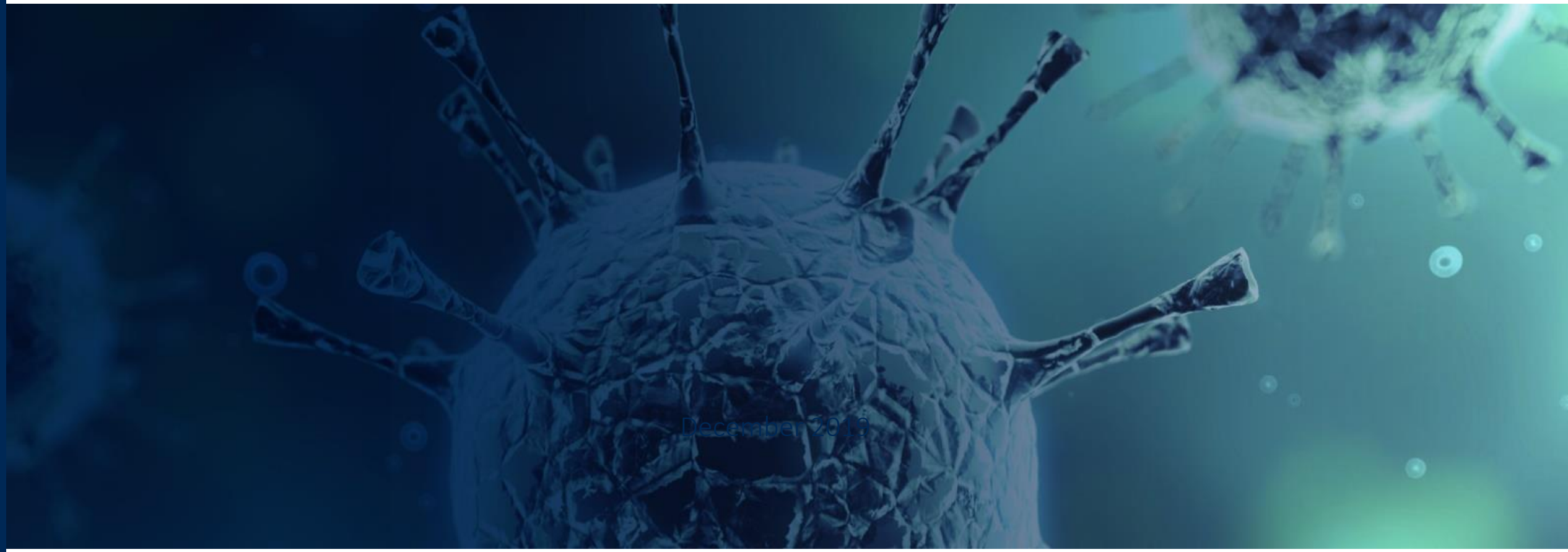
Nasdaq: AUTL



December 2019

AUTO3 Data Update - ASCO 2020

June 2020

Disclaimer

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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, US

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

5. Q&A: Dr. Christian Itin, Andrew Oakley (CFO), Dr. Vijay Reddy (CMO), Dr. Nushmia Khokhar (VP, Clinical Development), Dr. Robert Chen, Brent Rice

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. Vijay Peddareddigari
SVP, CMO
Experienced oncologist and drug developer; MD Anderson, GSK and most recently J&J

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

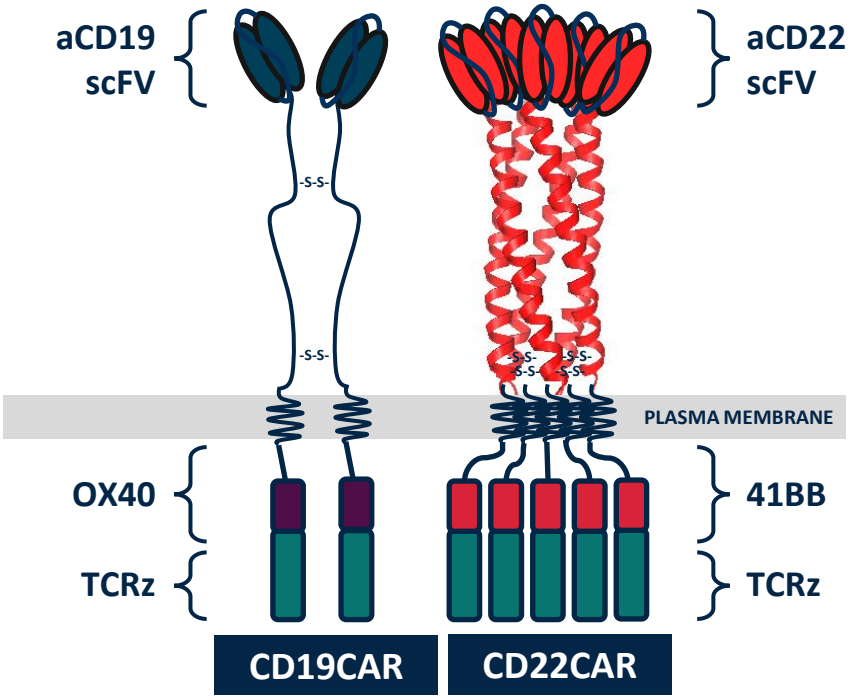
Andrew Oakley
CFO
17+ years experience as public company CFO in bio-pharma sector; more than 10 years at Actelion

