

Legend Biotech R&D Day

October 18, 2021

## **Forward-looking Statements**

Statements in this report about future expectations, plans and prospects, as well as any other statements regarding matters that are not historical facts, constitute "forward-looking statements" within the meaning of The Private Securities Litigation Reform Act of 1995. These statements include, but are not limited to, statements relating to Legend Biotech's overall strategies and objectives; Legend Biotech's ability to achieve milestones under its collaboration with Janssen Biotech; Legend Biotech's strategy and plans for the development, manufacturing and commercialization of ciltacabtagene autoleucel (cilta-cel), including anticipated regulatory milestones; the preclinical and clinical development strategy for product candidates and the anticipated timing of key regulatory and clinical milestones for such product candidates; the potential benefits afforded by investigational candidates; and the opportunities represented by preclinical data. The words "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "will," "would" and similar expressions are intended to identify forwardlooking statements, although not all forward-looking statements contain these identifying words. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors. Legend Biotech's expectations could be affected by, among other things, uncertainties involved in the development, manufacturing and commercialization of new pharmaceutical products; unexpected or inconsistent preclinical data; unexpected clinical trial results, including as a result of additional analysis of existing clinical data or unexpected new clinical data; unexpected regulatory actions or delays, including requests for

additional safety and/or efficacy data or analysis of data, or government regulation generally; unexpected delays as a result of actions undertaken, or failures to act, by our third party partners; uncertainties arising from challenges to Legend Biotech's patent or other proprietary intellectual property protection, including the uncertainties involved in the US litigation process; competition in general; government, industry, and general public pricing and other political pressures; the duration and severity of the COVID-19 pandemic and governmental and regulatory measures implemented in response to the evolving situation; as well as the other factors discussed in the "Risk Factors" section of the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on April 2, 2021. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in this report as anticipated, believed, estimated or expected. Legend Biotech specifically disclaims any obligation to update any forwardlooking statement, whether as a result of new information, future events or otherwise. In addition, caution should be exercised when interpreting results from separate trials involving separate product candidates. There are differences in the clinical trial design, patient populations, and the product candidates themselves, and the results from the clinical trials of distinct product candidates may have no interpretative value with respect to our existing or future results. Similarly, caution should be exercised when interpreting results relating to a small number of patients or individually presented case studies.



## Agenda

Welcome	Jessie Yeung, Head of Corporate Finance	10:00 a.m. – 10:05 a.m.
Introduction	Dr. Ying Huang, CEO & CFO	10:05 a.m. – 10:15 a.m.
Global BCMA Program	Dr. Lida Pacaud, VP of Clinical Development Steve Gavel, VP of Commercial Development	10:15 a.m. – 11:00 a.m.
Coffee Break		11:00 a.m. – 11:10 a.m.
<ul><li>Research &amp; Development</li><li>Solid Tumors</li><li>Allogeneic Programs</li></ul>	Dr. Frank Fan, Chief Scientific Officer	11:10 a.m. – 12:20 p.m.
Q&A		12:20 p.m. – 12:50 p.m.
Conclusion		12:50 p.m. – 1:00 p.m.

## Introduction

Ying Huang, Ph.D. Chief Executive Officer & Chief Financial Officer

## **Key Milestones**



### **Our Presenters**







A trained physician, Dr. Lida Pacaud formerly led the CART Global Clinical Program at Novartis and served as the Executive Medical Director of its Cell & Gene Unit. **Steve Gavel** Vice-President, Commercial Development

Steve Gavel has spent 20 years conducting commercial and marketing in the biotechnology industry. At Celgene, Steve headed commercial development activities for the bb2121 program. Frank Fan, M.D., Ph.D. Chief Scientific Officer, Co-Founder

Dr. Frank Fan is an applied immunologist who specialized in the field of immunotherapy and pioneered anti-BCMA CAR-T.



## **Pioneering Cellular Therapy**

Antibody

screening &

engineering

In-house antibody generation and CAR-T-specific functional screening technologies

Armoring strategy for solid tumors

Diverse allogeneic platforms, including non-gene editing universal CAR-T and NK

Diverse platform for allogeneic treatments



Multiple armored CAR-T strategies to overcome

tumors

challenges in treatment of solid

## What inspires us?

LEGEND-2 Patient #6



Wang B, et al. Presented at the 61st ASH Annual Meeting and Exposition; December 7-10, 2019. Abstract #579. Li J. Presented at the SAPA Scientific Symposium. August 15, 2020.

\*Updated follow-up data compared with ASH 2019 presentation.

8

## 5-year follow-up







# Advancing Treatment Options for Multiple Myeloma

**Lida Pacaud, M.D.** Vice President of Clinical Development

**Steve Gavel** Vice President of Commercial Development

## **Current Clinical Development Plan**

Ciltacabtagene autoleucel (cilta-cel)





## CARTITUDE-1: Unprecedented responses in relapsed/refractory multiple myeloma (ASCO 2021)

- 18 months median follow up
- 97.9% ORR
  - 94.8% ≥VGPR
  - 80.4% sCR
  - 91.8% MRD 10<sup>-5</sup> negative CR (61 evaluable patients)<sup>b</sup>
- Response rates were comparable across different subgroups
  - number of prior lines of therapy refractoriness, extramedullary plasmacytomas, and cytogenetic risk)<sup>a</sup>





## CARTITUDE-1: Long-term clinical benefit measured by PFS (ASCO 2021)

- Median duration of follow-up of 18 months
- Lower CI indicates minimum 22.8mo PFS benefit in all patents
- Median PFS will mature with further follow-up
- No new safety signals with longer follow-up
  - CRS: All grade 94.6% (Grade ≥3, 5.2%)
  - Neurotoxicity: All Grade 20.6%(Grade ≥3, 10.3%)





