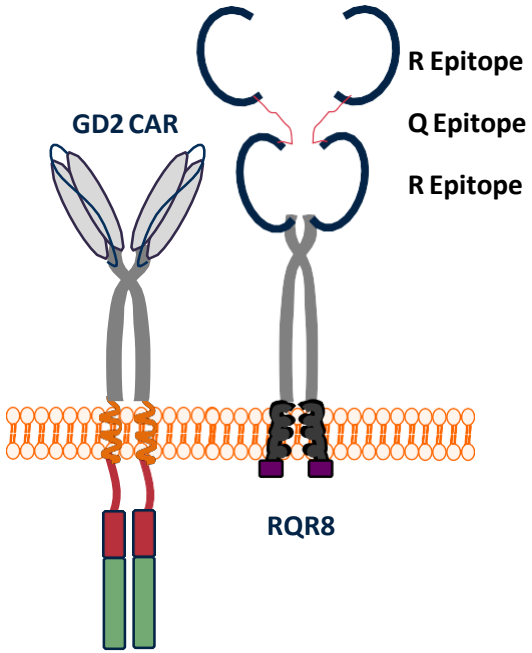
Designed to drive anti-tumor activity without inducing neurotoxicity

> Programmed T cell product candidate:

- New binder to minimize on-target, off-tumor toxicity
- Humanized binder to reduce immunogenicity
- RQR8 safety switch

> Phase 1 clinical trial in r/r neuroblastoma conducted by CRUK* in collaboration with UCL

> Autolus has exclusive worldwide rights to clinical data and patents



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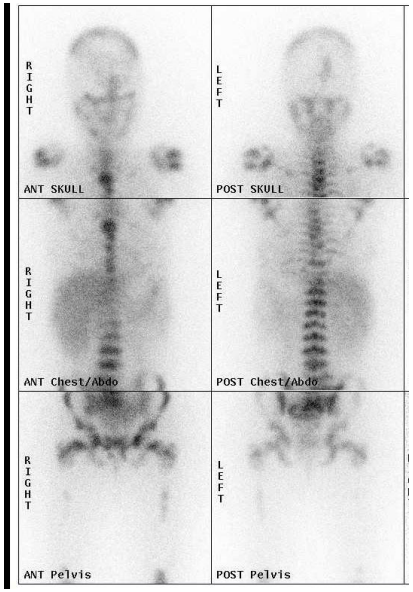
*Cancer Research UK

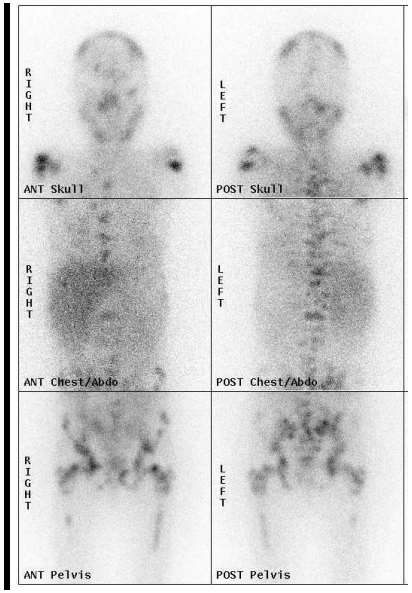
AUTO6 proof of principle presented at AACR 2018

Patient 10: AUTO6 anti-tumor activity without inducing neurotoxicity

Day 0



Day 28



MIBG: iodine-123-meta-iodobenzylguanidine

- Significant decrease in disease hot spots in patient 10 by MIBG scan after therapy
- No DLTs and no neurotoxicity or pain syndrome observed
- First GD2 CAR reported to demonstrate CRS and tumor lysis syndrome in solid tumor setting
- AUTO6 next generation program in advanced pre-clinical development

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AUTO6NG – Building on AUTO6 therapeutic window

Modular Approach: Designed to address a hostile tumor micro-environment

AUTO6

GD2 CAR

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

Safety Switch

To eliminate the therapy in the event of unexpected toxicities

dSHP2

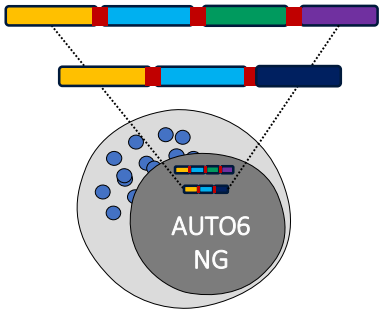
To overcome multiple checkpoint pathways