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

Improving CAR T cell immunotherapy in DLBCL

AUTO3 - Dual targeting CAR & prevention of early CAR T exhaustion

- CD19 CARs are active in r/r DLBCL
- However 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]
- Simultaneous targeting of CD19 and CD22 may reduce the probability of relapse due to antigen loss
- PD1/PDL1 mediated CAR T cell exhaustion may be prevented 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

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

Data Review

Dr. Robert Chen

Executive Director, AUTO3 Program Lead

Alexander, Phase 1/2 Study with AUTO3 in DLBCL

Key eligibility criteria

Inclusion criteria

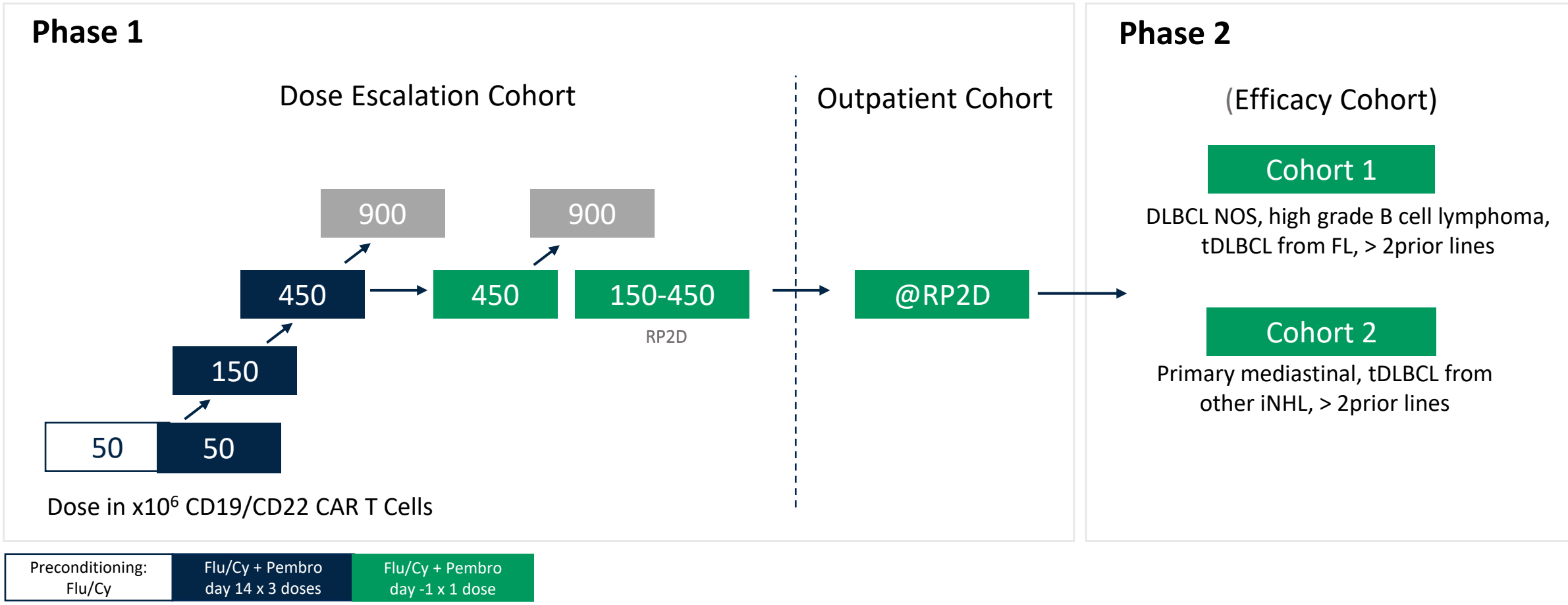
- ≥ 18 years
- Chemotherapy-refractory disease, or relapse after at least two lines of therapy, or after ASCT
- DLBCL not otherwise specified (NOS), and DLBCL with MYC and BCL2 and/or BCL6 rearrangements (double/triple hit)
- Transformed DLBCL from follicular lymphoma
- Transformed DLBCL from other indolent 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 (pembro)

