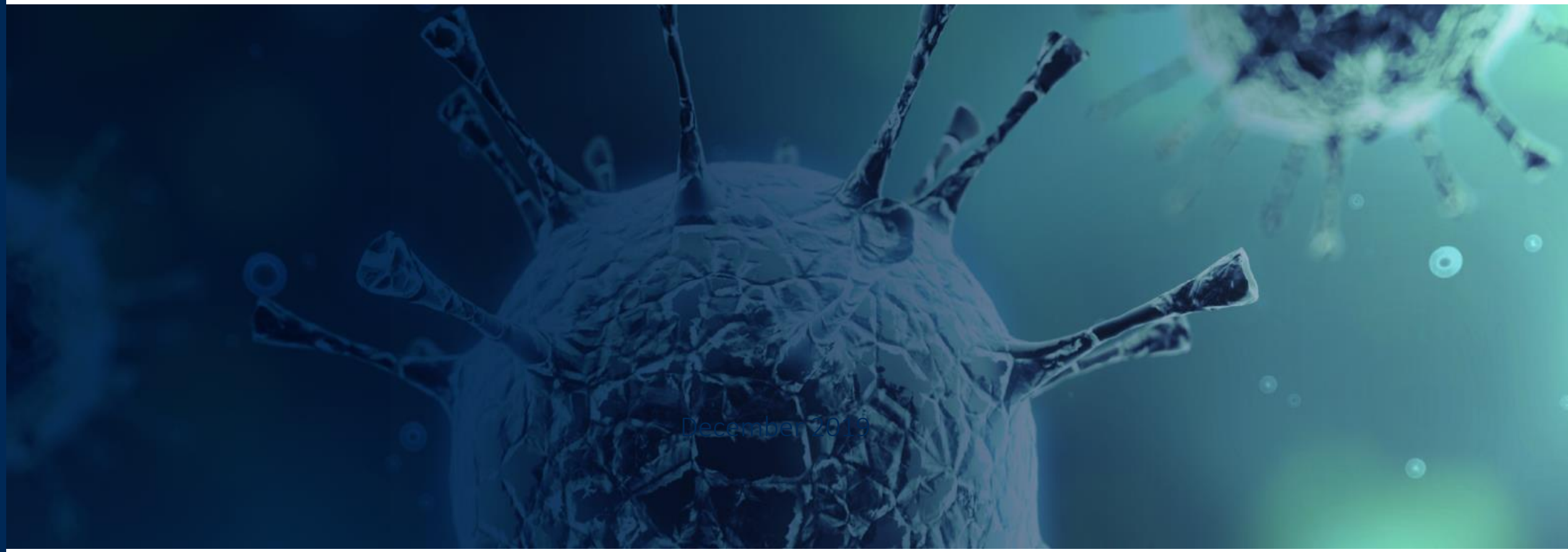
Nasdaq: AUTL



AUTO3 Data Update - ESMO 2020

September 2020

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Agenda

1. Welcome and Introduction: Dr. Christian Itin, Chairman and CEO

2. Data Review: Dr. Robert Chen, Executive Director, AUTO3 Program Lead

3. Commercial Opportunity: Brent Rice, Vice President, Chief Commercial Officer

4. Summary: Dr. Christian Itin, Chairman and CEO

5. Q&A: Dr. Christian Itin, Andrew Oakley (CFO), Dr. Nushmia Khokhar (Head of Clinical Development), Dr. Robert Chen

Welcome and introduction

Dr. Christian Itin

Chairman and CEO

Broad expertise in CAR T therapy development and market access

Dr. Christian Itin
Chairman & CEO
Previously CEO of Micromet; led development of Blincyto®, the first FDA-approved redirected T cell therapy

Dr. Robert Chen
Executive Director, Clinical Development
Previously Associate Professor at City of Hope Medical Center and Associate Director of the Toni Stephenson Lymphoma Center. Authored 100+ peer reviewed publications and abstracts

Dr. Nushmia Khokhar
SVP, Head of Clinical Development
Board certified oncologist, lead several successful registration trials within industry including global daratumumab program at Janssen Oncology

Brent Rice
VP, Chief Commercial Officer
25 years biotech/pharma experience; previously at Juno Therapeutics; 18 years at Amgen