Cytokine Signal

IL7R chimeric protein designed to improve CAR T cell persistence

dTGFβ Receptor

To overcome inhibitory effect of TGFβ in microenvironment

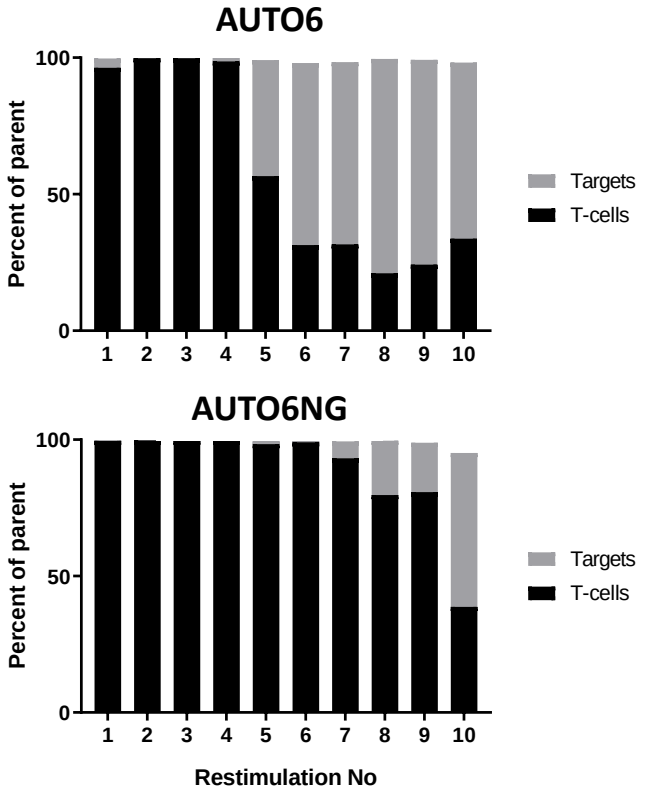


> AUTO6NG:

- Utilizes the GD2 CAR from AUTO6
- Designed to address persistence, control and tumor defenses
- Target neuroblastoma, osteosarcoma, melanoma and small cell lung cancer amongst others

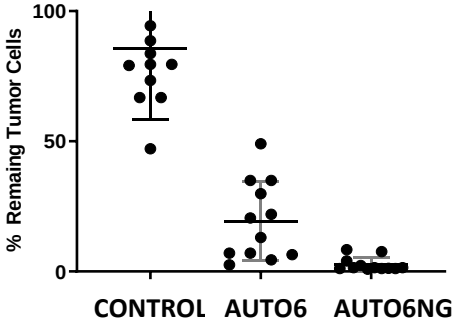
AUTO6NG Shows Superior Activity *In Vitro*

Enhanced Persistence



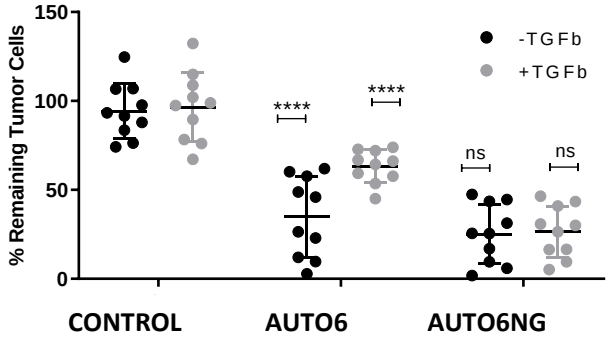
- Cytokine signal extends AUTO6NG activity through multiple rounds of restimulation

Checkpoint Resistance



- dSHP2 enhances AUTO6NG activity against PDL1+ tumor cells.