Alexander study design

AUTO3-DB1, single-arm, open-label, multi-center, Phase 1/2 Study



Patient characteristics

Baseline Patient Characteristics		N=23
Age, median (min-max)		57 (28-83)
Gender, N	Male, Female	14, 9
Current Histology, N	DLBCL tDLBCL	17 (74%) 6 (26%)
Disease Stage, N	II III IV	2 5 16
Relapsed/Refractory, N	Refractory Relapsed Relapsed and Refractory	5 3 15
IPI, N	0-1 2 3-4	4 7 12
No. Prior Therapies, median (min-max)		3 (2-10)
Prior ASCT, N		4
SPD, median (min-max)		22.3 cm (2.08 – 260.84)

Autolus

Cytokine Release Syndrome (CRS)

No grade 3 or higher CRS at ≥ 150 x10^6 cell dose

	50 x10^6 AUTO3 no pembro (N=4)	50 x10^6 AUTO3 D14 pembro (N=3)	150 x10^6 AUTO3 D14 pembro (N=4)	450 x10^6 AUTO3 D14 pembro (N=4)	450 x10^6 AUTO3 D -1 pembro (N=4#)	150-450 x 10^6 AUTO3 D-1 pembro RP2D (N=4)	Total (N=23)
Grade 1 CRS	1	0	1	1	2	1	6 (26%)
Grade 2 CRS	0	0	1	1	0	1	3 (13%)
≥ Grade 3 CRS	0	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 without CAR T expansion and with significant disease burden in lung that had been treated with radiation

Includes one patient that received only 125 x 10^6

- No prophylactic measures of any kind
- No grade 3 or higher CRS* with primary infusion
- Median time to CRS is 7 days (1-36), median duration of CRS is 5 days (1-19)
- 4 patients (17%) received tocilizumab for CRS

Neurotoxicity

No neurotoxicity (NT) of any grade at ≥ 150 x10^6 cell dose

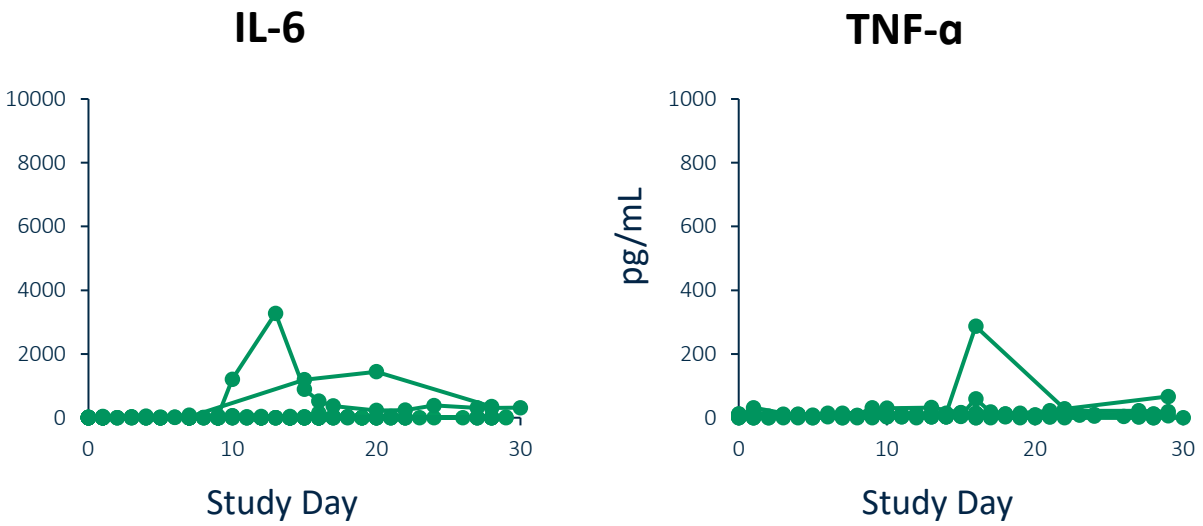
	50 x10^6 AUTO3 no pembro (N=4)	50 x10^6 AUTO3 D14 pembro (N=3)	150 x10^6 AUTO3 D14 pembro (N=4)	450 x10^6 AUTO3 D14 pembro (N=4)	450 x10^6 AUTO3 D -1 pembro (N=4#)	150-450 x 10^6 AUTO3 D-1 pembro RP2D (N=4)	Total (N=23)
All grades NT	1	0	0	0	0	0	1 (4%)
≥ Grade 3 NT	1	0	0	0	0	0	1 (4%)

Includes one patient that received only 125 x 10^6

- No prophylactic measures of any kind
- No neurotoxicity of any grade in AUTO3 + pembro
- Only 1 case of neurotoxicity (Grade 3) at lowest dose level which resolved quickly with steroids
  - No CAR T expansion was seen at any time. Grade 3 NT occurred on day 53. Symptoms improved in 3 days. The same symptoms of facial/muscle weakness occurred > 10 years ago without specific diagnosis.

