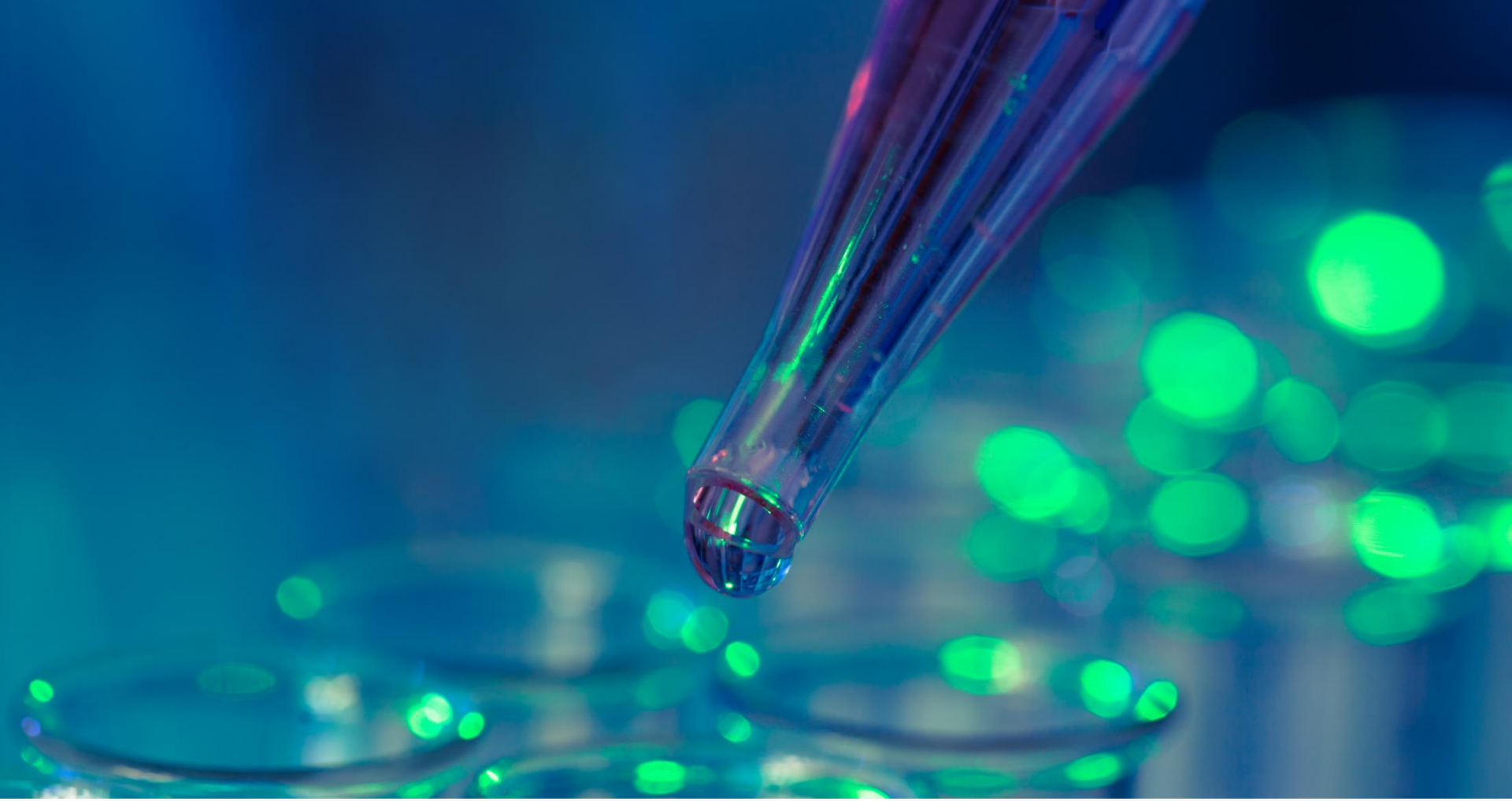

Corporate Presentation

JUNO THERAPEUTICS

Forward-looking Statements, Investigational Status, and Interim Data

This presentation and the accompanying oral commentary contain forward-looking statements that 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 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; 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 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; Juno's 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 our Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on May 4, 2017 and our other periodic reports filed from time to time 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.

