



TARGETING CANCER

New Science. New Cancer Therapies. New Hope.

Company Overview -- February 2020

FORWARD LOOKING STATEMENTS

This presentation includes forward-looking statements (including within the meaning of §21E of the U.S. Securities Exchange Act of 1934, as amended, and § 27A of the U.S. Securities Act of 1933, as amended). Forward looking statements, which generally include statements regarding goals, plans, intentions and expectations, are based upon current beliefs and assumptions of Oncternal Therapeutics, Inc. (“Oncternal,” or the “Company”) and are not guarantees of future performance. Statements that are not historical facts are forward-looking statements, and include statements regarding the expected timing for achieving key milestones, including completing and announcing results of clinical trials of the Company’s product candidates, and the anticipated market potential, duration of patent coverage, and ability to obtain and maintain favorable regulatory designations for the Company’s product candidates and preclinical programs.

All forward looking statements are subject to risks and uncertainties, which include, but are not limited to: uncertainties associated with the clinical development and process for obtaining regulatory approval of Oncternal’s product candidates, including potential delays in the commencement, enrollment and completion of clinical trials; inherent risks involved in the commercialization of any product, if approved; the risk that results seen in a case study of one patient likely will not predict the results seen in other patients in the clinical trial; the risk that interim results of a clinical trial do not predict final results and that one or more of the clinical outcomes may materially change as patient enrollment continues, following more comprehensive reviews of the data, as follow-up on the outcome of any particular patient continues, and as more patient data become available; the risk that unforeseen adverse reactions or side effects may occur in the course of developing and testing Oncternal’s product candidates; and the risk that Oncternal may be unable to obtain sufficient additional capital to continue to advance the development of its product candidates and preclinical programs.

Except as required by applicable law, Oncternal undertakes no obligation to revise or update any forward-looking statement. All forward-looking statements in this presentation are current only as of the date on which the statements were made. Additional factors that could cause actual results to differ materially from those expressed in the forward-looking statements are discussed in reports filed with the SEC by Oncternal, including its most recent Quarterly Report on Form 10-Q, and Current Reports on Form 8-K filed with the SEC. Cirmtuzumab, TK216 and Oncternal’s CAR-T targeting ROR-1 are investigational product candidates or preclinical programs that have not been approved by the U.S. Food and Drug Administration for any indication.

THREE NOVEL ONCOLOGY PRODUCT CANDIDATES IN DEVELOPMENT

TK216: TARGETED ETS INHIBITOR

- Deep and sustained response observed in Ewing sarcoma Phase 1 clinical trial
- Additional opportunities in other cancers with ETS alterations

CIRMTUZUMAB: ROR1 INHIBITORY MONOCLONAL ANTIBODY

- Sustained responses in MCL and CLL in Phase 1/2 clinical trial and TNBC in Phase 1b clinical trial
- Additional opportunities in other ROR1 expressing cancers

ROR1 CAR-T: PRECLINICAL DEVELOPMENT WITH CIRM AND SHANGHAI PHARMA

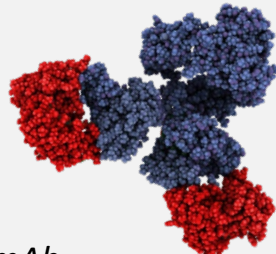
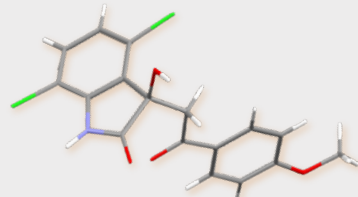
- Potential to improve on CAR-T efficacy and safety

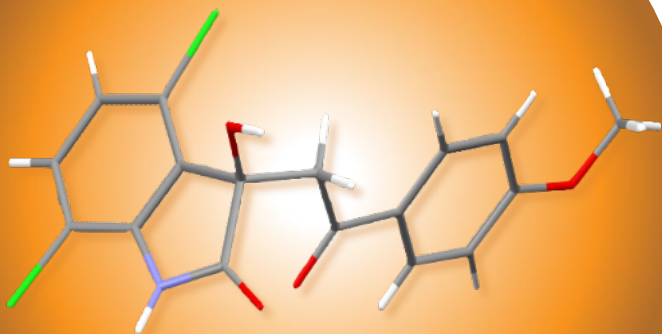
MULTIPLE DATA CATALYSTS EXPECTED IN 2020

- Clinical data updates expected in Ewing sarcoma, MCL, CLL and breast cancer
- ROR1 CAR-T expected to reach clinic in 4Q 2020 in China

EXPERIENCED MANAGEMENT AND BOARD OF DIRECTORS

Robust Pipeline – Novel Product Candidates in Multiple Indications

Product Candidate	Indication	Preclinical	Phase 1	Phase 2	Phase 3	Modality
Cirmtuzumab	Chronic Lymphocytic Leukemia (CLL)					 <i>ROR1 mAb</i>
	Mantle Cell Lymphoma (MCL)					
	Breast Cancer					
TK216	Ewing Sarcoma					 <i>ETS oncoprotein inhibitor</i>
	Acute Myeloid Leukemia (AML)					
	Prostate Cancer					
ROR1 CAR-T	Heme Cancers					 <i>ROR1 CAR-T cell therapy</i>
	Solid Tumors					



TK216

**Targeted ETS
Oncoprotein Inhibitor**

OPPORTUNITY

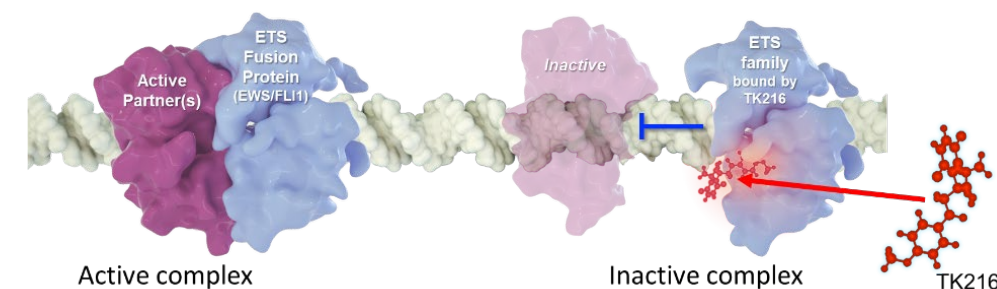
- Fast-to-market strategy in Ewing sarcoma
 - Potentially Pediatric Voucher eligible
- Significant market potential in other cancers with ETS alterations:
 - AML, prostate cancer, DLBCL
- Patent coverage through 2037

MECHANISM OF ACTION

- Novel small molecule inhibitor of ETS family oncoproteins
 - Designed to prevent/disrupt formation of transcriptionally-active protein complex
- ETS transcription factors regulate many target genes implicated in cancer development and progression

DEVELOPMENT STATUS

- Enrolling expansion cohort, Phase 1b clinical trial (n=18) in relapsed/refractory Ewing sarcoma
- Orphan Drug Designation and Fast Track Status granted by FDA



ETS = E26 Transformation-Specific
oncogene family

Unmet Medical Need

Relapsed / Refractory Ewing Sarcoma

- Orphan disease, second most common pediatric bone tumor
 - U.S. incidence ~430 p.a.⁽¹⁾
 - U.S. prevalence ~4,000⁽¹⁾
- Median age at diagnosis 15 years
- No standard second-line treatment and poor prognosis:
 - Metastatic EWS: 5-year OS ~30%
 - Recurrent EWS: 5-year OS ~10-15%
- Nearly all Ewing sarcoma driven by translocations of ETS family oncogenes (EWS-FLI1 85-90%, EWS-ERG ~10%)
 - ETS transcription factors regulate many genes implicated in cancer development and progression

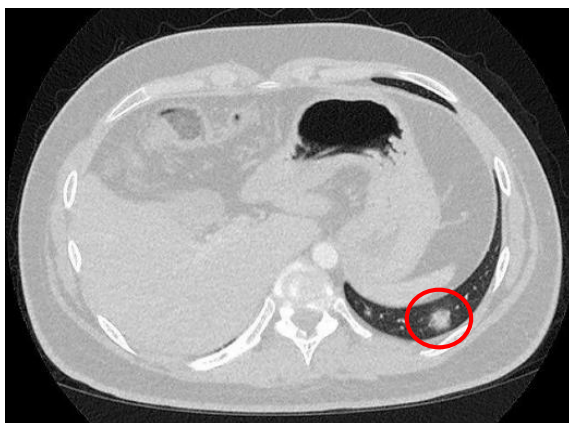


ETS = (E26 Transformation-Specific oncogene family)

(1) Incidence 1.3 per million, prevalence 12 per million – SEER data “ICD-0-3/WHO 2008 Ewing Tumor”, accessed January 3, 2020; NCI Ewing Sarcoma Treatment (PDQ), accessed September 11, 2019; Company analysis

