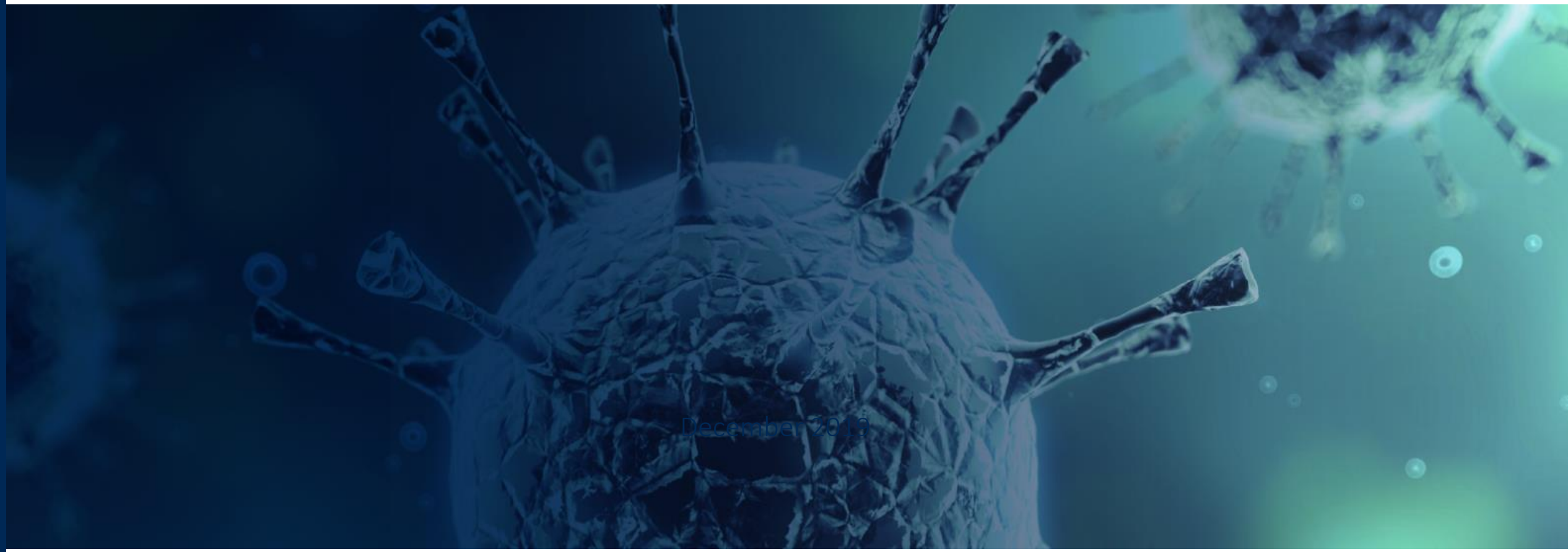
Nasdaq: AUTL



December 2019

Cowen and Co. 40th Annual Healthcare Conference

March 2020

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Corporate strategy

Short term value steps with best in class programs for ALL and DLBCL

- Focus on potentially best in class Acute Lymphoblastic Leukemia (ALL) and Diffuse Large B Cell Lymphoma (DLBCL) therapies with major value steps expected in 2020 / 2021
  - First pivotal study of adult ALL to complete in H1 2021 with approval targeted in 2022
  - Drive DLBCL program to POC and prepare for pivotal study
- Additional value steps in T cell lymphoma and first solid tumor indication
- Broad preclinical pipeline of next generation programs transitioning to clinical stage in 2020
- Broad proprietary cell programming technology
- Scalable, fully enclosed manufacturing platform

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 gen programs to start Ph 1 in 2020
- Designed to address:
  - Targeting & control
  - Tumor defenses & microenvironment
  - GvHD & immune rejection (Allogeneic)
  - Manufacturing
- Portfolio of owned and in-licensed intellectual property; 93 patent families

Strong Fundamentals

- $210.6 million at December 31, 2019*
- Worldwide rights retained for all programs
- Cash runway into 2022

Autolus

*Before adjusting for $75m net proceeds from our recent January 2020 public offering

Broad pipeline of clinical programs

Designed to address limitations of current T cell therapies

Product	Indication	Target	Pre-clinical	Phase 1/2	Phase 2/3
B Cell Malignancies					
AUTO1	Adult ALL	CD19	ALLCAR19		
AUTO1	Pediatric ALL	CD19	CARPALL		
AUTO3	DLBCL	CD19 & CD22	ALEXANDER		
T Cell Lymphoma					
AUTO4	TRBC1+ Peripheral TCL (LibrA T1)	TRBC1	LibrA T1		
GD2+ Tumors					
AUTO6	Neuroblastoma	GD2	CRUK		

Autolus

Adult Acute Lymphoblastic Leukemia

AUTO1 – tailored for adult ALL

No approved CAR T therapy for adult ALL patients

Severe toxicities of currently approved products have limited suitability in adult setting

- ALL is a significant opportunity
  - Up to 8,400* new cases of adult ALL diagnosed yearly worldwide‡
  - Addressable patient population is projected at 3,000 patients US & EU
- 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 approved redirected T cell therapy approved for adults generally is blinatumomab
  - CAR T therapies are highly active, but no clear sense of durability without subsequent allograft
  - Patients are generally more fragile, more co-morbidities
  - Yet CAR T toxicities in this setting have been notable with high incidences of severe CRS and cases of fatal neurotoxicity

FDA granted AUTO1 orphan drug designation for ALL

Autolus

*Sources: Prevalence calculated using SEER and EUCAN and extrapolated using IMS; American Cancer Society
‡ Autolus estimates

AUTO1: Key features

Designed for durability of responses without allo-transplant and reduced severe CRS

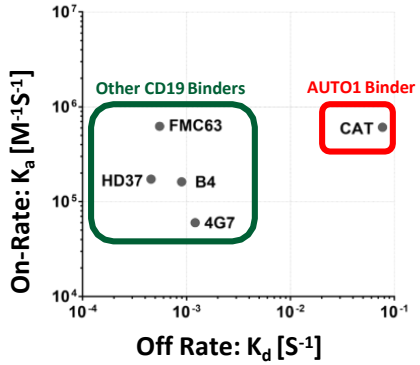
Conventional CD19 CARs	AUTO1
• Approved and near approved CD19 CAR Ts use identical high affinity CD19 binder (FMC63)	• AUTO1 has an optimized CD19 CAR with a lower affinity and a fast off rate
• FMC63 has a fast on-rate and a very slow off rate	• Engages efficiently, delivering a kill, disengages rapidly like a normal T cell
• Leads to over-activation, exhaustion and high-grade CRS and neurotoxicities	• Leads to enhanced activity and lower toxicities