Andrew Oakley
CFO
17+ years experience as public company CFO in bio-pharma sector; more than 10 years at Actelion

Near term value steps with potential best-in-class programs

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

Full data for ALL pivotal program expected end 2021 with approval targeted in 2022

Drive DLBCL program to POC and prepare for pivotal trial

- 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

Note on COVID-19: *While the ongoing COVID-19 pandemic has had varying degrees of impact on the ability of clinical sites to conduct clinical studies, we currently do not anticipate any significant impact on the timing or results of our clinical programs.*

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	AUTO1-AL1
AUTO1	Pediatric ALL	CD19	CARPALL	
AUTO3	DLBCL	CD19 & CD22	ALEXANDER	
AUTO4	TRBC1+ Peripheral TCL	TRBC1	LibrA T1	
AUTO6	Neuroblastoma	GD2	CRUK	

B Cell Malignancies T Cell Lymphoma GD2+ Tumors

Autolus

*Subject to confirmation by regulatory authorities

Current status of CAR T Cell therapies in DLBCL

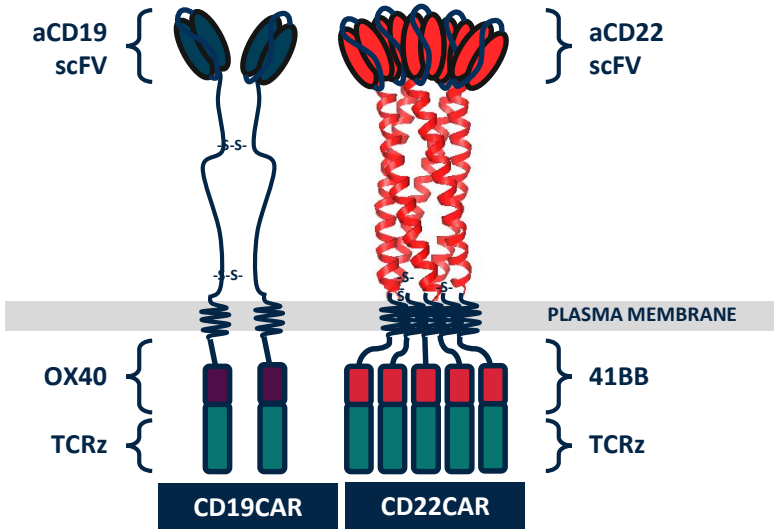
Two approved products (Yescarta® and Kymriah®) and one near to approval (liso-cel)

