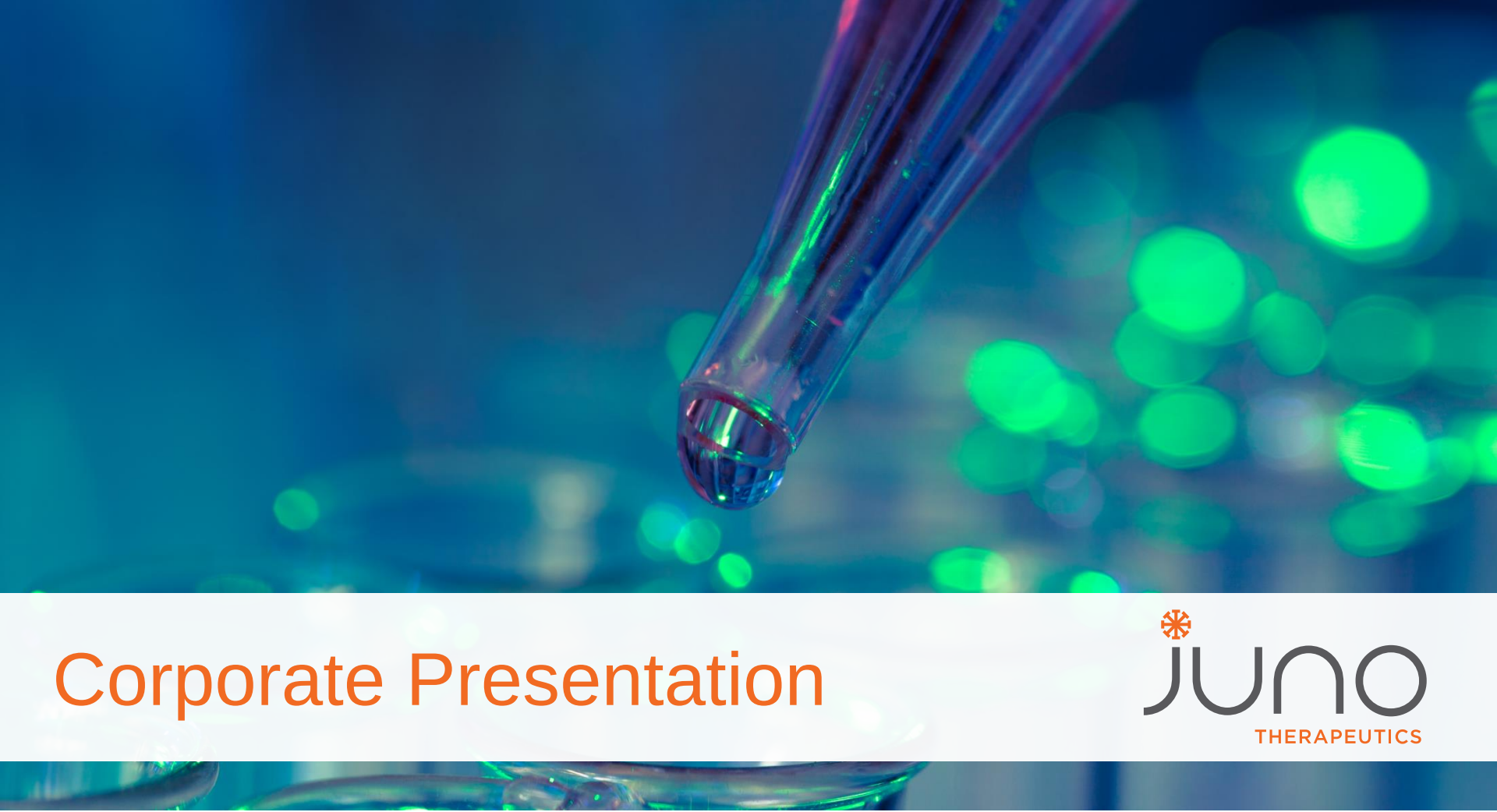

Corporate Presentation

JUNO THERAPEUTICS

Forward-looking Statements, Investigational Status, and Interim Data

This presentation and the accompanying oral commentary contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements involve risks, uncertainties, and assumptions; if the risks or uncertainties ever materialize or the assumptions prove incorrect, our results may differ materially from those expressed or implied by such forward-looking statements. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to, any statements of the plans, strategies, and objectives of management for future operations, including our clinical development, manufacturing and commercialization plans; any projections of financial information; any statements about historical results that may suggest trends for our business; any statements of expectation or belief regarding future events, potential markets or market size, technology developments, our product pipeline, clinical data or the implications thereof, enforceability of our intellectual property rights, competitive strengths or our position within the industry; any statements regarding the anticipated benefits of our Celgene collaboration or other strategic transactions; and any statements of assumptions underlying any of the items mentioned.

These statements are based on estimates and information available to us at the time of this presentation and are not guarantees of future performance. Actual results could differ materially from our current expectations as a result of many risks and uncertainties, including but not limited to, risks associated with: the success, cost, and timing of our product development activities and clinical trials; our ability to obtain regulatory approval for and to commercialize our product candidates; with respect to the timing of JCAR017 approval, the time it takes to complete enrollment of the pivotal cohort, the timing of Juno's FDA submission, and the duration of FDA review; our ability to establish a commercially-viable manufacturing process and manufacturing infrastructure; regulatory requirements and regulatory developments; the effects of competition and technological advances; our dependence on third-party collaborators and other contractors in our research and development activities, including for the conduct of clinical trials and the manufacture of our product candidates; our ability to attract and retain key scientific, quality control/assurance, manufacturing or management personnel; our dependence on Celgene for the development and commercialization outside of North America and China of our CD19 product candidates and any other product candidates for which Celgene exercises an option; our dependence on JW Therapeutics (Shanghai) Co., Ltd, over which Juno does not exercise complete control, for the development and commercialization of product candidates in China; our ability to obtain, maintain, or protect intellectual property rights related to our product candidates; among others. For a further description of the risks and uncertainties that could cause actual results to differ from those expressed in these forward-looking statements, as well as risks relating to our business in general, see the information we have included in our periodic reports and other documents filed with the Securities and Exchange Commission. Except as required by law, we assume no obligation and do not intend to update these forward-looking statements or to conform these statements to actual results or to changes in our expectations.