AUTO1 shows enhanced activity vs FMC63 CARs

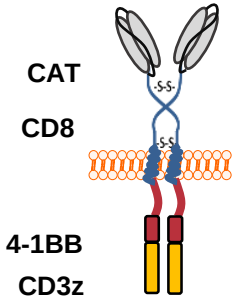
Preclinical data show higher cytotoxicity and proliferation

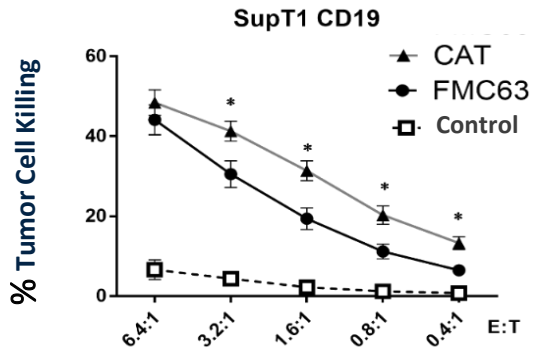
- AUTO1 is designed to reduce severe CRS (≥G3) through the introduction of a proprietary optimized CAT binder
- AUTO1 (CAT) binder with lower affinity for CD19
- Half-life of target interaction very short compared to Kymriah® (FMC63) binder*:
  - AUTO1 = 9.8 seconds
  - Kymriah® = 21 minutes

Fast Off-Rate

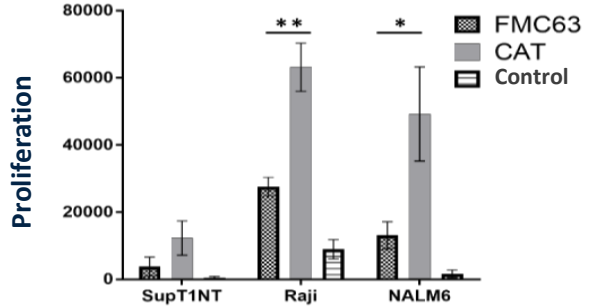


Enhanced Cytotoxicity





Enhanced Proliferation



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

Autolus

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

Relapsed/refractory Adult ALL clinical data

		[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%‡

◊ 15 patients evaluable for efficacy with at least 4 weeks follow up or RIP prior to Month 1
‡ 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

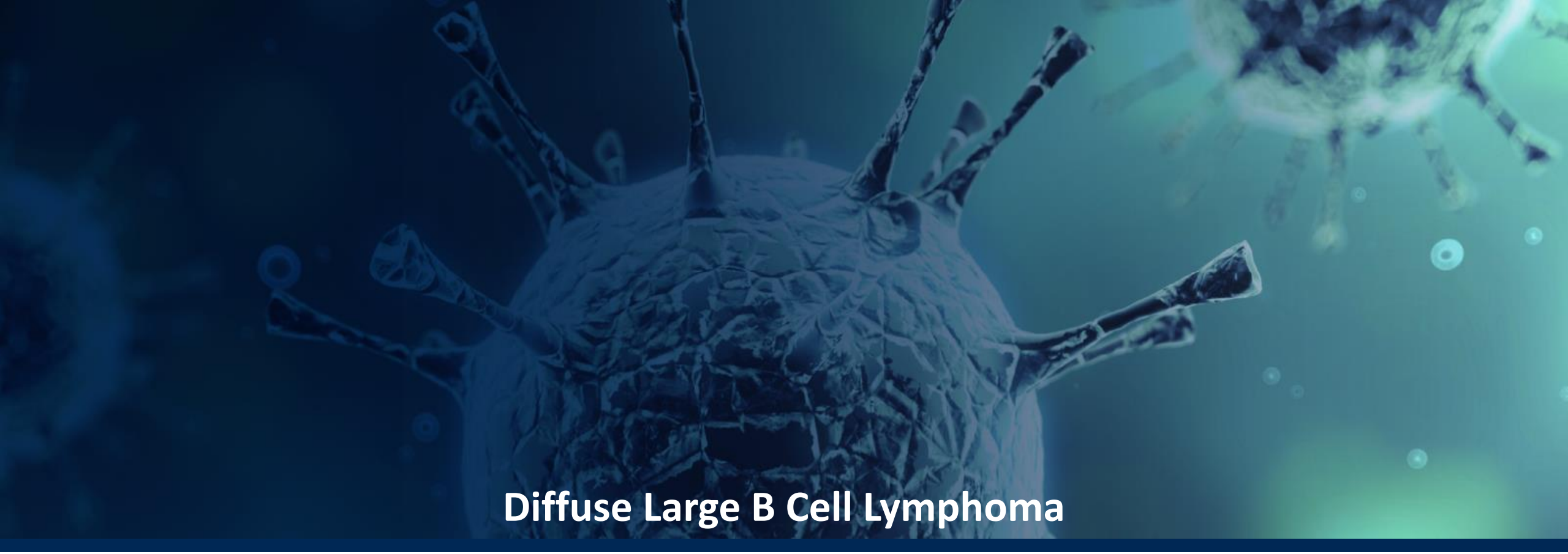
- AUTO1 preliminary data suggest manageable safety profile and a high level of clinical activity
- KTE-X19 CR Rate 68-84%, Grade ≥3 cytokine release syndrome (CRS) events occurred in 22-29% and neurologic events 11-38% of patients*

Sources: Prevalence calculated using SEER and EUCAN and extrapolated using IMS; American Cancer Society
Gilbert et al., 2017 (SITC)
*Shah et al, ASCO 2019

AUTO1 is first Autolus program to move to late stage development

Potential pivotal study in adult ALL:

- CTA filed in UK in November 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



Diffuse Large B Cell Lymphoma

AUTO3 – tailored for DLBCL

DLBCL is a large commercial opportunity

AUTO3 addressable patients in DLBCL

- Potential market size in DLBCL
  - Approx. 24,000 patients diagnosed in the US every year

- Aggressive and rapidly advancing cancer, survival outcomes remain poor
  - Most common type of Non-Hodgkin Lymphoma
  - High dose chemotherapy + mAb leads to remission in about 50-60% of patients
  - DLBCL patients who fail salvage regimens median overall survival 4.4m

- Two approved CAR T products (Yescarta® and Kymriah®)

- Initial AUTO3 positioning in DLBCL
  - High unmet need remains, despite highly active CD19 CARs in r/r DLBCL, given the responses are not durable and toxicity limits broad application

Current status of CAR T Cell therapies in DLBCL

Two approved products (Yescarta® and Kymriah®) and one near to approval (JCAR017)