Data cut-off: Feb 11, 2021; NE, not estimable; PFS, progression-free survival; OS, overall survival; sCR, stringent complete response. Usmani S, et al. ASCO Annual Meeting (Virtual). June 4-8, 2021. Abstract 8005

## **CARTITUDE-1**

RRMM: PI, IMiD and anti-CD38 exposed

#### **Commercial Assumptions & Implications**

- Indication assumption\* (Patients meeting label requirements)
  - US: 5L+ Prior lines of therapy patient opportunity
    - US: ~12,000
  - EU/JP: 4L+ Prior lines of therapy patient opportunity
    - EU: ~6,000
    - Japan: ~4,000
- Go to market model
  - 50/50 US co-promote with Janssen
  - Legend deployment will largely be hospital based
- Cilta-cel Product Positioning: Three critical dimensions
  - Clinical
  - Operational
  - Access

\*Estimate includes patients eligible for lead indication; Lead indication label assumptions:

### **Opportunity Assessment**

US label assumption of 5L+ is in-line with Abecma label

EU label assumption of 4L+ is in-line with Abecma approval in EU

JP label assumption of 4L+

<sup>&</sup>lt;sup>4</sup> Source: Kantar Health and Precision-IQ

## CARTITUDE-2: Phase II Multi-Cohort Study in Various Multiple Myeloma Settings ( $n \approx 160$ )





## CARTITUDE-2 Cohort A (n=20): 95% ORR in 1 – 3 prior lines RRMM (ASCO & EHA 2021)

- MM after 1–3 prior lines of therapy, refractory to lenalidomide
- Median prior lines of therapy was 2 (range, 1-3); 1 patient treated in an outpatient setting
- Median follow-up of 5.8 months
- 95% ORR
  - 85% had ≥ VGPR, 75% of ≥ CR
  - No progression of disease at in responding patients
  - All patients (n=4) with MRD-evaluableb samples at the 10-5 threshold were MRD negative at data cut-off
- The safety profile was manageable
  - CRS occurred in 85% (n=17); mostly grades 1/2; median time to CRS onset was 7 days (range, 5–9)
  - Neurotoxicities occurred in 20% (n=4) of patients; no grade ≥3; no incidence of movement and neurocognitive TEAEs





Data cut-off date: Jan 2021; aPatient who did not respond had stable disease. bMRD was assessed in evaluable samples (ie, patients with identifiable clone at baseline and sufficient cells for testing at 10-5 threshold in post treatment samples) by next-generation sequencing (clonoSEQ, Adaptive Biotechnologies) in all treated patients.

CR, complete response; MRD, minimal residual disease; ORR, overall response rate; PR, partial response; sCR, stringent complete response; TEAE, treatment-emergent adverse events; VGPR, very good partial response Agha M, et al. ASCO Annual Meeting (Virtual). June 4-8, 2021. Abstract 8013.

## CARTITUDE-4: Phase III Study in 1-3 prior line RRMM (NCT04181827)



#### **PRIMARY OBJECTIVE**

• To compare efficacy (PFS) of cilta-cel infusion to the standard treatments of PVd or DPd



#### **KEY INCLUSION CRITERIA**

- Age ≥18 with diagnosed MM
- 1–3 prior lines of therapy (PI+IMiD or PI+IMiD+CD38 exposed), and lenalidomide-refractory



#### **KEY EXCLUSION CRITERIA**

• Prior CAR-T or BCMA-targeting therapy





### **CARTITUDE-4 - Study Schema**



- Study start date: June 2020
- ~100 study locations, in 17 countries in North America, Europe and Asia.

PVd : Pomalyst, Velcade, dexamethasone

\* Physician's choice and dependent on prior anti-myeloma therapy.



18



## Myeloma RRMM Triplet Efficacy Outcomes - Current SoC

Regimen	% Len Refractory	Median PFS (Months)	Median PFS for Len Refractory Patients (Months)	Median Lines of Therapy (Publication)	Study Name and Reference
DVd arm (n=251)	17.9% (DVd)	16.7	9.3	2	CASTOR; Spencer 2018
PVd arm (n=281)	71% (PVd)	11.2	9.5	2	OPTIMISMM; Richardson 2019
DPd (n=103)	89%	8.8	NA	4	EQUULEUS; Chari 2017

DVd: Darzalex, Velcade, dexamethasone PVd : Pomalyst, Velcade, dexamethasone DPd: Darzalex,, Pomalyst, dexamethasone

## **CARTITUDE-4**

RRMM: 1-3 PL (PI+IMiD exposed + lenalidomide refractory)

## *First* Phase III Global BCMA CAR-T cell therapy Clinical Trial in 1-3 prior line setting

#### Cilta-cel indication assumption

- 1-3 prior lines of therapy
  - Does not require prior daratumumab exposure
    - ~80% of patients in 2L setting have not been daratumumab exposed
    - \*Eligible patient opportunity, across US/EMEA/Japan, is ~80,000 (2-5L) patients
  - Timing: TBD
- Competitive assumption
  - 2-4 Prior lines of therapy
    - Requires prior daratumumab exposure
    - Timing: Q4 2022 1H 2023

### **Opportunity Assessment**

\*Data Source: Kantar Health and Precision-IQ

## CARTITUDE-5: Phase III Study in newly diagnosed MM, not intended for transplant (NCT04923893)



#### **PRIMARY OBJECTIVE**

• To compare efficacy of VRd followed by cilta-cel vs VRd followed by Rd therapy



#### **KEY INCLUSION CRITERIA**

- Newly diagnosed multiple myeloma
- Not considered candidate for high-dose chemotherapy with ASCT due to advanced age or presence of comorbid condition(s) or defer high-dose chemotherapy with ASCT as initial treatment