All of Juno's product candidates are investigational product candidates and their safety and efficacy have not been established. Juno has not obtained marketing approval for any product, and there is no certainty that any marketing approvals will be obtained or as to the timelines on which they will be obtained.

Any data presented pertaining to Juno product candidates is interim data, and may include investigator-reported interim data for which Juno has not yet independently reviewed the source data. The interim data may not be representative of the final results that may be obtained in the corresponding trial, and results from earlier trials may not be representative of results obtained in later trials or pivotal trials.

Building the Leading T Cell Company

- Cell and gene engineering have the potential to change the way we treat serious diseases
  - Juno differentiation: controlling the cell product composition can lead to better patient outcomes
- JCAR017 (Liso-cel) efficacy and tolerability profile supports potential best-in-class profile in NHL
  - Expect BLA filing to be completed in 2H18 for approval as early as 2018
  - Phase I/II trial in CLL, a significant unmet need
  - Trials in earlier lines of therapy, combinations, and additional settings planned for 2018
- Multiple myeloma – a promising new opportunity for the field
  - JCARH125 IND cleared; trial expected to begin this quarter with data later this year
- Solid tumor targets – five in human testing; additional targets in pipeline

Expect Event Rich 2018

Liso-cel

- Pivotal Data for Liso-cel in r/r DLBCL
- Liso-cel FDA filing and potential approval in r/r DLBCL
- Data from the outpatient setting in r/r DLBCL
- Phase I data for Liso-cel in r/r CLL
- Potential initiation of pivotal trial for Liso-cel in r/r CLL
- Data from multiple Liso-cel combination trials

JCARH125

- JCARH125 Phase I data in r/r MM
- Potential initiation of pivotal trial for JCARH125 in r/r MM

Solid Tumors

- Data from multiple Phase I trials for multiple product candidates targeting solid tumors

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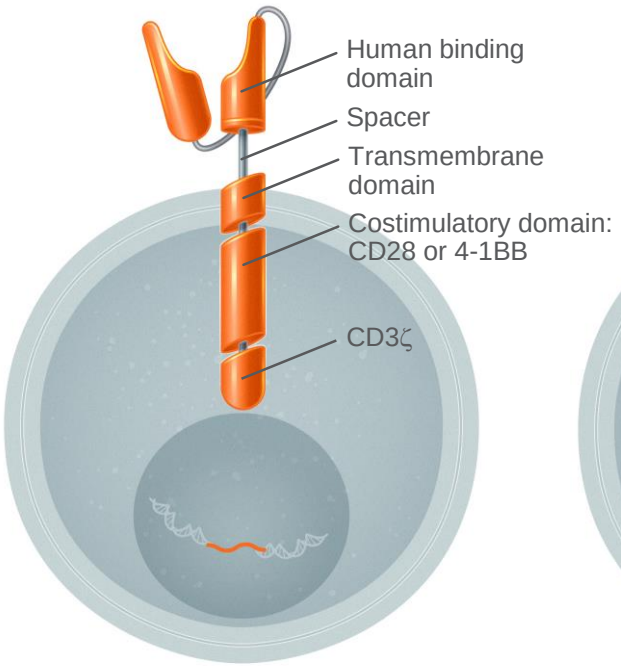
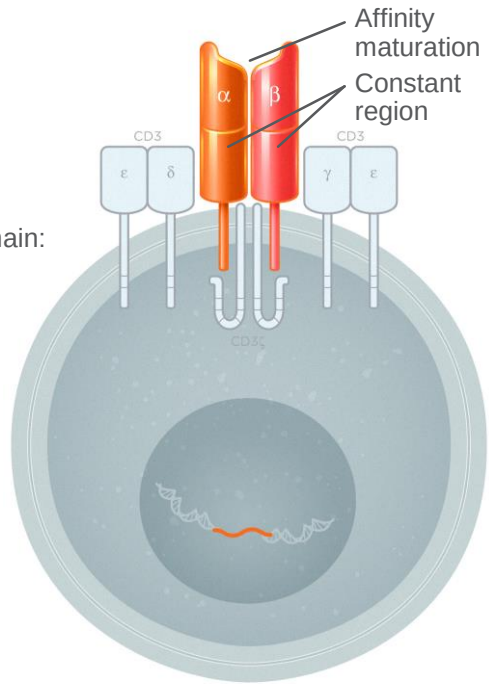
Engineered T cells to Recognize & Attack Cancer Cells