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

Autolus

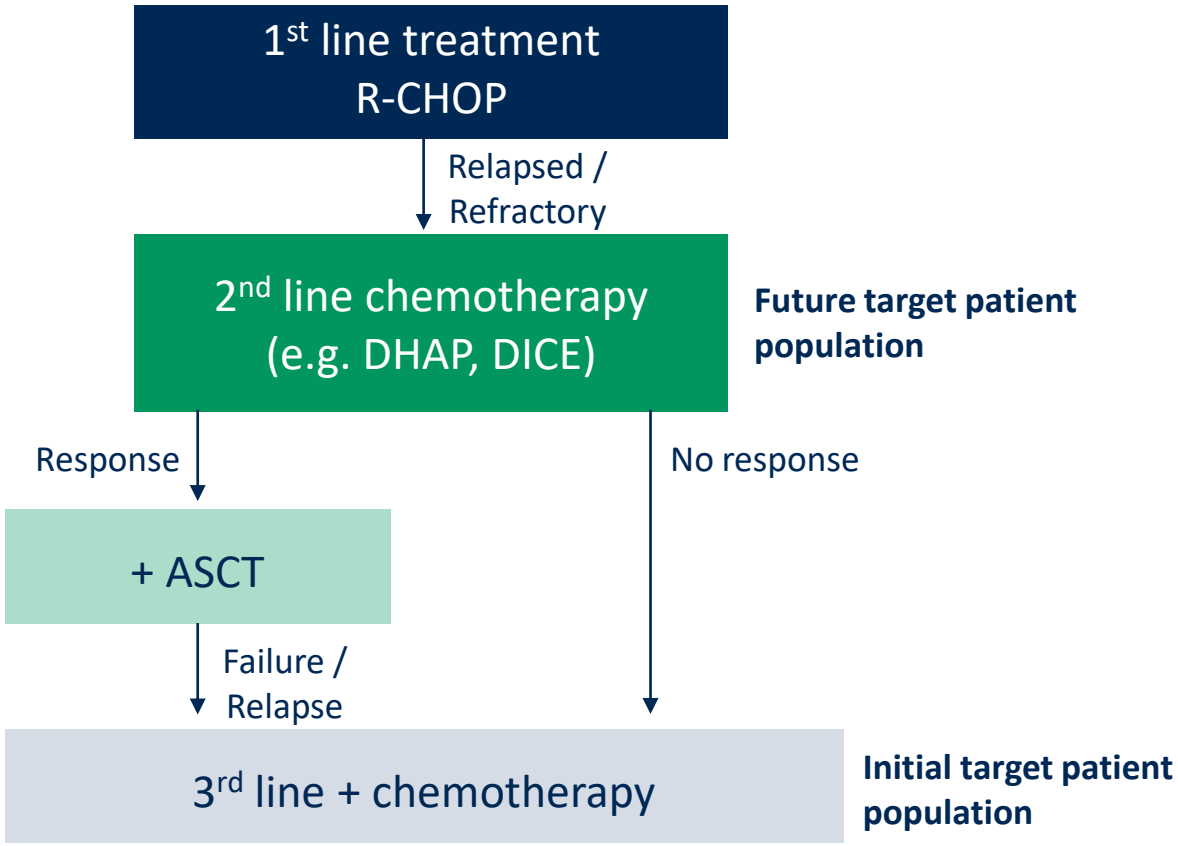
DLBCL is a large commercial opportunity

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

*SEER estimates

AUTO3 initially positioned in the 3rd line r/r DLBCL setting



In the 3rd line + relapsed setting there are multiple opportunities

- CAR T therapy
- Polatuzumab + Bendamustine and rituximab (BR)
- Selinexor

In 3rd line only CAR T therapies have curative potential

Autolus

Data Review

Dr. Robert Chen

Executive Director, AUTO3 Program Lead

VIRTUAL 2020 ESMO congress

Phase I Alexander study of AUTO3, the first CD19/22 dual targeting CAR T cell therapy, with pembrolizumab in patients with r/r DLBCL

Eleni Tholouli[1], Kirit Ardeshna[2], Aravind Ramakrishnan[3], Connie Batlevi[4], Maria Marzolini[2], Wendy Osborne[5], Carlos Bachier[6], Peter McSweeney[7], Elizabeth Budde[8], Nancy L. Bartlett[9], Yiyun Zhang[10], Muhammad Al-Hajj[10], Martin Pule[10], Simon Thomas[10], Maud Jonnaert[10], Vijay Peddareddigari[10], Nushmia Khokhar[10], Robert Chen[10], Lazaros Lekakis[11].