Patient Story: Sustained Clinical Response with TK216 in Patient with Extensively Treated Metastatic Relapsed / Refractory Ewing Sarcoma

- 19-year old male
- Presented in 2015 with metastatic Ewing sarcoma involving his clavicle and lungs
- Failed numerous treatments:
 - radiation
 - VDC/IE: vincristine, doxorubicin, cyclophosphamide, ifosfamide, etoposide
 - irinotecan
 - temozolomide
 - bevacizumab
 - pazopanib
- Enrolled in Phase 1 study of TK216 at MSKCC in 2019
- Received TK216 in final, highest dose-finding dosage cohort (200 mg/m²/day TK216 for 14 days)
- After two cycles of **single-agent** TK216: resolution of all target pulmonary metastases
 - Treatment well tolerated, with minimal myelosuppression
- Sustained response after 6 months of TK216
 - Vincristine added after 2nd cycle
- Residual non-target 7 mm lung lesion excised, leading to surgical complete remission
- **No evidence of disease at 10+ months on study**

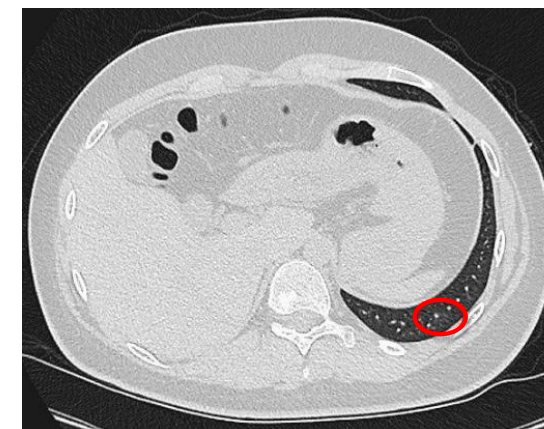


Baseline

2 cycles single agent TK216



Target lesions resolved

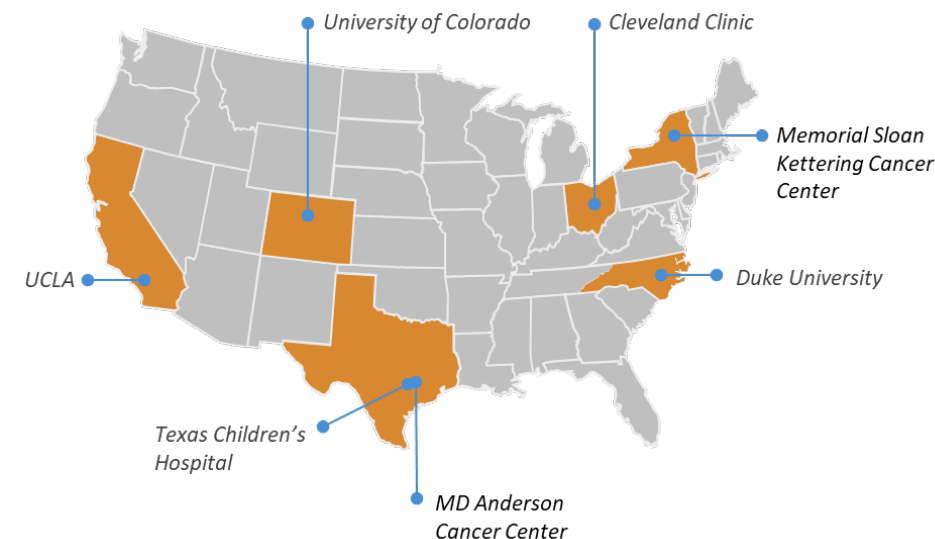


Phase 1b of TK216 in Patients with Relapsed / Refractory Ewing Sarcoma

Phase 2 Dose Selected and Now Enrolling Expansion Cohort

Interim data presented at Connective Tissue Oncology Society (CTOS) 2019¹:

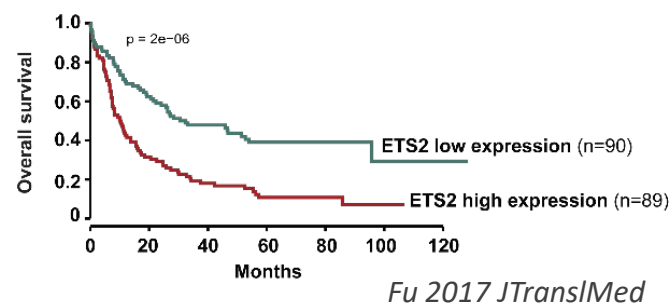
- 3+3 dose and schedule escalation cohorts
 - 32 patients with relapsed, refractory Ewing sarcoma
 - Average of 4 prior therapies
 - Phase 2 dose selected: 200 mg/m²/day TK216 for 14 days
- Safety: generally well-tolerated, with dose limiting toxicity of manageable myelosuppression and no obvious off-target toxicity
- PK: drug plasma levels met or exceeded those associated with anti-cancer activity in preclinical models
- Activity: Phase 2 dose demonstrated early evidence of activity
 - 1 surgical CR (deep PR on single-agent TK216), 1 SD, 1 PD
 - ORR 33.3%, disease control 66.7%
- Phase 1b expansion cohort opened in December 2019
 - 18 patients will be treated using Phase 2 dosing regimen



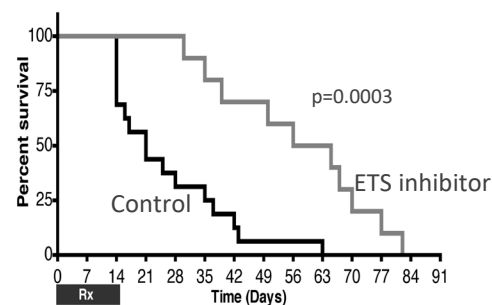
1 – Meyers MSKCC, 2019 CTOS Tokyo

Acute Myeloid Leukemia (AML)

- ETS family proteins overexpressed in ~30% AML cases
- ETS expression is associated with shorter OS

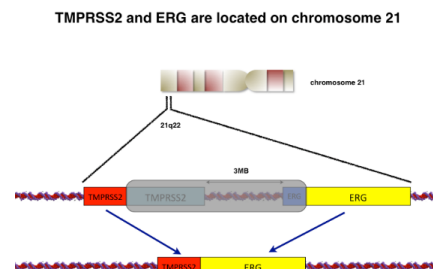


- Sensitivity of AML cell lines to TK216 was proportional to level of ETS overexpression
- ETS inhibition prolonged survival in EWS-FLI1 transgenic AML model

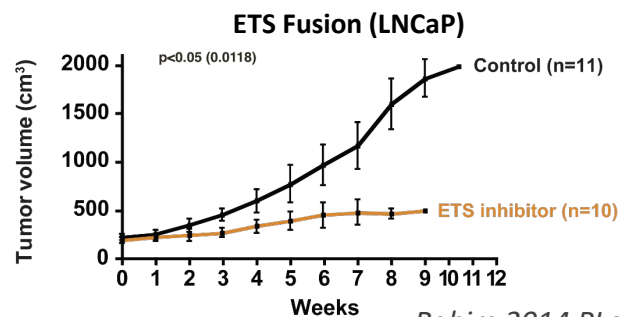


Prostate Cancer

- 55% of men with advanced prostate cancer carry ETS family gene fusion TMPRSS2-ERG associated with androgen resistance and poor clinical outcomes

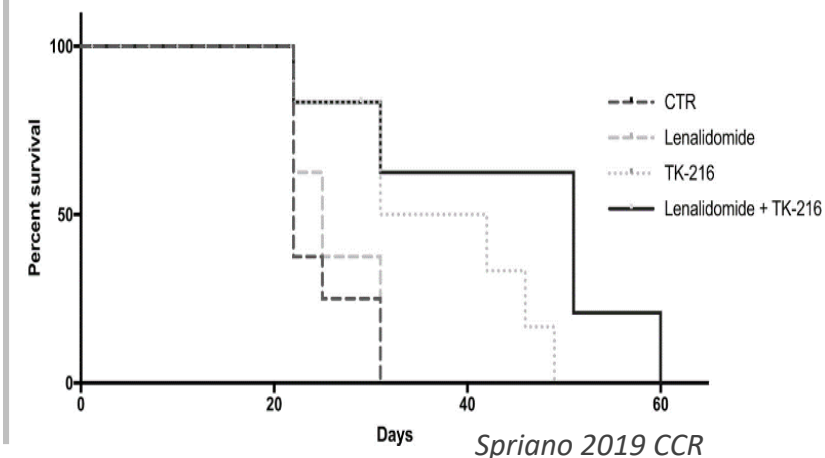


- ETS inhibition demonstrated anti-tumor activity in human prostate cancer xenograft model