Efficacy

- Despite high ORR (70-80%) and high best CRR (40-55%), only 29-37% patients achieve durable CRR in DLBCL[1,2]
- Approximately a third of CRs are lost over time
- Loss of CRs are caused by PD-L1 upregulation[3] which contributes to CAR T exhaustion and CD19 antigen loss[4]

Safety

- High rates of severe cytokine release syndrome (13-22%) and severe neurotoxicity (12-28%)[2,4]
- Early onset and severity of toxicities requires intensive inpatient management

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

Approach designed to address antigen escape & PDL-1 inhibition

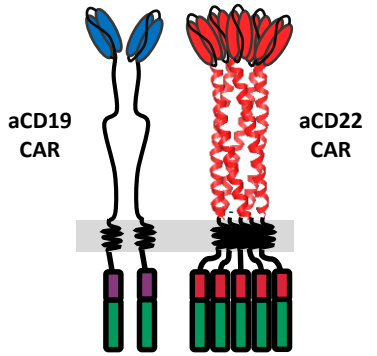
AUTO3: CD19 and CD22 targeting bicistronic CAR

Rationale

- CD19 CARs are highly active in r/r DLBCL
- Unmet need remains with CD19 CAR T Cell Therapy
  - Only 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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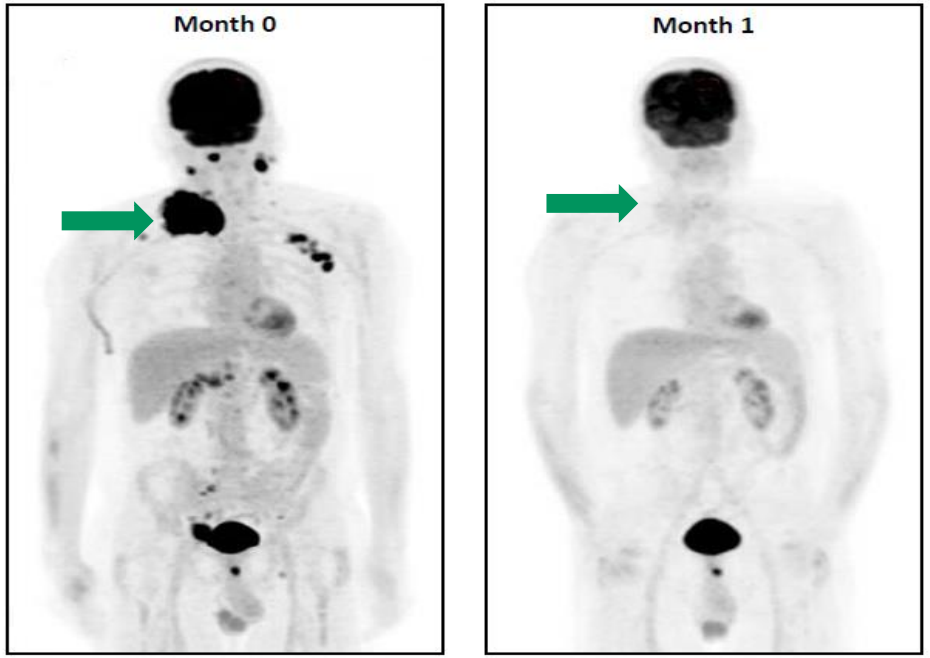
Preliminary efficacy* indication of dose response

AUTO3 - DLBCL

	50 x 10^6 No Pem (n=4)	50 x 10^6 D14 Pem (n=3)	150 x 10^6 D14 Pem (n=4)	450 x 10^6 D14 Pem (n=4)	450 x 10^6 D-1 Pem (n=3)
CR	1	1	2	2	2
PR	1	1	0	1	NA
NE	0	1	0	0	0
CRR	25%	33%	50%	50%	66%

- 450 million: ORR 5/7 (71%) and CR 4/7 (57%)

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+

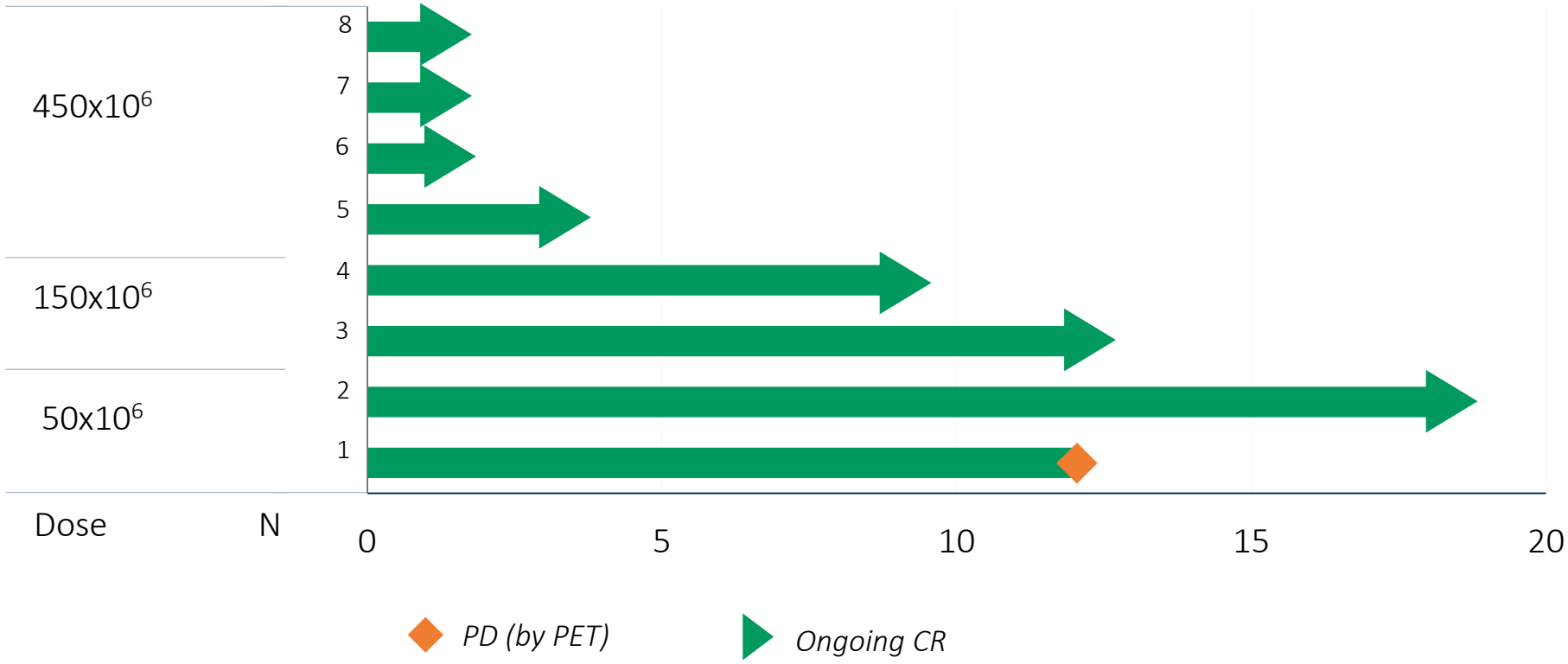
21 January 2020 data cut-off

Autolus

* Per Lugano criteria; CR: complete response; PR: partial response; NE: not evaluable; PD: progressive disease
Data for patients with 4 weeks efficacy follow-up