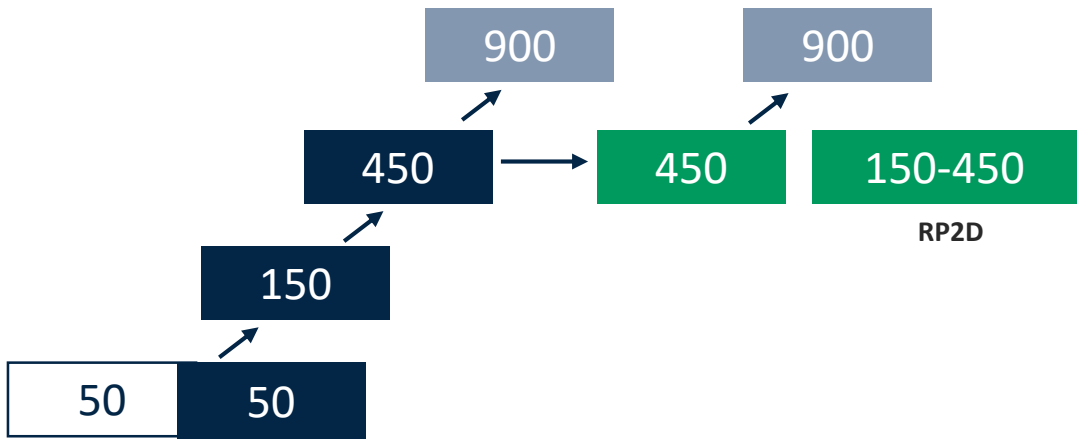
[1]Department of Haematology, Manchester Royal Infirmary, Manchester, UK; [2]Department of Haematology, University College London Hospitals NHS Foundation Trust, London, UK; [3]Sarah Cannon Blood Cancer Center at St. David's South Austin Medical Center, Austin, TX; [4]Memorial Sloan Kettering Cancer Center, New York, NY; [5]Department of Haematology, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; [6]Texas Transplant Institute, Nashville, TN; [7]Colorado Blood Cancer Institute at Presbyterian/St. Luke's Medical Center, Denver, CO; [8]T Cell Therapeutics Research Laboratory, Department of Hematology and Hematopoietic Cell Transplantation, City of Hope National Medical Center, Duarte, CA; [9]Washington University School of Medicine Siteman Cancer Center, St. Louis, MO; [10]Autolus Therapeutics, London, UK; [11]Sylvester Comprehensive Cancer Center, University of Miami Miller School of Medicine, Miami, FL

Alexander Study Design

AUTO3-DB1, Single-Arm, Open-Label, Multi-Center, Phase 1/2 Study

Phase I

Dose Escalation Cohort
n = 30



Dose in x10^6 CD19/CD22 CAR T Cells

Preconditioning: Flu/Cy	Flu/Cy + Pembro day 14 x 3 doses	Flu/Cy + Pembro day -1 x 1 dose

Outpatient Cohort
n = 20

@RP2D

Phase II

Efficacy Cohort

Cohort 1

DLBCL NOS, high grade B cell lymphoma, tDLBCL from FL, > 2 prior lines

Cohort 2

Primary mediastinal, tDLBCL from other iNHL, > 2 prior lines

Alexander, Phase I/II Study with AUTO3 in DLBCL

Key eligibility criteria

Inclusion criteria

- ≥ 18 years
- Chemotherapy-refractory disease, or relapse after at least two lines of therapy, or after ASCT
- DLBCL not otherwise specified (NOS), and DLBCL with MYC and BCL2 and/or BCL6 rearrangements (double/triple hit)
- Transformed DLBCL from follicular lymphoma
- Transformed DLBCL from other indolent lymphomas (excluding Richter's transformation)
- High-grade B cell lymphoma with MYC expression (excluding Burkitt's lymphoma)
- Primary mediastinal large B cell lymphoma

Exclusion criteria

- Pre-existing significant neurological disorder
- Prior allogenic haematopoietic stem cell transplant
- Prior CD19 or CD22 targeted therapy
- Contraindication to receiving pembrolizumab

Patient Characteristics - All Patients

Baseline Patient Characteristics		N=35
Age, median (min-max)		59 (28-83)
Gender, n	Male, Female	23, 12
Current Histology, n	**DLBCL** - GCB - Non-GCB **tDLBCL** - FL - MZL **High Grade B Cell Lymphoma**	**25** 17 8 **8** 7 1 **2**
Disease Stage, n	II III IV Unknown	3 9 22 1
Relapsed/Refractory, n	Refractory Relapsed Relapsed and Refractory	7 9 19
IPI, n	Low risk Low-intermediate risk High-intermediate risk High risk Unknown	4 6 10 4 11
No. Prior Therapies, median (min-max)		3 (1-10)
Prior ASCT, n		8
SPD, median (min-max)		19.31 cm (2.1 – 260.84)

No Severe Cytokine Release Syndrome (CRS) – All Patients

	50 x10^6 AUTO3 no pem (N=4)	50 x10^6 AUTO3 D14 pem (N=3)	150-450 x10^6 AUTO3 D14 pem (N=8)	150-450 x 10^6 AUTO3 D-1 pem RP2D (N=20)	Total (N=35)
Grade 1 CRS	1	0	2	5	8 (22.9%)
Grade 2 CRS	0	0	2	2	4 (11.4%)
≥ Grade 3 CRS	0	0*	0	0	0 (0%)

