IOVANCE BIOTHERAPEUTICS

Corporate Overview

March 6, 2023

ADVANCING IMMUNO-ONCOLOGY

Forward-Looking Statements

Certain matters discussed in this press release are “forward-looking statements” of Iovance Biotherapeutics, Inc. (hereinafter referred to as the “Company,” “we,” “us,” or “our”) within the meaning of the Private Securities Litigation Reform Act of 1995 (the “PSLRA”). All such written or oral statements made in this press release, other than statements of historical fact, are forward-looking statements and are intended to be covered by the safe harbor for forward-looking statements provided by the PSLRA. Without limiting the foregoing, we may, in some cases, use terms such as “predicts,” “believes,” “potential,” “continue,” “estimates,” “anticipates,” “expects,” “plans,” “intends,” “forecast,” “guidance,” “outlook,” “may,” “could,” “might,” “will,” “should” or other words that convey uncertainty of future events or outcomes and are intended to identify forward-looking statements. Forward-looking statements are based on assumptions and assessments made in light of management’s experience and perception of historical trends, current conditions, expected future developments and other factors believed to be appropriate. Forward-looking statements in this press release are made as of the date of this press release, and we undertake no duty to update or revise any such statements, whether as a result of new information, future events or otherwise. Forward-looking statements are not guarantees of future performance and are subject to risks, uncertainties and other factors, many of which are outside of our control, that may cause actual results, levels of activity, performance, achievements and developments to be materially different from those expressed in or implied by these forward-looking statements. Important factors that could cause actual results, developments and business decisions to differ materially from forward-looking statements are described in the sections titled "Risk Factors" in our filings with the Securities and Exchange Commission, including our most recent Annual Report on Form 10-K and Quarterly Reports on Form 10-Q, and include, but are not limited to, the following substantial known and unknown risks and uncertainties inherent in our business: the effects of the COVID-19 pandemic; risks related to the timing of and our ability to successfully develop, submit, obtain and maintain U.S. Food and Drug Administration (“FDA”) or other regulatory authority approval of, or other action with respect to, our product candidates, and our ability to successfully commercialize any product candidates for which we obtain FDA approval; whether clinical trial results from our pivotal studies and cohorts, and meetings with the FDA, may support registrational studies and subsequent approvals by the FDA; preliminary and interim clinical results, which may include efficacy and safety results, from ongoing clinical trials or cohorts may not be reflected in the final analyses of our ongoing clinical trials or subgroups within these trials or in other prior trials or cohorts; the risk that enrollment may need to be adjusted for our trials and cohorts within those trials based on FDA and other regulatory agency input; the changing landscape of care for cervical cancer patients may impact our clinical trials in this indication; the risk that we may be required to conduct additional clinical trials or modify ongoing or future clinical trials based on feedback from the FDA or other regulatory authorities; the risk that our interpretation of the results of our clinical trials or communications with the FDA may differ from the interpretation of such results or communications by the FDA (including from the recent pre-BLA meeting with the FDA); the risk that the rolling BLA submission for lifileucel in metastatic melanoma may take longer than expected; the acceptance by the market of our product candidates and their potential reimbursement by payors, if approved; our ability or inability to manufacture our therapies using third party manufacturers or our own facility may adversely affect our potential commercial launch; the results of clinical trials with collaborators using different manufacturing processes may not be reflected in our sponsored trials; the risk that the acquisition of Proleukin® may not be completed in a timely manner or at all; the failure to satisfy the closing conditions to the consummation of the Proleukin® acquisition, including the receipt of all required regulatory approvals; the risk that unanticipated expenses may decrease our estimated cash balances and forecasts and increase our estimated capital requirements; and other factors, including general economic conditions and regulatory developments, not within our control.

Global Leadership in Innovating, Developing and Delivering TIL Therapy for Patients with Cancer

Platform

600+
Patients Treated with Iovance TIL

90%+
Manufacturing Success Rate

22-day
Proprietary Manufacturing Process

Pipeline

1 Rolling BLA Submission in Progress

6 Active Clinical Trials

5 Tumor Types in Clinic

3 Fast Track **1** BTD **1** RMAT
Designations

People & Assets

~$670M*
Unaudited Cash Position as of 2/24/23

60+
US and International Patents

500+
Employees

Partners & Collaborators

NIH National Cancer Institute

The University of Texas MD Anderson Cancer Center

Moffitt Cancer Center

Yale Cancer Center

cellectis Editing Life

Abbreviations: BLA=Biologics License Application; BTD=Breakthrough Therapy Designation; RMAT=Regenerative Medicine Advanced Therapy Designation
*Unaudited. Includes net proceeds from an at-the market (ATM) equity financing facility of approximately $450.0 million raised during the fourth quarter of 2022 and early 2023. In addition, Iovance has agreed to a term sheet for a secured line of credit of up to $100 million from Quogue Capital. Proceeds expected to fund the acquisition of Proleukin® and Iovance's operating plan into 2024.

2022 Accomplishments

REGULATORY

- BLA: Commenced rolling BLA submission in August 2022

PIPELINE

- Advanced melanoma (post-anti-PD-1): C-144-01 Cohort 4 data at SITC 2022 and in JITC
- Frontline advanced melanoma: began Phase 3 TILVANCE-301 trial
- NSCLC: enrolled additional patients in IOV-LUN-202 and IOV-COM-202 trials
- Cervical: expanded C-145-04 Cohort 2 to support regulatory submissions
- TIL combinations: continued ongoing solid tumor cohorts of TIL + pembrolizumab
- Genetically-modified TIL: began first-in-human trial of PD-1 inactivated IOV-4001, IOV-GM1-201
- Research: advanced next generation products toward clinic

MANUFACTURING

- Executed GMP commercial readiness activities, scaled up production at *i*CTC

COMMERCIAL

- Executed ATC onboarding activities and payer engagement

Proleukin® Transaction Strategic Benefits

- Global rights to Proleukin® (aldesleukin, human recombinant IL-2) and associated revenue
- Secure IL-2 supply chain for lifileucel regimen
- Lower clinical trial costs and future COGS
- Significant additional revenue expected with TIL commercialization

Key Figures

£167.7M Upfront investment

£41.7M Following first lifileucel approval

Financed with existing cash

Iovance Solid Tumor Pipeline Highlights

	PRODUCT CANDIDATE	INDICATION(S)	PHASE 1	PHASE 2	PIVOTAL
Advanced Melanoma (Metastatic or Unresectable)	TIL (Lifileucel/LN-144)	Post-anti-PD-1	C-144-01, Cohorts 2 & 4		Rolling BLA In Progress, ODD, RMAT
	Lifileucel + pembro	Frontline	TILVANCE-301 Phase 3		Confirmatory, FTD
	Lifileucel + pembro	Anti-PD-1 naïve	IOV-COM-202, Cohort 1A		
Next Generation	PD-1 Inactivated TIL (IOV-4001)	Post-anti-PD-1	IOV-GM1-201, Cohort 1		
Metastatic NSCLC	LN-145	2L post-chemo & post-anti-PD-1	IOV-LUN-202, Cohorts 1 & 2		
	LN-145 + pembro	Anti-PD-1 naïve	IOV-COM-202, Cohort 3A		
	LN-145	2-4L incl. post-anti-PD-1	IOV-COM-202, Cohort 3B*		
	LN-145 + ipi/nivo	Post-anti-PD-1	IOV-COM-202, Cohort 3C		
Next Generation	LN-145 Gen 3 + core biopsy	2L post-chemo & post-anti-PD-1	IOV-LUN-202, Cohort 3		
	PD-1 Inactivated TIL (IOV-4001)	2-4L incl. post-anti-PD-1	IOV-GM1-201, Cohort 2		
Cervical	Lifileucel	Post-chemo & post-anti-PD-1	C-145-04, Cohort 2		BTD, ODD
	LN-145 + pembro	1L chemo and anti-PD-1 naïve	C-145-04, Cohort 3*		

*Enrollment complete
Abbreviations: 1L=first line; 2L=second line; 4L=fourth line; BTD=Breakthrough Therapy Designation; FTD=Fast Track Designation; ipi/nivo=ipilimumab/nivolumab; NSCLC=non-small cell lung cancer; ODD=Orphan Drug Designation; PD-1=programmed cell death protein-1; RMAT=Regenerative Medicines Advanced Therapy; TIL=tumor infiltrating lymphocytes

Significant Market Potential in Solid Tumors

90%

of all cancer cases are solid tumors[1]

1.7M

New cases of solid tumors in the U.S.[1]

Move into earlier line of therapy

Expand into other indications

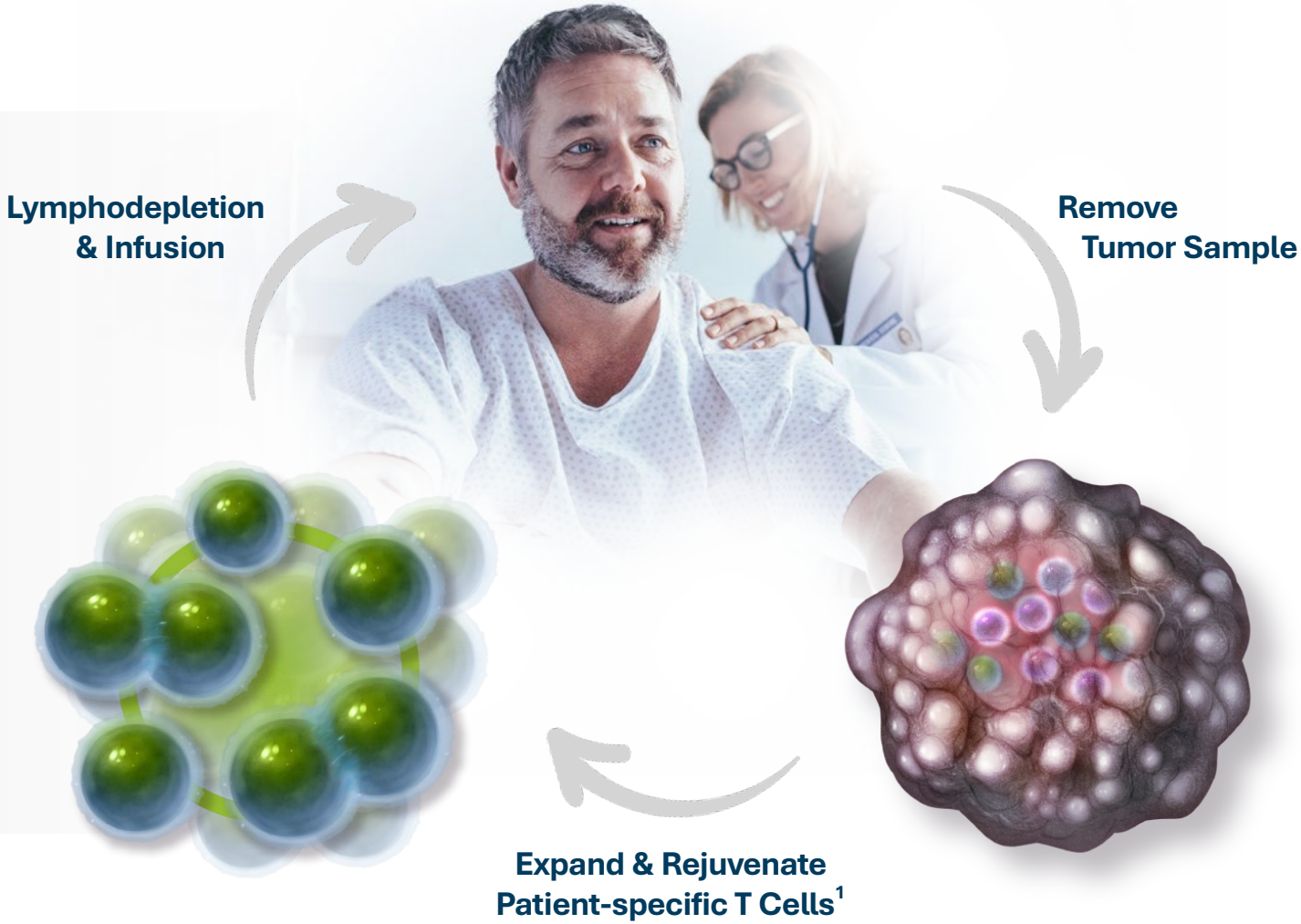
	Deaths[1]	New Cases[1]
Melanoma	7,650	99,780
Cervical	4,280	14,100
Lung & Bronchus	130,180	236,740
Oral Cavity, Pharynx & Larynx	15,050	66,470
Breast	43,780	290,560
Pancreatic	49,830	62,210
Brain & Other Nervous System	18,280	25,050
	Potential to address unmet need in late lines of treatment	**Potential market for early lines in combo with standard of care**