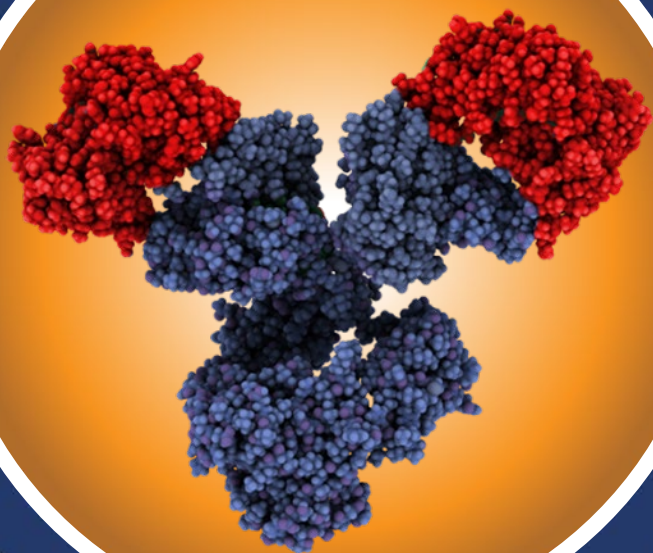


Diffuse Large B Cell Lymphoma (DLBCL)

- ETS proteins overexpressed in DLBCL
- ETS family member genes are essential for activated B-cell-like (ABC) DLBCL and germinal center B-cell type (GCB) DLBCL
- ETS inhibition demonstrated anti-tumor activity in xenograft models
- Synergy with lenalidomide and venetoclax shown in preclinical model



- Phase 1b in **Ewing sarcoma**: expansion cohort data **2H 2020**
 - Expect to enroll 5-10 additional patients by mid-2020
- IND-enabling data in additional **ETS-driven tumors** **2H 2020**
 - AML, prostate, DLBCL



CIRMTUZUMAB

ROR1 monoclonal antibody

OPPORTUNITY

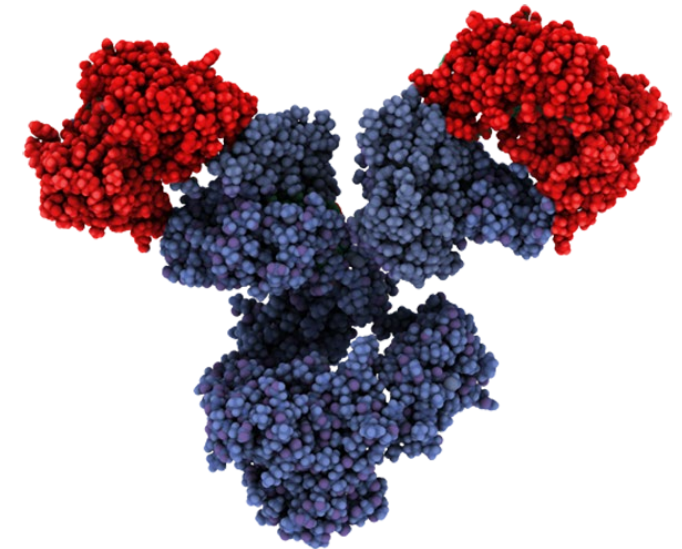
- Potential in multiple hematologic and solid cancers
- Supported by ~\$14M non-dilutive CIRM grant
- Patent coverage through 2033

MECHANISM OF ACTION

- High-affinity humanized ROR1 monoclonal antibody
- Inhibits Wnt5a stimulated ROR1 signaling
 - Decreased proliferation, invasion, metastasis, stemness
- Preclinical synergy observed with ibrutinib or paclitaxel

DEVELOPMENT STATUS

- Well-tolerated and active in completed CLL Phase 1
- Phase 1b enrolled in CLL in combination with ibrutinib
- Randomized Phase 2 enrolling in CLL in combination with ibrutinib
- Phase 1b enrolling in MCL in combination with ibrutinib
- Phase 1b enrolling in HER2-negative breast cancer



ROR1 = Receptor tyrosine kinase-like Orphan Receptor 1
CIRM = California Institute for Regenerative Medicine

Unmet Medical Need: Mantle Cell Lymphoma and Chronic Lymphocytic Leukemia

Unmet Medical Need

- While ibrutinib alone is active in CLL and MCL, patients are not cured and must continue treatment until intolerance or resistance develops:
 - CLL ibrutinib CR rate < 10%⁽¹⁾
 - MCL ibrutinib CR rate ~25%⁽²⁾
- US incidence⁽³⁾
 - CLL ~20,000 p.a.
 - MCL ~4,200 p.a.
- Average age at diagnosis
 - CLL: 71⁽⁴⁾
 - MCL: mid-60s⁽³⁾

(1) O'Brien 2018 Blood; CR rate at 12 months of therapy

(2) Wang 2015 Blood

(3) seer.cancer.gov, Dec. 2019; Leukemia and Lymphoma Society

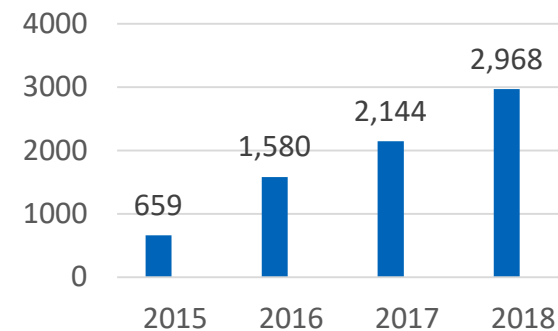
(4) cancer.net, Dec. 2019

(5) AbbVie Form 10-K Feb. 2019

Cirmtuzumab + BTKi Target Product Profile

- Potential differentiation in CLL and MCL: achieve deeper and more durable responses than BTKi alone, with better tolerability or minimal added toxicity
- Become standard-of-care combination therapy for patients with CLL and MCL, particularly for patients who are older and/or have significant co-morbidities
 - Certain other combination therapies are associated with significant toxicities

Ibrutinib U.S. Sales (\$M)⁽⁵⁾

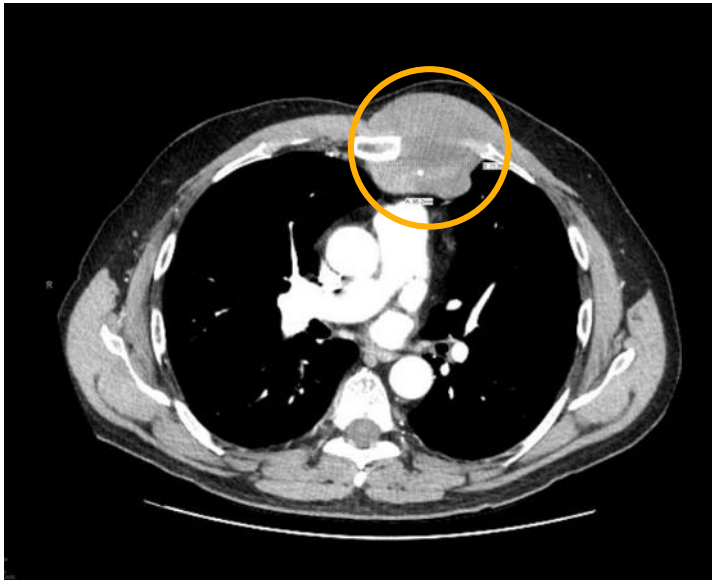


Patient Story: Durable Complete Response in Patient with Relapsed Mantle Cell Lymphoma in Clinical Trial of Cirmtuzumab and Ibrutinib

- 67-year old male
- Diagnosed with MCL in 2009
- Previously received and failed 5 treatment regimens including chemotherapy, biologics, autologous stem cell transplant, and allogeneic stem cell transplant before enrolling onto this study
- 9x7 cm mediastinal / chest wall lesion

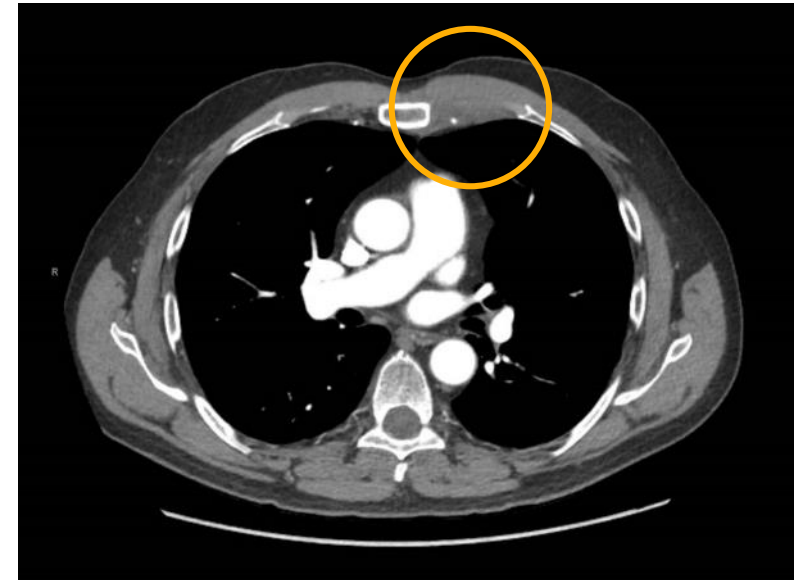
- Rapid clinical response with confirmed CR after 3 months cirmtuzumab + ibrutinib
- CR confirmed and durable at 20+ months on study