#### **KEY EXCLUSION CRITERIA**

- Frailty index of ≥2 according to Myeloma Geriatric Assessment
- Prior CAR-T or BCMA-targeting therapy
- Any prior therapy for multiple myeloma or smoldering myeloma



### **CARTITUDE-5 - Study Schema**



- Study start date: August 2021
- ~118 study locations

\* Participants who received 1 cycle of VRd therapy prior screening, will only receive 5 cycles of VRd. \*\* Conditioning regimen: cyclophosphamide/ fludarabine

Study start/locations source: clinicatrials.gov



### VRd Regimen in Newly Diagnosed Multiple Myeloma -Current SoC

Regimen	PFS for VRd	Study Name and Reference
VRd arm (n=242)	43 months	SWOG S0777; Durie 2017
VRd arm (n=350)	36 months	IFM/DFCI2009; Attal 2017

VRd: Darzalex, Revlimid, dexamethasone



## **CARTITUDE-5**

Frontline: Transplant not intended (TNI)

## *First* Phase 3 Global BCMA CAR-T cell therapy Clinical Trial in Frontline Setting

#### **Commercial Assumptions/Implications**

- Cilta-cel indication assumption
  - 64,000 newly diagnosed patients across US/EU/Japan
  - \*Transplant not intended eligible patient populations
    - o 50% US: ~17,000
    - 40% EU: ~9,000
    - o 25% Japan: ~1,600
  - Indication represents significant downstream cost avoidance opportunities

### **Opportunity Assessment**

<sup>\*</sup> Transplant not intended (TNI) = clinically transplant ineligible + clinically transplant eligible but deferred Data Source: Kantar Health and Precision-IQ

## Clinical Program - Cilta-cel Studies in Multiple Myeloma

Late Line Studies of Therapy 🛛 🚔 🍎 🔵

Earlier Lines of Therapy 🛛 🚔 💮 💿 👘 💿 🊫 🔶

#### NCT03548207

**CARTITUDE-11** 

- Phase 1b/2, multi-center registrational study of cilta-cel in RRMM
- Fully enrolled and ongoing in US and Japan

**CARTIFAN-1**<sup>2</sup>

cilta-cel in various clinical settings to evaluate MRD negativity Enrolling in US/EU/Israel NCT03758417 NCT04181827 Global, randomized, registrational study Phase II, multi-center registrational, **CARTITUDE-4**<sup>4</sup> Phase III open-label study of cilta-cel vs DPd or confirmatory, study of cilta-cel in RRMM PVd in patients with RRMM, 1-3 lines of prior Ongoing in China therapy and refractory to lenalidomide Enrolling in US/EU/JP/AUS/Israel/Korea NCT04923893 Global, randomized, registrational study Phase III open-label study of VRd followed by **CARTITUDE-55** cilta-cel vs. VRd followed by Rd maintenance, in patients with newly diagnosed MM for whom ASCT is not planned as initial therapy Planned in US/Canada/EU/AUS/Israel/Brazil

**CARTITUDE-23** 

ASCT, autologous stem cell transplant: DPd. daratumumab, pomalidomide, dexamethasone; EU, European Union; JP, Japan; PVd, pomalidomide, bortezomib, dexamethasone; RRMM, relapsed and/or refractory multiple myeloma: SoC, standard of care; US, United States; VRd, bortezomib, lenalidomide, dexamethasone <sup>1</sup>NCT03548207. Clinicaltrials.gov website. https://clinicaltrials.gov/ct2/show/NCT03548207. CARTITUDE-1 is global registrational study; <sup>2</sup>NCT03758417. Clinicaltrials.gov website. https://clinicaltrials.gov/ct2/show/NCT03758417. CARTIFAN-1 is registrational study for China only; 3NCT04133636. Clinicaltrials.gov/website. https://clinicaltrials.gov/ct2/show/NCT04133636; 4NCT04181827. Clinicaltrials.gov website: https://clinicaltrials.gov/ct2/show/NCT04181827. CARTITUDE-4 is global registrational study; 5NCT04923893. Clinicaltrials.gov website:



NCT04133636

Global, multi-cohort study

Phase II open-label study of

https://clinicaltrials.gov/ct2/show/NCT04923893. CARTITUDE-5 is global registrational study.

## Conclusion: Global BCMA Program

- Cilta-cel has demonstrated potential best-in-class efficacy in CARTITUDE-1 study in RRMM
- Preliminary data from CARTITUDE-2 shows early promise for cilta-cel in early line MM
- CARTITUDE-4 is enrolling well and positions cilta-cel well in 2+ line MM
- CARTITUDE-5 is the first pivotal global Phase III trial for a BCMA targeting CAR-T in 1st line MM

Potential best-in-class efficacy



## **Coffee Break**

The presentation will resume in 10 minutes



## In Fierce Pursuit of Novel Therapies

Frank Fan, M.D., Ph.D. Chief Scientific Officer



#### Overview

Introduction of R&D culture Ab discovery expertise Diverse technology platforms

#### Solid Tumors

Gastric cancer & Pancreatic cancer

HCC and NSCLC

SCLC

#### **Allogeneic Platforms**

Unique non-genome editing allogeneic CAR-T platform

Legend CAR-NK platform



## The Strengths of Our R&D Program



#### **CORE TECHNOLOGIES**

- Outstanding CAR target identification expertise
- High-throughput antibody screening and engineering capability
- Proprietary multi-specific CAR-T platform
- A series of innovative CAR enhancing strategies
- Unique non-genome editing allogeneic CAR-T platform
- Robust LGkine energized CAR-NK platform
- Legend armored CAR- $\gamma\delta$ -T platform
- TCR-T



#### **HIGHLIGHTS FROM OUR PIPELINE**

- Highly selective Claudin 18.2 targeting CAR for gastric and pancreatic cancers
- Armored GPC-3 CAR targeting HCC, NSCLC, etc.
- Novel CAR targeting DLL-3 for SCLC
- Allogeneic CAR products for BCMA
- CAR-NK designed to further antitumor efficacy