1. https://seer.cancer.gov accessed March 2023

Tumor Infiltrating Lymphocytes (TIL): Leading Platform for Treatment of Solid Tumors

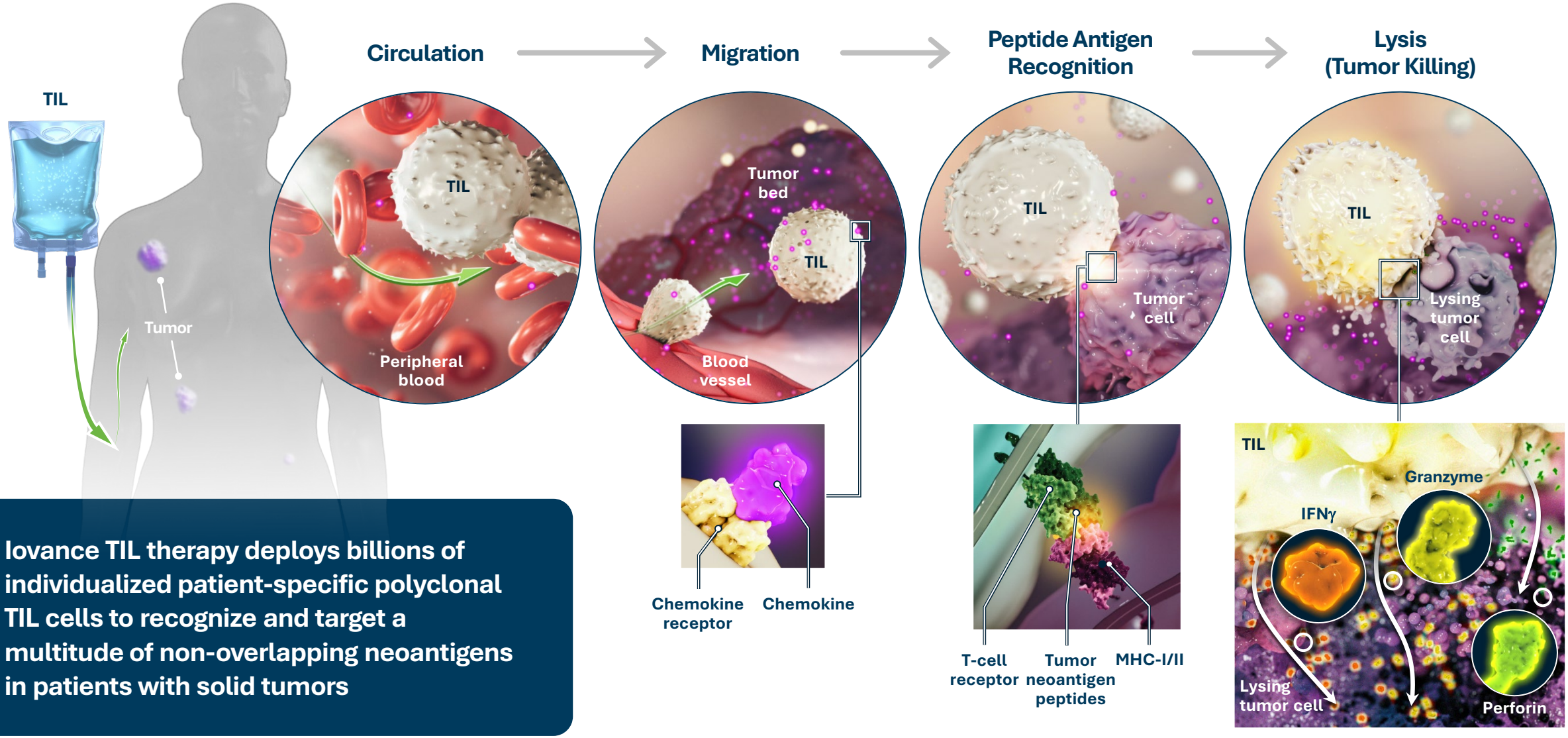
TIL – Unique Mechanism of Action

- Individualized
- Patient's own immune system amplified and rejuvenated
- One-time therapy



1. Simpson-Abelson et al., ESMO 2020

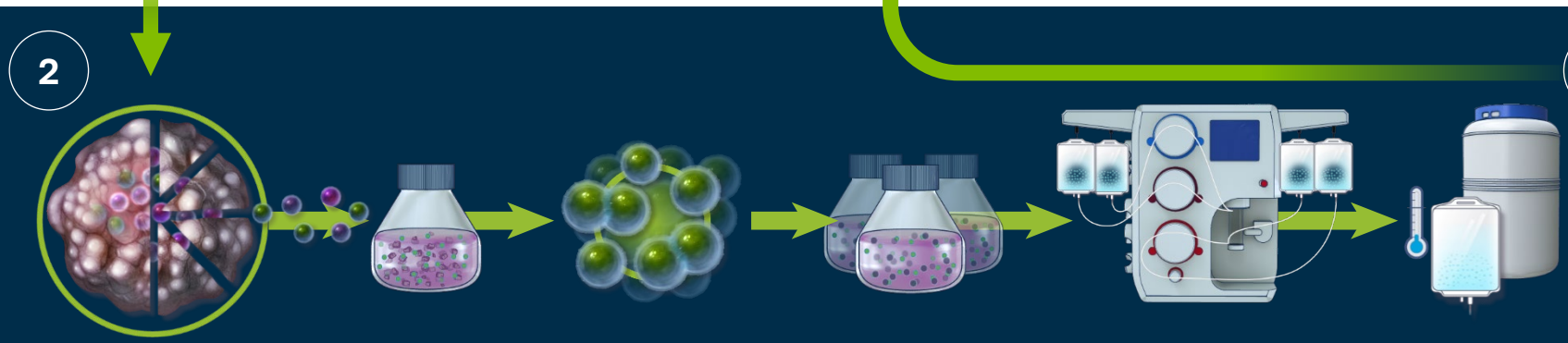
TIL Mechanism of Action



Iovance TIL therapy deploys billions of individualized patient-specific polyclonal TIL cells to recognize and target a multitude of non-overlapping neoantigens in patients with solid tumors

Iovance Streamlined 22-Day GMP Manufacturing Process

1. Patient Intake
2. Tumor Sample Procurement
3. NMA-LD
4. TIL
5. IL-2
6. Recovery/Discharge



Gen 2 Process: 22 Days

Iovance Cell Therapy Center: *i*CTC

Built-to-suit custom facility in Navy Yard Philadelphia

136,000 ft^2, $85M investment

LEED gold certification for core and shell building

Honorable Mention Winner: 2022 ISPE Facility of the Year Awards

Clinical supply initiated 3Q21

Commercial manufacturing expected with BLA approval

Control to optimize capacity, quality & COGS

Leading Cell Therapy Manufacturing Facility

IOVANCE BIOTHERAPEUTICS CELL THERAPY CENTER

FOYA 2022 ISPE Facility of the Year Awards

CATEGORY WINNER
Honorable Mention

Iovance Cell Therapy Center (*i*CTC): Building Annual Capacity for Thousands of Cancer Patients

Phase 1 *i*CTC Today

100s
of patients/year

BLA Prep
in core suites for commercial

4
separate flex suites for clinical

Phase 2 *i*CTC Ongoing Staffing

2,000+
patients/year

12
core suites for commercial

4
separate flex suites for clinical

Phase 3 *i*CTC Expansion[1]

5,000+
patients/year

24
core suites for commercial

4
separate flex suites for clinical

Phase 4 *i*CTC+ Additional Site(s)

10,000+
patients/year

***i*CTC**

Adjacent and new sites[2]

Automation

1. Expansion within existing shell
2. Option to build on adjacent parcel

Iovance TIL Therapy in Advanced Melanoma

IOVANCE BIOTHERAPEUTICS

Unmet Medical Need for Metastatic Melanoma Therapy

No FDA Approved Treatment Options After Progression on ICI (Anti-PD-1) Therapy and BRAF/MEK inhibitors

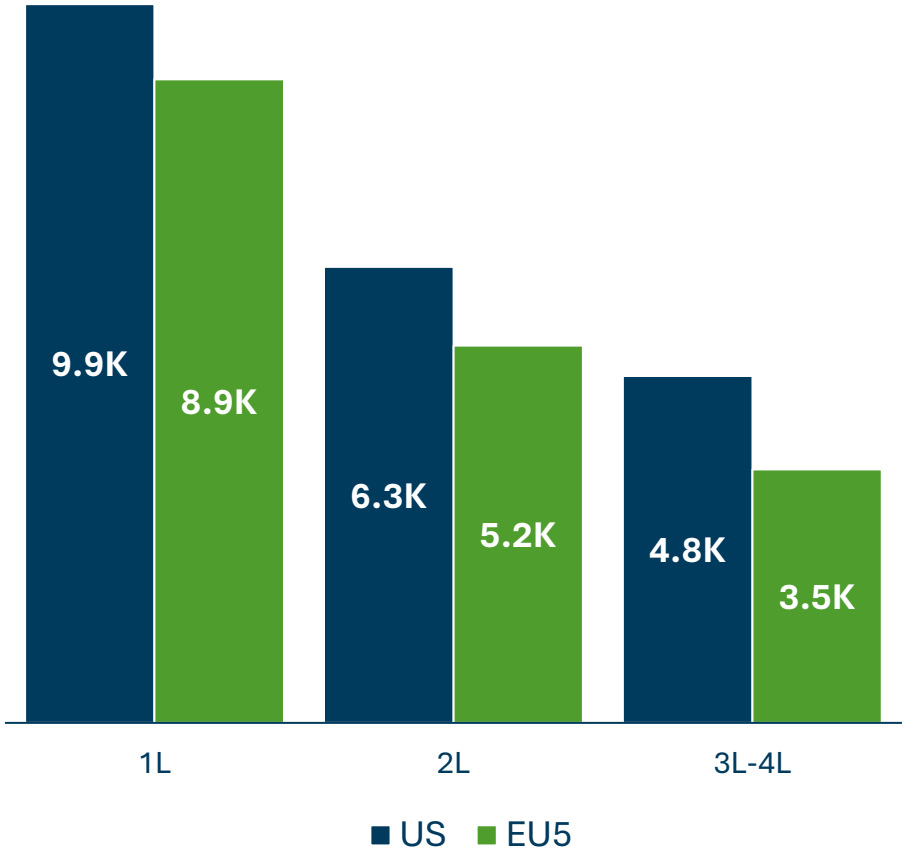
325k Annual new cases worldwide[1]

57k Annual deaths worldwide[1]

100k Annual new cases in U.S.[2]

7.7k Annual deaths in U.S.[2]

Melanoma Drug-Treated Population in 2021[3]
Unresectable / Metastatic (US and EU5)



Available Care:

1L Anti-PD-1 Immunotherapy
21%-33% ORR[4]