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Building the Leading T Cell Company

- Progress with potential best-in-class CD19 product candidate and platform
  - JCAR017 on the market as early as 2018
  - Significant advances in defining attributes that correlate with complete response in NHL
  - Ongoing and planned trials with fully-human CD19, combinations, CD22, and “Armored” CARs
- Moving beyond CD19
  - First trial in multiple myeloma underway
  - Solid organ tumor targets – five in human testing; additional targets in pipeline
- Building platform and self-sustaining research capability to support leadership in the engineered T cell space
- With Celgene, global manufacturing, development, and commercial capabilities to bring engineered T cells to market globally
- Strong balance sheet with $850.7 million in cash and equivalents as of 1Q17

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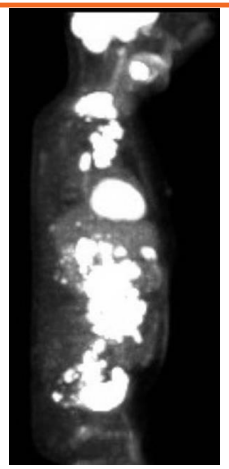
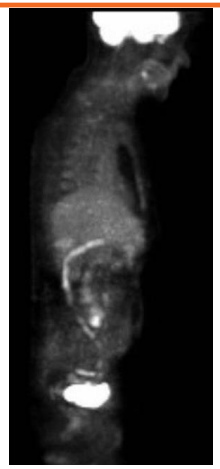
Examples of Rapid Tumor Shrinkage in Clinical Trials