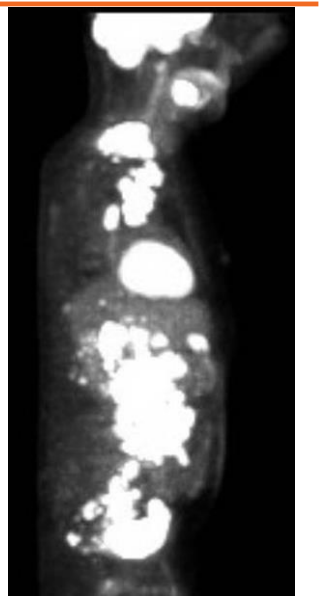
CAR



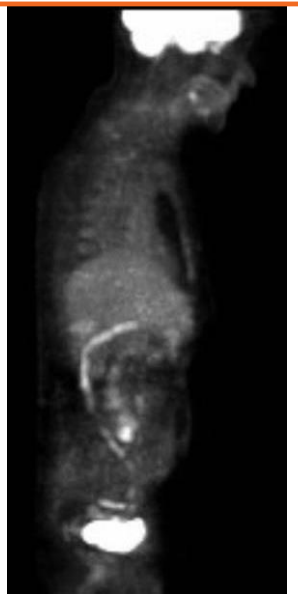
TCR



NHL Patient Before CD19 CAR T Cells



Day 29 After CD19 CAR T Cells



The Type of CAR T Cell Matters

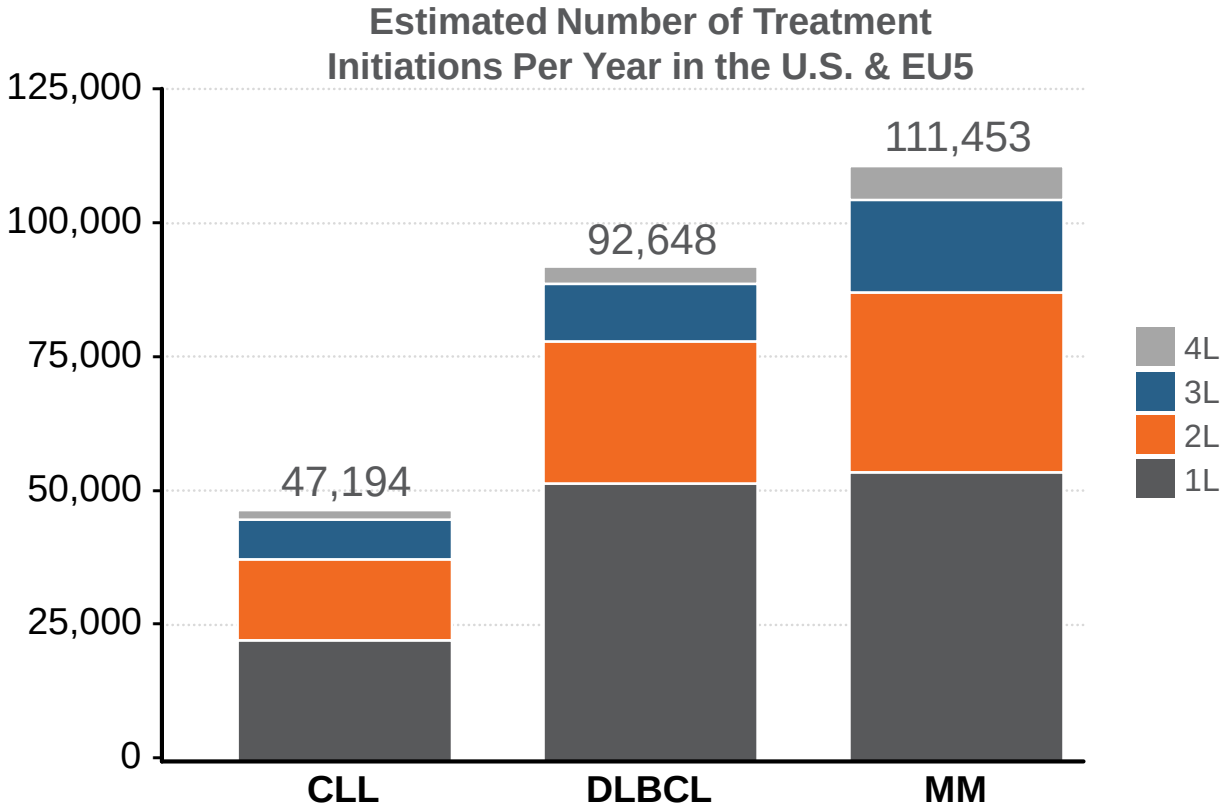
Precise dose, consistent product, and optimization of cell health and cell function

- How is it done
  - Highly controlled manufacturing process and control strategy
  - Drug product characterized for >100 phenotypic, functional, and cell health–related attributes

- What do you get
  - Precise dose of $CD4^+$ and $CD8^+$ CAR T cells
  - Better cell health
  - Control and optimization of phenotypes and in vitro function

Large CD19 & BCMA Commercial Opportunity

~120,000 relapsed/refractory patients in the U.S. and EU5 Combined



Note: Drug-treated populations only for DLBCL, CLL, and MM
Source: Kantar, 12/2016 DLBCL, CLL, and MM

Liso-cel: A Potential Best-in-class Profile in NHL

Liso-cel in DLBCL[1] (NCT02631044)

	CORE Dose Level 2	CORE All Doses
Best ORR	81% (22/27)	80% (52/65)
ORR at 3 months	74% (14/19)	65% (34/52)
CR at 3 months	68% (13/19)	54% (28/52)
CR at 6 months	50% (7/14)	42% (16/38)
Severe Cytokine Release Syndrome	0% (0/29)	1% (1/67)
Severe Neurotoxicity	7% (2/29)	15% (10/67)

(1) Investigator-reported data as-of Oct 9, 2017. Includes fludarabine and cyclophosphamide conditioning regimen. Other treatment-emergent adverse events, whether or not treatment related, occurring in at least 25% of patients included neutropenia, fatigue, thrombocytopenia, constipation, nausea, and anemia

CR = complete response; PR = partial response; ORR = CR + PR.