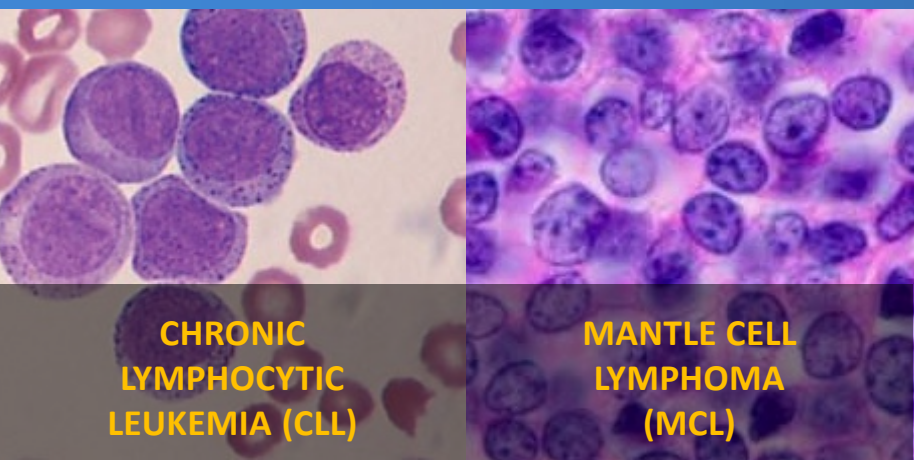
Baseline



After 3 months
→
Complete Response

Cirmtuzumab + Ibrutinib

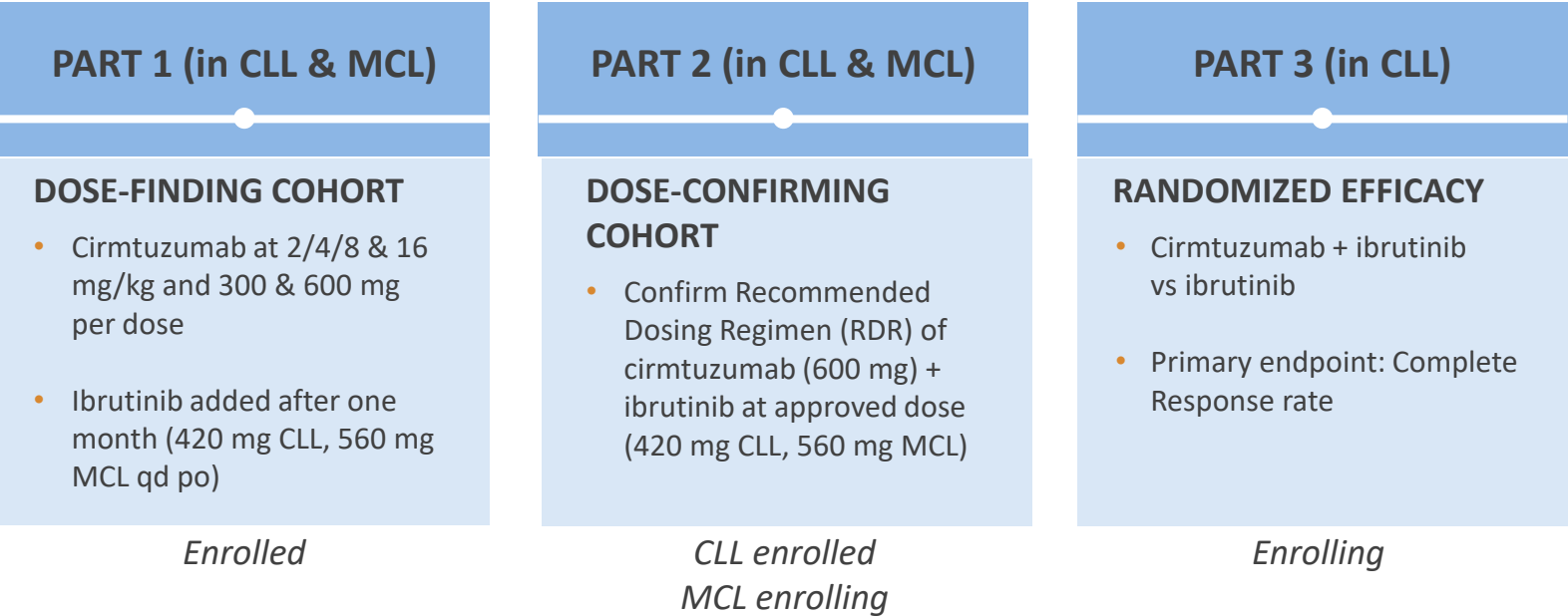




CIRLL Study:

- Cirmtuzumab and Ibrutinib targeting ROR1 for Leukemia and Lymphoma
- Data will determine whether to seek regulatory approval through accelerated approval pathway

STUDY DESIGN



MCL Part 1

- N=12 evaluable patients with relapsed/refractory MCL
 - Median 2 prior therapies
 - 10 of 12 patients with ≥ 2 prior therapies
 - Auto-SCT (n=4), allo-SCT (n=1), CAR-T (n=1), ibrutinib (n=4)
- Median follow-up 5.7 months
- Efficacy: 4 CR (33%), 6 PR (50%), 2 SD (17%)
 - Best ORR 83% (10 of 12)
 - Clinical Benefit (CR, PR or SD) seen in 100% of subjects
 - All CRs achieved within 3-4 months on cirmtuzumab + ibrutinib

CLL Parts 1 & 2

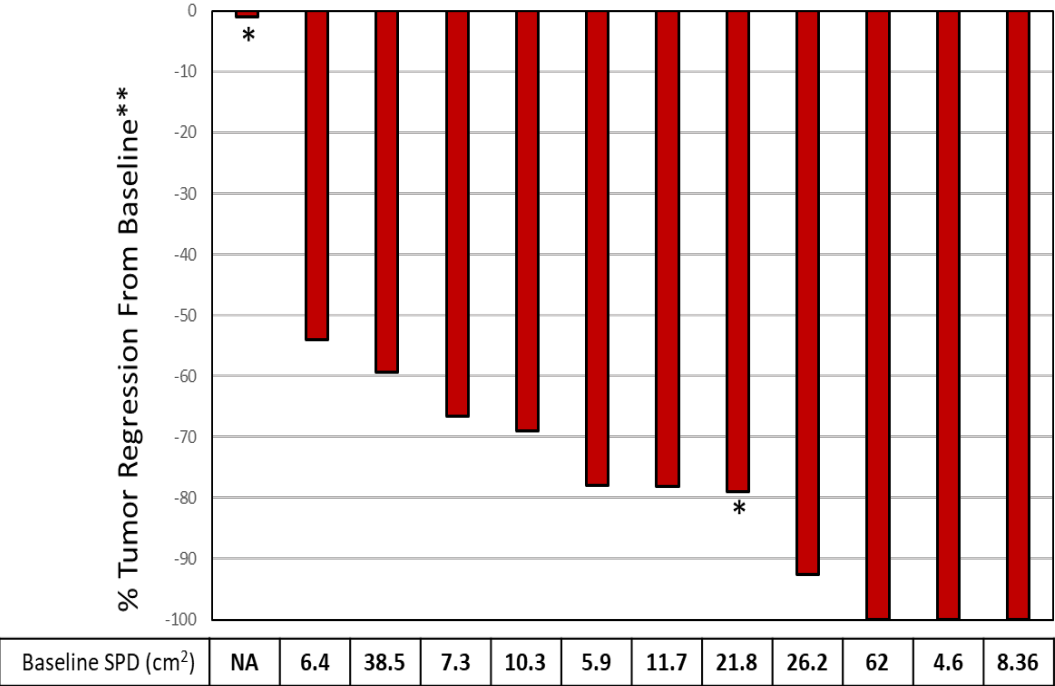
- N=34 evaluable patients (22 relapsed/refractory, 12 treatment naïve)
 - Median 2 prior therapies for r/r patients
 - 79% of patients high risk based on del(17p), del(11q), unmutated IGHV
- Median follow-up 9.9 months
- Efficacy: 1 CR (3%), 29 PR (85%), 4 SD (12%)
 - Best ORR 88% (30 of 34)
 - Clinical Benefit (CR, PR or SD) seen in 100% of subjects
 - Additional 3 clinical complete responses (confirmatory bone marrow biopsies pending)
 - No progressive disease observed on study (PFS=100%)

-
- Adverse events typical for ibrutinib alone
 - No dose limiting toxicities or discontinuations due to cirmtuzumab
 - No Grade 3 or higher common adverse events attributed to cirmtuzumab alone
 - Neutropenia 13% (Grade 3-4: 8.7%)