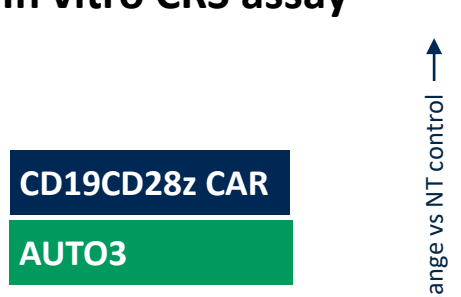
Low *in-vitro* and *in-vivo* cytokines consistent with low grade CRS

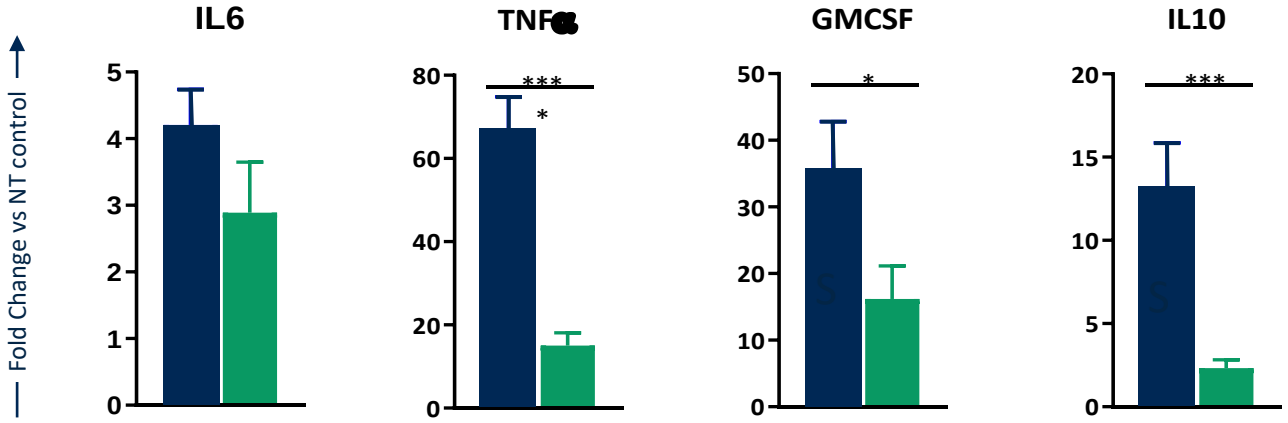
Clinical



CAR T Product	CRS Grade 0-2 Median IL-6 level pg/ml	CRS Grade ≥3 Median IL-6 level pg/ml
AUTO3	16.55 (0 – 3275)	NA
Yescarta®	49.4 (3.5, 12109.7)	713.9 (152.5- 50705)

In vitro CRS assay





CRS-associated cytokines were produced at multi-fold higher levels by CD19CD28z CAR* versus AUTO3 in a transwell/ macrophages in vitro CRS model (Norelli et al 2018)

* CD19CD28z CAR is an FMC63 based CAR similar to Yescarta®

Autolus

Preliminary efficacy indicative of high level of activity

Dose level ≥ 150 x 10^6 cells with day -1 pembro selected as Phase 2 dosing regimen (RP2D)

	50 x 10^6 No pembro (N=4)	50 x 10^6 D14 pembro (N=3)	150 x 10^6 D14 pembro (N=4)	450 x 10^6 D14 pembro (N=4)	450 x 10^6 D-1 pembro (N=4)	150-450 x 10^6 D-1 pembro RP2D (N=4)
CR	1	1	2	2	2	3
PR	1	1	0	1	0	1
PD	2	0	2	1	2**	0
NE	0	1*	0	0	0	0

- All Dose Levels (N=23): ORR 65%, CRR 48%
  - ≥ 150 x 10^6 (N=16): ORR 69%, CRR 56%
  - ≥ 150 x 10^6, Day -1 pembro (N=8): ORR 75%, CRR 63%