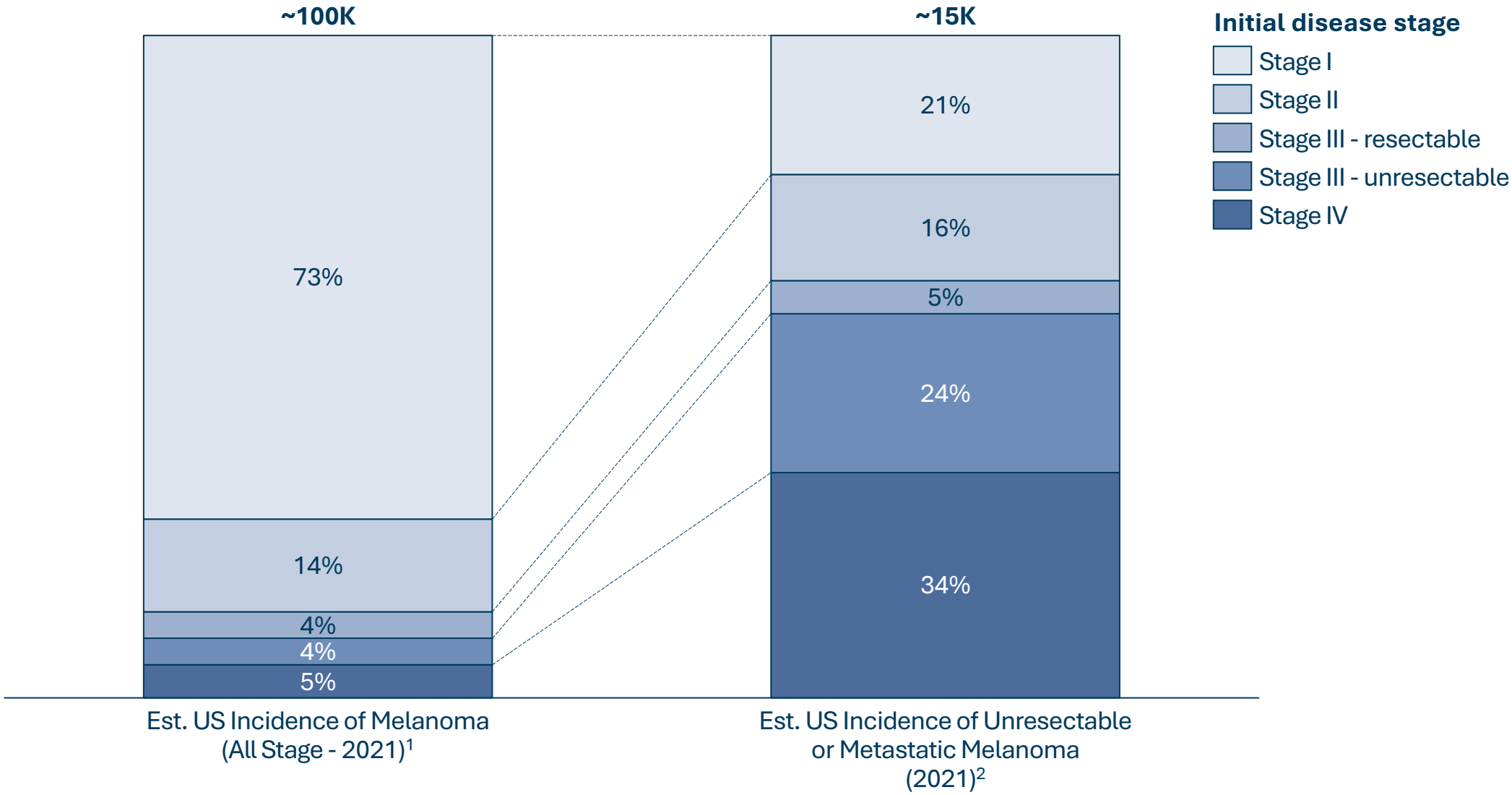
BRAF/MEK inhibitors if BRAF mutation +

2L+ Chemotherapy
ORR 4-10%[5]
mOS ~7-8 months[6]

1. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries, CA Cancer J Clin., May 2021
2. https://seer.cancer.gov accessed March 2023
3. Clarivate DRG Disease Landscape (2021)
4. Keytruda USPI
5. Keytruda USPI (4%) and Weber et al., Lancet Oncol 2015 (ICC 10%)
6. Kirchburger et al., Eur J Cancer 2016 and Goldinger et al., J Clin Oncol 2018

Abbreviations: EU5=France, Germany, Italy, Spain and United Kingdom; 1L=first line therapy, 2L=second line therapy, 3L=third line therapy, 4L=fourth line therapy; ICI=immune checkpoint inhibitor; ORR=objective response rate; mOS=median overall survival; PD-1=programmed cell death protein-1

Estimated total incidence and incidence of unresectable or metastatic melanoma by initial disease stage (US)



1. Estimate of US incidence from Epiphany Health with stage III resectability status informed by market research
2. Estimate of US incidence of unresectable or metastatic melanoma based on secondary and primary market research

C-144-01 Phase 2 Study Design

Identical Eligibility and Treatment for Cohorts 2 and 4

Phase 2, multicenter study to assess the efficacy and safety of autologous TIL (lifileucel) for treatment of patients with metastatic melanoma (NCT02360579)

Patient Population

Unresectable or metastatic melanoma treated with ≥1 prior systemic therapy including a PD-1–blocking antibody and, if BRAF V600 mutation positive, a BRAF inhibitor ± MEK inhibitor

Cohort 1: Non-cryopreserved TIL product (Gen 1)
N=30

Closed to enrollment

Cohort 2: Cryopreserved lifileucel (Gen 2)
N=66

Enrollment: Apr 2017 to Jan 2019

Cohort 4: Pivotal Cryopreserved lifileucel (Gen 2)
N=75

Enrollment: Feb 2019 to Dec 2019

Cohort 3: TIL re-treatment
N=~10

Key Endpoints

- Primary: ORR (IRC-assessed using RECIST v1.1)
- Secondary: DOR, PFS, OS, TEAE incidence and severity

Key Eligibility Criteria

- Tumor lesion/s for TIL generation and response assessment
- No limit on number of prior therapies or markers of tumor burden (including size or LDH)

Treatment Regimen (Cohorts 2 and 4)

- 22-day Gen 2 manufacturing process
- All patients received NMA-LD, a single lifileucel infusion, and up to 6 doses of high-dose IL-2

Data cutoff date: July 15, 2022

Abbreviations: DOR=duration of response; ECOG=Eastern Cooperative Oncology Group; IL-2=interleukin 2; IRC=Independent Review Committee; NMA-LD=nonmyeloablative lymphodepletion; ORR=objective response rate; OS=overall survival; PD-1=programmed cell death protein 1; RECIST=Response Evaluation Criteria in Solid Tumors; TEAE=treatment-emergent adverse events; TIL=tumor-infiltrating lymphocytes

Highlighted Prior Therapy and Baseline Disease Characteristics*

Cohorts 2 and 4 Heavily Pre-Treated and Mostly Similar; Cohort 4 had Higher Disease Burden and LDH Elevation

Prior Therapy Experience (Cohorts 2+4)

- Median of 3 lines of therapy (range, 1-9)[1]
- Median of 2 lines (range, 1-7) of ICI-containing therapy
- 113 (73.9%) retreated with ICI-containing therapy
- 125 (81.7%) received anti–CTLA-4
- 82 (53.6%) received anti–PD-1 + anti–CTLA-4 combination

Baseline Disease Characteristics

Disease burden (>3 lesions)

83.9%	65.2%
Cohort 4 (n=87)	Cohort 2 (n=66)

Elevated LDH (>ULN), a negative prognostic factor

64.4%	40.9%
Cohort 4 (n=87)	Cohort 2 (n=66)

*Refer to SITC 2022 presentation for full baseline characteristics
1. All patients received prior anti-PD1 therapy
Abbreviations: CTLA-4=cytotoxic T-lymphocyte antigen 4; ICI=immune checkpoint inhibitor; LDH=lactate dehydrogenase; PD-1=programmed cell death protein 1; ULN=upper limit of normal

Safety

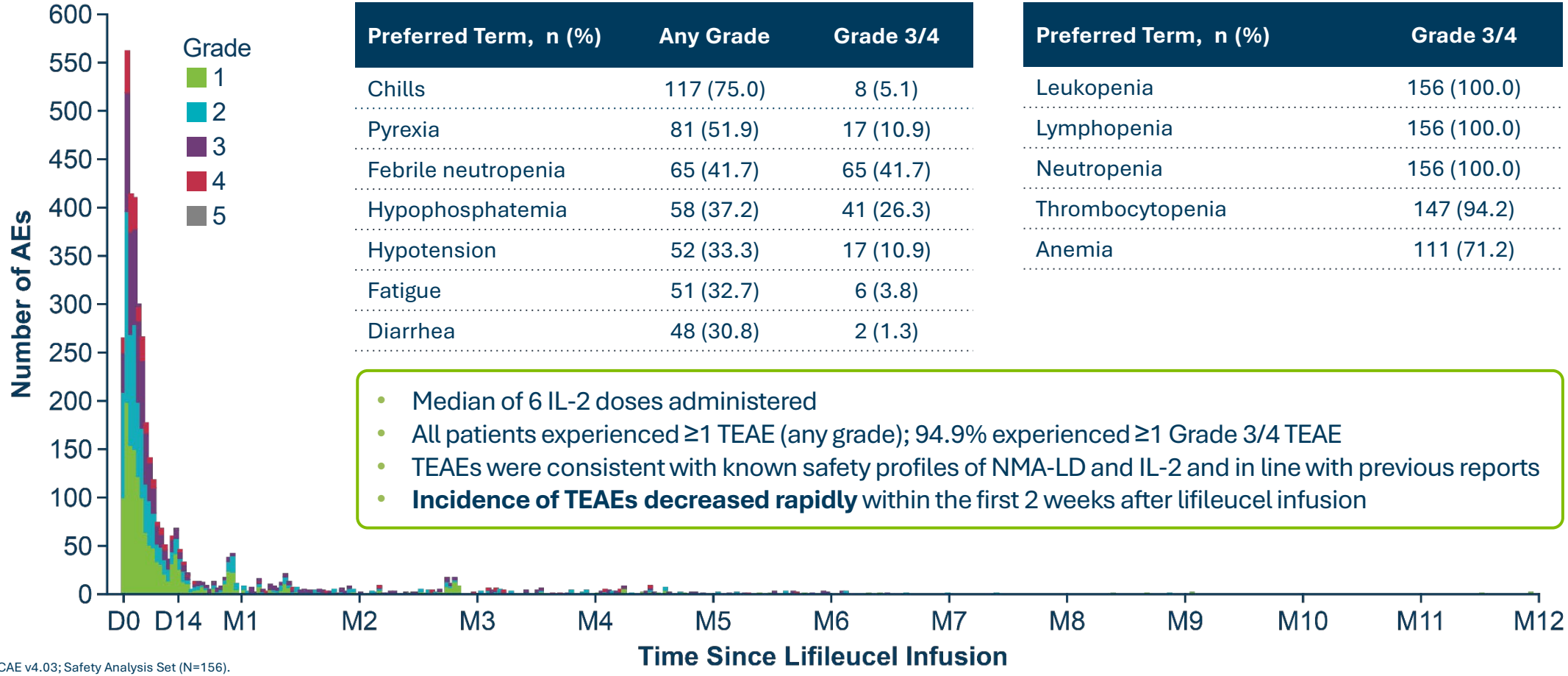
Transient and Manageable Nature of AEs Support the Potential Benefit of One-Time Treatment with Lifileucel

Non-Hematologic TEAEs in ≥30% of Patients*†

Preferred Term, n (%)	Any Grade	Grade 3/4
Chills	117 (75.0)	8 (5.1)
Pyrexia	81 (51.9)	17 (10.9)
Febrile neutropenia	65 (41.7)	65 (41.7)
Hypophosphatemia	58 (37.2)	41 (26.3)
Hypotension	52 (33.3)	17 (10.9)
Fatigue	51 (32.7)	6 (3.8)
Diarrhea	48 (30.8)	2 (1.3)

Grade 3/4 Hematologic Lab Abnormalities*

Preferred Term, n (%)	Grade 3/4
Leukopenia	156 (100.0)
Lymphopenia	156 (100.0)
Neutropenia	156 (100.0)
Thrombocytopenia	147 (94.2)
Anemia	111 (71.2)



- Median of 6 IL-2 doses administered
- All patients experienced ≥1 TEAE (any grade); 94.9% experienced ≥1 Grade 3/4 TEAE
- TEAEs were consistent with known safety profiles of NMA-LD and IL-2 and in line with previous reports
- **Incidence of TEAEs decreased rapidly** within the first 2 weeks after lifileucel infusion

*Per CTCAE v4.03; Safety Analysis Set (N=156).