CIRLL Trial: Interim MCL Part 1 Data

Complete Responses in Four Heavily Pretreated Patients

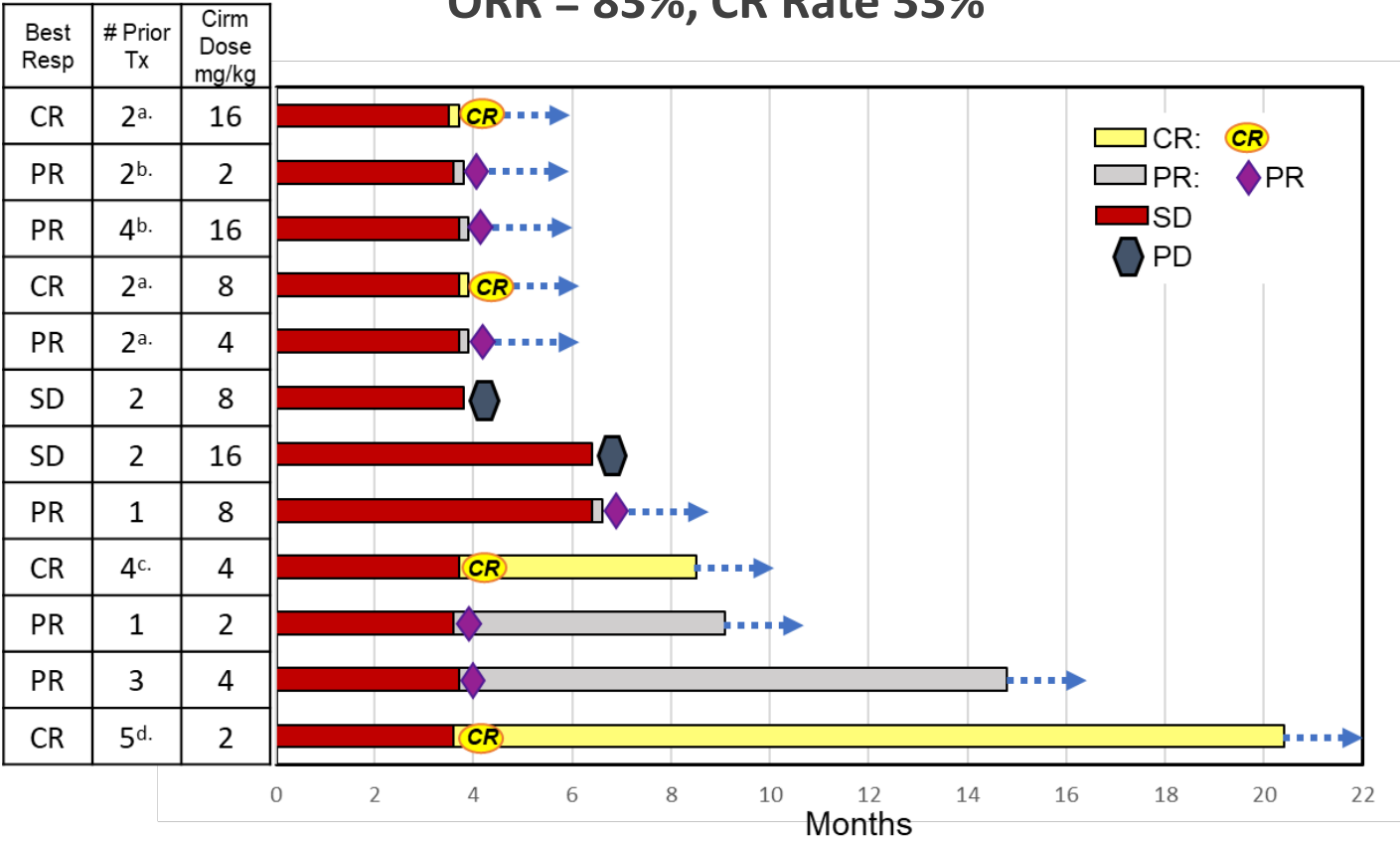
Tumor Regression:
Maximal Change in SPD From Baseline



* SD Patients: 1 unconfirmed SD, 1 progressed after unconfirmed PR
** Change in tumor size (SPD: Sum of Perpendicular Diameters)

Rule Haematologica 2019: ORR 67% and CR rate 23%
for ibrutinib in MCL with >1 prior lines of therapy in a
pooled analysis across three third-party clinical studies

Best Tumor Response Over Time
ORR = 83%, CR Rate 33%

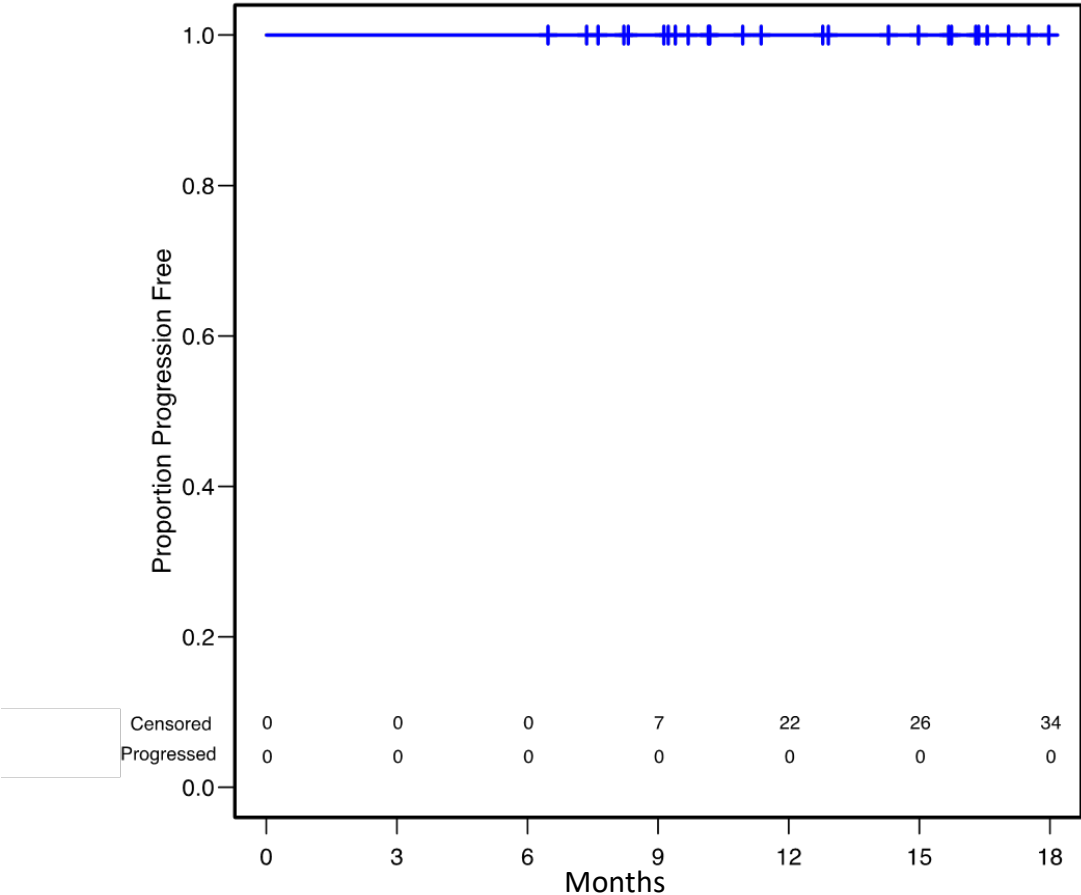


- a. Prior ibrutinib/ritux (7-10 mos), R-HyperCVAD
- b. Prior chemo, auto-stem cell transplant (SCT)
- c. Prior chemo, auto-SCT, CAR-T
- d. Prior chemo, auto-SCT, allo-SCT