TGFβ Resistance



- dTGFβ Receptor enhances AUTO6NG activity in the presence of TGFβ

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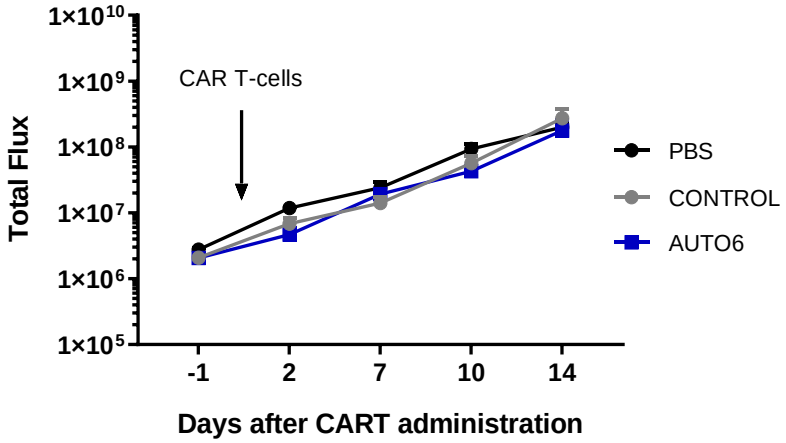
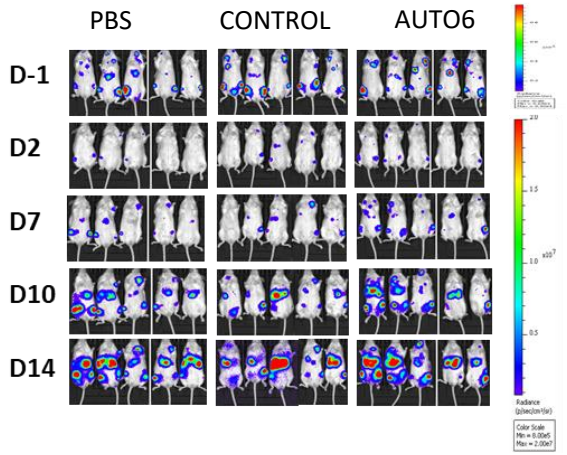
Achkova, D., et al SITC 2019 (abstract)

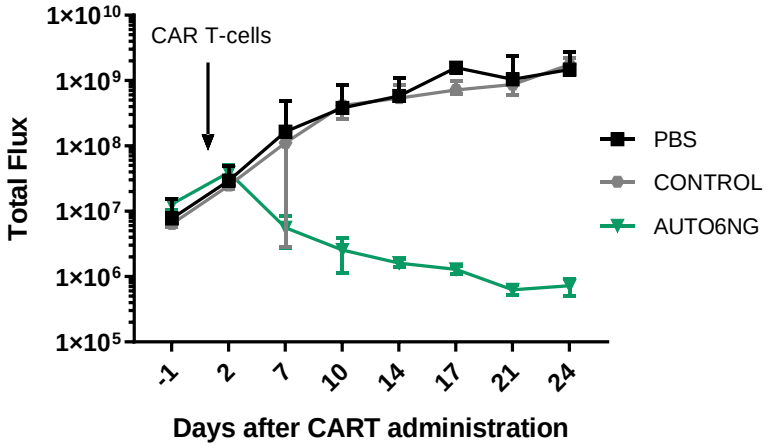
AUTO6NG Exhibits Potent Anti-tumor Activity and Extends Survival in Challenging *In Vivo* Model

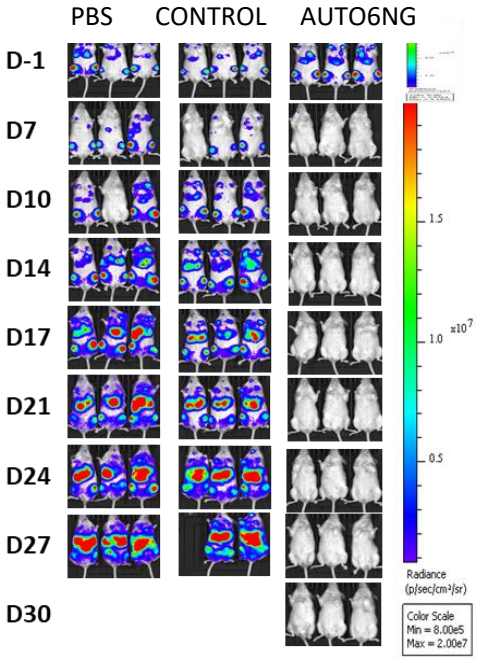
AUTO6





AUTO6NG





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

AUTO6NG

Positioned for additional value inflection in 2020

- Plan to commence Phase 1 H2 2020
- Encouraging preclinical data on three T cell programming modules presented at SITC 2019
  - Constitutively signaling IL7 cytokine receptor (IL7R_CCR module) is shown to enhance persistence
  - Dominant negative TGFbRII (dnTGFbRII module) observed to block TGFβ signaling
  - Truncated SHP2 (dSHP2 module) observed to confer resistance to inhibitory signals such as those from PD1
  - In established tumor model AUTO6NG eliminated the tumor, whereas AUTO6 did not

Towards a Unique Approach to Allogeneic T Cell Therapies

Modular programming without the requirement for gene editing

- Key challenges
  - Graft vs Host Disease – mediated by TCR of donor cells
  - Immune rejection – recognition of MHC on donor cells by host cells