†Grade 5 TEAEs included pneumonia (n=1), acute respiratory failure (n=1), arrhythmia (n=1), and intra-abdominal hemorrhage (n=1).

All occurrences of AEs were counted if a patient experienced a new onset of the same AE at different timepoints. If multiple records were reported on the electronic case report form because of toxicity grade decrease of the same AE that had not resolved, then the event was counted once with the highest grade reported.15 events were reported after Month 12 (Grade 1, n=7; Grade 2, n=6; Grade 3, n=1; Grade 5, n=1)

Abbreviations: AE=adverse event; D=day; IL-2=interleukin 2; M, month; NMA-LD=nonmyeloablative lymphodepletion; TEAE=treatment-emergent adverse event

Objective Response Rate (ORR) of 31.4% by IRC

91% Concordance Rate between IRC- and Investigator-assessed ORR

	Cohort 2 (n=66)	Cohort 4 (n=87)	Cohort 2+4 (N=153)
ORR, n (%)	**23 (34.8)**	**25 (28.7)**	**48 (31.4)**
(95% CI)	(23.5, 47.6)	(19.5, 39.4)	(24.1, 39.4)
Best overall response, n (%)			
CR	5 (7.6)	4 (4.6)	9 (5.9)
PR	18 (27.3)	21 (24.1)	39 (25.5)
SD	24 (36.4)	47 (54.0)	71 (46.4)
Non-CR/Non-PD*	1 (1.5)	0	1 (0.7)
PD	15 (22.7)	12 (13.8)	27 (17.6)
Nonevaluable†	3 (4.5)	3 (3.4)	6 (3.9)

- 33 days median time from resection to lifileucel infusion
- Lifileucel manufactured within specification in 94.7% of patients
- Median number of TIL cells infused was 21.1×10^9 (range, 1.2×10^9 to 99.5×10^9)

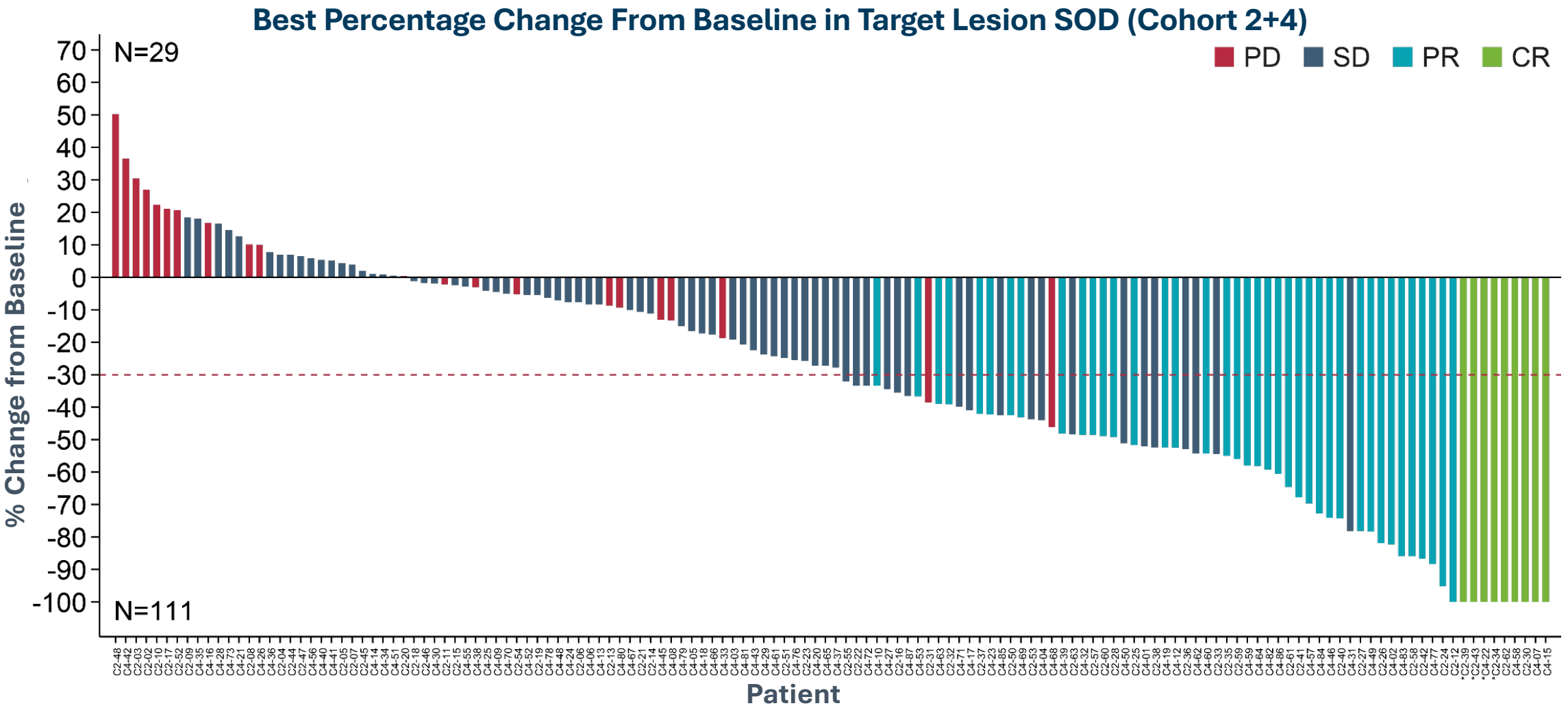
*Patient did not have acceptable target lesions and had best overall response of non-CR/non-PD per IRC assessment

†Six patients were nonevaluable for response (5 due to early death; 1 due to new anticancer therapy)

Abbreviations: CR,=complete response; IRC=independent review committee; ORR=objective response rate; PD=progressive disease; PR=partial response; SD=stable disease

Tumor Burden Reduction and Best Response to Lifileucel

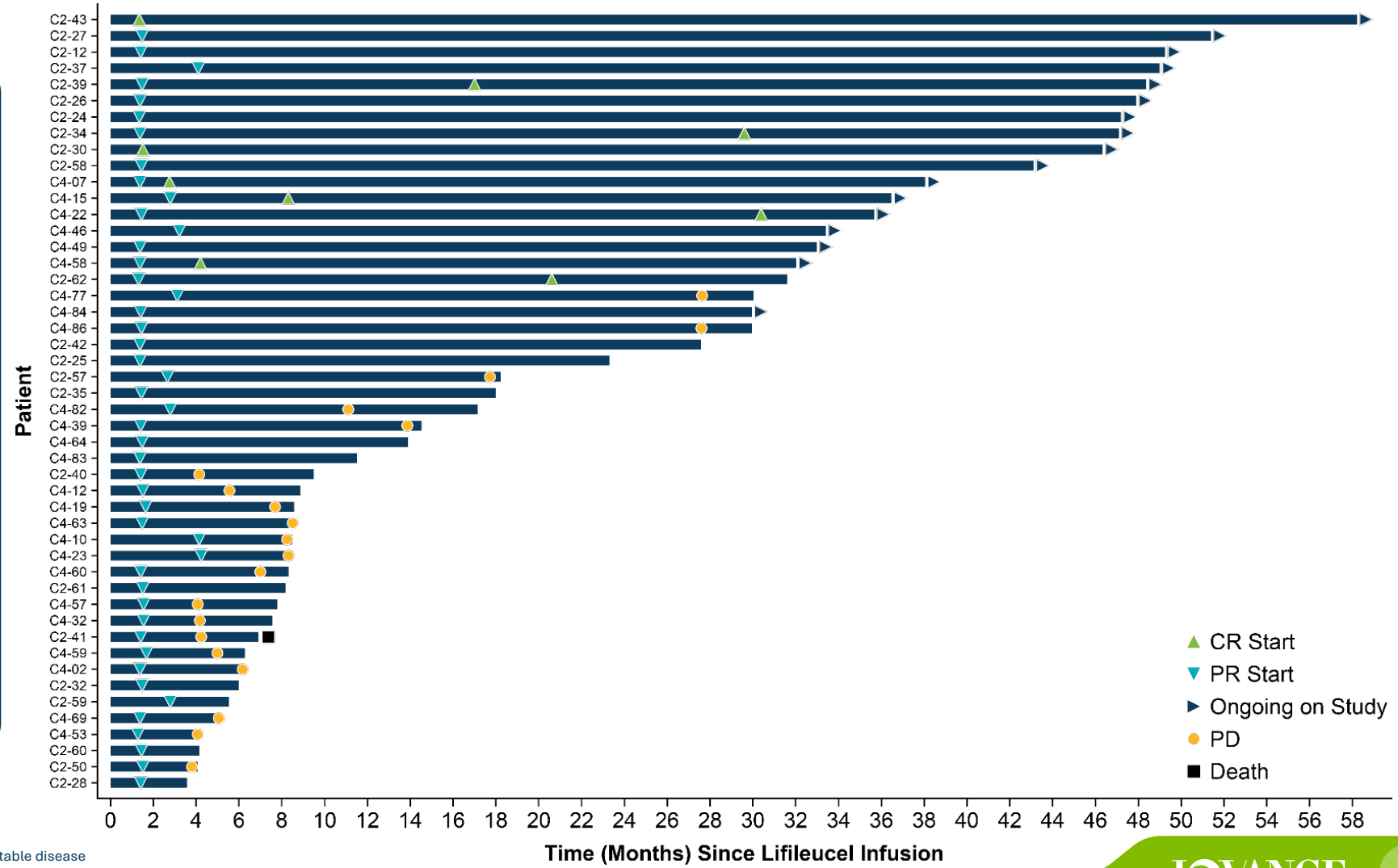
Reduction of Tumor Burden in 79.3% (111/140) of Patients



13 patients in the full analysis set are not included (9 had no post lifileucel target lesion SOD measurements, and 4 had no acceptable target lesions by IRC).
*-100% change from baseline is presented for CR assessment that includes lymph node lesions.
Abbreviations: CR=complete response; PD=progressive disease; PR=partial response; SD=stable disease; SOD=sum of diameters

Time to Response, Duration of Response, and Time on Efficacy Assessment for Confirmed Responders (PR or Better)