CIRLL Trial: Interim Part 1&2 CLL Results

100% PFS and Reduced Lymphocytosis

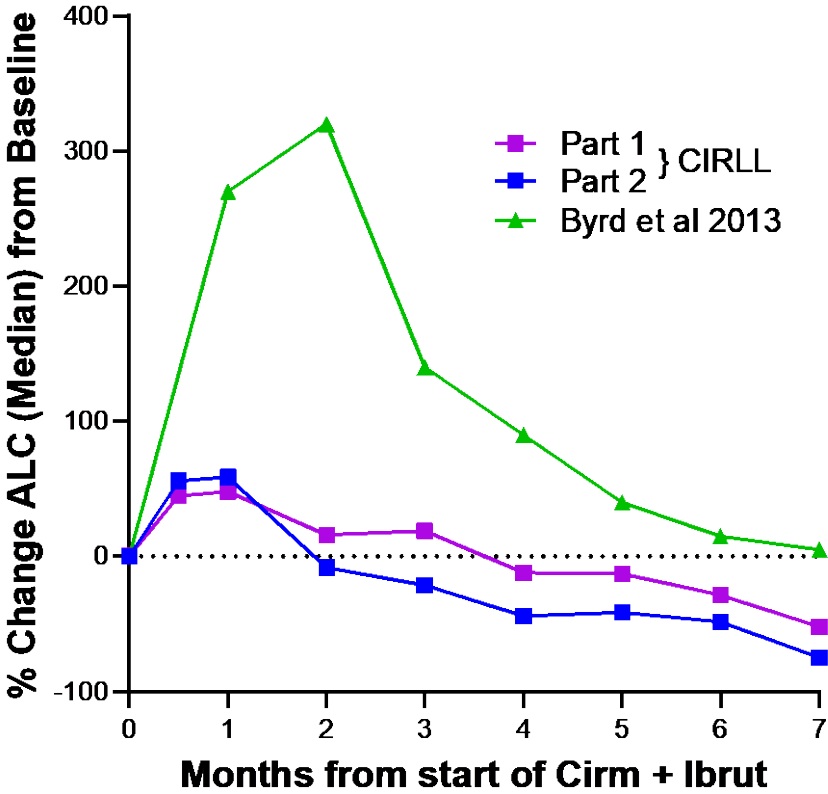
Progression-Free Survival 100%



Note: 1 patient died of complications of acute cholecystitis off study without evidence of CLL progression

Source: Company data as of January 29, 2020

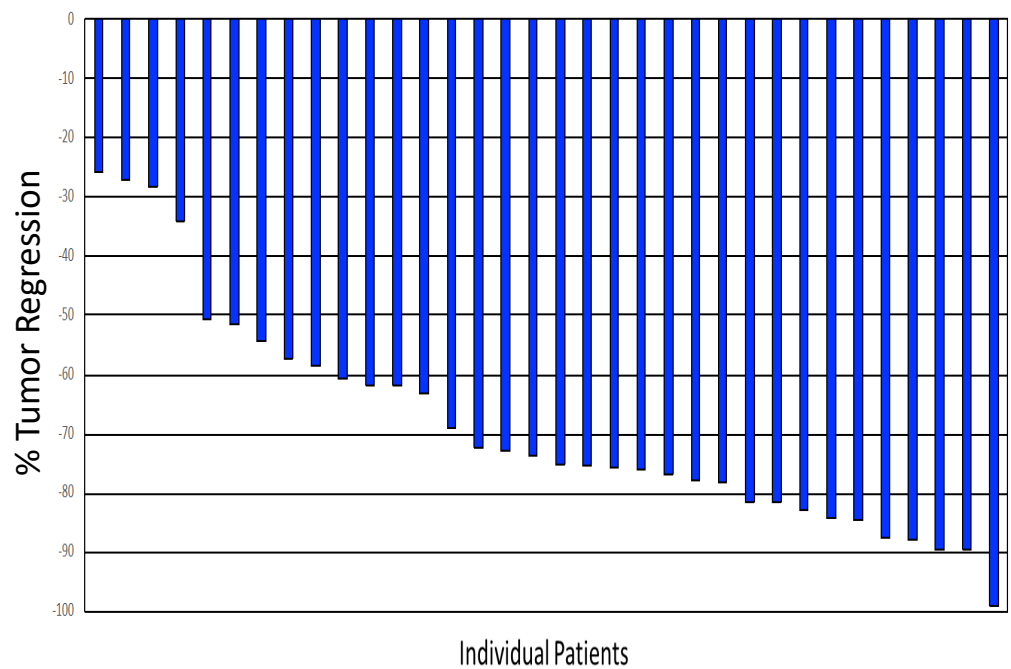
Reduced lymphocytosis compared to historical ibrutinib data



ALC = Absolute Lymphocyte Count

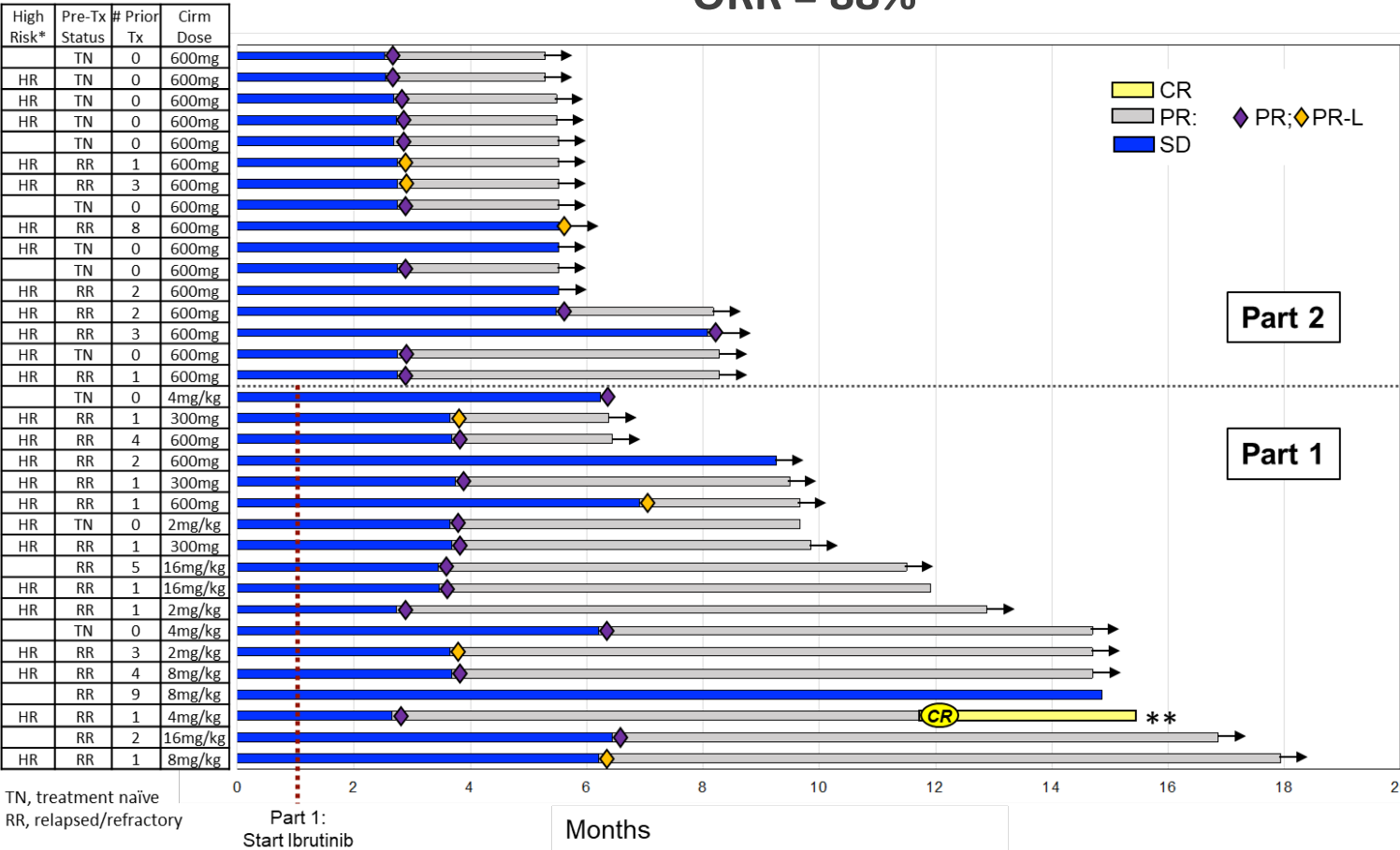
Source: Choi, 2019 ASH (data cutoff early November 2019)

Tumor Regression:
Maximal Change in SPD From Baseline



SPD = Sum of Perpendicular Dimensions of measurable disease

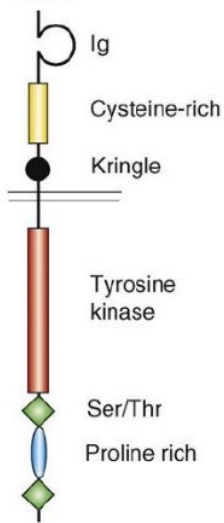
Best Tumor Response Over Time
ORR = 88%



* HR = known high risk factors: unmutated IgVH, del 17p/ TP53, and/or deletion 11q
** Sustained CR for 6+ months on no CLL therapy

ROR1 Overexpressed in Multiple Tumors and Associated with More Aggressive Cancer

Recceptor Tyrosine Kinase-like Orphan Receptor 1



- ROR1 expression is suppressed in normal adult tissues **BUT** reactivated as survival factor by many different cancers
- Cancer cells overexpressing ROR1 show increased survival, migration and resistance to chemotherapy