## Legend NGS and Bioinformatics Capabilities

NGS Platform		Bioinformatics Platform			
In-house 10X Genomics single cell sequencing platform In-house HPC and AWS cloud computation Sophisticated NGS and bioinformatician teams					
<b>Target Discovery and</b> <b>Validation</b> Tumor heterogeneity Tumor vs normal tissues	<b>TME Analysis</b> TME cell type analysis Guide armor strategy	Drug Product Characterization Phenotype Gene expression profile	<b>Clinical Study</b> Cell dynamical change Bio-marker & MOA study		
	Support pre-clinical R&D, proces	sing development and clinical	study		



## Multiple Antibody Development Platforms





## Legend VHH-Based Multi-Specific CAR-T Platform

- Improved CAR expression and stability
- Easier access to novel and hidden epitopes, which specifically facilitates the design of membrane proximal binders
- Robust engineering flexibility for the design of complex multi-specific CAR



## Challenges in Treating Solid Tumor by T-cell Therapy



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## **Technologies for Conquering Solid Cancers**





## Proprietary Intracellular Modulator (IM) Platform

Modification of intracellular molecules in CAR-T cells could resist inhibitory signal from cell surface and increase their persistence and activity in tumor microenvironment.



Our intracellular modulator KO CAR-T cells showed a more energetic and younger phenotype.


### Capability Summary of the Legend R&D Team





# Solid Tumors: LB1908



### LB1908: CLDN18.2 CAR-T

For gastric cancer and pancreatic cancer



#### TARGET

- Claudin (CLDN) are a family of tight junction proteins<sup>1</sup>
- CLDN18.2 is commonly expressed on multiple cancers including gastric cancer and pancreatic cancer<sup>2</sup>
- CLDN18.2 is highly conservative cross species, extracellular domain 1 are identical between human and mouse



#### **MOA/SCIENTIFIC RATIONALE**

- LB1908 targets CLDN 18.2 through a high-affinity VHH antibody identified in-house
- The VHH antibody binds to CLDN 18.2 only, but not to the closely related CLDN 18.1
- Balance of safety and efficacy was fine-tuned in a relevant murine toxicology model



#### **CLINICAL DEVELOPMENT STRATEGY**

- IIT clinical study in China is ongoing for the treatment of adult patients with advanced gastric cancer
- Promising early sign of safety and efficacy supports expansion to multi-center trials and endorses dose escalation above 3 million/kg
- US IND is being developed with planned submission in 1H2022

#### Claudin18.2 Expression is Gastric Tissue-restricted



https://www.proteinatlas.org/ENSG00000066405-CLDN18/tissue/lung#img

\*Clin Cancer Res 2008;14(23) December 1, 2008



### Claudin18.2 Protein is Widely Expressed in GC and PDAC

Presence of Claudin18.2 protein in human cancer tissues (66 tissue IHC, EU)

Primaries				
	Any labeling	≥2+ in ≥60% of cells significant labeling		
GC	51/66(77%)	37/66 (56%)		
Diffuse		15/20 (75%)		
Intestinal		21/45 (46%)		
Esophagus AC	17/22(78%)	11/22 (50%)		
Esophagus SCC	0/7	0/7		
PDAC	8/10 (80%)	6/10 (60%)		
Pancreatic islet cell carcinoma	0/5	0/5		

#### **Ovarian AC**

0/25	0/25
4/17 (24%)	4/17 (24%)
Metastases	
19/29(66%)	15/29(51%)
32/33 (96%)	23/33 (69%)
6/28 (21%)	0/28
8/12 (66%)	6/12 (50%)
	0/25 4/17 (24%) Metastases 19/29 (66%) 32/33 (96%) 6/28 (21%) 8/12 (66%)

Claudin 18.2 expression in gastric tumor and LN metastases (262 cases IHC, Japan)

Primaries				
	Any labeling	≥2+ in ≥60% of cells significant labeling		
GC	228/262 (87.0%)	135/262 (51.5%)		
Diffuse	119/134 (88.8%)	77/134 (57.5%)		
Intestinal	47/59 (79.7%)	23/59 (39%)		
Mucinous	6/7 (85.7%)	1/7 (14.3%)		
Others	7/10(70%)	3/10(30%)		
Missing	49/52 (94.2%)	31/52 (59.6%)		
Metastases				
LN metastases	108/135(80%)	61/135(45.2%)		



#### CLDN18.2 expression in matched pairs of primary tumors and corresponding LN metastases. X-axis: CLDN18.2+% tumor cells in the primary tumor;

Y-axis: CLDN18.2+% tumor cells corresponding LN metastasis

Japanese Journal of Clinical Oncology, 2019, 1–7



Abbreviations: AC, adenocarcinoma; SCC, squamous cell carcinoma; LN, lymph node. Source: CLIN CANCER RES 2008;14(23) DECEMBER 1, 2008

41

### LB1908 Modality and Features

- LB1908 (LCAR-C18S) consists of autologous T cells genetically modified to express a CAR utilizing a lentiviral vector
- Preclinical studies demonstrate a target-specific profile of efficacy as well as safety



- Highly specific VHH characterized by human frozen tissue array by IHC, restricted to gastric tissues
- Highly specific to Claudin18.2; no off-target binding to Claudin18.1
- Superior CAR-T anti-GC and anti-PDAC potency in vivo over benchmarks



42

### LB1908 VHH Binding Patterns and Performance

- High specificity is the premise and cornerstone of developing a safe, live drug targeting CLDN18.2
- LB1908 VHH strongly and specifically binds to CLDN18.2, but not to CLDN18.1





### LB1908 CAR-T Showed Cytotoxicity Only to Claudin18.2

#### • Toxicity was not shown to Claudin18.1+cells or a set of human primary cells



Representative data from the Incucyte ® Live-Cell Analysis System; Red dye labeling target cells by IncuCyte CytoLight Rapid Red Reagent Green dye labeled by IncuCyte® Caspase-3/7 Green Apoptosis Reagent



### LB1908: Anti-tumor Efficacy in Gastric Tumor CDX Model





For LB1908 (C18S): tumor free can achieved in 75% 1M group and all 3M/5M; for benchmark 1: No tumor free at 5M but tumor relapsed.