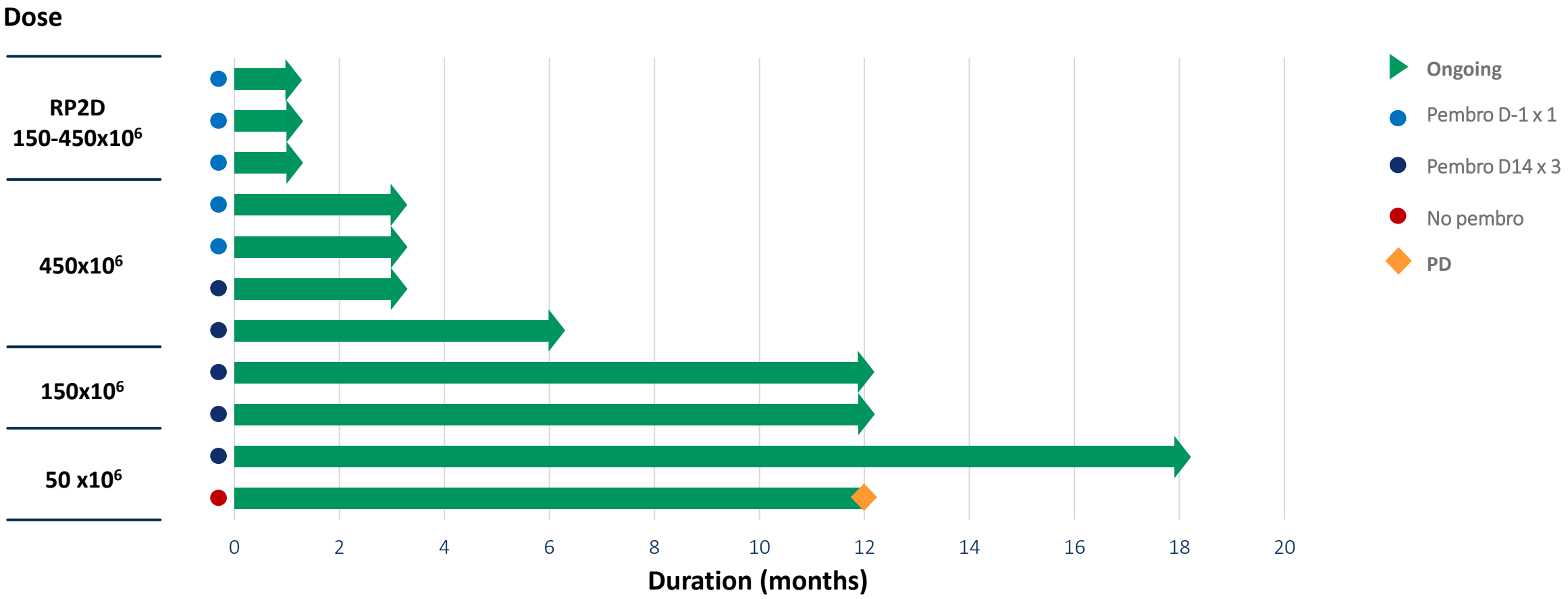
* NE because baseline PET negative disease,
** Includes one patient that received only 125 x 10^6 and NE per protocol

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

Encouraging signs of durable complete responses

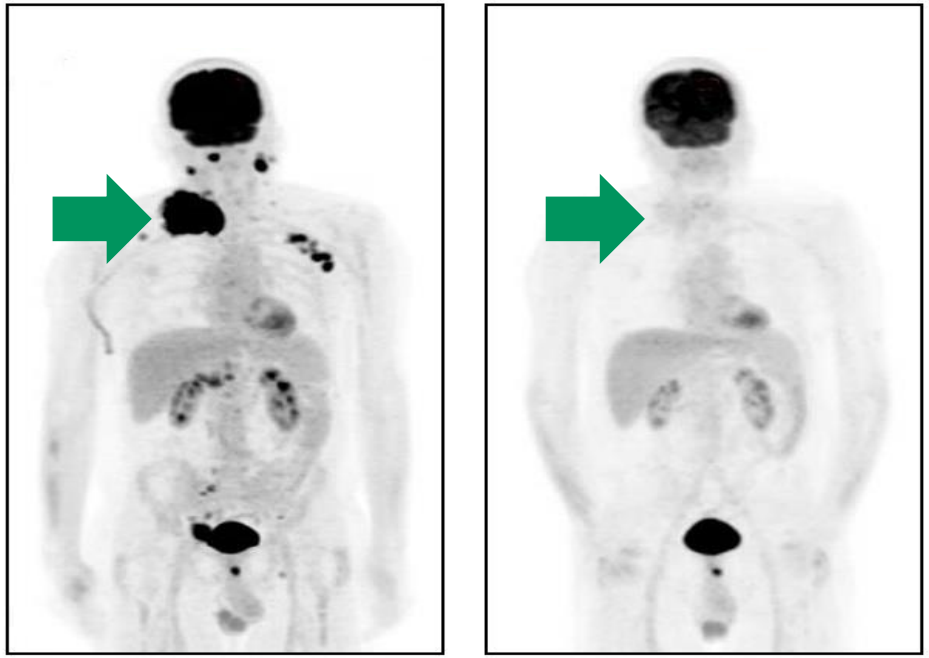
10 of 11 complete responses ongoing



At ≥ 150 x 10^6 dose, all complete responses are ongoing with a median follow up 3 months (range 1-12m)