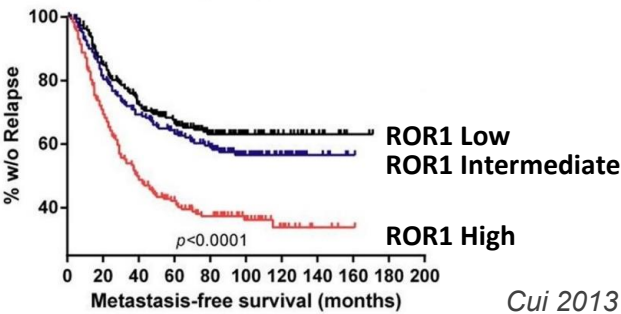
ROR1 Expressed on Multiple Solid and Liquid Tumors

MCL	95%
CLL	95%
Uterus	96%
Lymphoma	90%
Prostate	90%
Skin	89%
Pancreatic	83%
Adrenal	83%
Lung	77%
Breast	75%
Testicular	73%
Colon	57%
Ovarian	54%

Zhang 2012 AJP

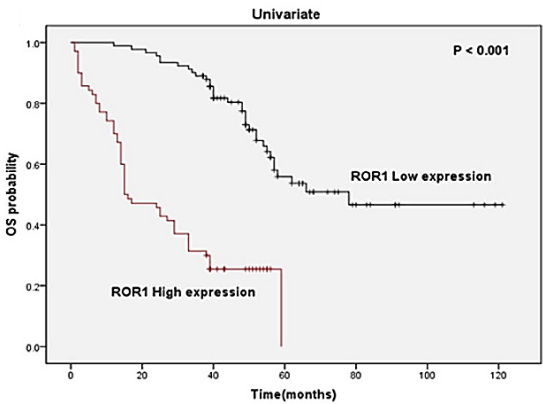
ROR1 Expression Associated with More Aggressive Tumors

- ROR1 expression associated with higher risk of breast cancer relapse



Cui 2013 Cancer Res

- ROR1 expression associated with shorter OS in patients with lung adenocarcinoma



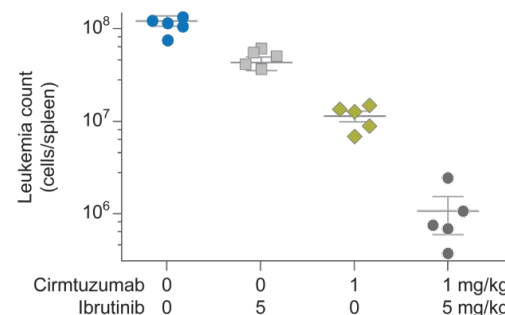
Zheng 2016 Scientific Reports

Cirmtuzumab Demonstrated Promising Preclinical Data in Multiple Tumor Models

- Discovered by Professor Thomas Kipps (UC San Diego)
- High affinity anti-ROR1 humanized monoclonal antibody
 - Observed $t_{1/2}$ ~30 days supports monthly dosing
- Binds important inhibitory epitope blocking Wnt5a interaction
- No binding to normal adult tissues in GLP tissue cross-reactivity studies

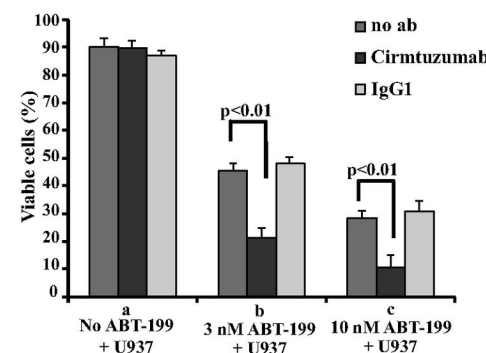
Synergism with Targeted Agents

- Synergistic with ibrutinib in CLL + MCL
 - ROR1-Wnt5a pathway not inhibited by ibrutinib



Yu 2017 Leukemia; Zhang 2019 PNAS

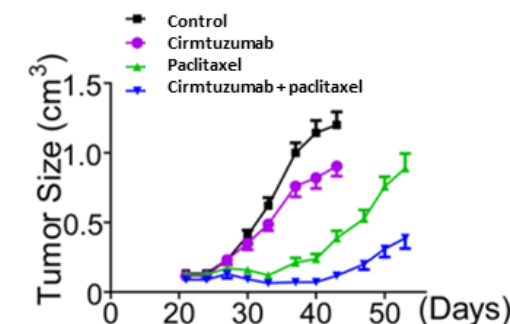
- Synergistic with venetoclax (ABT-199)



Rassenti 2017 PNAS

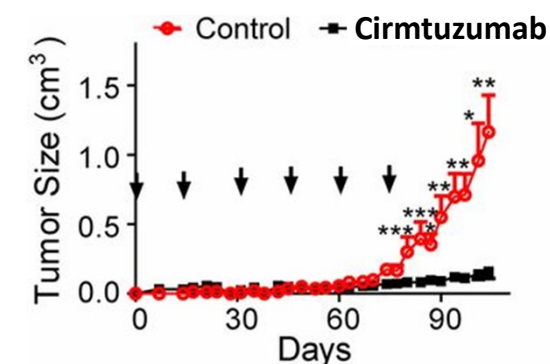
Supporting Preclinical Data in Solid Tumors

- Synergistic with paclitaxel in TNBC PDX xenograft model



Zhang 2016 Cancer Res

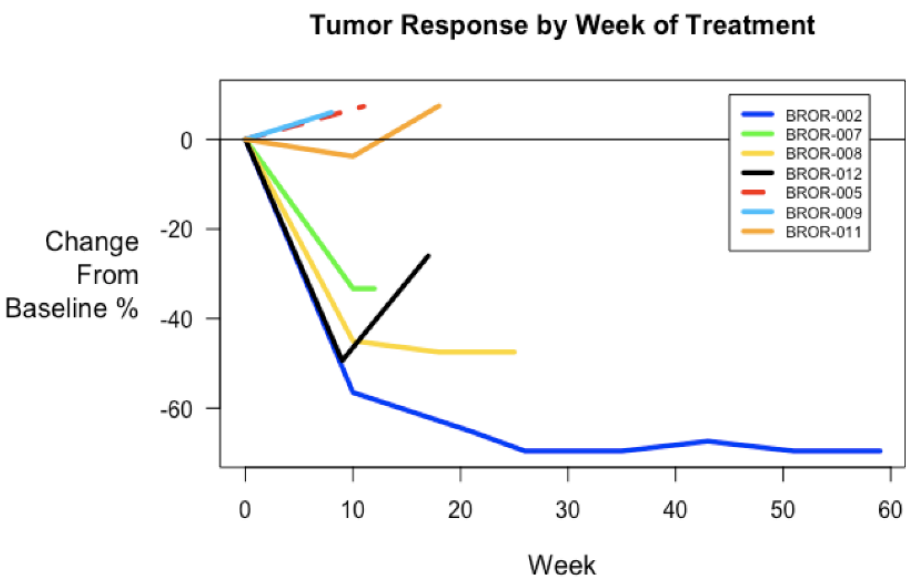
- Anti-tumor activity in PDX models of ovarian cancer



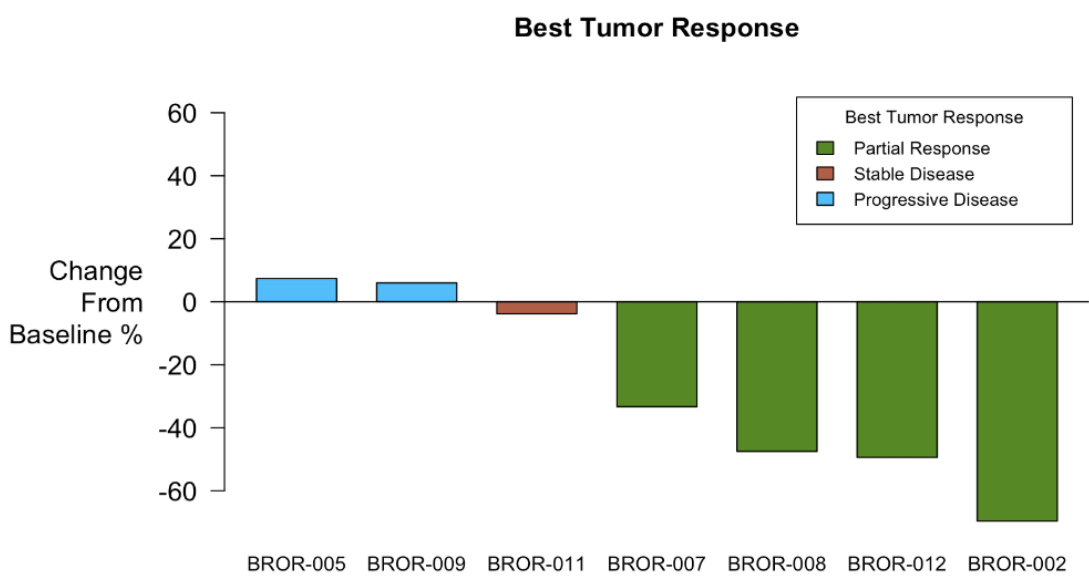
Zhang 2014 PNAS

HER2-negative Breast Cancer: Interim Phase 1 Data Cirmtuzumab + Paclitaxel Presented at SABCS 2019: ORR 57%