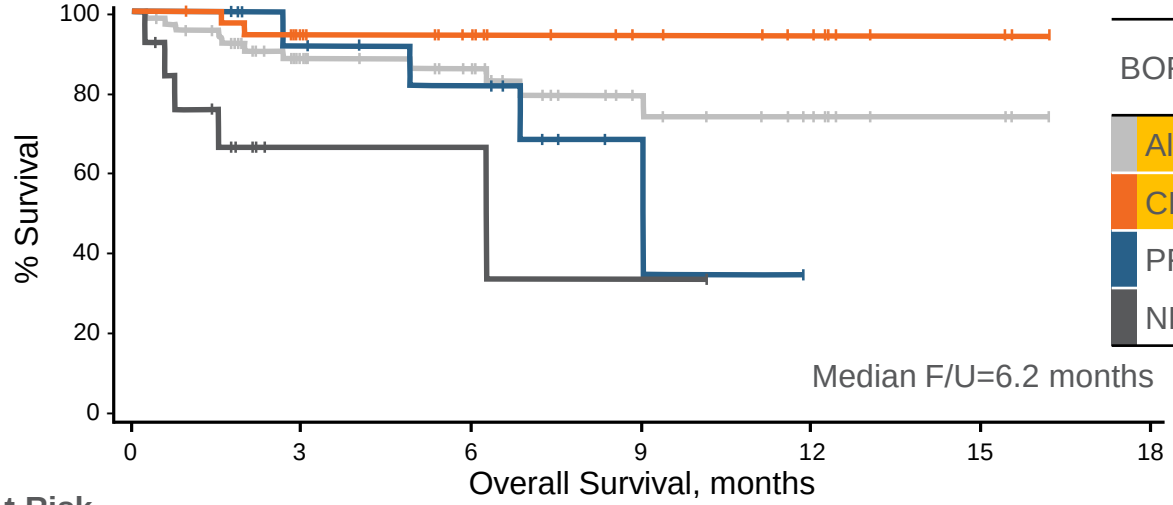
Key Findings

- High rates of responses despite a very poor prognosis
  - CORE: ~90% of patients have at least 1 poor-risk disease feature predictive of short median OS (3-6 months)[a,b]
    - Double/Triple hit, never in CR, never undergone ASCT
- Safety data approaching 100 patients
  - N=91 supporting potential best-in-class tolerability profile[1]
  - Minimal use of tocilizumab (12%) and dexamethasone (16%)
  - 60% of patients did not experience any cytokine release syndrome or any neurotoxicity
- Outpatient experience building
  - ~40% reduction in hospital days
  - 7/8 (88%) remained outpatient for at least 3 days post infusion

[a] Crump et al. *Blood*, 2017.
[b] Van de Neste et al. *Bone Marrow Transplant*, 2016.

CORE: Early Overall Survival (OS) Data are Encouraging

Includes data from dose level 1 and dose level 2



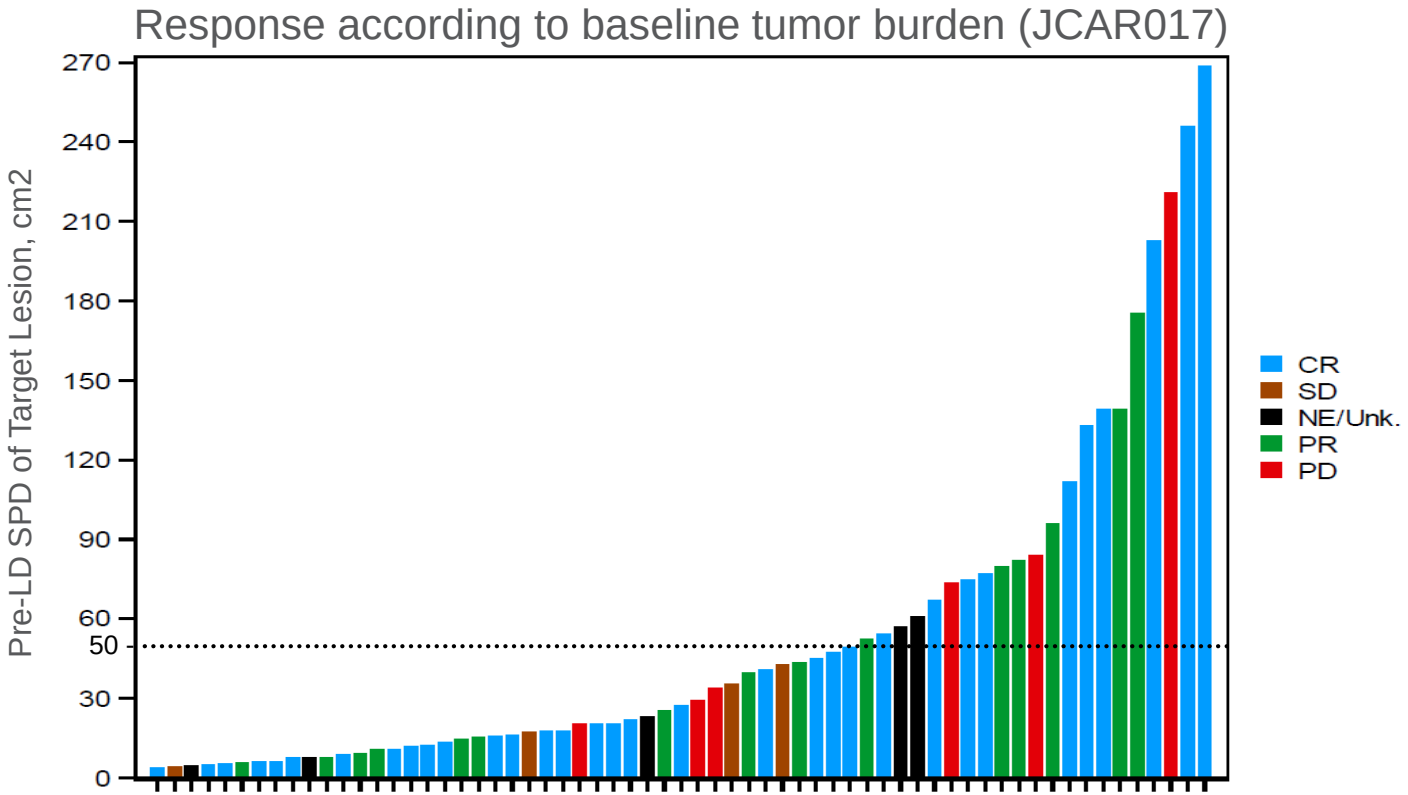
BOR	Median, mos (95% CI)	6-month OS, % (95% CI)
All	NR (NR, NR)	86 (73, 93)
CR	NR (NR, NR)	94 (78, 98)
PR	9.0 (4.9, NR)	81 (44, 95)
NR	6.2 (0.6, NR)	66 (73, 93)