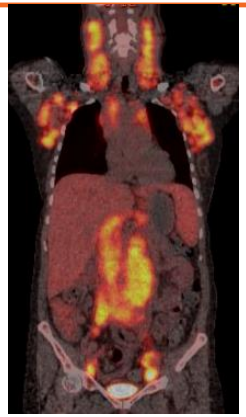
NHL Patient Before CD19 CAR T Cells



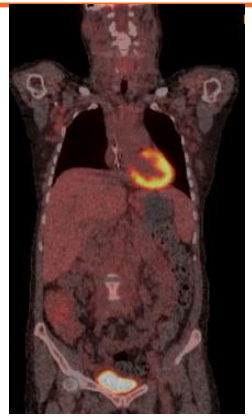
Day 29 After CD19 CAR T Cells



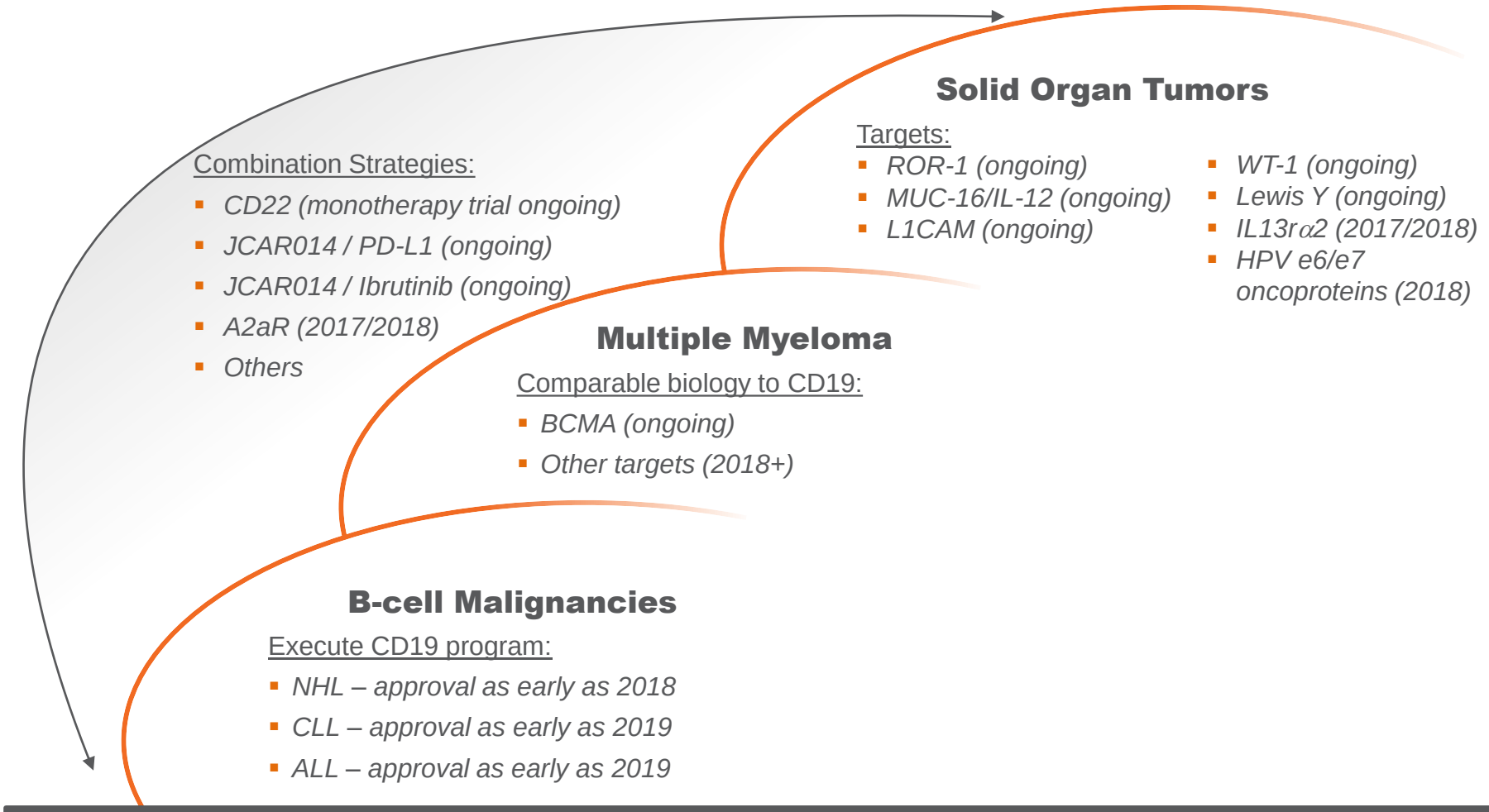
CLL Patient Before CD19 CAR T Cells



Day 33 After CD19 CAR T Cells



Building Blocks for Value Creation



Building best-in-class products & platform

MANUFACTURING • PROCESS DEV • T CELL BIOLOGY • TRANSLATIONAL MED

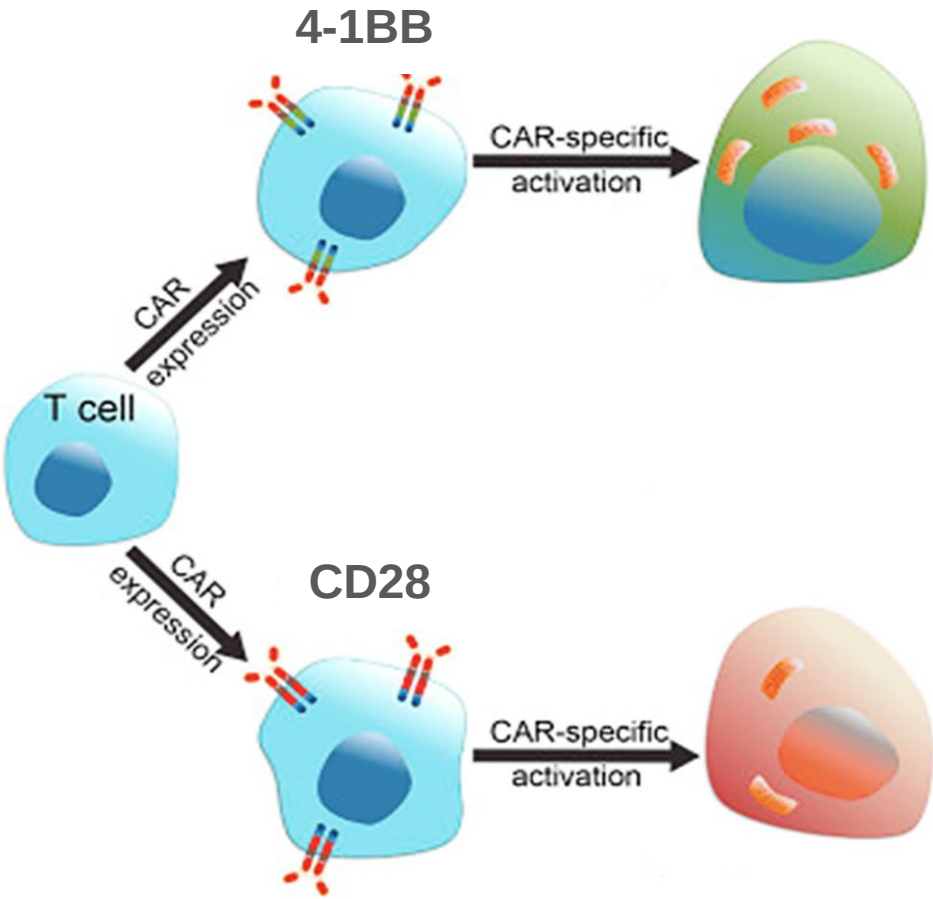
All of Juno's product candidates are investigational product candidates and their safety and efficacy have not been established. Juno has not obtained marketing approval for any product, and there is no certainty that any marketing approvals will be obtained or as to the timelines on which they will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