#### LB1908: Anti-tumor Efficacy in PDAC CDX Model



18.

16-

  Days after treatment

 

14 21 28 35 42 49

Days after treatment

Days after treatment

### Human Tissue Cross-reactivity with LB1908 Antibody

**Tissue IHC:** 30 different normal human tissues from 3 individuals.

- Tissue list •
  - Adrenal
  - Bone Marrow •
  - Breast •
  - Cerebrum
  - Cerebellum
  - Pituitary •
  - •
  - Artery •
  - Esophagus •
  - Fallopian Tube
  - Heart •
  - Kidney •
  - Liver •
  - Lung •

47

Lymph Node •

- Ovary
- Pancreas
- Placenta
- Prostate
- Skin
- Spinal Cord
- Spleen
  - Striated muscle
  - Stomach
  - Testis
  - Thymus
  - Thyroid
  - Ureter
  - Uterus
  - Cervix









Cell membrane staining restricted to gastric mucosal epithelial cells.





Colon

### LB1908 Investigator Initiated Clinical Trial

#### A Clinical Study to Evaluate CAR-T Cell-based Medicinal Product in the Treatment of Advanced Gastric Cancer

Key Inclusion and Exclusion Criteria <sup>1</sup>						Study Endpoints		
Inclusion: Aged 18-75 years; Claudin18.2 positive recurrent or metastatic advanced G/GEJAC; previous total gastrectomy/subtotal gastrectomy, and adequate standard of care recommended by NCCN 2019 V3 or the CSCO 2019; documented disease progression after most recent therapy; ECOG 0-1; Expected survival ≥ 3 months					<b>Primary Outcome Measures:</b> Dose-limiting toxicity (DLT) and incidence, severity, and type of TEAEs; RP2D regimen finding; CAR positive cell concentration			
Exclusion: Prior CAR-T or Claudin18.2-targeted treatment; treatment for certain other malignancies or recent antitumor therapy; Presence of local recurrence of gastric lesions; Brain metastases with central nervous system symptoms; Gastric perforation, pyloric obstruction et al (all details please refer to Clinicaltrial.gov)								
STUDY DESIGN								
<b>Screening</b> (28 days)		Apheresis		Bridging therapy		<b>Day -7 to -5:</b> Start 3-day conditioning regimen cy & flu		Day 1:       Follow-up and assessment
T-cell transduction and expansion to manufacture LCAR-C18S								

Site: Shanghai East Hospital **Principal Investigator:** Jin Li, MD, PhD

Actual Study Start Date: September 21, 2020 Estimated Primary Completion Date: November 2022

NCT04467853. Available: https://clinicaltrials.gov/ct2/show/NCT04467853

Abbreviations: Dose-limiting toxicity (DLT); treatment-emergent adverse events (TEAEs);

Maximum tolerated dose (MTD) and recommended Phase II dose (RP2D); Overall response rate (ORR); Duration of remission (DOR) ; Progress Free Survival (PFS);

Overall Survival (OS) Disease control rate (DCR); Time to Response (TTR); pharmacokinetics (PK); anti-drug antibody (ADA).

#### **Study Design and Status**

- A Phase I, Open-Label Study Evaluating the Safety, Tolerability and Efficacy of LB1908, a CAR-T Cell Therapy targeting Claudin18.2 in Patients With Advanced Gastric Cancer
- Study Objectives: the safety, tolerability, PK profile, efficacy of LB1908 in advanced GC
- Study Status: 4 subjects dosed, last subject dosed with 3.0M\*/kg CAR+ viable T cells. 3 subjects completed DLT observation and no DLT observed





### **Case Report**

- First dosed subject, Female/41, Gastric Adenocarcinoma, HER-2 (-), Claudin18.2 IHC (>75%,+++)
  - Sep 2017: radical gastrectomy
  - From Nov 2019 to Jul 2020: received 5 prior lines systemic treatment for recurrent disease



#### RESULTS

- No DLT or SAE
- Efficacy assessment on Day 180 is continuous SD, with large pelvic tumor as target lesions achieved ~15% regression, the ascites and pelvic effusion as non-target lesions achieved significant decrease
- CAR-T expansion was detected from Day 2 and not detectable since Day 92
- Continue long term follow-up



#### Preliminary Sign of Clinical Response Emerge in the 1st Dosed Subject of LB1908

**CASE REPORT** 

Single injection at the lowest dose level (0.5 million/kg)

		Baseline(2021-03-04) (mm)	Day 45(2021-04-28) (mm)	Day 90(2021-06-16) (mm)	Day 180(2021-09-09) (mm)
Target Lesions	1. Pelvic Lesion	132.7	119.4	113.08	118.8
	2. Pelvic Lesion	128.1	109.7	107.2	105.0
	SOD	260.8	229.1 (-12.15%)	221.1(-15.22%)	223.8(-14.19%)
Non-Target Lesions	1. Ascites	Large amount	Significantly decreased	Exist, same as last visit	Exist, same as last visit
	2. Pelvic effusion	Large amount	Significantly decreased	Exist, same as last visit	Exist, same as last visit
New Lesions			No	No	No

#### **Prior CAR-T injection**

Huge pelvic lesion Acute upper tract obstruction Acute renal injury needs bilateral pyelostomy Large amount of ascites need abdominal drainage