At Risk							
All	65	39	30	15	9	3	0
CR	36	26	20	12	9	3	0
PR	16	11	8	2	0		
Nonresponder	13	2	2	1	0		

Data as of October 9, 2017.
BOR, Best overall response; CR, complete response; PR, partial response; NR, nonresponder.

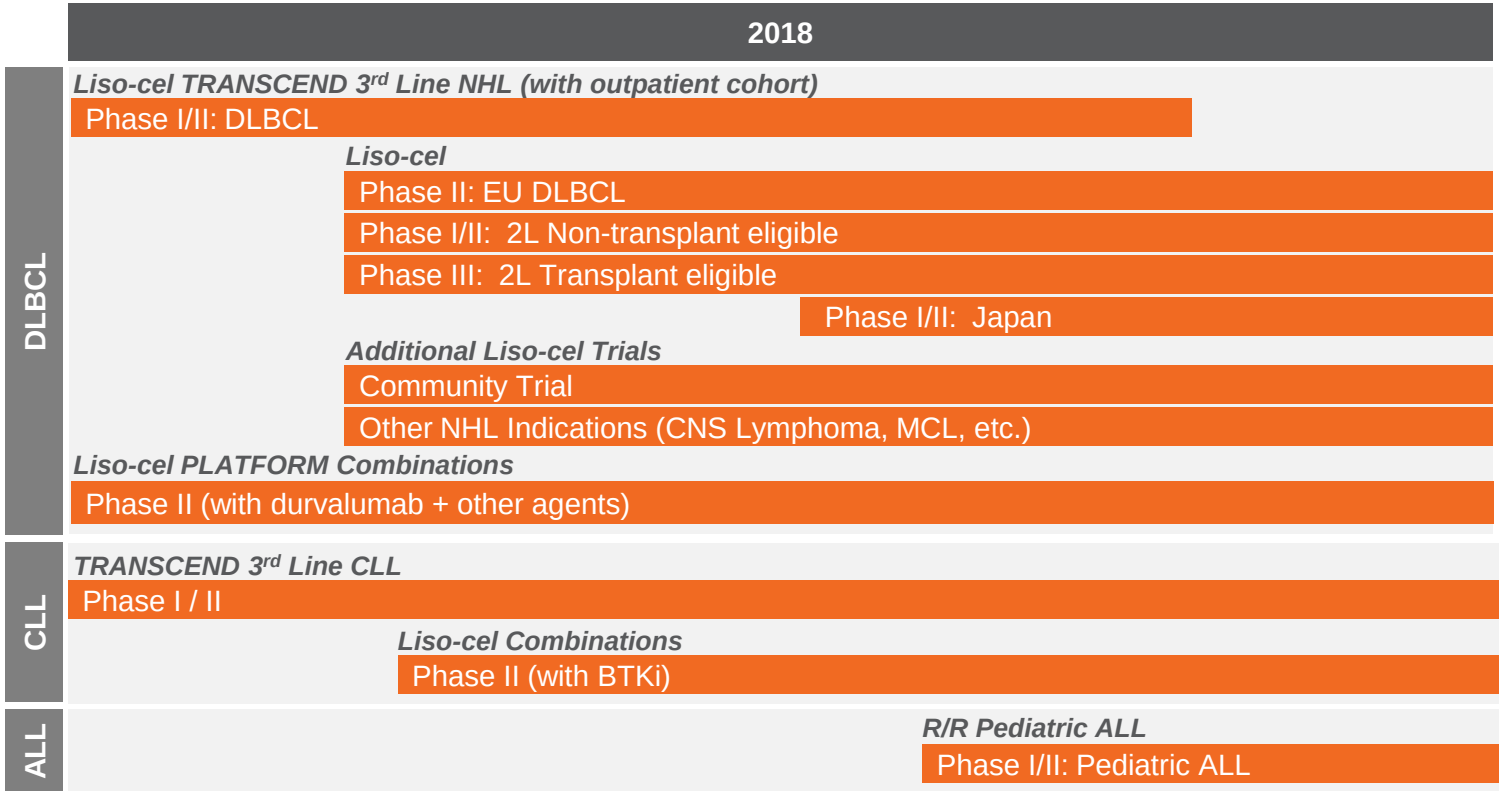
Liso-cel: High Tumor Burden Patients Respond