% Tumor Volume Reduction by Week of Therapy



Best Tumor Volume Response by Patient ORR = 57% (4/7)



HER2-negative
breast cancer

SABCS 2019 presentation of
interim data

- Investigator sponsored trial at UC San Diego, Barbara Parker & Rebecca Shatsky
- Patients with HER2 negative, metastatic or locally-advanced unresectable breast cancer
- 600 mg cirmtuzumab monthly + 80 mg/m² paclitaxel weekly
- No DLTs or discontinuations
- Adverse events consistent with paclitaxel profile
- PK consistent with half-life of 30 days

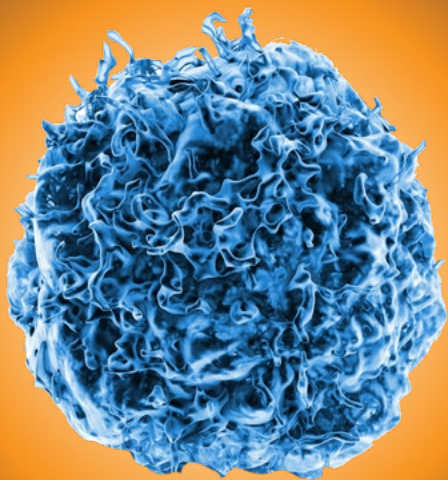
Shatsky 2019 SABCS
(data cutoff November 27, 2019)

Historical reported weekly paclitaxel ORR ~30%⁽¹⁾

(1) Weekly paclitaxel ORR: 21% - Miller 2007 NEJM, 32-42% - Seidman 2008 JCO, 32% - Kim 2017 Lancet Oncol, 29% - Schmid 2019 JCO. Disclaimer: Results not based on head-to-head clinical studies. The results from historical trials not directly comparable and do not imply a clinical benefit of cirmtuzumab + paclitaxel over paclitaxel alone.

Cirmtuzumab – Data Anticipated in 2020

- | | |
|---|-----------------|
| <ul style="list-style-type: none">• Phase 1b additional data in MCL<ul style="list-style-type: none">- Follow-up for 12 patients in Part 1 | Mid-2020 |
| <ul style="list-style-type: none">• Phase 1/2 additional data in CLL<ul style="list-style-type: none">- 12-month follow-up for 34 patients in Parts 1&2 | Mid-2020 |
| <ul style="list-style-type: none">• Phase 1b additional data in HER2-negative breast cancer | 2H 2020 |
| <ul style="list-style-type: none">• Phase 1b cirmtuzumab + venetoclax in CLL<ul style="list-style-type: none">- Initial data | 2H 2020 |
| <ul style="list-style-type: none">• IND-enabling data in additional indications<ul style="list-style-type: none">- Targeting NSCLC, prostate, ovarian cancer | Mid-2020 |



CAR-T Program

Targeting ROR1

Unmet Need: Emerging CAR-T Issues

Treatment failures

- Increasing number of patient relapses following CAR-T therapy, frequently due to mutations or loss of the target antigen tumor (e.g. CD19), evading CAR-T efficacy

Safety concerns

- Persistent CAR-T safety issues including deaths potentially related to activation by normal cells expressing the target antigen



Advantages to Targeting ROR1

Potential for fewer antigen negative relapses

- ROR1 expression associated with aggressive tumor phenotype
- ROR1 mutation or antigen loss might render cancer cells less aggressive and susceptible to chemotherapy

Potential safety advantages

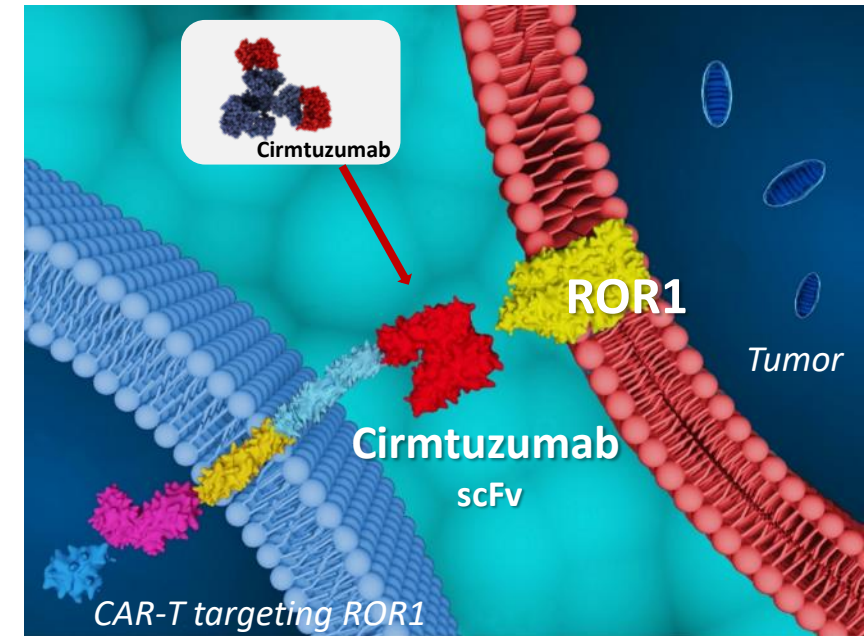
- Cirmtuzumab did not bind to normal human tissues in GLP tissue cross-reactivity studies
- No serious adverse events related to cirmtuzumab-only reported in clinical studies

DEVELOPMENT STATUS

- Preclinical data in hematologic and solid tumor models
- Utilizing cirmtuzumab scFv as targeting component
- Ongoing process optimization and scale-up
- UCSD collaboration with non-dilutive financing from California Institute for Regenerative Medicine (CIRM)
- Shanghai Pharma collaboration, which covers certain manufacturing and clinical development costs

OPPORTUNITY

- Selective targeting strategy applicable to multiple tumors with ROR1 expression
- Target initial human proof-of-concept in hematological cancers, then expansion into solid tumors





BUSINESS & FINANCIALS

Ticker	ONCT (Nasdaq)
Cash & Cash Equivalents @ 9-30-19 Cash Runway through 2Q 2020	\$23.1M
Debt	\$0
Capitalization:	
Common Shares Outstanding	15.4M
Options	2.5M
Warrants	0.8M
Fully Diluted	18.7M
Non-Dilutive Support	
<ul style="list-style-type: none">CIRM Grant for CIRLL StudyIbrutinib CTM for CIRLL Study	~\$14M Expanded Supply Agreement

Anticipated Pipeline Milestones in 2020

- **TK216**
 - Phase 1b in **Ewing sarcoma**: expansion cohort data **2H 2020**
 - Expect 5-10 additional patients enrolled by mid-2020
 - IND-enabling data in additional **ETS-driven tumors** **2H 2020**
- **Cirmtuzumab**
 - Phase 1b additional data in **MCL** **Mid-2020**
 - Follow-up for 12 patients in Part 1
 - Phase 1/2 additional data in **CLL** **Mid-2020**
 - 12-month follow-up for 34 patients in Parts 1&2
 - Phase 1b additional data in **HER2-negative breast cancer** **2H 2020**
 - Phase 1b cirmtuzumab + venetoclax in **CLL** **2H 2020**
 - Initial data
 - IND-enabling data in **additional indications** **Mid-2020**
- **ROR1 CAR-T** first-in-human dosing in China **4Q 2020**

Experienced Team



James Breitmeyer, MD, PhD
CEO, Founder, Director

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CFO

Igor Bilinsky, PhD
CBO

Frank Hsu, MD
CMO

Gunnar Kaufmann, PhD
CSO

Hazel Aker
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Raj Krishnan, PhD
SVP, Manufacturing



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Co-founder, Board Chairman

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Director

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Director

Bill LaRue
Director

Xin Nakanishi, PhD
Director

Charles Theuer, MD, PhD
Director

Robert Wills, PhD
Director



THREE NOVEL ONCOLOGY PRODUCT CANDIDATES IN DEVELOPMENT

TK216: TARGETED ETS INHIBITOR

- Deep and sustained response observed in Ewing sarcoma Phase 1 clinical trial
- Additional opportunities in other cancers with ETS alterations

CIRMTUZUMAB: ROR1 INHIBITORY MONOCLONAL ANTIBODY

- Sustained responses in MCL and CLL in Phase 1/2 clinical trial and TNBC in Phase 1b clinical trial
- Additional opportunities in other ROR1 expressing cancers

ROR1 CAR-T: PRECLINICAL DEVELOPMENT WITH CIRM AND SHANGHAI PHARMA

- Potential to improve on CAR-T efficacy and safety

MULTIPLE DATA CATALYSTS EXPECTED IN 2020

- Clinical data updates expected in Ewing sarcoma, MCL, CLL and breast cancer
- ROR1 CAR-T expected to reach clinic in 4Q 2020 in China

EXPERIENCED MANAGEMENT AND BOARD OF DIRECTORS