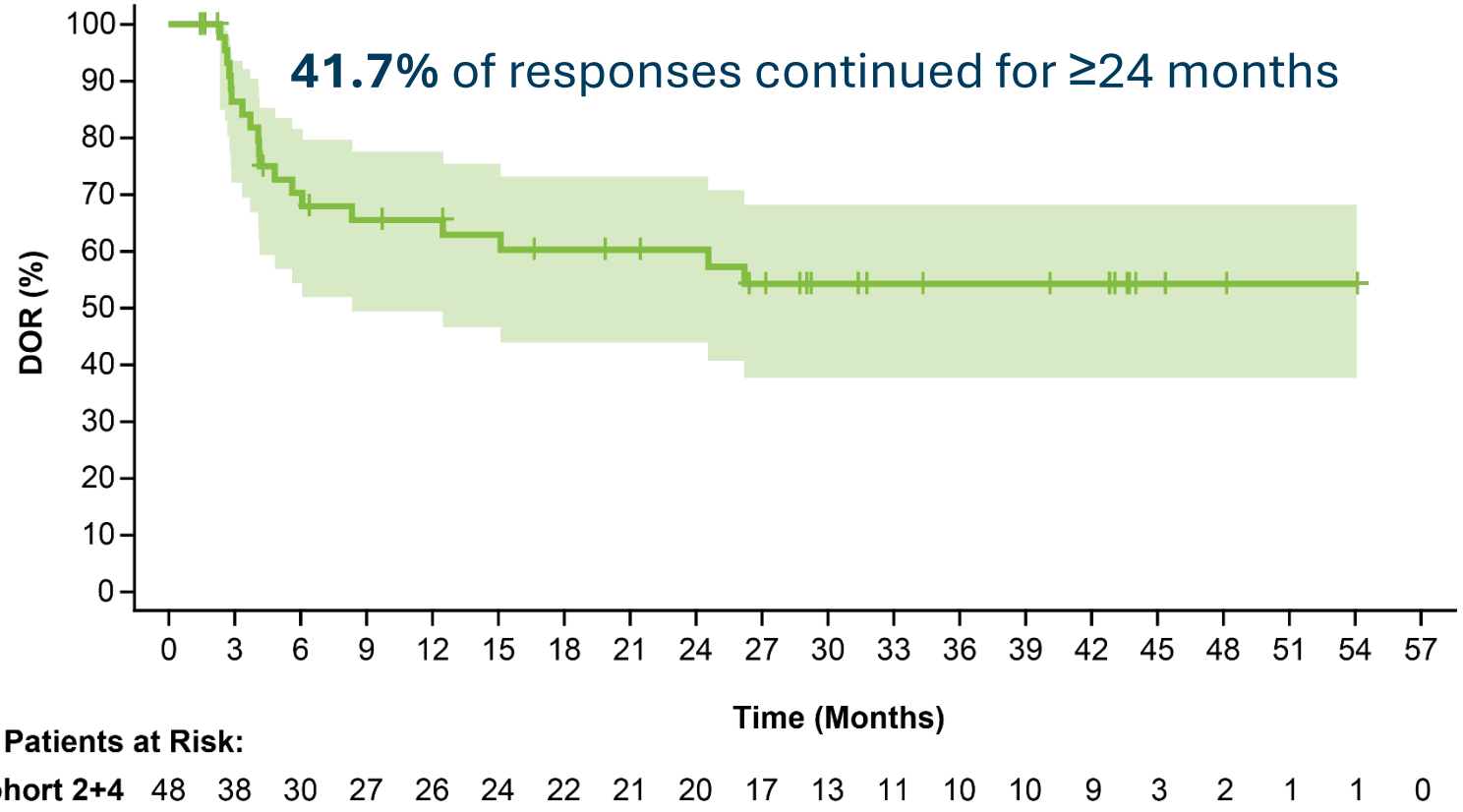
- **Median time from lifileucel infusion to best response was 1.5 months**
- **Responses deepened over time**
  - 7 patients (14.6%) initially assessed as PR were later confirmed CR
  - 4 patients (8.3%) converted to CR >1 year post-lifileucel infusion; 2 (4.2%) of 4 patients converted after 2 years
  - 10 patients (20.8%) improved from best response of SD to PR
- **35.4% of responses ongoing as of data cutoff**



Abbreviations: CR=complete response; PD=progressive disease; PR=partial response; SD=stable disease

Duration of Response*

Median DOR Not Reached at Median Study Follow Up of 36.5 Months



	Cohort 2 (n=23)	Cohort 4 (n=25)	Cohort 2+4 (N=48)
Median follow-up, months	45.1	33.0	36.5
95% CI	(44.2, 51.4)	(30.4, 35.2)	(34.7, 44.2)
Median DOR†, months	NR	10.4	NR
95% CI	(NR, NR)	(4.1, NR)	(8.3, NR)
Min, max (months)	1.4+, 54.1+	1.4+, 34.3+	1.4+, 54.1+
DOR ≥12 months, n (%)	**15 (65.2)**	**11 (44.0)**	**26 (54.2)**
DOR ≥24 months, n (%)	**11 (47.8)**	**9 (36.0)**	**20 (41.7)**

*Patients not experiencing PD or who did not die prior to the time of data cut had their event times censored at the last adequate tumor assessment. For patients who received new anticancer therapies, DOR was censored at the date of last tumor response assessment prior to the start of new anticancer therapies. For patients with PD or death immediately after ≥2 consecutive missing tumor assessment visits, DOR was censored at the last adequate tumor assessment prior to the missing tumor assessments.
†Based on Kaplan-Meier estimate
Shaded area indicates 95% CI
Abbreviations: DOR=duration of response; NR=not reached; PD=progressive disease

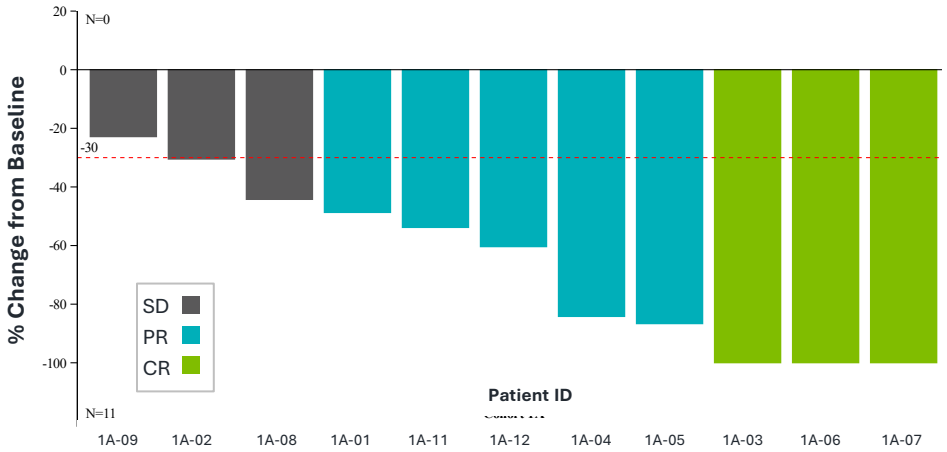
Iovance TIL Clinical Highlights in Combination with Pembrolizumab in Metastatic Melanoma

Lifileucel in combination with anti-PD-1/PD-L1 therapy in ICI-naïve patients
(IOV-COM-202 Cohort 1A, N=12)[1]

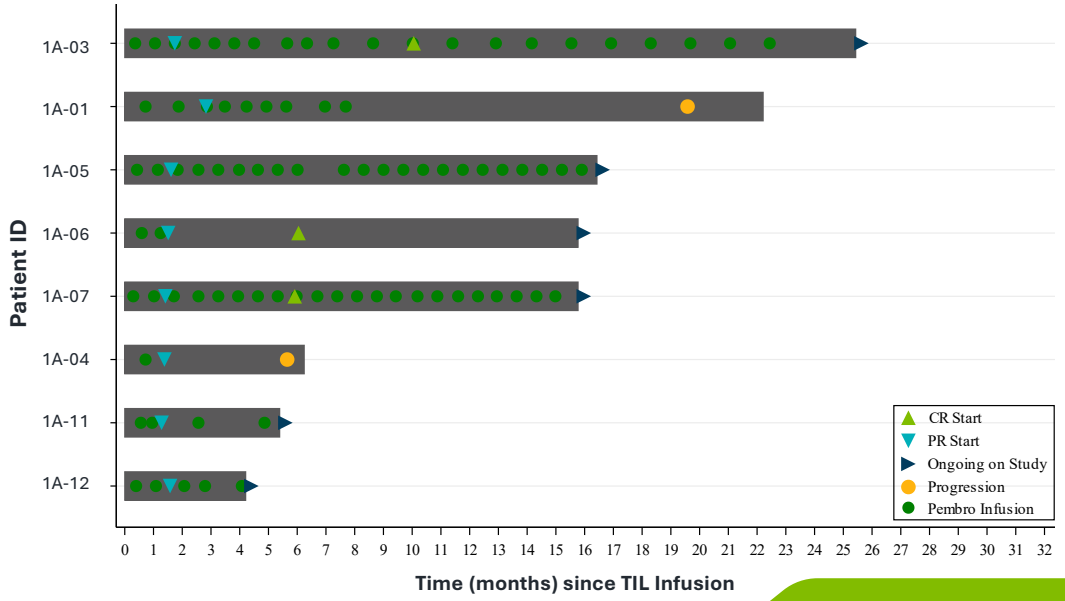
66.7% ORR

- 8 / 12 patients had a confirmed objective response per RECIST v1.1 (3 CRs & 5 PRs)
- 6 / 8 responders had ongoing response
- 5 responders had DOR >1 year
- FDA Fast Track Designation

Best Overall Response for Evaluable Patients



Time to Response for Responders[2]

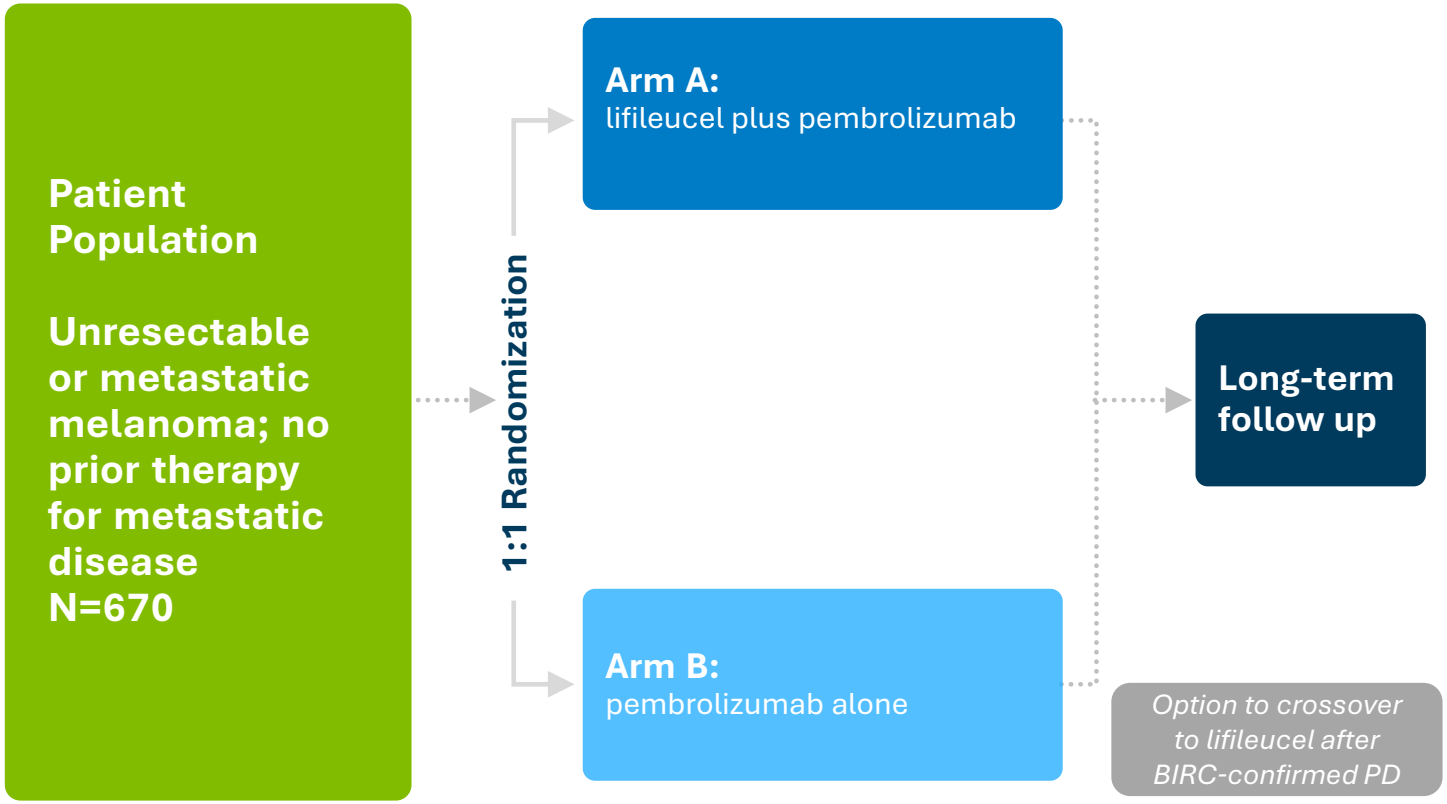


1. As assessed by investigator using RECIST 1.1 (January 20, 2022 data cutoff)
2. Each bar is presented for each patient starting from date of TIL infusion up to date of new anti-cancer therapy, end of assessment, death, or data cutoff date, whichever occurs earlier.