1/3 of Patients are High Burden

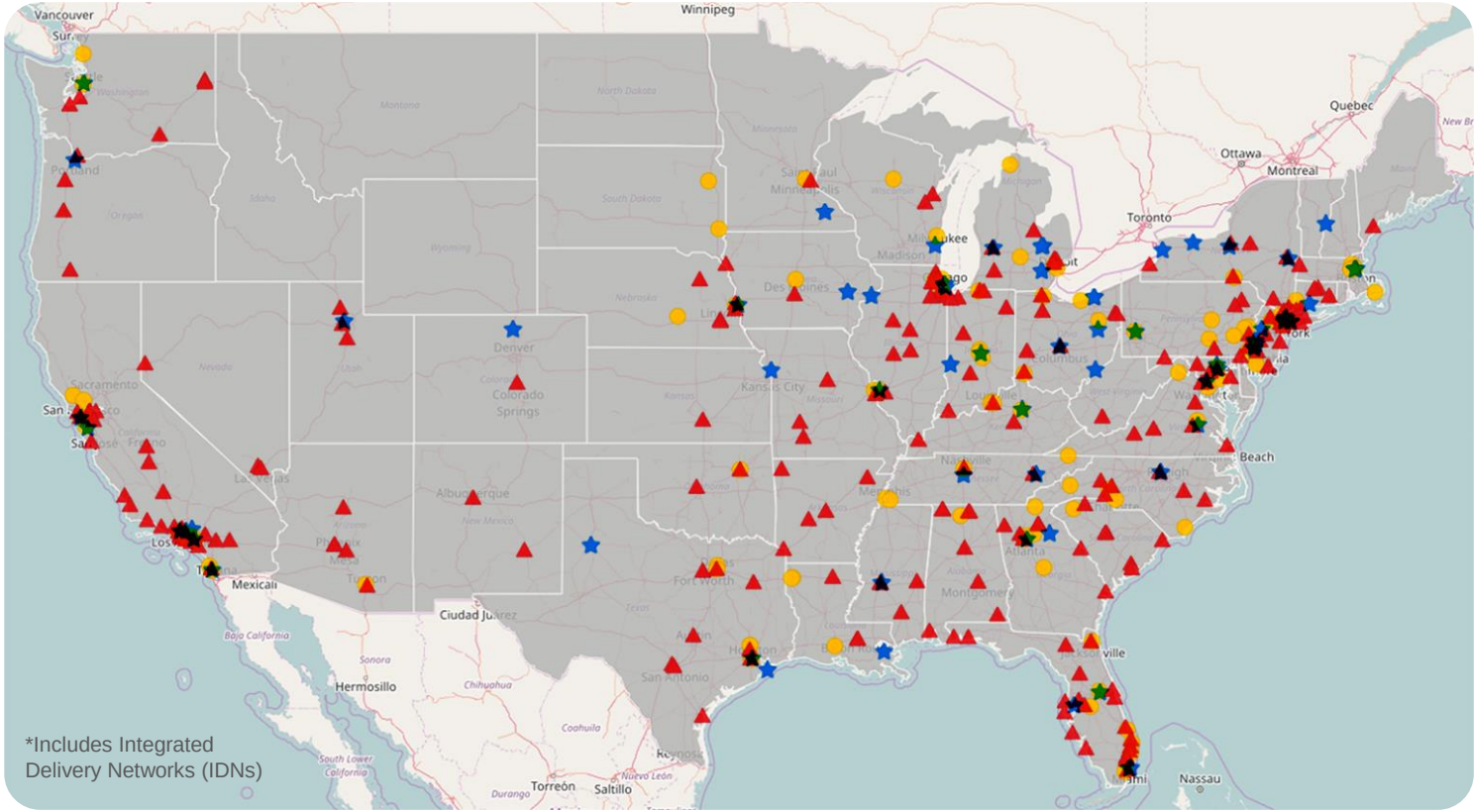


Broad Liso-cel Clinical Development Plan

Moving to address more diseases, earlier lines of therapy and combinations; ~2.5x more patients entering trials in 2018



Majority of DLBCL Patients Treated Outside Academic Centers



Key

- Academic Centers
- Community Hospitals*
- Community Clinics

Academic Centers
~20% of the DLBCL Market

Community Hospitals
~30% of the DLBCL Market

Community Clinics
~50% of the DLBCL Market

Keys To Maximizing Commercial Opportunity in Lymphoma

Demonstrate best-in-class treatment option

Compelling clinical profile:
- The type of cell matters
- Earlier lines and combinations
- Democratize access

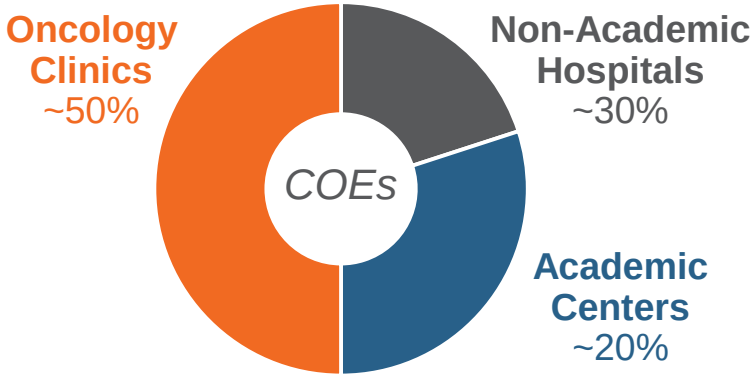
Access the market

Target ~400 NHL accounts for Liso-cel:
- ~80% of total NHL patient volume in ~400 accounts