#### Post CAR-T injection Reduction of lesion Resume urination

Removal of pyelostomy catheters Removal of abdominal drainage



#### Case Report: PK Profile

- CAR-T cells and CAR copies were detected from Day 2 and thereafter, with C<sub>max</sub> on Day 12
- CAR-T cell returned to low level on Day 45 and kept at low level on Day 58





- Claudin 18.2 is a very promising target for gastric cancer and pancreatic cancer
- Claudin 18.2 is also a very challenging target for developing a safe but efficacious CAR-T product
- LB1908 has demonstrated anti-tumor efficacy using both in vitro and in vivo models
- In a currently ongoing IIT, anti-tumor activities were observed in the first dosed GC patient; dose escalation has now reached 3.0 million cells per kg
- Encouraging safety signals have allowed us to expand the IIT to multi-center trials, with 3 additional sites
- The US IND preparation for LB1908 is currently in progress



# Solid Tumors: LB2101



### LB2101: The Armored CAR-T Targeting GPC-3

#### TARGET

- GPC3 is a promising target with highly specific over-expression in solid tumors
- Significantly upregulated in liver cancer (76%), lung SCC (52%), germcell cancers (44-100%) et al.<sup>1</sup>



#### MOA/ SCIENTIFIC RATIONALE

- In house developed humanized scFv with high affinity and specificity to GPC3
- Innovative armor platform: Utilize immunosuppressive signal in TME to augment CAR-T potency
- Optimized CAR design outperforms benchmarks in vivo



#### **CLINICAL DEVELOPMENT STRATEGY**

- Plans to pursue an IND in China and follow with phase I studies in other markets
- Plans to earn proof-of-concept data from HCC and expand to additional indications





### GPC3: A Well-Validated Target for Multiple Cancer Indications

- GPC3, an oncofetal protein, is absent in normal vital tissues.
- GPC3 has been found to be significantly upregulated in Liver Cancer (76%), Lung SCC (52%), Germ-cell Cancers (44-100%) et al<sup>1</sup>.



GPC3 in Hepatoblastoma<sup>2</sup>. A (H&E) and B (IHC)

Indications	%GPC3
Liver Cancer	
HCC	76%
Hepatoblastoma	100%
Lung cancer	
SCC (NSCLC)	52%
Germ cell tumors	
Extragonadal YST	100%
Germ cell tumors NOS	44%
Nondysgerminomas	100%
Nonseminomas	52%
Esophageal Cancer	
Esophageal SCC	27%
CNS tumors	
Atypical teratoid rhabdoid tumor	77%
Thyroid cancer	
Follicular	67%
Medullary	40%
Wilms Tumor	38%



### Design of GPC3-CAR (H93) Using scFv as a Binder

- Humanized single chain antibody fragment (scFv)
- Targeting C-terminus of GPC3, unaffected by shedding of N-terminus of GPC3
- High affinity to human GPC3: 73 ± 8.7 pM (SPR)
- No off-target binding in normal human tissues (TMA)
- Superior in vivo anti-tumor efficacy over benchmarks





### Legend's Innovative Armor Platform

Utilize TME signals to augment CAR-T functions

Legend's approach focuses on modifying CAR-T cells to improve intrinsic T-cell functionality in the solid tumor microenvironment.

LB2101 components:

- CAR: humanized scFv with optimized CAR design to target and eliminate cancer cells
- Innovative armoring strategy, with the objective of overcoming TME immunosuppression
  - Membrane bound protein with restricted functions in CAR-T cells
  - Conditional activation: Armor is activated by CAR signal and TME signal, thus will not alter CAR-T specificity to GPC3
  - Improved CAR-T infiltration into tumor
  - Enhanced expansion and persistence with improved anti-tumor efficacy





# The Armoring Strategy for LB2101 Markedly Improves CAR-T Functions

- Conditional armor activation: Improved LB2101 (H93T) expansion in the presence of GPC3 and the TME signal only
- Potency: LB2101 showed tumor-free efficacy at a very low dose
- Improved CAR-T expansion of H93T (LB2101) in vivo compared with un-armored H93
- No observed bodyweight loss or other in vivo toxicity





### Conclusion: LB2101

- LB2101 is a novel investigational CAR-T therapy for the treatment of HCC and SCLC by specifically targeting GPC3
- LB2101 shows superior suppression of tumor growth compared to the benchmark-based CAR-T in the HCC model
- Legend's innovative armoring strategy improves CAR-T persistence and overcomes immunosuppressive TME in a non-clinical model
- The first-in-human study is being planned for HCC and the indication may be expanded to other cancers in the future
- Further development of allogeneic approaches for LB2101 are also in progress



# Solid Tumors: LB2102



### LB2102: Legend Armored CAR-T Targeting DLL-3

#### TARGET

- DLL-3, a promising target with prevalent and homogeneous expression in SCLC (~80% positive) and other neuroendocrine tumors
- Minimal to no expression in normal tissues
- SCLC --- market size: 15% of all lung cancers, ~270,000 new cases globally per year
- SCLC --- unmet medical needs: median OS with extensive stage SCLC <10 mo, 5-yr OS ~3%</li>



#### MOA/SCIENTIFIC RATIONALE

- Tandem humanized sdAb-derived binders with high DLL3 binding affinity and specificity
- Superior efficacy in SCLC animal models in comparison to selected benchmarks
- An armor overcoming hostile microenvironment to boost the *in vivo* anti-tumor efficacy with increased proliferation and infiltration of CAR-T cells in tumors



#### SAFETY & CLINICAL DEVELOPMENT STRATEGY

- Well-tolerated *in vivo* in s.c and pulmonary orthotopic xenograft models
- Development of US IND is in preparation