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

- No prophylactic measures of any kind
- Median time to CRS 6 days (1-36), median duration of CRS 3 days (1-19)
- No Grade 3 or higher CRS* with primary infusion
- 5 patients (14%) received tocilizumab for CRS

Autolus

*CRS grading as ASCT/ASBMT (Lee et al 2019)
3 August 2020, Data cut

Alexander

Low Rates of Neurotoxicity (NT) – All Patients

	50 x10^6 AUTO3 no pem (N=4)	50 x10^6 AUTO3 D14 pem (N=3)	150-450 x10^6 AUTO3 D14 pem (N=8)	150-450 x 10^6 AUTO3 D-1 pem RP2D (N=20)	Total (N=35)
≥ Grade 3 NT	1	0	0	1	2 (5.7%)
Total NT	1	0	0	2	3 (8.6%)

- No prophylactic measures of any kind
- No NT of any grade in patients that achieved CR (these patients had robust CAR T expansion)
- All NT atypical in context of tumour progression with zero to minimal CAR T expansion in peripheral blood
  - NT (G3): Facial/muscle weakness, onset day 53. Similar symptoms occurred > 10 years ago without specific diagnosis (Resolved)
  - NT (G2): Altered mental status associated with sepsis and narcotic (Resolved)
  - NT (G4): Encephalopathy associated with sepsis, hyponatremia overcorrection to hypernatremia, metabolic acidosis, and multiorgan failure (Patient died due to disease progression and multiorgan failure)

Encouraging Complete Response Rate (CRR) - Completed Cohorts Only

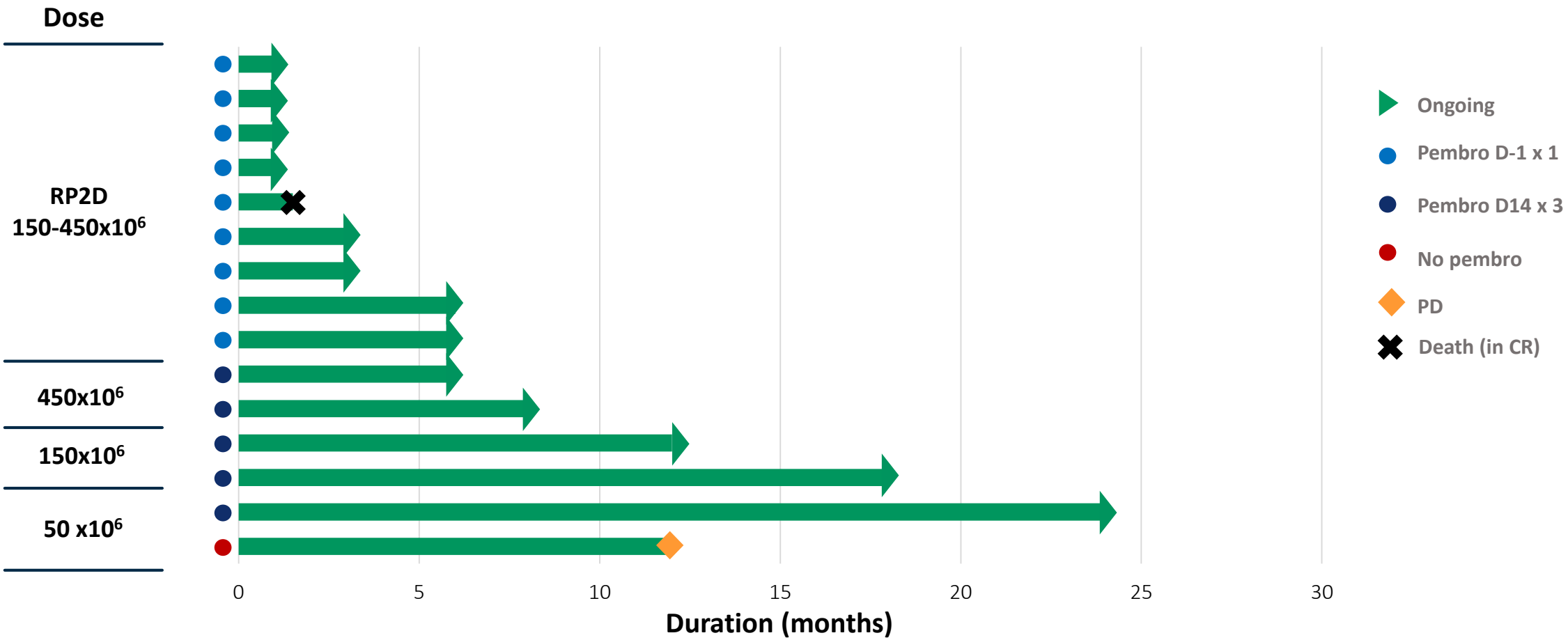
	50 x10^6 AUTO3 no pem (N=4)	50 x10^6 AUTO3 D14 pem (N=3)	150-450 x10^6 AUTO3 D14 pem (N=8)	150-450 x 10^6 AUTO3 D-1 pem RP2D (N=20)	Total (N=30)
N evaluable*	4	2	8	14	28
ORR (CR + PR)	2	2	5	10	19
CR	1	1	4	9	15
PR	1	1	1	1	4
PD	2	0	3	4	9