Abbreviations: CR=complete response; ICI=immune checkpoint inhibitor; ORR=objective response rate; PR=partial response; SD=stable disease; pembro=pembrolizumab; RECIST=Response Evaluation Criteria in Solid Tumors

TILVANCE-301 Global Phase 3 and Confirmatory Trial

Randomized, multicenter study with optional crossover to offer all patients potential to receive lifileucel (NCT05727904)



Study Design with FDA Agreement

- Dual Primary Endpoints: ORR and PFS
- Registrational for frontline melanoma
- Confirmatory for full approval in post-anti-PD-1 melanoma

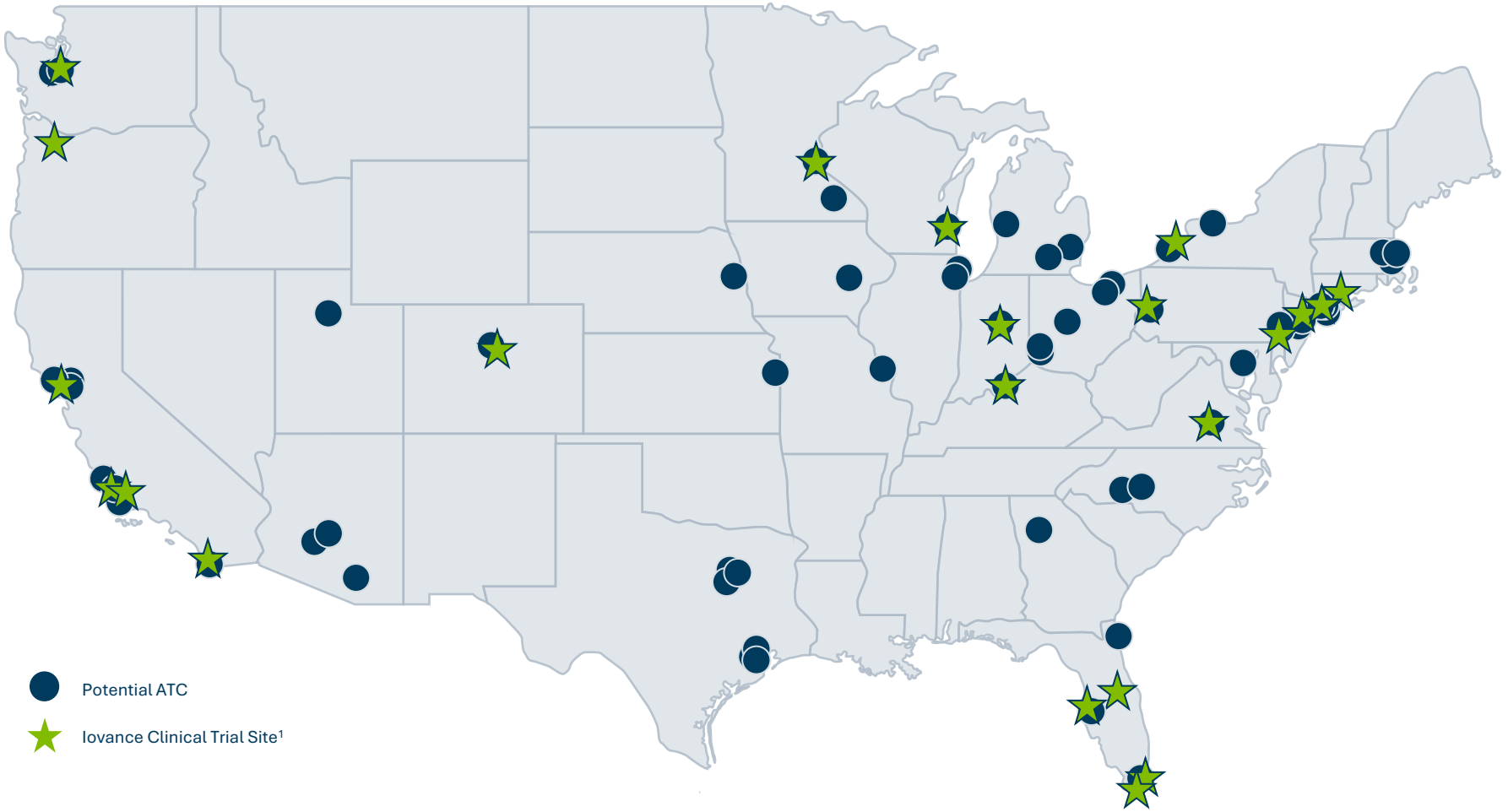
Abbreviations: BIRC, blinded independent review committee; ORR=objective response rate; PD=progressive disease; PD-1, programmed cell death protein-1; PFS=progression free survival

Launch Preparation

*i*CTC Designed for High-Volume TIL Manufacturing and Flexibility

- Core suites: TIL commercial manufacturing
- Flexible suites: clinical supply, pipeline expansion and advanced manufacturing
- Integrated quality control, supply chain and IT systems
- 100+ employees with additional staffing into launch and beyond
- *i*CTC supplemented with external CDMO manufacturing capacity

Targeting Potential Authorized Treatment Centers (ATCs)



Targeting Considerations

- Patient volume
- NCCN status, KOLs
- Existing cell therapy / BMT
- Inpatient capacity
- Iovance clinical trial(s)

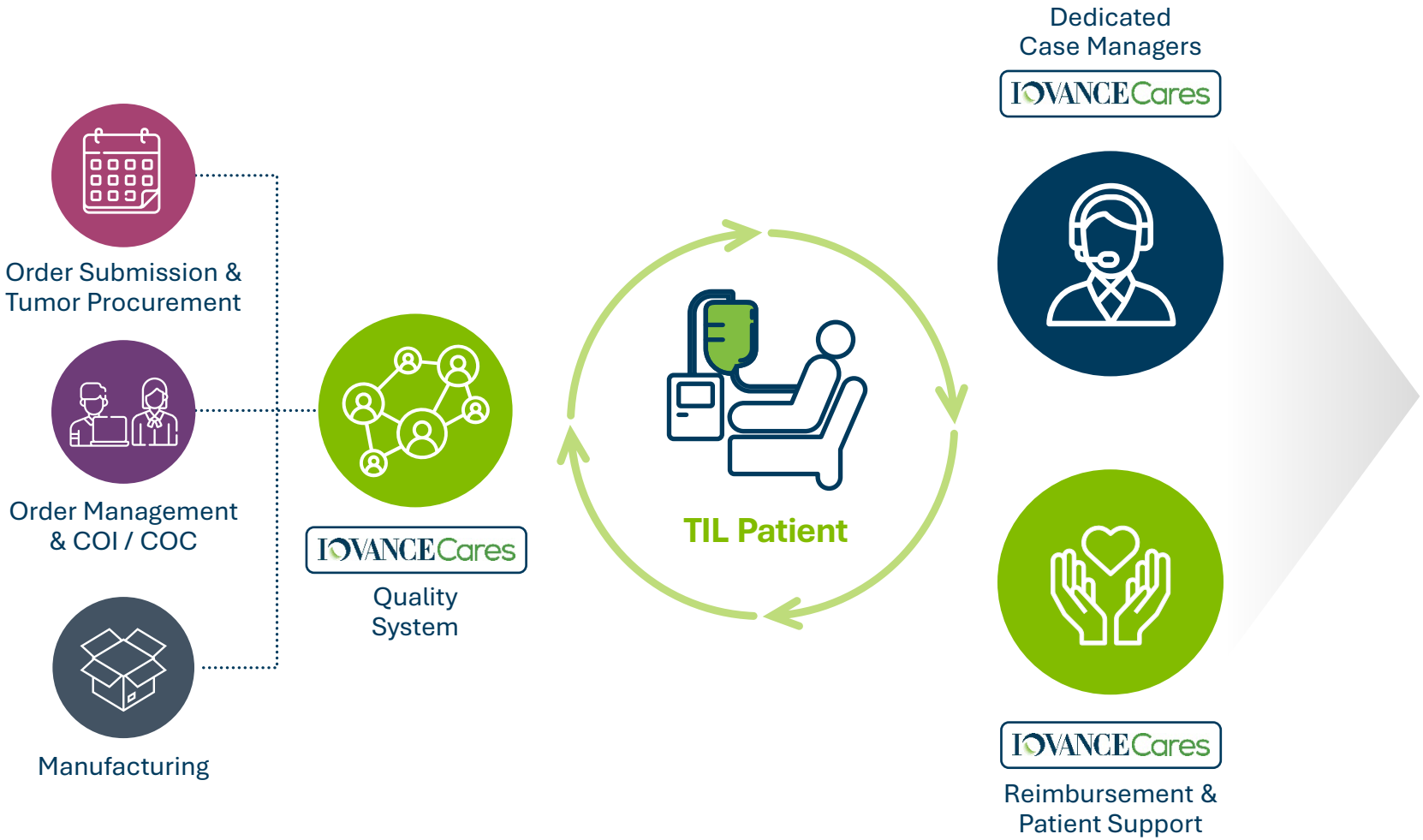
Drive Demand

- Top account prioritization
- Community referrals

1. ClinicalTrials.gov

Abbreviations: NCCN=National Comprehensive Cancer Network; KOL=Key Opinion Leaders; BMT=Bone Marrow Transplant

Supporting Providers & Patients: IovanceCares™



Customer-Centric

- Patient management ecosystem
- Proprietary COI/COC
- Treatment center quality program

Patient-Centric

- Dedicated case managers
- Reimbursement support
- Patient support

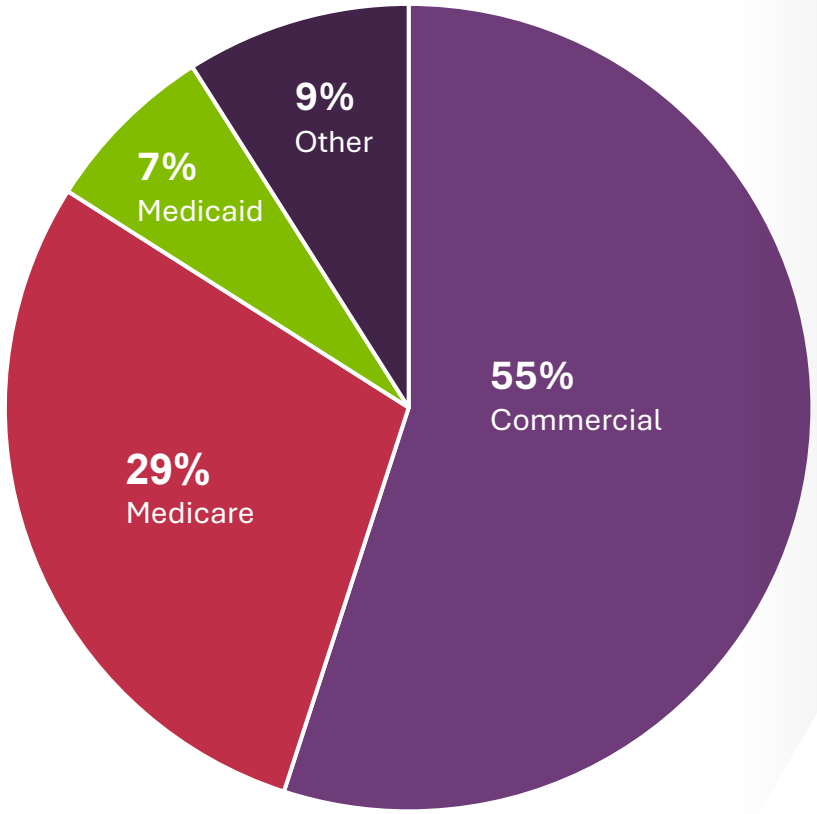
Abbreviations: COI=Chain of Identity; COC=Chain of Custody

Enabling Market Access

High Unmet Need in Metastatic Melanoma and Clinical Value of Lifileucel

Metastatic Melanoma Payer Mix

All Treatment Settings and Lines of Therapy[1]



Payer Engagement

- Unmet need
- Clinical data
- Educational presentations and tools
- Engagement with commercial and Medicare payers responsible for ~90% of covered lives

Coding, Coverage and Payment

- ICD-10 PCS codes issued
- Medicare expanded DRG-018 to other immunotherapies, including lifileucel, in IPPS FY 2022 final rule

1. Metastatic Melanoma Insurance Claims Analysis, TIL-eligible patients treated in the ATC setting (1/1/2018 – 6/30/2021)

Abbreviations: ICD-10 PCS=International Classification of Diseases, 10th Revision, Procedure Coding System; IPPS=In-patient Prospective Payment System

TIL Therapy Clinical Program Highlights

Potential Market for Non-Small Cell Lung Cancer (NSCLC)

Addressing a Defined Unmet Need in Second Line NSCLC

> The clinical data for LN-145 in heavily treated patients with metastatic non-small cell lung cancer is exciting. It represents the first experience for TIL monotherapy to show clinical benefit in metastatic non-small cell lung cancer."