Optimize health economics

Address patient, provider, and payer:
- Reduction in hospital admissions
- Reduction in ICU and inpatient beds
- Outpatient reimbursements = ASP+6%

3L+ r/r DLBCL U.S. Patients Across Site of Care
Average % of Patients



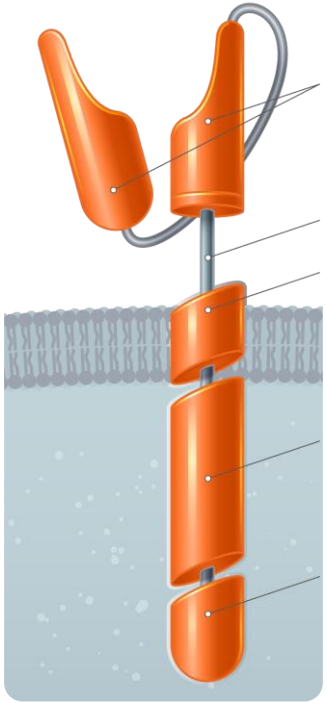
Source: Syndicated claims analysis; Primary research

Expanding the Franchise into Multiple Myeloma

- Late line multiple myeloma market represents over 10,000 patients in the U.S. alone
- JCARH125 IND cleared with trial expected to begin this quarter
- JCARH125 data expected this year
- Plan to move into early lines of therapy, potentially challenging transplants
- Strategy beyond targeting BCMA alone
  - Licensed gamma secretase inhibitor
  - Combination trials expected to begin this year with BCMA
  - New targets under evaluation

JCARH125 Construct Optimizes Key Features to Potentially Improve Clinical Profile

Optimized construct



Human BCMA-specific binder

Modified spacer

CD28 transmembrane domain

4-1BB costimulatory domain

CD3ζ signaling domain

Optimized cells

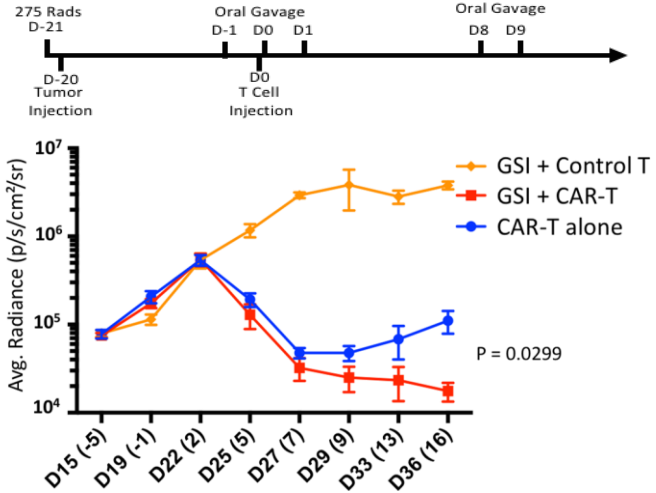
Important factors:

- Consistent cell health
- Highly enriched for central memory cells
- Precise dose

Gamma Secretase Inhibitor (GSI) Combination Provides Opportunity to Increase Target Antigen

- GSI + BCMA CAR T cells increases functional activity *in vitro* and *in vivo*
- Combination trials expected to begin this year

GSI augments antitumor activity of BCMA CAR-T cells in NSG mice



Data from S.Riddell lab

Developing & Scaling Manufacturing

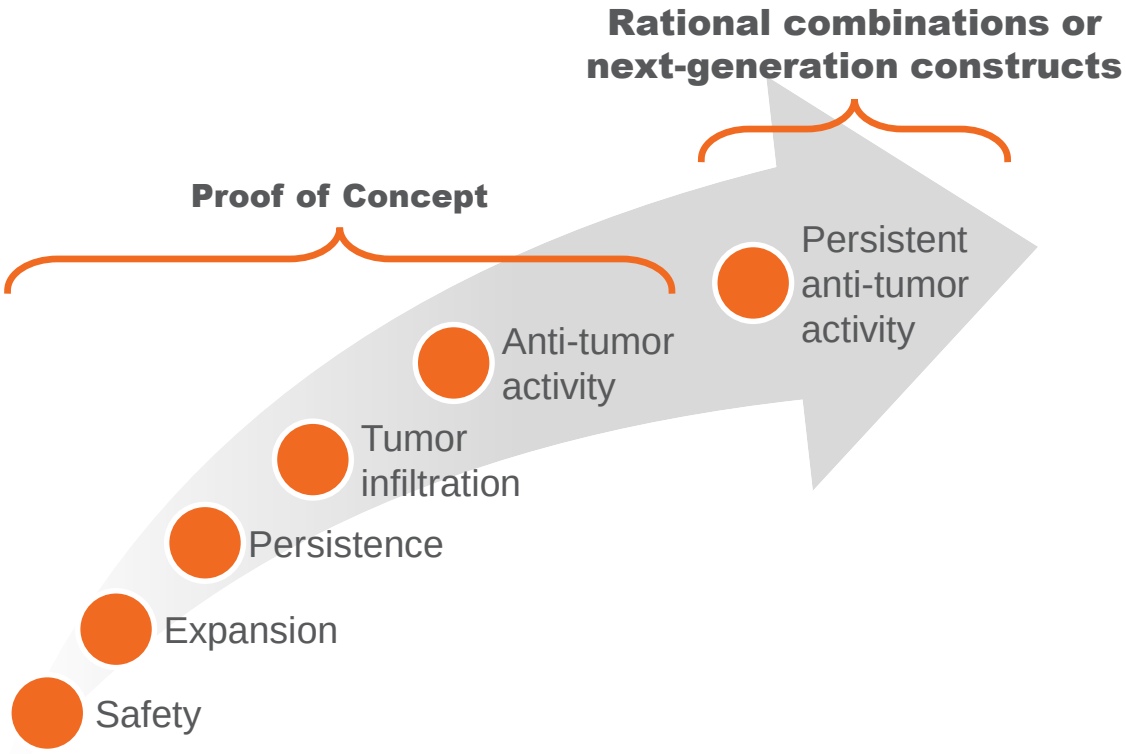
NEXT GENERATION	TARGET TURNAROUND TIME	COGS
Generation 1 (Liso-cel)	< 21 days	COGS Baseline at Liso-cel Launch
Generation 2 (JCARH125)	14-18 days	~70% of baseline
Generation 3	~8 days	~40% of baseline
Generation 4	3-6 days	~30% of baseline