* Evaluable = PET positive disease prior to start of pre-conditioning

- Overall: ORR 68%, CRR 54%
- ≥ 150 x 10^6 CD19/CD22 CAR T cells , Day -1 pem (N=14 evaluable): ORR 71%, CRR 64%

Complete Remissions Appear Durable

14 out 15 (93%) CRs without PD with median follow up of 6 months (range 1-24m)



Dose in x10^6 CD19/CD22 CAR T Cells

Summary

Phase I Cohorts, ALEXANDER Study

- AUTO3 has a tolerable and best-in-class safety profile
  - 0% ≥ Grade 3 CRS with primary infusion
  - 0% neurotoxicity in patients achieving CR with detectable CAR-T cell expansion
  - 6% ≥ Grade 3 (2/35) neurotoxicity
    - All cases of neurotoxicity in setting of disease progression, very minimal / undetectable CAR-T cells in peripheral blood and with confounding factors
    - Patients that achieved complete responses, where robust expansion was observed, no severe CRS or neurotoxicity of any grade was seen
- Completed RP2D cohort (150 - 450 x 10^6 CD19/CD22 CAR T cells with pembrolizumab D-1)
  - ORR 71% and CRR 64% (N=14)
- Complete responses are durable, 14/15 (93%) without progression (median f/u 6 months)
- Outpatient expansion cohort enrolling

Commercial Opportunity

Brent Rice

Vice President, Chief Commercial Officer, US

AUTO3 bicistronic CAR T optimised for best-in-class clinical profile

Product Candidate	AUTO3	Yescarta™	Kymriah™	liso-cel
Manufacturer	**Autolus**	Gilead	Novartis	BMS
Target Antigen	**CD19 & CD22**	CD19	CD19	CD19
Costimulatory Domain	**OX40 & 41BB Humanized**	CD28	41BB	41BB

AUTO3 program designed to address tumor escape mechanisms with a potential best-in-class safety profile#				
PDL-1 Upregulation*	**Yes**	No	No	No
CD19 Antigen Loss	**Yes**	No	No	No
Grade>3 or higher CRS	**No**	Yes	Yes	Yes
All Neurotoxicity**	**9%**	64%	58%	30%

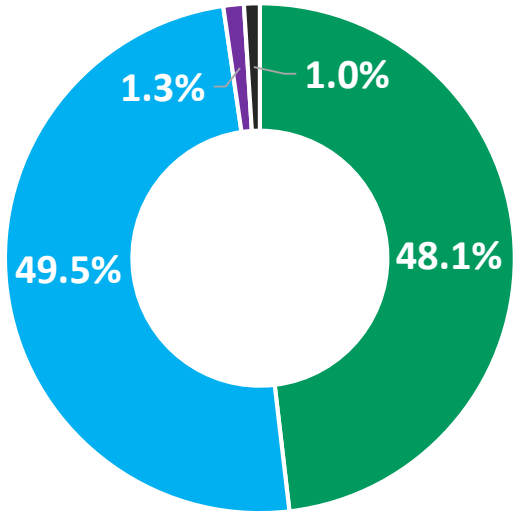
* Pembrolizumab (anti-PD-1 mAb) is part of the recommended Phase 2 dose (RP2D) pre-conditioning regimen. AUTO3NG incorporates the dSHP2 activity enhancing module.
**Kymriah label (https://www.fda.gov/), Neelapu S et al NEJM 2017, Abramson et al., 2019 (ASH)
Check point inhibitor designed to prevent resistance due to PDL-1 upregulation, CAR-T cell exhaustion, Increase in depth and duration of response
Information is not based on head-to-head clinical testing