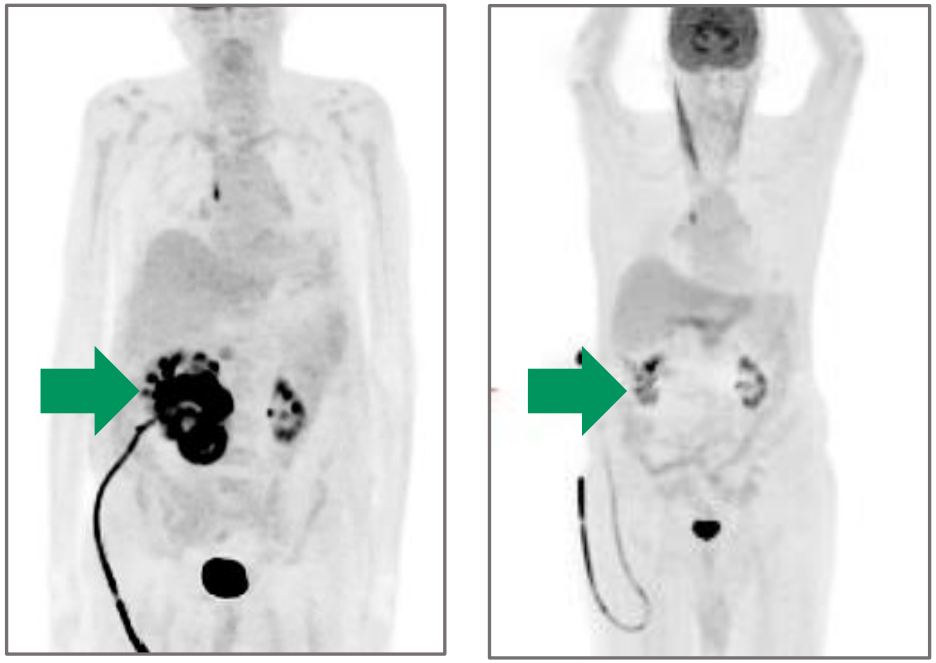
Complete responses seen in bulky tumors without sCRS or NT

Pre AUTO3 **Post AUTO3 Day 28**



60 yo male, Refractory DLBCL NOS, Bulky
Refractory to RCHOP/RICE/RESHAP
Dose: 50 x 10^6 D14 pembro
No CRS or NT
CR duration 18 months+

Pre AUTO3 **Post AUTO3 Day 28**



83 yo male, Refractory DLBCL NOS, Bulky: SPD 125 cm^2
Refractory to RCHOP, RDHAX, Polatuzumab + R
Bendamustine
Dose 450 x 10^6 D-1 pembro
Grade 2 CRS, no NT

Autolus

Updated Alexander data suggests unique clinical profile

- AUTO3 product was successfully manufactured for all patients
- Tolerable safety profile, 0% ≥ Grade 3 CRS and 4% (1/23) Grade 3 neurotox with primary infusion
  - No neurotoxicity of any grade in patients treated ≥ 150 x 10^6 cells
- RP2D range of 150 - 450 x 10^6 cell dose with pembro D-1 selected
  - CRR ≥ 150 x 10^6 with D-1 pembro is 63% (N=8)
- Complete responses achieved with minimal management of patients
- Complete responses are durable, 10/11 ongoing (median f/u 3 months)
- Outpatient expansion cohort is enrolling

Commercial Opportunity

Brent Rice

Vice President, Chief Commercial Officer, US

Full outpatient opportunity unlikely to be realized with current CAR Ts

- Real-world Medicare claims data for adults with lymphoma who received CAR T-cell therapy from 2017 to 2018 suggests median length of hospital stay is 17 days. Median time in the intensive care unit (ICU) is 13 days, nearly 50% of patients require an ICU stay*
- Outpatient treatment with liso-cel in r/r DLBCL resulted in 57% of patients requiring hospitalisation post-treatment with a median time to hospitalization of 5.5 days**
- Aggressive steroid management to reduce toxicity may have a negative impact on efficacy***

Autolus

* Real-World Healthcare Utilization and Costs Support Broader Use of CAR T-Cell Therapy, February 2020, Vol 11, No 1 | Payers' Perspectives In Oncology | Including ASH 2019 Highlights
Source: ASCO Abstracts; **8037 , ***8011,