JCAR017: Not All CAR T Cells are the Same

	JCAR015	JCAR017
Co-stimulatory domain	CD28	4-1BB
Cells	T cells selected	Defined composition (1:1 ratio of CD4 / CD8)
Manufacturing	Key steps automated and functionally closed	Process design to deliver more naïve and quiescent cells
Viral Vector	Gamma	Lenti

CAR T Co-stimulatory Domain Matters

4-1BB versus CD28



- Increased persistence
- Increased central memory & naïve cells
- Metabolic profile supporting gradual, sustained expansion

- Decreased persistence
- Increased effector memory cells
- Metabolic profile supporting rapid expansion

Adapted from Omkar U. Kawalekar, et al. Immunity Volume 44, Issue 2, 2016, 380–390

The Type of Cell Matters

Defined Cell

CD8/CD4 Ratio Control + Phenotype Control

CD8/CD4 Ratio

Manufacturing Process

$CD4^+$ T cell

$CD8^+$ T cell

Potency

CAR T Dose Comparison[1]

Disease Setting	JCAR017 (total dose)	CTL019 (total dose)	KTE-C19 (total dose)
NHL	50 million[2]	~250 million[3]	160 million
Pediatric ALL	~50 million	~100-250 million[4]	~100 million

Potential for Better Therapeutic Window

[1]Assumes body weight of 80 kg for adult NHL and 50 kg for pediatric ALL.
[2]Dose level 1 from the Phase I TRANSCEND trial.
[3]The dosing range for the trial is 100 - 500 million as a flat dose.
[4]Total dose is dependent on body weight.

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JCAR017: Potential Best-in-class Profile in NHL

Potential to differentiate on efficacy and safety

JCAR017 in DLBCL[1] (NCT02631044)

	CORE All Doses N=32-44	FULL All Doses N=41-55
ORR	38/44 (86%)	41/54 (76%)
ORR at 3 months	21/32 (66%)	21/41 (51%)
CR at 3 months	16/32 (50%)	16/41 (39%)
Severe Cytokine Release Syndrome	1/44 (2%)	1/55 (2%)
Severe Neurotoxicity	8/44 (18%)	9/55 (16%)

(1) Investigator-reported data as-of May 4, 2017. Includes fludarabine and cyclophosphamide conditioning regimen. Includes single dose and 2-dose schedules. Efficacy data includes 53 patients with r/r DLBCL and 1 patient treated at Dose Level 1 with follicular lymphoma grade 3B, which is biologically similar to DLBCL. One patient at dose level 2 was evaluable for safety but not yet evaluable for efficacy. Other treatment-emergent adverse events, whether or not treatment related, occurring in at least 25% of these patients included fatigue, thrombocytopenia, and nausea.