Autolus

AUTO3 positioned to reach full Medicare opportunity in Part A and B

While c.50% DLBCL patients are covered by Medicare, only 13% of CAR T patients are Medicare

DLBCL Payer Coverage

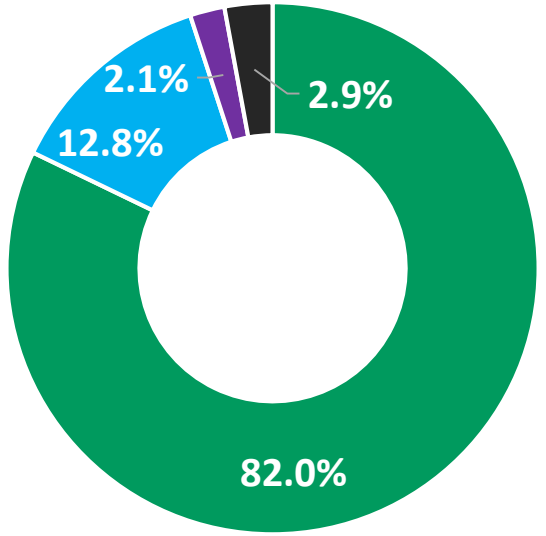


n = 62,074

■ Commercial ■ Medicare ■ Medicare Adv ■ Medicaid

DLBCL patients are split equally in terms of payor coverage with 49.5% being Medicare coverage and 48.1% covered commercially

CAR T Payer Coverage



n = 1,709

■ Commercial ■ Medicare ■ Medicare Adv ■ Medicaid

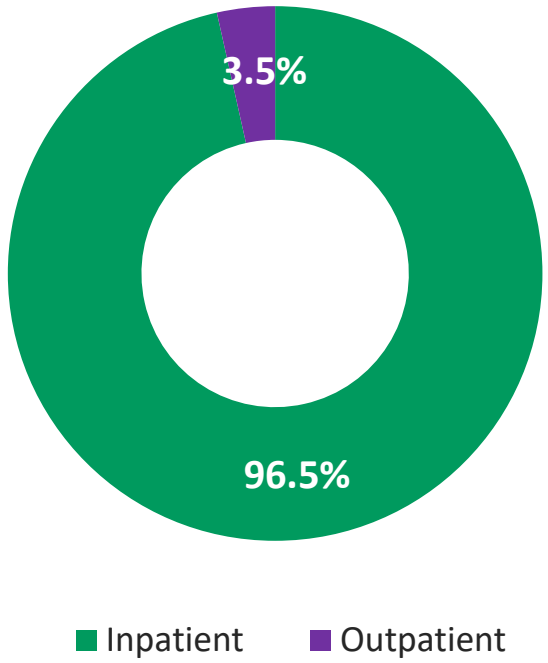
Majority of patients who receive a CAR T are commercially covered (82%)

Autolus

Approved CAR T's are unable to penetrate outpatient setting

Creates significant upside for AUTO3 with potential to go where patients reside

Percentage of patients who currently receive a CAR T in outpatient or inpatient setting