Early encouraging signs of durable complete responses

Auto 3 - DLBCL



Median Follow-up:
6 months (1 – 18 month)

18 patients treated, 7 out of 8 (87%) CRs ongoing, 3 PRs not durable
7 of 7 (100%) CRs* are ongoing in AUTO3+ Pembro cohorts at a median f/u of 3 months (1-18m)

21 January 2020 data cut-off

Autolus

* Efficacy assessment Per Lugano criteria; CR: complete response; PR: partial response; NE: not evaluable; PD: progressive disease
Data for patients with 4 weeks efficacy follow-up

AUTO3 has a safety profile which may allow outpatient use

	[1]AUTO3 + Pembro ≥ 150 x10^6 Dose	[2]YESCARTA	[3]KYMRIAH	[4]JCAR017
Best CR	55%*	54%	40%	53%
CRS ≥ grade 3	0%	11% #	23%	2% #
Neurotox any grade	0%	64%	21%	30%
Neurotox ≥ Grade 3	0%	28%	12%	10%

* All CRs ongoing at a median f/u of 2 months (1-12 month)
# CRS rate achieved with intensive management

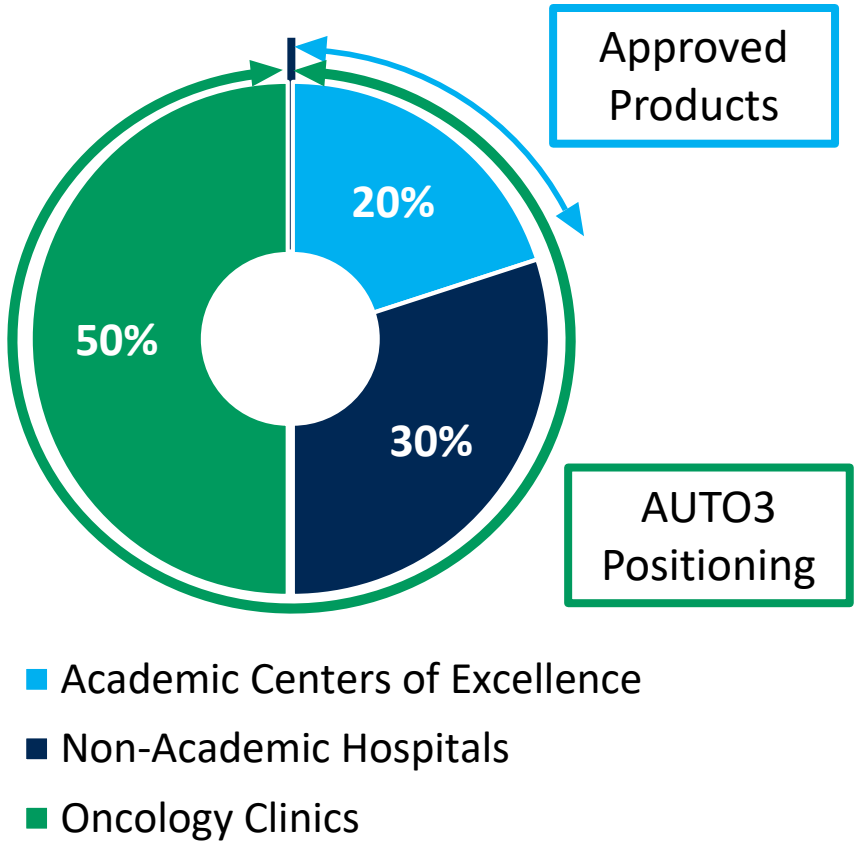
Autolus

1. Data cut off 21 January 2020
2. Nellapu et al, 2017
3. Schuster et al., 2019
4. Abramson et al., 2019 (ASH)

AUTO3 is designed to reach total addressable r/r DLBCL population

AUTO3 has the potential to be a true outpatient therapy

US Site of Care Distribution 3L+ R/R DLBCL



Source: 2016 IMS & CMS patient claims data

Approved CD19 CAR T Products

- Patients receive approved products as inpatients in CoEs because of the high rate & severity of toxicities plus intensity of patient management
- Market opportunity limited to ~20% of patients

AUTO3 Products

- Minimal tox management of AUTO3 should allow treatment across all settings of care
- Increased healthcare utilization of AUTO3 grows the addressable market and maximizes reimbursement options compared to approved products