Key Attributes

- 66% (29/44) patients did not experience any cytokine release syndrome or any neurotoxicity in the CORE analysis group
- Dose response (CR at 3 months of 42% at Dose Level 1 and 56% at Dose Level 2) observed with consistent toxicity profile at each dose
- 9/10 patients in CORE group in response at 3 months remain in response at 6 months
- CORE data set represents pivotal trial patient population
- Product was available for 98% (86/88) of patients apheresed

Goal » JCAR017 NHL

Registration trial to initiate in 2H17 with approval as early as 2018

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

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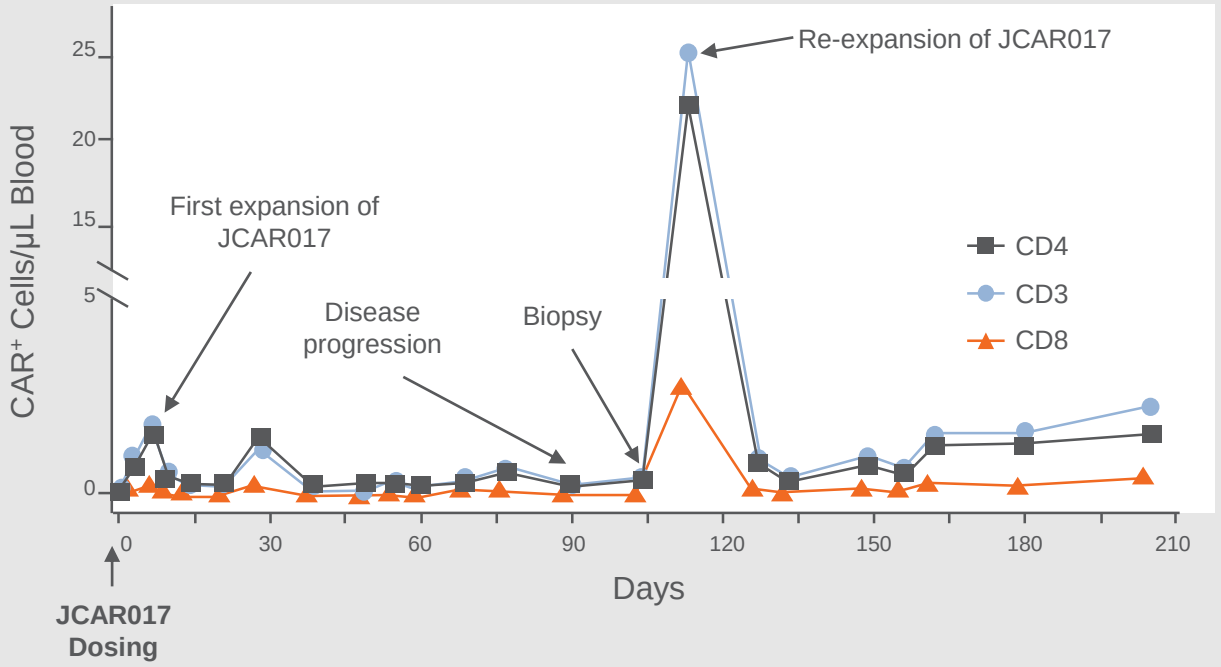
Cell Persistence + Tolerability = Ability to Combine

- Case study from TRANSCEND trial demonstrates persistent CAR T cells can re-induce CR
- Separate combination trial ongoing with JCAR014 and durvalumab

Complete Response at Day 29



From ASH 2016. Investigator-reported data as-of November 23, 2016 cut-off date.

CLL Emerging as a Significant Opportunity

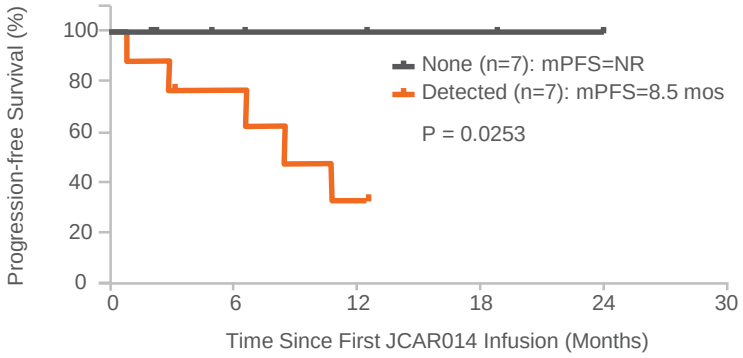
All Patients Previously Treated with Ibrutinib; 58% Patients with del (17p)