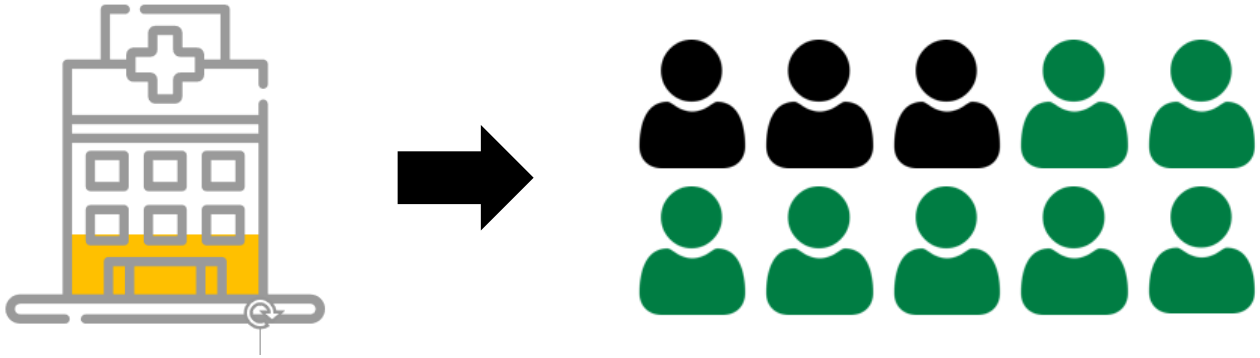
- 97% of patients receive approved CAR Ts as inpatients in CoEs because of the high rate and severity of toxicities and the need for intensive patient management
- 54% of patients required hospitalisation post – treatment when treated with liso-cel*. Reason for hospitalisation was mainly CRS and/or NEs (29%) or other AEs (25%)
- AUTO3 is designed to have best-in-class clinical profile potentially best suited for outpatient use
- AUTO3 stands to democratize use across all settings of care

Autolus

Source: Komodo Health, ASCO 2020: 8037

Current CAR T usage is very localised in a few key centres

AUTO3 is well positioned to grow the current CAR T market by penetrating additional COEs while leveraging additional market expansion opportunities via non-academic hospitals and community clinics



17%
of accredited COEs

70%
of CAR T patients

Autolus

Source: Komodo Health

Expansion cohort is assessing feasibility in outpatient setting

- Purpose of the ALEXANDER expansion cohort is to assess the feasibility of using AUTO3 in an outpatient setting
  - Opportunity to evaluate additional safety and efficacy data with more patients' data
  - Enables centers to broaden their experience with AUTO3 and gain confidence in use as an outpatient therapy
  - Drive early adopters in a potential pivotal study, planned to start H1 2021
  - Allows us to build an understanding of healthcare resource utilization, facilitating the design of a pivotal study
  - Enables early exploratory metrics to be considered (e.g. readmission rates), which may be relevant to supporting an outpatient profile

Summary and Next Steps

Dr. Christian Itin

Chairman and CEO

AUTO3 appears favorably differentiated to approved CAR T products

- AUTO3 continues to show a high level of clinical activity
  - CRR of 64% at the RP2D
  - Patients achieving a CR without experiencing high grade CRS or NT of any grade

- Complete remissions appear durable
  - Among all dose cohorts, 93% of patients who achieved a CR did not have a relapse (median f/u six months)
  - Most relapses with other products occur by 3-6 months

- Overall, favorable adverse event profile
  - No severe CRS with primary infusion
  - Low rates of Neurotoxicity

Multiple clinical data points expected through H2 2020 / 2021

PRODUCT	INDICATION	TARGET	EVENT
AUTO1	Adult ALL	CD19	Ph1 long-term follow up Q4 2020 Pivotal data end of 2021
AUTO1NG	Pediatric ALL	CD19 & CD22	Start Ph1 H2 2020
AUTO3	DLBCL	CD19 & CD22	Ph1 data update H2 2020 (planned for ASH)
AUTO4	TRBC1+ Peripheral TCL	TRBC1	Ph1 interim data H1 2021
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2	Start Ph1 2021
AUTO7	Prostate Cancer	PSMA	Start Ph1 2021
AUTO8	Multiple Myeloma	BCMA & CAR X	Start Ph1 study H1 2021
Undisclosed	Undisclosed	Undisclosed	Start Ph1 Q4 2020

B Cell Malignancies T Cell Lymphoma Solid Tumors Multiple Myeloma Allogeneic Approach

Autolus

Q&A

Dr. Christian Itin (Chairman and CEO)

Andrew Oakley (CFO)

Dr. Nushmia Khokhar (SVP, Head of Clinical Development)

Dr. Robert Chen (Executive Director, AUTO3 Program)

Brent Rice (VP, Chief Commercial Officer, US)

Thank you