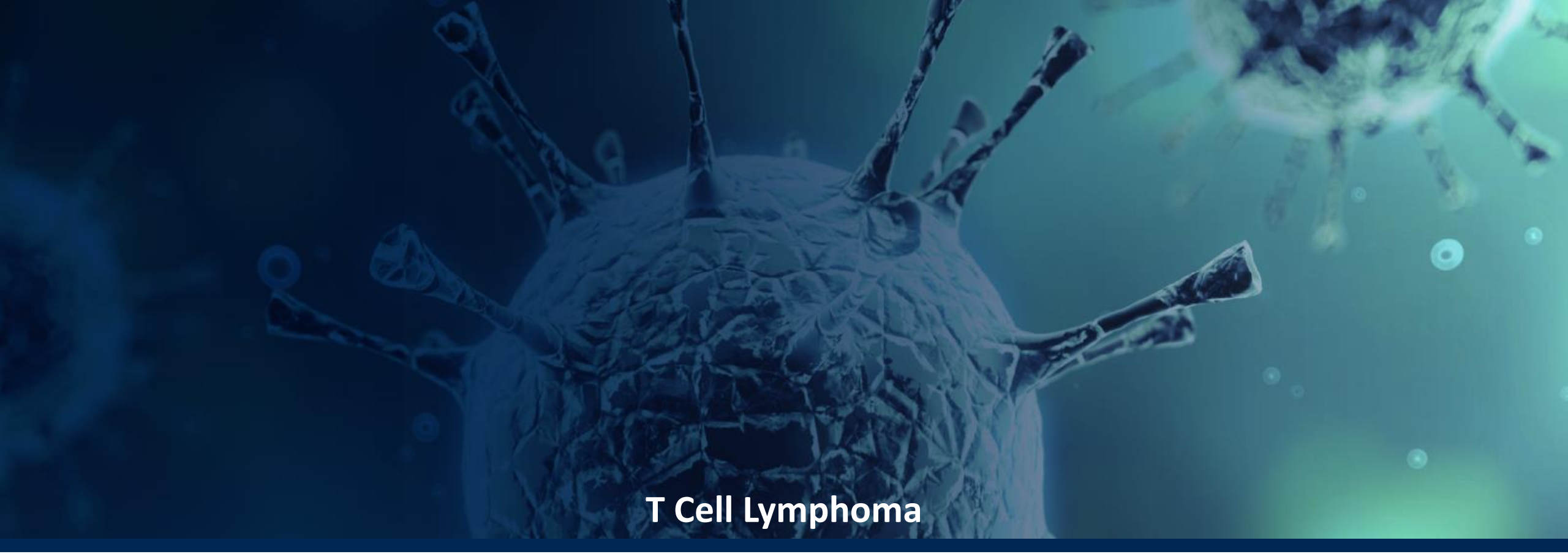
Autolus

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

AUTO3 in DLBCL

- AUTO3 product was successfully manufactured for all patients
  - Products manufactured at Cell and Gene Therapy Catapult at Stevenage in the UK for US and EU use
- No neurotoxicity or severe CRS* in patients treated with AUTO3 at active dose levels
- Complete responses achieved without severe CRS, neurotoxicity or ICU care
- 7/8 CRs ongoing with a median follow up of 6 months (1-18 months)
- Pembrolizumab on D-1 x single dose is being evaluated further
- Decision for triggering Phase 2 initiation planned for mid-2020

* > Grade 3

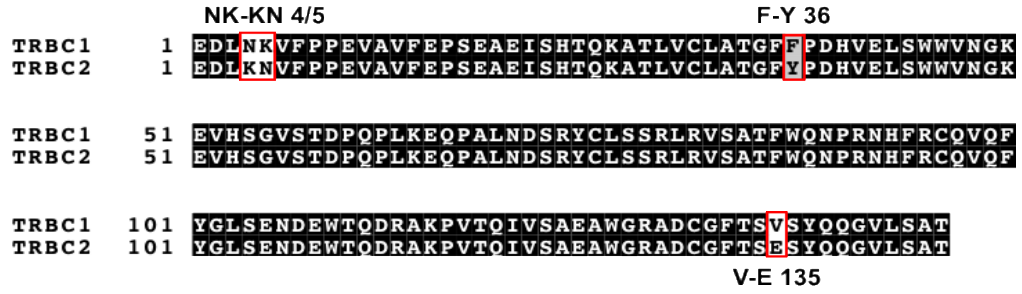


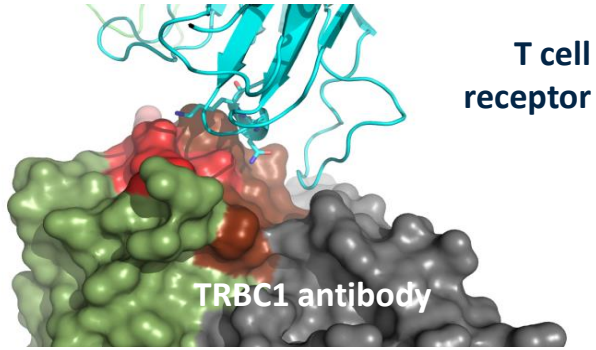
AUTO4 – tailored for T Cell Lymphoma

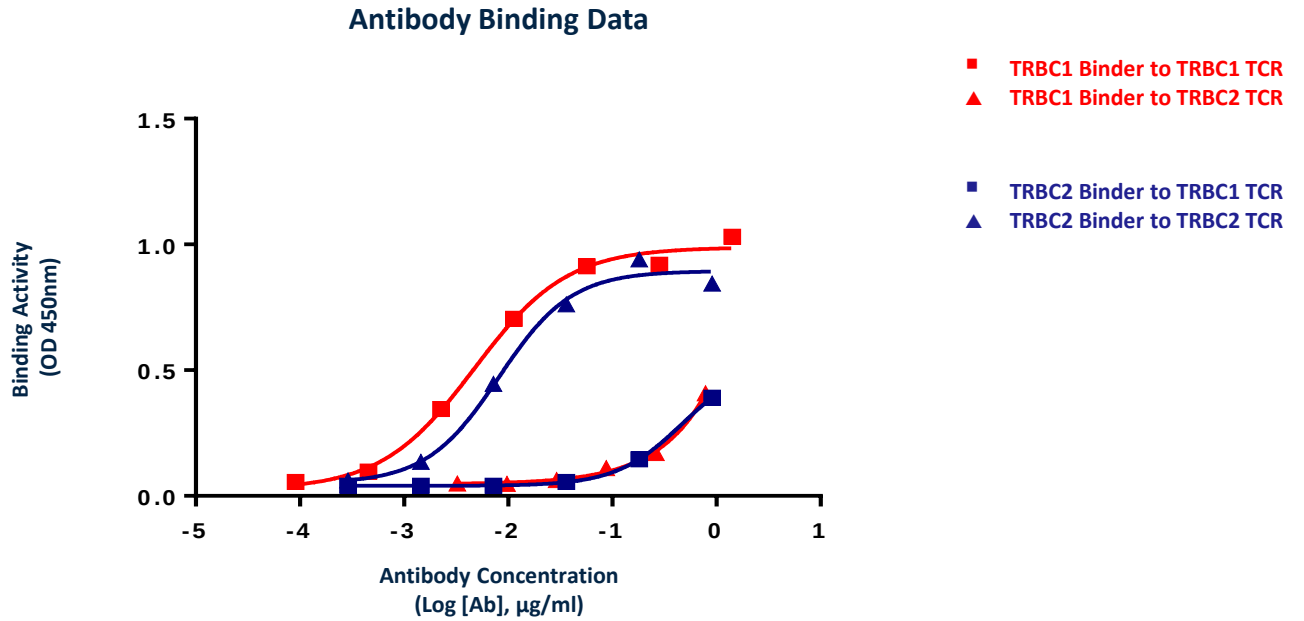
Unique targeting of TRBC1 & TRBC2 opens new therapeutic approach