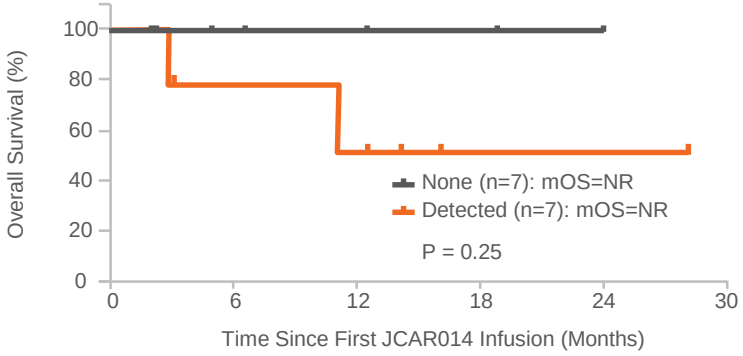
JCAR014 Response Assessment

(NCT01865617)

Lymphodepletion	Flu/Cy lymphodepletion (N=21)[1]
	All patients (N=19 restaged)
Dose Level	DL 1, 2
IWCLL restaging	N=19
ORR (at 4 weeks)	14/19 (74%)
CR (at 4 weeks)	4/19 (21%)
IGH deep sequencing	N=14
CR	7/14 (50%)

Progression-Free Survival & Overall Survival (IGHseq)





[1]All CLL patients have been previously treated with ibrutinib.
There was 1 treatment-related death in 24 treated CLL patients to-date.
Severe cytokine release syndrome = 8% (2 of 24 patients).
Severe neurotoxicity = 25% (6 of 24 patients).
For JCAR014, investigator-reported data as-of December 4, 2016.
IGH assessment of the bone marrow generally on Day 28.
CR = complete response; PR = partial response; ORR = CR + PR; Flu/cy = fludarabine and cyclophosphamide
IGHseq = Immunoglobulin heavy chain sequencing by advanced PCR technologies; mPFS = median progression free survival, NR = not reached at time of data cut-off; mOS = median overall survival; del (17p) = high risk cytogenetic marker of CLL disease [deletion of the short arm of chromosome 17].

Expanding the Franchise into Multiple Myeloma

First trial in multiple myeloma underway

	B-cell malignancies	Multiple myeloma
1. Predictable cell surface proteins	✓	✓
2. Cell surface protein expression limited to B cell lineage	✓	✓
3. Multiple targets identified	✓	✓

Challenges	Juno's potential solutions
1 Inadequate CAR T cell persistence	▪ Fully-human binders ▪ 4-1BB and next-gen co-stim domains ▪ Manufacturing technologies
2 Complex tumor micro-environment	▪ Combinations ▪ Cell Signaling ▪ Armored CARs ▪ Gene editing
3 Variable BCMA surface expression	▪ Binder selection ▪ Combinations ▪ Multiple targets

Applying CARs & TCRs to Solid Organ Cancers

Demonstrate that T cells kill cancer – recent checkpoint inhibitor and tumor infiltrating lymphocytes data	✓
Demonstrate that T cells home to the tumor	✓
Understand and overcome how the tumor microenvironment may be limiting the activity of engineered T cells, and understand how to induce epitope spread	
Identify the right targets	

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)
Lung Cancer

Planned for 2017 / 2018

IL13rα2
GBM

Expect data from one or more trials in 2017

AML = acute myeloid leukemia, NSCLC = non-small cell lung cancer, GBM = glioblastoma