### Delta-like Ligand 3 (DLL3) is an Emerging Target for SCLC

#### **DLL3 in SCLC tumors**

- Highly and homogeneously expressed
- Both on plasma membrane and in cytoplasm

#### **DLL3 in normal tissues**

- Minimal to no expression
- Exclusive in cytoplasm



#### **DLL3 protein expression by IHC**

(A) NSCLC(B) LCNEC(C) Naïve SCLC(D) Recurrent/refractory SCLC



**DLL3 expression in SCLC-A/N subtypes** 



Baine, J Thorac Oncol, 2020



Saunders, Sci Transl Med, 2015

63

### LB2102: DLL3-targeting CAR-T Cell for SCLC

- Similar to the design of cilta-cel, **two VHH binding domains targeting** DLL3 were coupled to deliver activation signal to CAR-T cells.
- An armor is integrated alongside the CAR to overcome the immunosuppressive tumor microenvironment.
- Preclinical pharmacology and toxicology demonstrated superior anti-tumor activity with minimized potential safety concerns.



### In Vitro Pharmacology of LB2102

- Legend proprietary biparatopic targeting strategy significantly enhanced CAR-T persistence.
- Persistence of armored CAR-T cells was significantly prolonged during repetitive challenges with target cells.
- The armor resisted the inhibition of cytokine production and T cell exhaustion under tumor microenvironment-mimicking conditions.





### In Vivo Pharmacology of LB2102

 The armored CAR-T showed significantly superior tumor inhibition, when compared to conventional CAR-T, along with higher peripheral blood CAR-T proliferation and more prominent CAR-T infiltration in the tumors.





### In Vivo Safety Study of LB2102

 A high dose of CAR-T cells was well tolerated in SHP-77 s.c. tumor-bearing mice;

 A high dose of CAR-T cells was well tolerated as of Day 28 post-infusion in a SHP-77luc-derived pulmonary orthotopic SCLC model in NCG mice, mimicking tumor burden in the lung.

#### G ∽ ₩ 2000 Tumor burden Body weight %CAR-T in PB Body weight (g) Mean 🛓 SD Hind South and S 🔶 Un T Σ cells 🛨 Armored CAR-T live <u>\_</u> ۲ د 20 0 10 30 40 0 10 20 30 40 % 0 5 10 15 20 25 30 Days after treatment Days after treatment Days after treatment

SUBCUTANEOUS TUMOR MODEL

#### **ORTHOTOPIC TUMOR MODEL**





### Conclusion: LB2102

- DLL3 is a promising target expressed in SCLC but barely in normal tissues.
- Leveraging a biparatopic tandem VHH sdAb-design and TME-resistant armor strategy, LB2102 has demonstrated potent cytotoxicity, improved proliferation, persistence and tumor infiltration, and these led to efficient in vivo tumor growth inhibition.
- Well-tolerated in tumor-bearing animal models.
- First-in-human study and US IND in preparation.





## Allogeneic Platforms: Non-Gene Editing LUCAR Platform



### "Mainstream" Allogeneic CAR-T Approach

<ul> <li>Gene editing</li> <li>ZNF</li> <li>TALEN</li> <li>CRISPR-Cas9</li> </ul>	<ul> <li>Knockout strategy</li> <li>TCRα KO to avoid GvHD</li> <li>B2M KO to evade HvG</li> <li>CD52 KO to increase persistence</li> </ul>
<ul> <li>Advantages</li> <li>Availability of diverse gene-editing tools</li> <li>Permanent gene KO</li> </ul>	<ul> <li>Disadvantages</li> <li>Off-target concerns</li> <li>Chromosomal aberration/translocation</li> <li>2-steps: LV transduction of CAR + gene KO</li> <li>IP issues</li> </ul>



### Legend's Unique Non-gene-editing Allogeneic Platform

**Gene-editing** 

**Allo-CART** 

CAR

**41BB** 



TCRα/TCRβ heterodimer (functional TCR complex)

No TCRα/TCRβ heterodimer (no functional TCR complex)



No TCRα/TCRβ heterodimer (no functional TCR complex)



#### Legend's Unique Non-gene-editing Allogeneic Platform



"Autologous-like" CMC process for highly homogeneous LUCART cells.


### Safety: Disruption of the TCR Complex and Its Function

UnT LUCAR-20S Q6-1 88.69% 10<sup>6.5</sup> Q6-1 0.01% Q6-2 0.54% Q6-2 0.08% 105 105 **TCR**αβ- and 104 104 CAR+ 98.63% APC-H 10<sup>3</sup> 10 <mark>6</mark>  $10^{2}$ 102 TCRαβ Q6-4 0.44% Q6-3 1.28% Q6-4 98.63% Q6-3 100.9 -10<sup>0.9</sup> 10.33% 103 104 105 106 107.1 -103.1 103 104 10<sup>5</sup> 106 107.1 -103.1 FITC-4 FITC-H CAR

Phenotype of LUCAR-20S

TCR $\alpha\beta$  negative cells >97% in final product



#### Mixed Lymphocyte Reaction (MLR)



Lack of activation by LUCAR-20S signifying GvHD free potential



### Allogeneic LUCAR-20S CAR-T Against CD20



#### TARGET

- CD20 is a cell surface protein on B cells with role in development and differentiation into plasma cells
- Expressed in majority of mature B-cell neoplasms, including plasma cell myelomas, B-lymphoblastic neoplasms, Hodgkin lymphomas, T-cell neoplasms, and AMLs



#### **MOA/SCIENTIFIC RATIONALE**

- Novel non-gene-editing allogeneic platform to target CD20
- Co-express Gene X to disrupt T-cell receptor for inhibiting GvHD (basic version: LUCAR-20S)
- Innovative armoring strategies to control HvG and promote persistence (full version: LUCAR-20SD)



#### **CLINICAL DEVELOPMENT STRATEGY**

- Limited cell expansion and efficacy were obtained from exploratory IIT of LUCAR-20S, a basic version which only implemented anti-GvHD solution
- Preliminary clinical data indicated promising safety profile in preventing GvHD
- Exploratory IIT trial is planned to obtain proof-of-concept data for full version LUCAR-20SD, in which anti-rejection (HvG) armoring strategies are also implemented



#### Main Challenges of Allogeneic CAR-T Platform



Necessitates design to prevent GvHD and resist HvG at the same time.