Adam J. Schoenfeld, MD
Medical Oncologist
Memorial Sloan Kettering Cancer Center

2.2M New cases WW each year[1]

1.8M Deaths WW each year[1]

237k New cases in U.S. each year[2]

130k Deaths in U.S. each year[2]

Available Care:

Checkpoint Inhibitor + Chemo as 1st line option

9-13% ORR for docetaxel in 2nd line NSCLC following progression on chemo[3]

1. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries, CA Cancer J Clin., May 2021
2. https://seer.cancer.gov accessed March 2023
3. Brahmer et al., NEJM 2015; Borghaei et al., NEJM 2015; Herbst et al., Lancet 2016; Rittmeyer et al., Lancet 2017

LN-145 Efficacy in NSCLC Cohort 3B (post ICI)

Single-Agent LN-145 Following Progression on Anti-PD-1 Therapy
(IOV-COM-202 Cohort 3B, N=28)

21% ORR

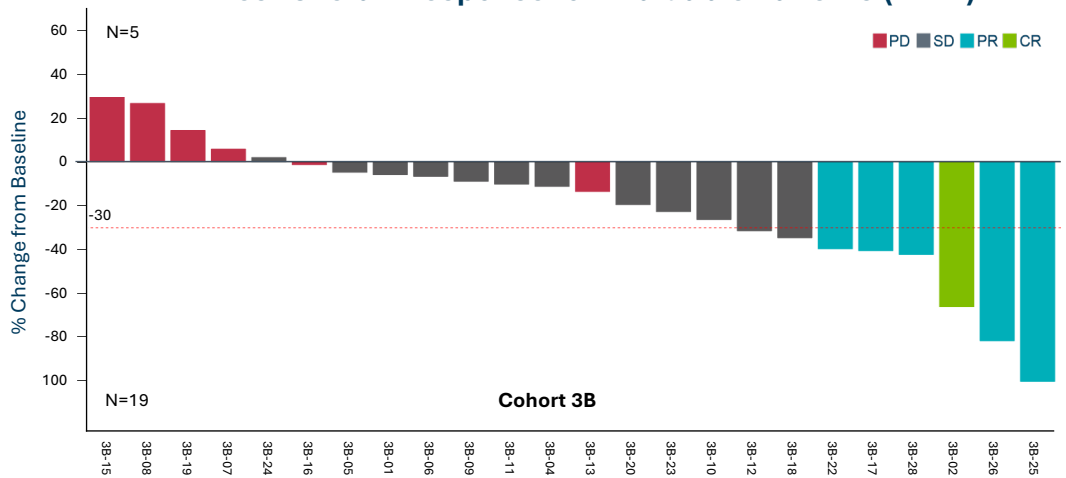
37+ months ongoing CR

Heavily Pre-Treated Patient Population

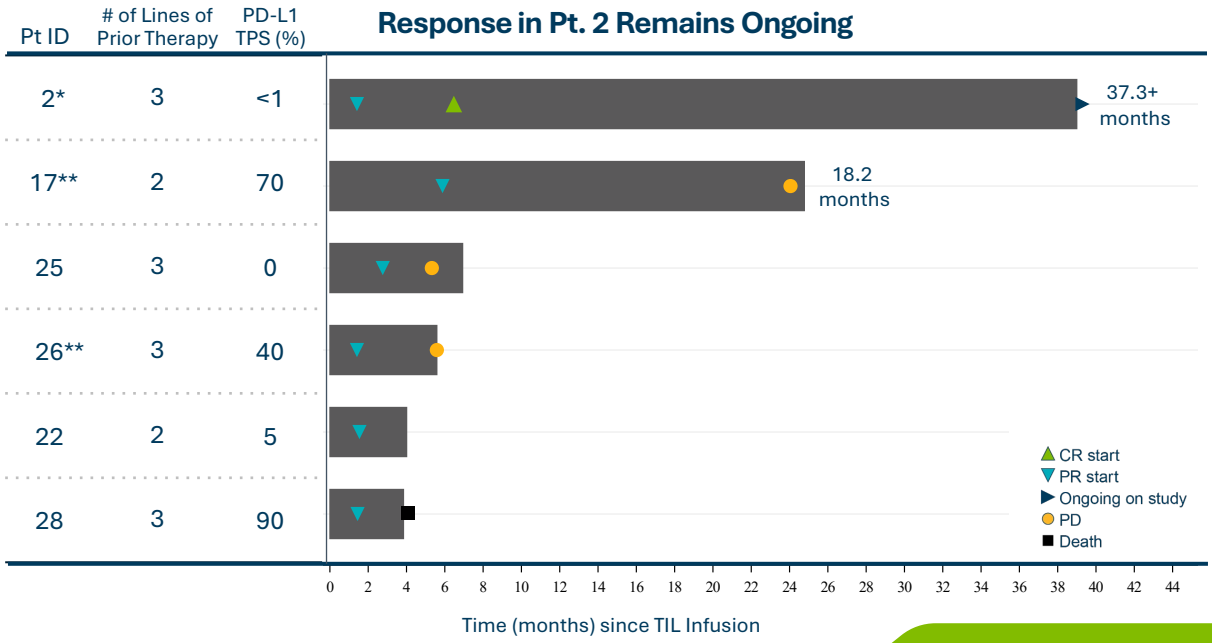
- All received prior anti-PD-1 / anti-PD-L1 therapy
- 24/28 patients (85.7%), including all responders, received ≥2 prior lines of systemic therapy

Long Lasting Responses with Durations of 18 and 37+ (ongoing) Months

Best Overall Response for Evaluable Patients (n=24)



Time to Response for Confirmed Responders (PR or Better; n=6)



*Patient 2 is reported as a CR based on negative FDG-PET scans by investigator
**Driver oncogene mutations: Patient 17 (KRAS G12C); Patient 26 (KRAS G12D)
Abbreviations: CR=complete response; PD=progressive disease; PR=partial response; SD=stable disease; TIL=tumor infiltrating lymphocytes; PD-1=programmed cell death protein-1; ICI=immune checkpoint inhibitor

LN-145 + Pembro Efficacy in NSCLC Cohort 3A (anti-PD-1 naïve)

Lifileucel in combination with anti-PD-1/PD-L1 therapy in ICI-naïve patients
(IOV-COM-202 Cohort 3A, N=17)

47% ORR

2 Complete Responses

Clinical Subset	ORR
Treatment naïve	80% (4/5)
Post-chemotherapy	43% (3/7) Includes 1 CR
EGFR-mutant after prior treatment with TKI	20% (1/5) Includes 1 CR

Key Takeaways

- 8/17 patients had a confirmed objective response per RECIST 1.1 (2 CRs and 6 PRs)
- Responses observed regardless of PD-L1 status
- Safety consistent with other Iovance TIL combination studies
- Observed differences in ORR among three subsets informing a subsequent potential registration study

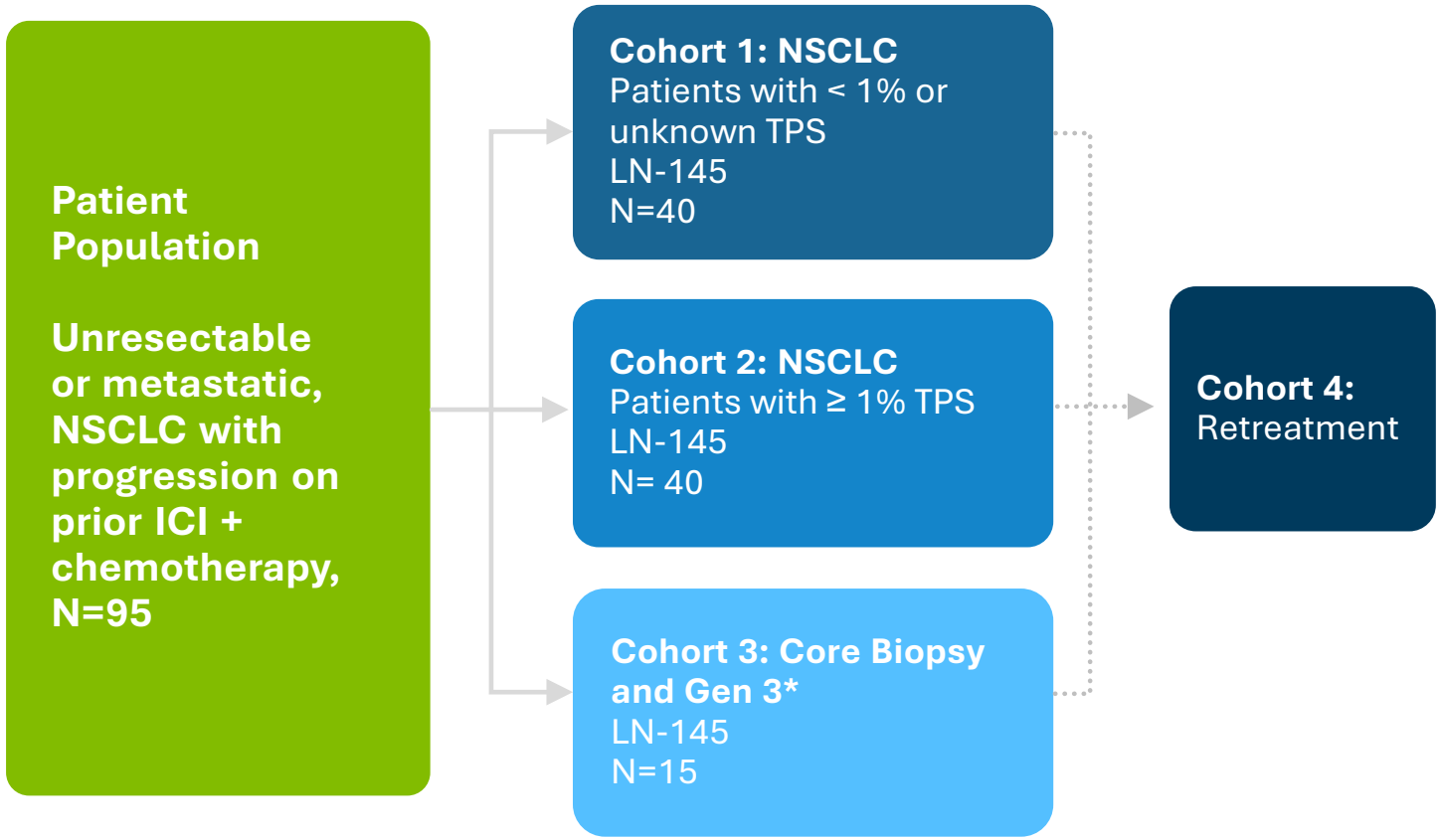
Next Steps

- Continue enrollment
- Present at medical meeting
- Meet with FDA to discuss data and potential registrational trial in frontline advanced NSCLC

Abbreviations: CR=complete response; ICI=immune checkpoint inhibitor; NSCLC=non-small cell lung cancer; ORR=objective response rate; PR=partial response; pembro=pembrolizumab; RECIST=Response Evaluation Criteria in Solid Tumors; ; TIL=tumor infiltrating lymphocytes