AUTO4/5 in Peripheral T Cell Lymphoma

Differences between TRBC1 and TRBC2 are small







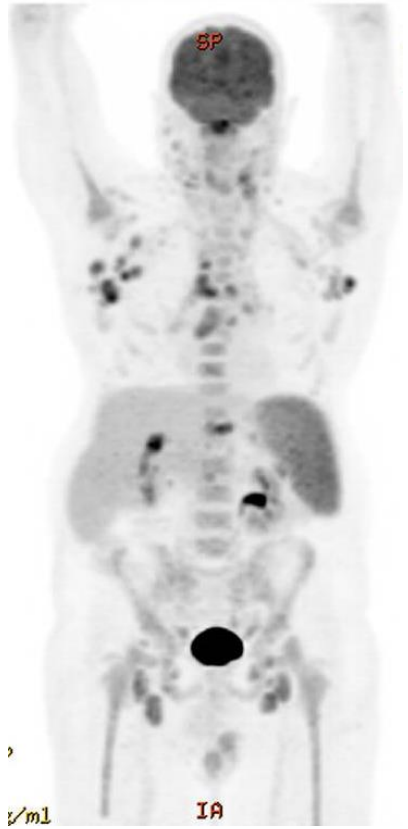
Autolus

Encouraging signal from AUTO4 treated patient

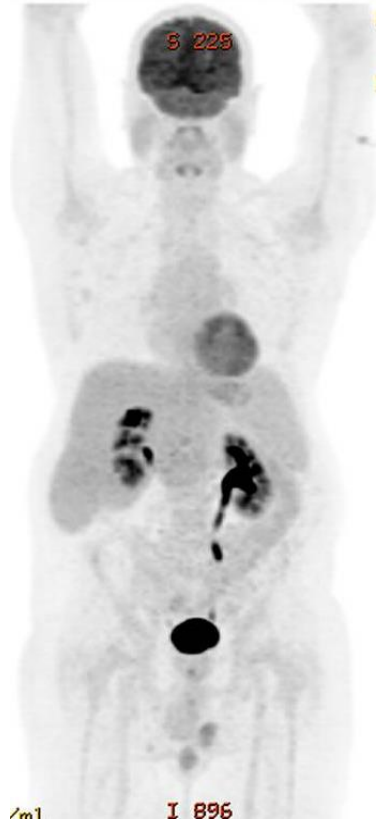
Clinical outcome of patient 1

- 57 yr old with Angioimmunoblastic T cell lymphoma
- Past treatments include CHOP (CR) & IVE (refractory)
- AUTO4 Treatment
  - Treated with $25x10^6$ anti-TRBC1 CAR T cells
  - No expansion of CAR T cells was noted
  - No CRS or neurotoxicity or T-cell aplasia was noted
  - Initial PET/CT at one month showed Complete Metabolic Response but subsequently had progression on day 71

Baseline PET/CT scan
Pre-AUTO4 treatment



Month 1 PET/CT scan



Pipeline

A broad portfolio of next generation modular T cell therapies

Broad pipeline of next generation programs

Designed to address limitations of current T cell therapies

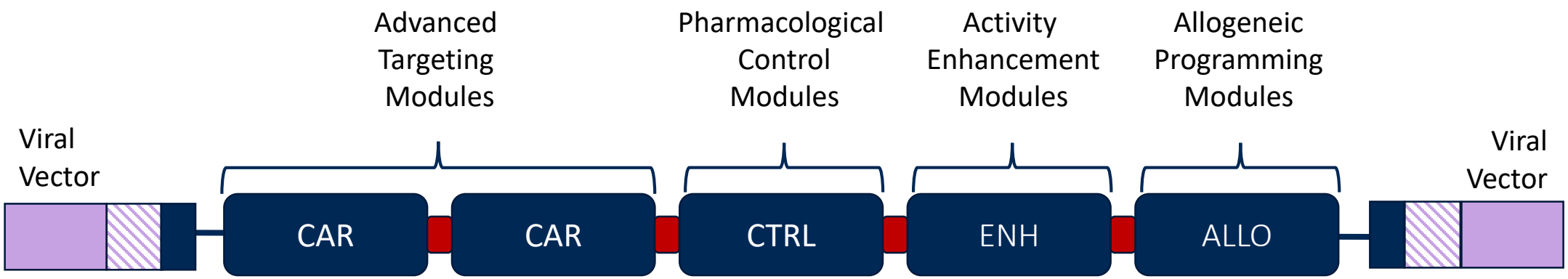
Product	Indication	Target	Pre-clinical	Phase 1 Start
B Cell Malignancies				
AUTO1NG	ALL	CD19 & CD22		1H 2020
AUTO3NG	DLBCL	CD19 & CD22		Life cycle mgmt
T Cell Lymphoma				
AUTO5	TRBC2+ Peripheral TCL	TRBC2		1H 2021
GD2+ Tumors				
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2		Q4 2020
Prostate Cancer				
AUTO7	Prostate Cancer	Undisclosed		1H 2021
Multiple Myeloma				
AUTO8	Multiple Myeloma	BCMA & CAR X		2H 2020

Autolus

NG = Next Generation
SCLC = Small Cell Lung Cancer

A broad toolkit building on our core principles of modular innovation

Advanced T cell programming



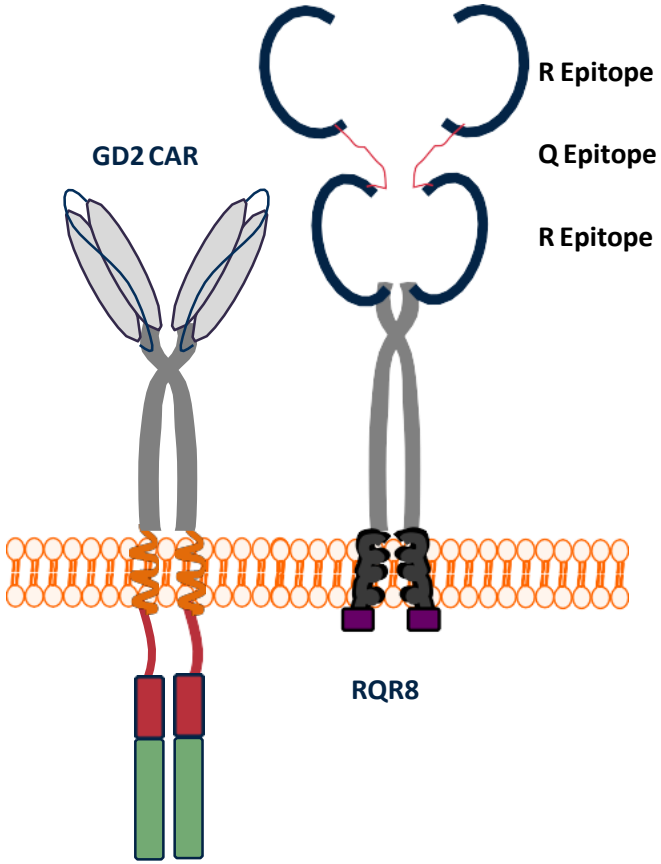
Advanced Targeting Modules	Pharmacological Control Modules	Activity Enhancement Modules	Allogeneic Programming Modules
Fast off Rate CARs	**Safety Switches**	**dSHP2**	**GvHD**
Dual Targeting CARs	**Tunable CARs**	**dTGFβ Receptor**	**Immune Rejection**
Avidity Enhancing Spacers		**Chimeric Cytokine Receptors**	
Logic Gates		**Host Immune Cell Recruitment**	
AUTO1 AUTO1NG AUTO3 AUTO8	AUTO4 AUTO5 AUTO6 AUTO6NG AUTO7 AUTO8	AUTO3NG AUTO6NG AUTO7 AUTO8	1st Clinical Program 4Q 2020