AUTO3 is designed for potential best-in-class efficacy and safety

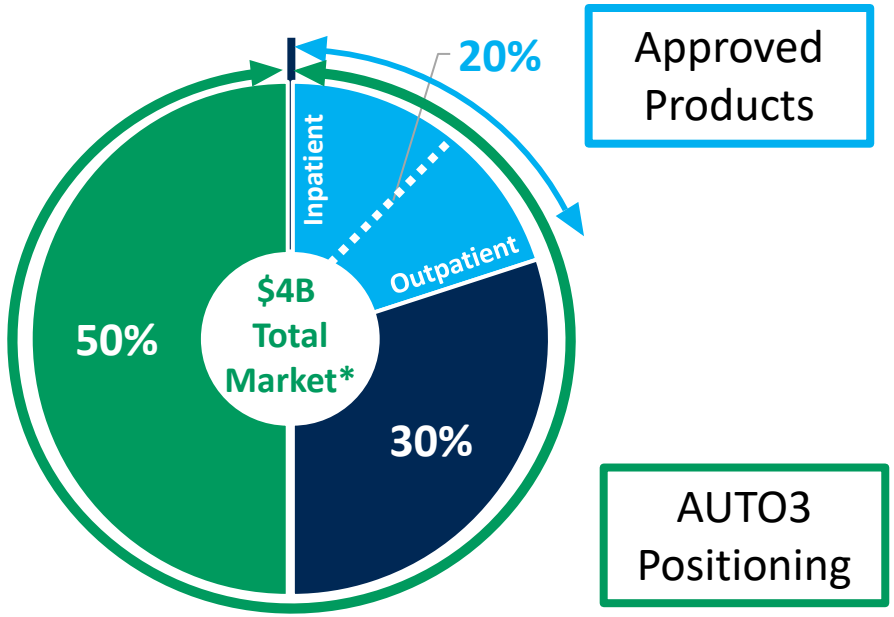
Differentiated product profile expected to open access to full market opportunity

- First-in-class CD19 & CD22 CAR with novel signaling domains, design & manufacturing process
- Designed to provide best-in-class efficacy with high rates of durable complete responses
- Potential for best-in-class safety with no need for intensive patient management
- Highly differentiated clinical profile with potential for true outpatient treatment across all settings of care
- Outpatient cohort initiated with potential to move to a pivotal study early 2021
- AUTO3 has the potential to reach patients without the need for referrals to academic centers

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: US Retrospective Claims Analysis by Site of Distribution
*Autolus approximate estimates

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

- Minimal toxicity management of AUTO3 should allow treatment across all settings of care
- AUTO3 potentially grows the addressable market and maximizes reimbursement options compared to approved products
- >80% of 3L+ and 2L DLBCL patients treated outside of Academic CoEs

Autolus

Widespread adoption of CAR T products has been limited by toxicities

High rates and severity of toxicities require intensive management and inpatient care

	Yescarta®	Kymriah®/ liso-cel	AUTO3*
Best CRR	54%	40-53%	63%
Ongoing CR rate	36% at 6m	29-35% at 6m	tbd
CRS ≥ grade 3	11%	2-23%	0%
NTX any grade	64%	21-30%	0%
NTX ≥ grade 3	28%	10-12%	0%
Toxicity management	Intensive		Minimal
Healthcare utilization	Inpatient Treatment		Outpatient Positioning

AUTO3 has been designed to minimise loss of CRs with a safety profile suitable for all settings of care including outpatient therapy

*AUTO3: 27 April 2020 Data cut (AUTO3 + Day – 1 Pembro ≥ 150 x10^6)
Nellapu et al, 2017
Schuster et al., 2019
Abramson et al., 2019 (ASH)

Autolus

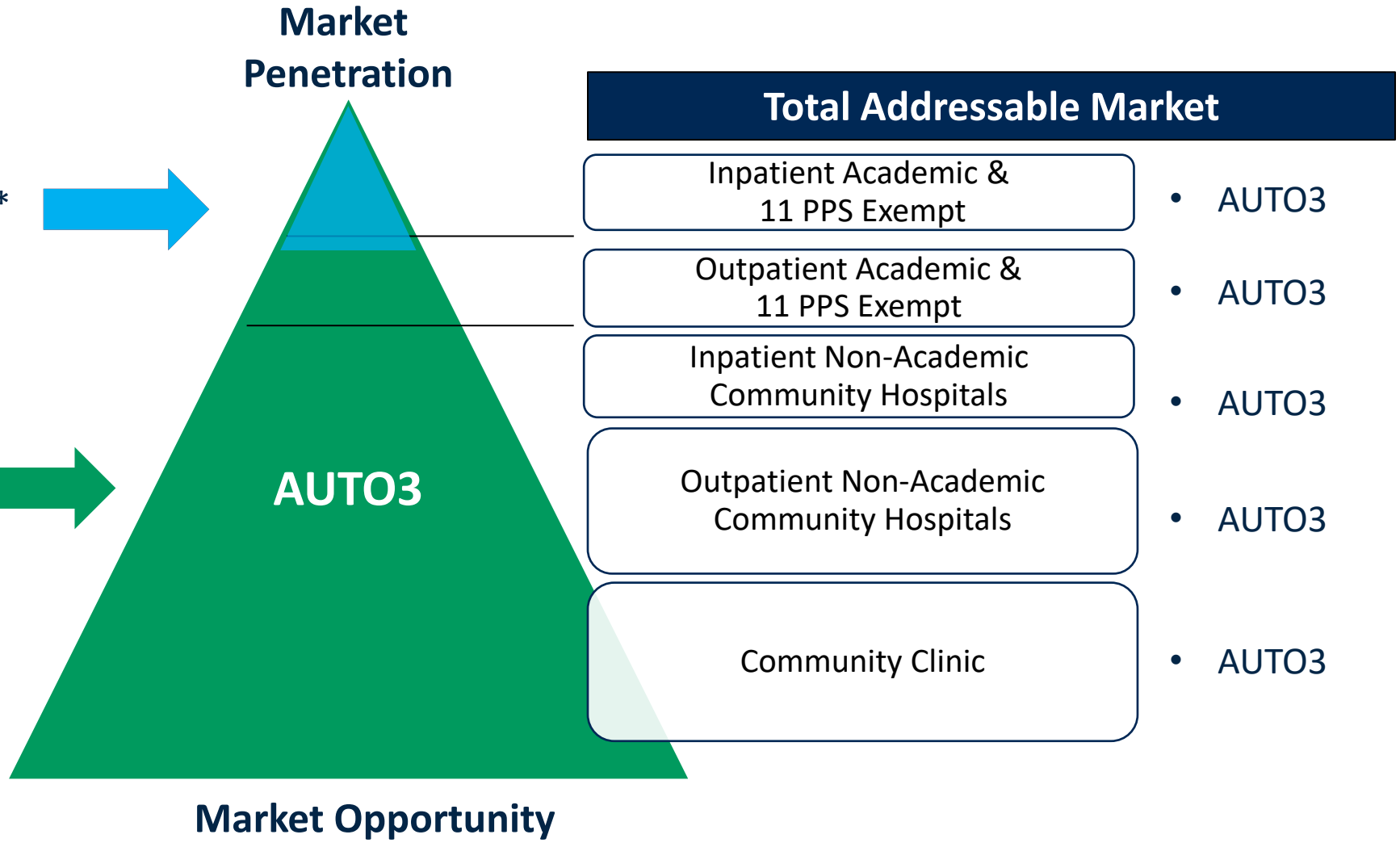
Yescarta® & Kymriah® utilization capped in Academic COEs