#### Proof-of-concept Clinical Studies by Exploratory IIT





### Study Design of LUCAR-20S

- An open label, single arm, Phase I study to evaluate the safety, tolerability, and pharmacokinetics of LUCAR-20S CAR-T cells in patients with relapsed or refractory CD20+ non-Hodgkin lymphoma
- Study Objectives: the safety, tolerability, PK profile, efficacy of LUCAR-20S in r/r NHL
- Study Status: 5 subjects dosed, last subject dosed with 300M\* CAR+ viable T cells.
   3 (60%) subjects achieved partial response(PR) and no DLT was observed



Site A: Hematological Department, People's Hospital of Jiangsu Province

Site B: Oncology Department, The First Affiliated Hospital of USTC west district



\*M = 1×10<sup>6</sup> \*\*Interim Analysis: 30 days after the last patient of dose escalation receiving LUCAR-20S

### Case Report: LUCAR-20S

- Female/50, Follicular Lymphoma, Grade 3A, CD20 (+)
  - Diagnosed on Feb 2018
  - 4 prior lines of therapy, including anti-CD20 monoclonal antibody (Rituximab)



#### RESULTS

- No GvHD, no SAE, no DLT.
- Efficacy assessment on Day 30 is PR, with all target and nontarget lesions regressing to normal or absent on CT, and CMR\* on PET-CT, but remaining positive on BM biopsy.
- Continued follow-up is needed



#### LUCAR-20SD Will Be Studied in Exploratory IIT





#### Safety: GvHD Assessment in Murine Model



Absence of GvHD response suggesting efficient downregulation of TCR



LCAR-20S Conventional CAR (Autologous) LUCAR-20SD Legend full version allogeneic CAR



#### Resistance of LUCAR-20SD to HvG

Host cells and graft LUCAR-20SD cells in the MLR co-culture system



Drug Y facilitates resistance of LUCAR-20SD to HvG by host cells



#### **Conclusion: LUCAR Platform**

- A proprietary non-gene-editing allogeneic CAR-T platform that avoids multiple gene editing and their inherited risks of off-target effects or genotoxicity
- All-in-One vector design for single step modification
  - High homogeneity in drug product to ensure stability and safety
  - Simple and efficient CMC for high yields and low COGS
- Solutions for both GvHD and HvG
  - Preliminary clinical data supports that the non-gene-editing platform successfully manages GvHD in humans
- The full version LUCAR-20SD, which incorporates an anti-HvG function, will be studied in a clinical trial



## Allogeneic Platforms: CAR-NK with LGkine Armoring



### Unique Features of CAR-NK Immunotherapy

- NK cells are rapid and efficient killers of tumor cells
- CAR-NK provides a promising solution to overcome TAA escape through recognition of tumor cells by multiple mechanisms
- CAR-dependent killing
- CAR-independent killing (e.g. NKG2D, NCRs, etc.)
- Antibody-mediated ADCC
- Flexible combination with therapeutic antibody drugs
- Clinical benefits and excellent safety profiles have been documented in multiple trials





### Challenges of Allogeneic CAR-NK Therapy

#### CHALLENGES

- Short persistence
- Feeder cell-based NK expansion processes
- Low transduction efficiency
- Fragility after cryopreservation



- Long term anti-tumor activity by LGkine armoring
- Feeder cell-free expansion process
- >500 doses/batch
- Robust transduction efficiency
- Cryopreserved product maintains viability and functionality



### **Key Features of CAR-NK Product**

- High purity
- High transduction efficiency

- Robust feeder cell-free expansion process
- Strong in vitro anti-tumor efficacy



 Cryopreserved product maintains viability and functionality





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### Feeder-Free Cord-Blood NK Platform

- Scalable feeder free expansion, potentially providing >500 doses/donor
- High purity: >90% NK cells, <1% T cell contamination
- Robust CAR transduction



87



#### Rationally Designed LGkine Can Achieve a Balance between Efficacy and Safety

 Long-term anti-tumor activity and extended animal survival were observed in animals treated with LGkine-armored CAR-NK cells





### Highlights of Legend's CAR-NK Product



#### EXPANSION METHOD

- Feeder cell free
   expansion process
- High transduction
   efficiency
- >1000 doses per batch manufacture

#### ARMOR APPROACH

- Long-term anti-tumor efficacy
- Strong IP position

#### MULTI-TUMOR TARGETING MECHANISMS

- Optimized CAR structure for NK cells;
- Enhanced CAR independent tumor killing mechanisms

#### CRYO-FORMULATION AND PROCESS

- Minimal loss of viability after thaw;
- Strong anti-tumor efficacy by frozen product



### Global R&D Strategy

Institutional R&D Model that accelerates Cell Therapy Discovery and Development				CORE TECHNOLOGY
	>300 employees One of the largest global cell therapy R&D teams	CLINICAL PLAN		CAR-T TCR-T NK ນຈິ - T
	Potential <b>best-in-class</b> proprietary technology platforms	Multiple Phase I programs in China		PRODUCT PLATFORM Autologous
	<b>Global</b> innovation development US, China, Europe			Allogeneic DISEASE AREAS
	Strong intellectual property position	Multiple clinical programs in US		Hematologic malignancy Solid tumor Autoimmune Infectious Disease
				1





# Q&A

Questions can be submitted by chat or by card



# THANK YOU