Autolus

AUTO6 designed to drive anti-tumor activity without neurotoxicity

AUTO6: GD2-targeted programmed T cell therapy

- 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

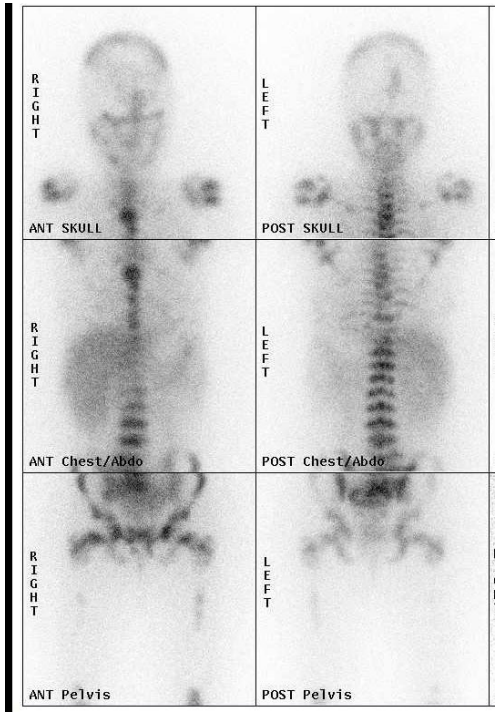


*Cancer Research UK

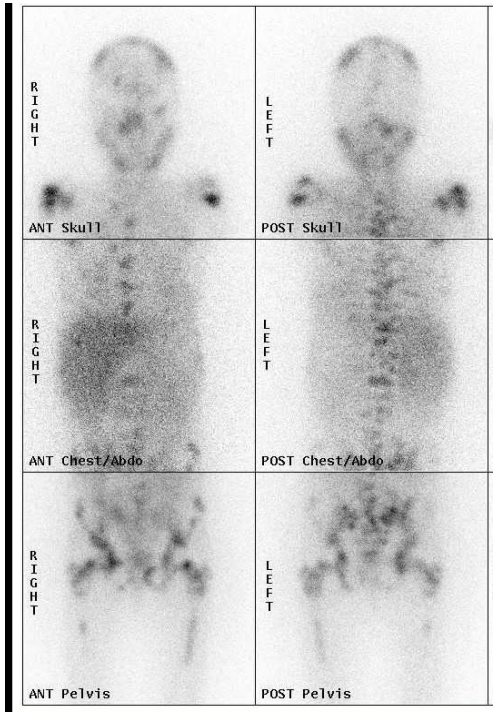
Anti-tumor activity evident absent neurotoxicity

AUTO6 proof of principle presented at AACR 2018

Day 0



Day 28



MIBG: iodine-123-meta-iodobenzylguanidine

- Significant decrease in disease hot spots 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

Autolus

Modular approach enhances AUTO6NG for solid tumor environment

Next generation programs powered by a technology tool box

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

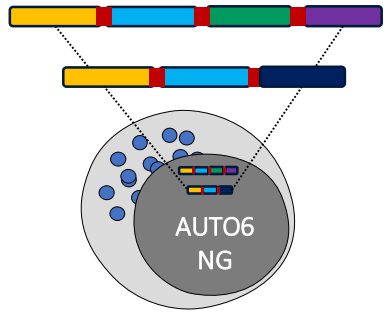
To overcome multiple checkpoint pathways

Cytokine Signal

IL7R chimeric protein designed to improve CAR T cell persistence

dTGFβ Receptor

To overcome inhibitory effect of TGFβ in microenvironment



AUTO6NG:

- Utilizes GD2 CAR from AUTO6, but further enhanced to address persistence, control and tumor defences
- Targeting neuroblastoma, osteosarcoma, melanoma and small cell lung cancer amongst others
- Plan to commence Phase 1 H2 2020

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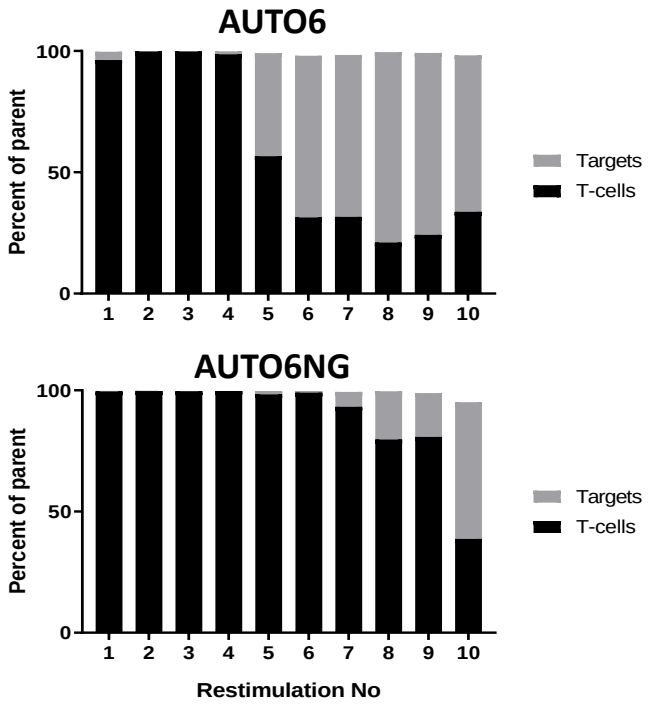
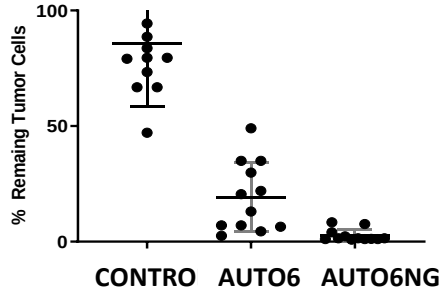
AUTO6NG shows superior activity *in vitro*

Enhanced Persistence



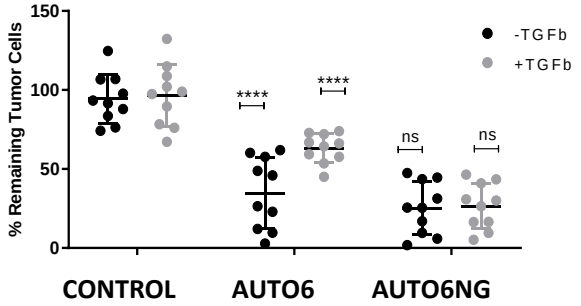
- Cytokine signal extends AUTO6NG activity through multiple rounds of restimulation

Checkpoint Resistance



- dSHP2 enhances AUTO6NG activity against PDL1+ tumor cells.