Democratize Access: Automation Lowers Cost and Improves Efficiency

Standard Process

- Manual process
- ISO 5
- staff:
- cost: $$$$

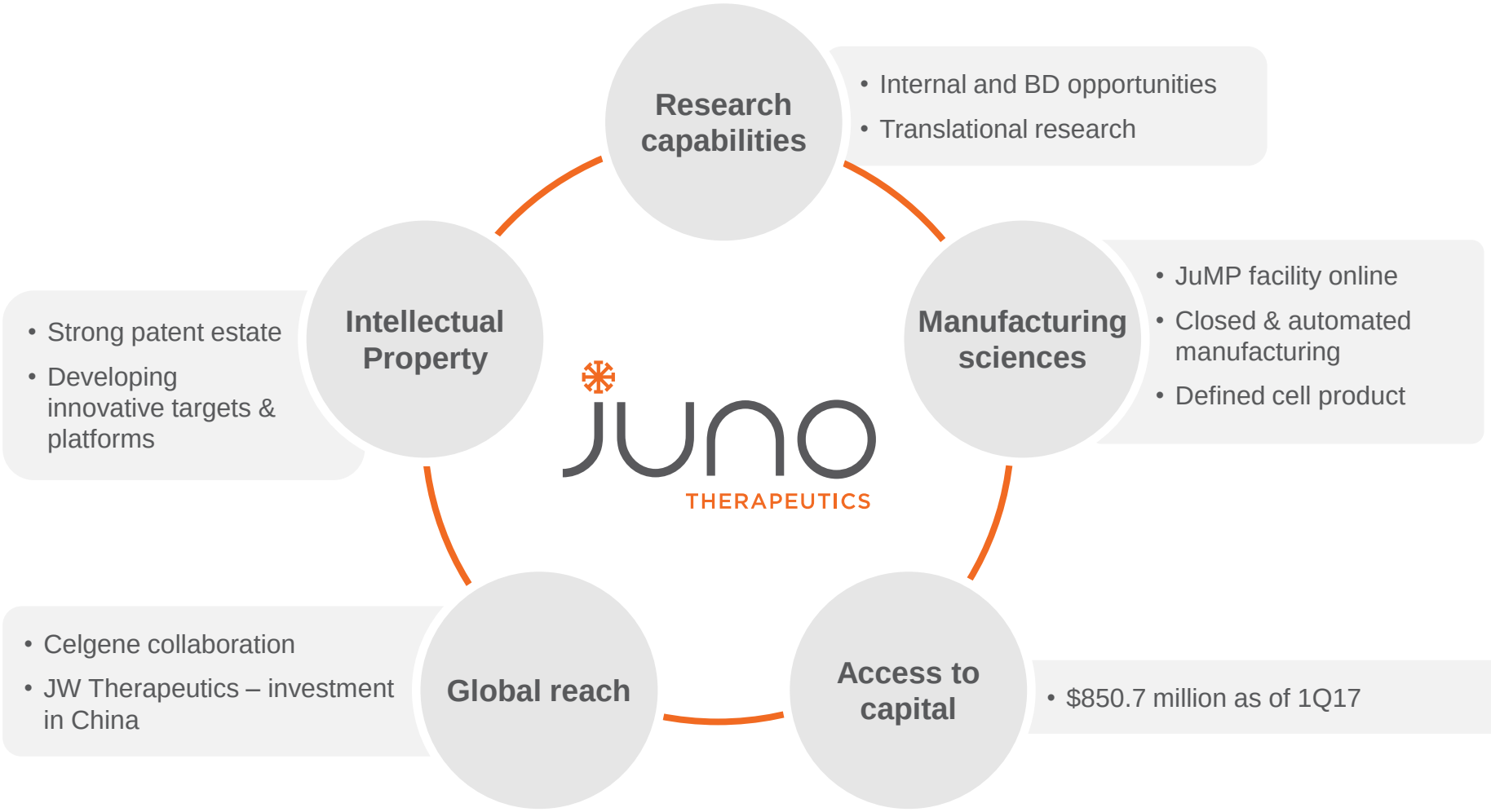
Juno Process Today

- Closed and automated process
- Defined cell process
- ISO 7 / 8
- staff:
- cost: $$$

Goal for Juno Process in the Medium-term

- Closed, automated, and integrated process
- 2-4 day manufacturing time
- staff:
- cost: $$

Building Capabilities



Robust and Diverse CAR & TCR Pipeline

Active Programs	Description
CD19: JCAR017	▪ NHL Phase I
CD19: JCAR014 Combinations	▪ NHL Phase I (with Durvalumab) ▪ CLL (with Ibrutinib)
CD19: Fully-Human scFv	▪ Adult B Cell Malignancies
CD19 / 4-1BBL "Armored" CAR	▪ B Cell Malignancies
CD22: JCAR018 Fully-Human scFv	▪ Pediatric ALL / NHL Phase I
BCMA	▪ 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	▪ Lung Cancer Phase I

Planned Programs	Description
CD19: JCAR017 or Similar Product Candidate	▪ CLL, ALL
CD19: JCAR017 Combinations	▪ NHL (with Durvalumab)
IL13rα2	▪ Glioblastoma
A2aR Antagonist	▪ B Cell Malignancies and Solid Tumor Cancers
HPV e6/e7 Oncoproteins	▪ HPV-Associated Cancers

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