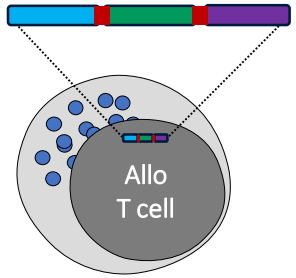
- Novel approach using protein-based programming integrates with Autolus' existing T cell programming and manufacturing platform:
  - TCR expression is disrupted by intracellular retention and degradation using a single programming module
  - Programming modules are also in development to protect the donor cells from immune rejection
  - Approach can be combined with all other T cell programming modules under development at AUTL
  - Approach fits current manufacturing approach at AUTL

- Avoids technical and IP complexities of gene editing

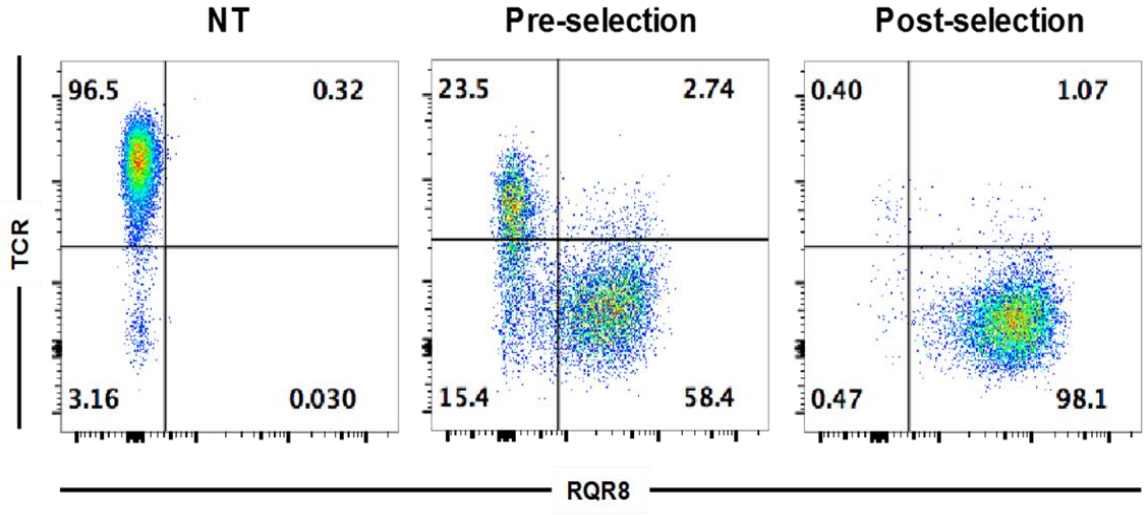
Allogeneic CAR T

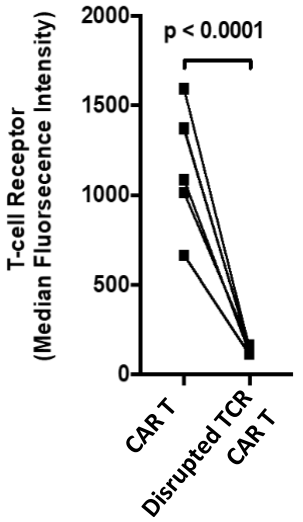
Complete TCR down regulation in primary T cells

CAR ◆ Safety Switch ◆ TCR Disruption



- TCR Disruption module is co-expressed with the CAR and safety switch in the same viral vector
- Potential for rapid and simple manufacturing using positive or negative magnetic bead selection