Investing in capacity, supply chain and next generation:

Short-term: New U.S. plant ground-breaking in 2018; supply chain security

Medium-term: Reduce turnaround time, optimize QC testing

Success in Solid Tumors Requires Stepwise Approach



Ongoing Trials

WT-1 (TCR)
NSCLC / Mesothelioma / AML

L1CAM (CAR)
Neuroblastoma

ROR-1 (CAR)
NSCLC / Breast Cancer

MUC-16 / IL-12 "Armored CAR"
Ovarian Cancer

Lewis Y (CAR)
Solid Tumors

Planned for 2018

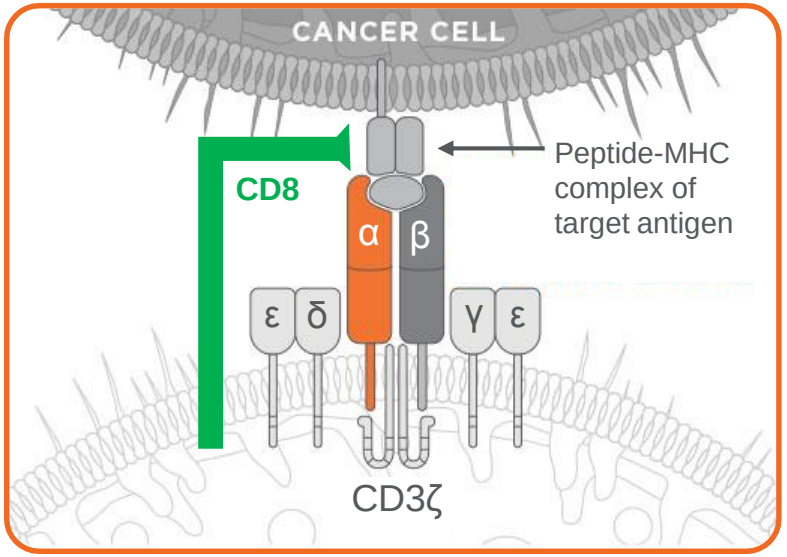
IL13rα2
GBM

Expect data from multiple trials in 2018

Enhancing Activity of eTCRs

- Key programs for Juno's TCR platform
  - **Binders:** High throughput screening
  - **CD4 Help:** Engineering to enable activity on $CD4^+$ and $CD8^+$ T cells
  - **Co-stimulation:** Provision of transgenic co-stimulation
- Application to our HPV program: expect to begin IND-enabling studies in 2018
  - Key is GMP quality gene-editing

Engineered TCR Technology



CD8 T cell

Expect Event Rich 2018

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- Liso-cel FDA filing and potential approval in r/r DLBCL
- Data from the outpatient setting in r/r DLBCL
- Phase I data for Liso-cel in r/r CLL
- Potential initiation of pivotal trial for Liso-cel in r/r CLL
- Data from multiple Liso-cel combination trials

JCARH125

- JCARH125 Phase I data in r/r MM
- Potential initiation of pivotal trial for JCARH125 in r/r MM

Solid Tumors

- Data from multiple Phase I trials for multiple product candidates targeting solid tumors

Robust and Diverse CAR & TCR Pipeline

Active Programs	Description
CD19: Liso-cel	▪ NHL Phase I ▪ CLL Phase I / II
CD19: JCAR014 Combinations	▪ NHL Phase I (with Durvalumab) ▪ CLL (with Ibrutinib)
CD19: Fully-Human scFv	▪ Adult B Cell Malignancies
CD19: Liso-cel Combinations	▪ NHL (with Durvalumab)
CD19 / 4-1BBL "Armored" CAR	▪ B Cell Malignancies
CD22: JCAR018 Fully-Human scFv	▪ Pediatric ALL / NHL Phase I
BCMA: MCARH171 & FCARH143	▪ Multiple Myeloma Phase I
WT-1: JTCR016	▪ AML Phase I / II ▪ NSCLC / Mesothelioma Phase I / II
L1CAM: JCAR023	▪ Pediatric Neuroblastoma Phase I
MUC16 & IL-12: JCAR020 "Armored" CAR	▪ Ovarian Phase I
ROR-1: JCAR024	▪ NSCLC / Breast Phase I
Lewis Y	▪ Solid Tumor Phase I

Planned Programs	Description
CD19: JCAR017 or Similar Product Candidate	▪ ALL
BCMA: JCARH125	▪ Multiple Myeloma Phase I
BCMA + GSI Combination	▪ Multiple Myeloma Phase I
IL13rα2	▪ Glioblastoma
A2aR Antagonist	▪ B Cell Malignancies and Solid Tumors
HPV e6/e7 Oncoproteins	▪ HPV-Associated Cancers

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