AUTO3 democratizes use across all settings of care

Yescarta® and Kymriah® Medicare utilization:

- 42% in 7 PPS Exempt COEs*
- 58% in 52 PPS Hospitals*

Greatest and untapped market opportunity



*Medicare SAF Oct 2018 – June 30, 2019

Autolus

AUTO3 positioned to potentially leapfrog competition

Alexander trial to include Academic, Non-Academic and Community Oncology Clinics

- Across all lines of DLBCL the vast majority of patients are treated outside of COEs
- Community Clinics generally choose not to refer 2L patients to COEs
- AUTO3 mitigates referral networks by going where patients are treated
- AUTO3 has potential to reach full addressable 2L and 3L+ patient opportunity
- AUTO3 product attributes and flexible reimbursement poised to be best-in-class

Summary and Next Steps

Dr. Christian Itin

Chairman and CEO

Autolus poised for value inflection in 2020

- AUTO1
  - Initiating recruitment for UK & US in Autolus' first pivotal program in Adult ALL in Q2 2020
  - Granted orphan drug designation by the FDA for treatment of ALL
  - Pediatric ALL – moving forward with AUTO1/AUTO1NG
- AUTO3
  - Outpatient treatment cohort started in Q2 2020
  - Confirmation of transition to pivotal stage in Q3 2020
  - Pivotal study could start early 2021
- Additional value inflection in 2020 from our preclinical solid tumor and hem-onc programs
- Key data releases expected at upcoming medical conferences
- Strong balance sheet with $243.3m in cash as of March 31, 2020

Multiple clinical data points expected through 2020

Product	Indication	Target	Event
B Cell Malignancies			
AUTO1	Adult ALL	CD19	• Ph1 long-term follow up Q2 & Q4 2020 • Ongoing recruitment and dose last patient H1 2021
AUTO1NG	Pediatric ALL	CD19 & 22	• Start Ph1 H2 2020
AUTO3	DLBCL	CD19 & 22	• Decision on Ph2 Q3 2020 • Full Ph1 data H2 2020
AUTO3NG	DLBCL	CD19 & 22	• Ready to start Ph1 H2 2020, life cycle mgmt
Multiple Myeloma			
AUTO8	Multiple Myeloma	BCMA & CAR X	• Start Ph1 study H2 2020
T Cell Lymphoma			
AUTO4	TRBC1+ Peripheral TCL	TRBC1	• Ph1 interim data H1 2021
GD2+ Tumors			
AUTO6NG	Neuroblastoma; Melanoma; Osteosarcoma; SCLC	GD2	• Start Ph1 H1 2021
Allogeneic Approach			
Undisclosed	Undisclosed	Undisclosed	• Start Ph1 Q4 2020

Q&A

Dr. Christian Itin (Chairman and CEO)

Andrew Oakley (CFO)

Dr. Vijay Reddy (CMO)

Dr. Nushmia Khokhar (VP, Clinical Development)

Dr. Robert Chen (Executive Director, AUTO3 Program)

Brent Rice (VP, Chief Commercial Officer, US)

Thank you