TGFβ Resistance



- dTGFβ Receptor enhances AUTO6NG activity in the presence of TGFβ

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

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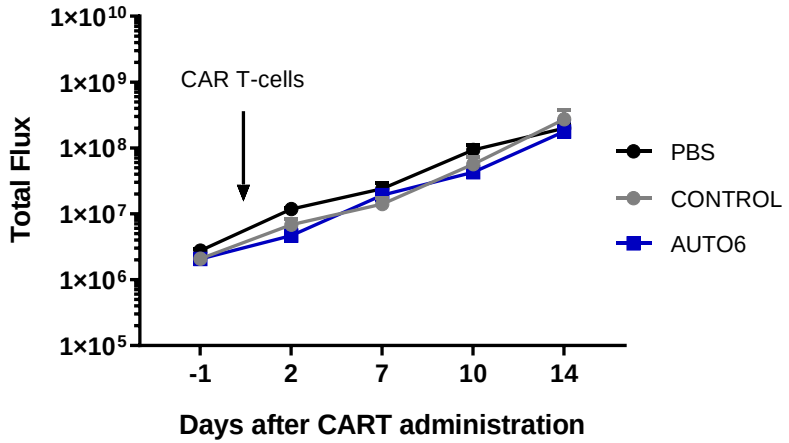
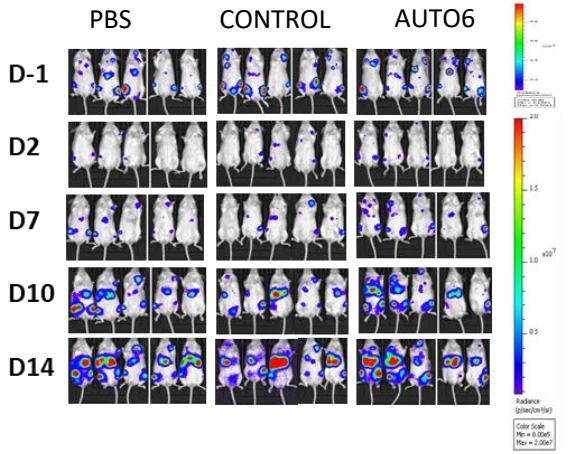
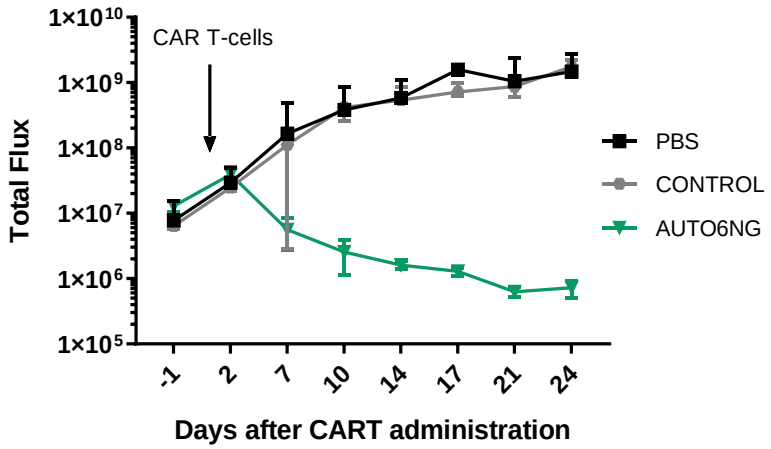
AUTO6NG exhibits potent anti-tumor activity and extends survival in challenging *in vivo m*odel

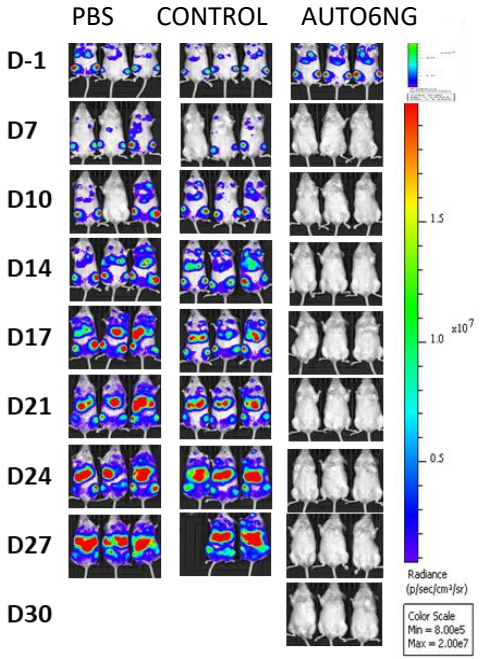
AUTO6





AUTO6NG





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

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.

Multiple clinical data points 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	• Ready to 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

Pre-clinical data presentations at AACR (April 2020)

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Autolus poised for value inflection in 2020

- AUTO1
  - First Autolus program to move into a pivotal program – Adult ALL
  - FDA granted orphan drug designation for treatment of ALL
  - Opportunity for best in class CD19 CAR T
  - Pediatric ALL – moving forward with AUTO1/AUTO1NG
- AUTO3 – decision on Phase 2 transition targeted for mid-2020
  - Focus on DLBCL – potential to expand CAR T therapy beyond centers of excellence with safety profile manageable in out patient setting
  - AUTO3NG opportunity as next generation product
- Opportunity for additional value in 2020 from AUTO1NG, AUTO4, AUTO6NG and AUTO8
- Key data releases expected at upcoming medical conferences
  - 1H 2020: Presentations targeted for AACR, ASCO and EHA
  - 2H 2020: Presentations targeted for SITC and ASH
- Strong balance sheet with approx. $286m* in cash as of 31 Jan 2020

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*Cash balance after adjusting for $75m net proceeds from our recent January 2020 public offering

Thank you