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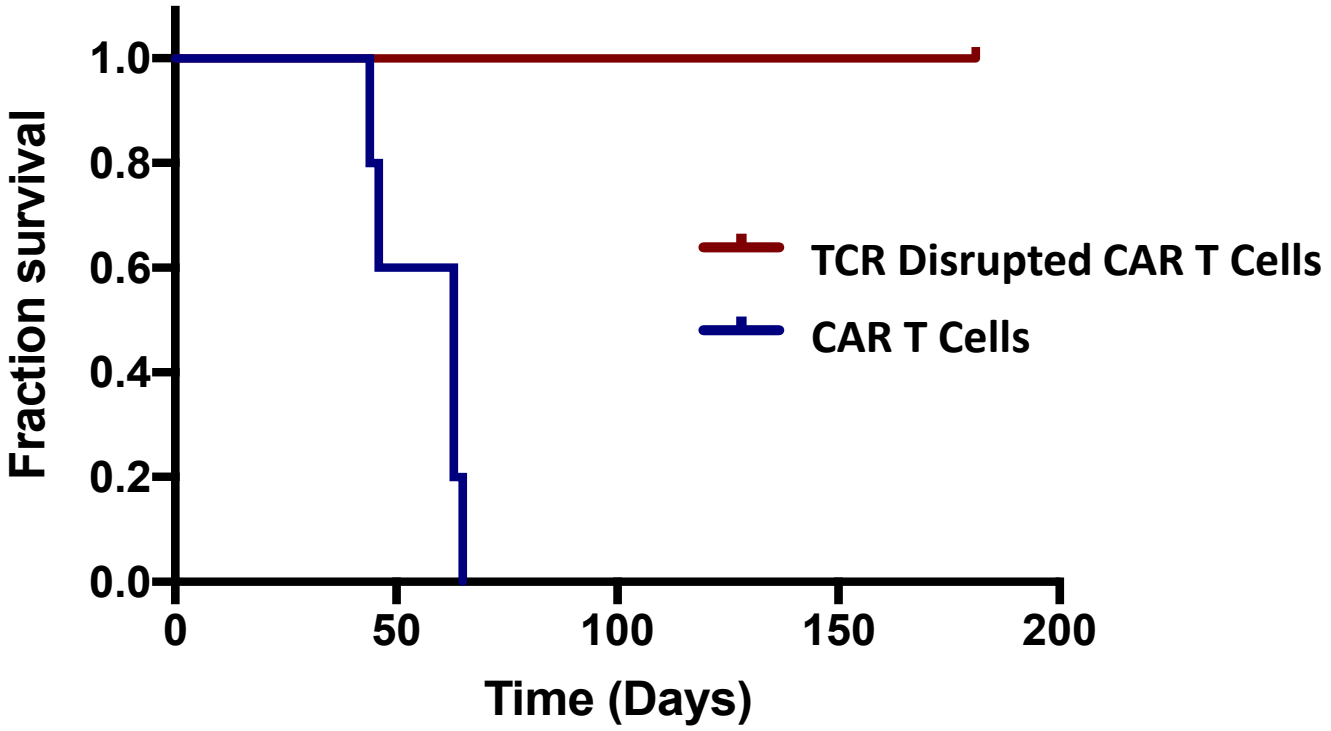
Macocia et al., 2018 (ASH)

Allogeneic CAR T

TCR disrupted cells prevent GvHD and prolong survival in sensitive mouse model



- Exploratory phase 1 clinical trial incorporating the TCR Disruption Module planned to start in Q4 2020 with an academic partner

Macocia et al., 2018 (ASH)
NSG xeno-GvHD Mouse Model
Median survival 63 days versus not reached
Hazard Ratio = 20.6, p = 0.002
n = 5 per group

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Clinical newsflow expected through 2020

Product	Indication	Target	Event
B Cell Malignancies			
AUTO1	Adult ALL	CD19	• Ph 1 long-term follow up Q2 &Q4 2020 • Start pivotal program H1 2020
AUTO1NG	Pediatric ALL	CD19 & 22	• Start Ph 1 H1 2020
AUTO3	DLBCL	CD19 & 22	• Ph 1 data Q2 & Q4 2020 • Decision on Ph 2 transition mid 2020
AUTO3NG	DLBCL	CD19 & 22	• Start Ph 1 H2 2020
Multiple Myeloma			
AUTO8	Multiple Myeloma	BCMA & CAR X	• Start Ph 1 study H2 2020
T Cell Lymphoma			
AUTO4	TRBC1+ Peripheral TCL	TRBC1	• Ph 1 interim data Q4 2020
GD2+ Tumors			
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2	• Start Ph 1 H2 2020
Allogeneic Approach			
NA	NA	NA	• Start Ph 1 Q4 2020

Investment highlights

Broad clinical-stage pipeline

- 4 product candidates
- 4 hematological indications
- 1 solid tumor program

Multiple upcoming milestones

- AUTO1 long term follow up in aALL
- POC for AUTO3 in DLBCL
- POC for AUTO4 in PTCL

Proprietary manufacturing process

- Fully enclosed, semi-automated
- Designed to be economical at commercial scale
- Expanding to new US/UK facilities

Modular programming approach

- Enables rapid cycle of innovation
- 4 next generation versions of lead programs to enter clinical development in 2020
- Designed to address:
  - Targeting & control
  - Tumor defenses & microenvironment
  - GvHD & immune rejection (Allogeneic)
  - Manufacturing
- Portfolio of owned and in-licensed intellectual property; 85 patent families

Strong Fundamentals

- $229 million at September 30, 2019
- Worldwide rights retained for all programs
- Cash runway into H2 2021

Thank you