IOV-LUN-202

Phase 2, Multicenter Study of LN-145 in Patients with Metastatic NSCLC (NCT04614103)



Endpoints

- Primary: Efficacy defined as ORR by IRC
- Secondary: Safety and efficacy

Study Updates

- 2Q21: first patients treated
- 40+ sites are active in U.S., Canada, Europe

IOV-LUN-202 is designed to enroll patients with NSCLC with an unmet medical need but with limited prior lines of therapy to maximize the potential for more sustained responses

*Cohort 3 patients unable to undergo surgical harvest, TIL grown from core biopsy

Abbreviations: ICI=immune checkpoint inhibitor; IRC=independent review committee; NSCLC=non-small-cell lung cancer; ORR=objective response rate; TPS=tumor proportion score

Phase 1/2 Open-Label First-in-Human Study: IOV-GM1-201

Genetically Modified, PD-1 Inactivated TIL Therapy IOV-4001 in Previously Treated Metastatic Melanoma and NSCLC (NCT05361174)

Patient Population

Adults with unresectable or metastatic melanoma or advanced NSCLC

N=53

Cohort 1: Unresectable or metastatic melanoma
Post-anti-PD-1/L1, post-BRAF/MEK inhibitor in patients with BRAF mutations

Cohort 2: Stage III or IV NSCLC
Post -anti-PD-1/L1 or post targeted therapy and either chemotherapy or anti-PD-1/L1

Endpoints

- Phase 1: Safety
- Phase 2: Objective Response Rate (ORR) per RECIST v1.1 as assessed by the investigator
- Secondary endpoints include complete response (CR) rate, duration of response (DOR), disease control rate (DCR), progression free survival (PFS), overall survival (OS), safety and tolerability, feasibility

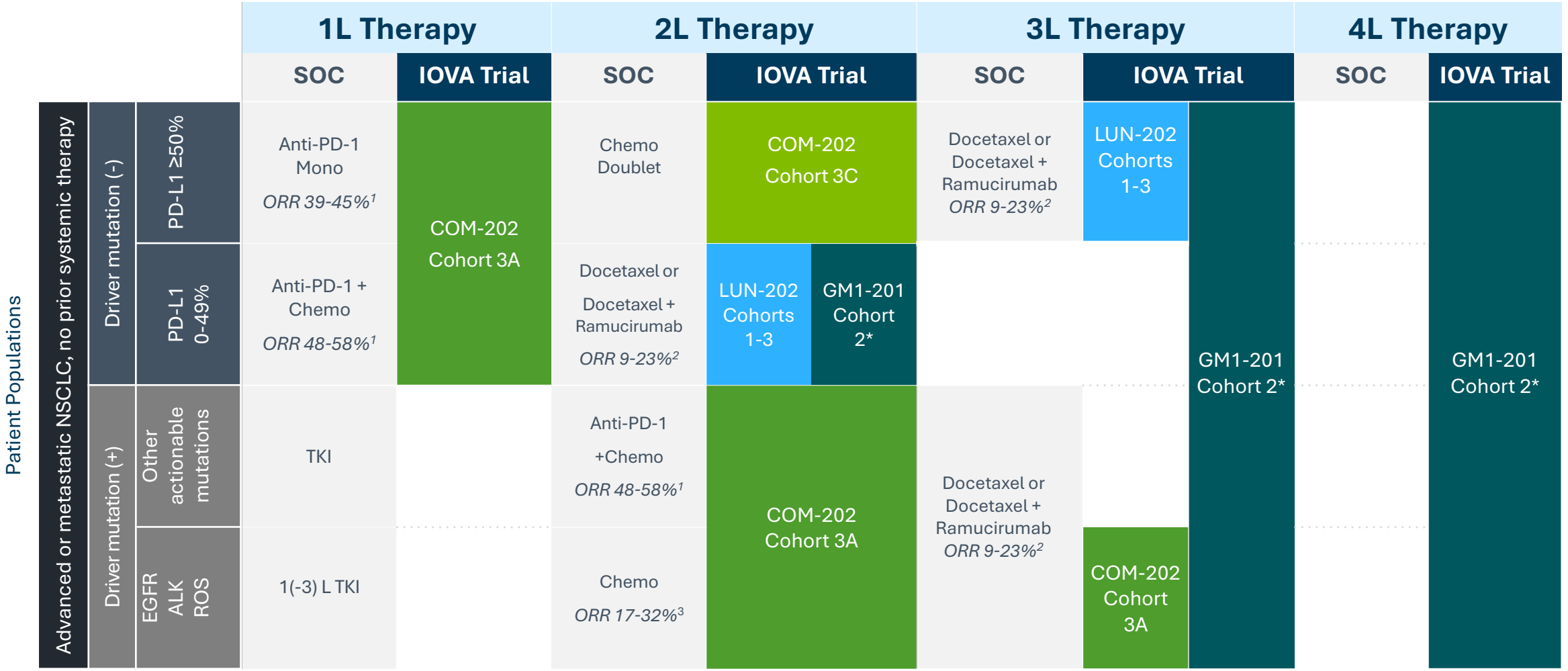
Study Updates

- 3Q22: first patient treated

NSCLC=non-small-cell lung cancer

Moving TIL Therapy into Relevant Lines of Therapy in NSCLC

COM-202 Cohort 3A (TIL+pembrolizumab) | COM-202 Cohort 3C (TIL+nivolumab/ipilimumab) | GM1-201 Cohort 2 IOV-4001 (PD1-KO TIL) | LUN-202 Cohorts 1-3 (TIL mono) | Current Standard of Care



Abbreviations: L=line; NSCLC=non-small cell lung cancer PD-1=programmed cell death protein-1; TIL=tumor infiltrating lymphocytes; TKI=tyrosine kinase inhibitor

* GM1-201 Cohort 2 population is comparable to completed COM-202 Cohort 3B

1. KEYTRUDA USPI; 2. CYRAMZA USPI; Brahmer et al., NEJM 2015; Borghaei et al., NEJM 2015; Herbst et al., Lancet 2016;Rittmeyer et al., Lancet 2017; 3. Park et al., Cancer Res Treat 2015; Yoshida et al., Lung Cancer 2017

IOVANCE

Potential Market for Cervical Cancer

Addressing a Defined Unmet Need in Cervical Cancer Following Chemo and Anti-PD-1

604k New cases WW each year[1]

342k Deaths WW each year[1]

14k Diagnoses in U.S. each year[2]

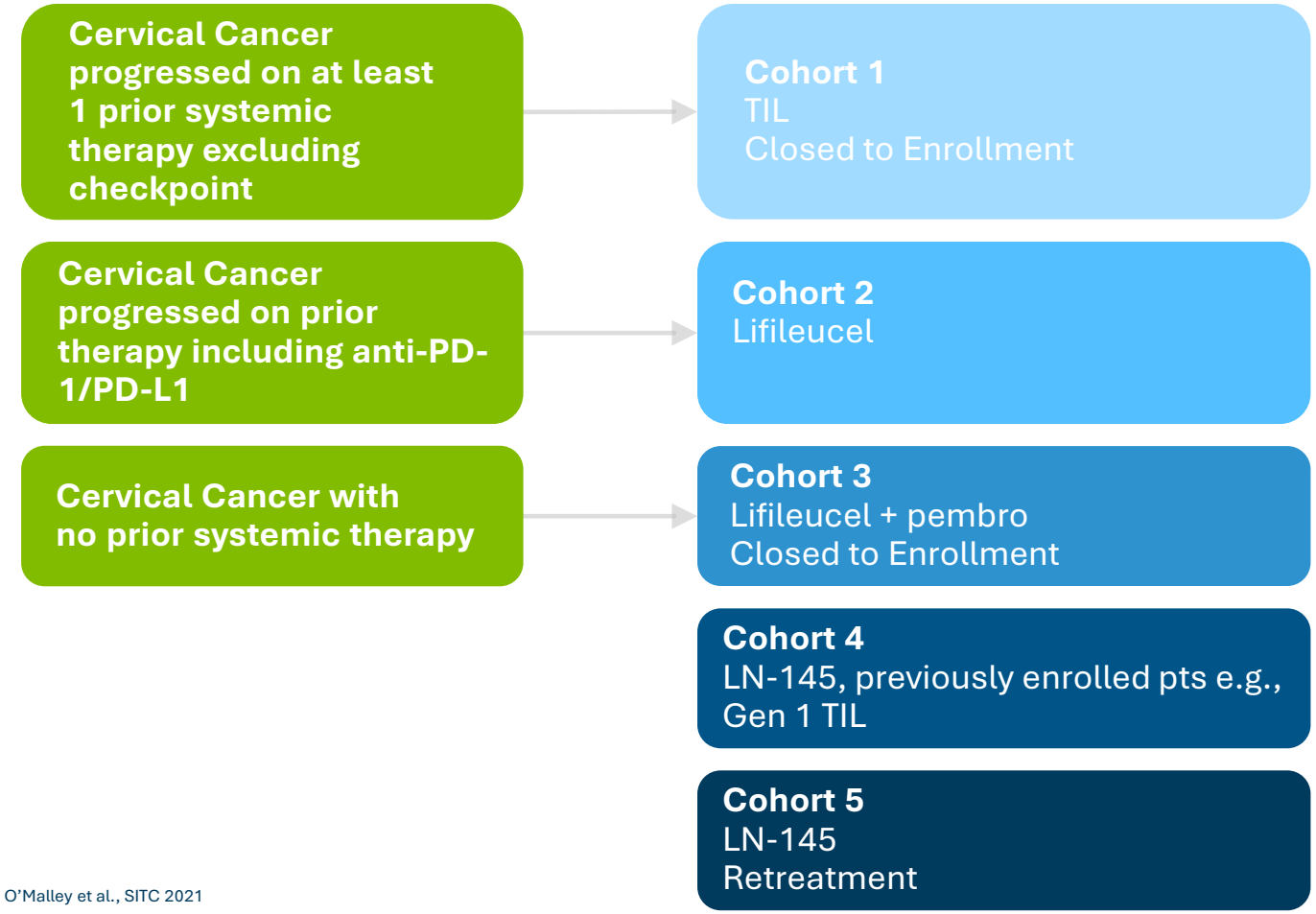
4k Deaths in U.S. each year[2]

Available Care	ORR	Median DOR
Frontline:		
Combination chemotherapy + bevacizumab[3]	48%	Not reported
Pembrolizumab + chemo + bevacizumab (PD-L1+ patients)[4]	68.1%	18 months
Second Line/Third Line:		
Pembrolizumab post-chemo (PD-L1+ patients)[5]	14.3%	Not reached
Tisotumab vedotin-tftv post-chemo[6]	24%	8.3 months
Chemotherapy in second line/third line[7,8]	3.4%–15%	4.4 months[8]

1. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries, CA Cancer J Clin., May 2021; 2. https://seer.cancer.gov accessed March 2023; 3. Tewari, et al., NEJM 2014; 4. Colombo et al., NEJM 2021; 5. Keytruda USPI; 6. Coleman et al., Lancet Oncol 2021; 7. McLachlan et al., Clin Oncol 2017; 8. Miller et al., Gynecol Oncol 2008

Pivotal Phase 2 Study of Lifileucel in Recurrent, Metastatic or Persistent Cervical Carcinoma (NCT03108495)

Regulatory Strategy Focused on Significant Unmet Need in Cervical Cancer Following Chemo and Anti-PD-1 Therapy



Endpoints (Pivotal Cohort 2)

- Primary: ORR as determined by IRC
- Secondary: safety and efficacy

Study Updates

- 4Q21: initial Cohort 3 data at SITC[1]
- 3Q22: regulatory strategy updated with Cohort 2 to be pivotal
- Expanded Cohort 2 to support regulatory submissions

1. O'Malley et al., SITC 2021

Next Generation Research Programs

Trailblazing Next Generation TIL Programs

Genetically modify TIL

Cellectis gene-editing TALEN® collaboration[1,2]

PD-1 and other immune checkpoint targets for single or multiple knockouts

Cytokine tethered TILs

Optimize TIL composition

PD-1+ selected TIL

CD39/69 double negative TILs[3]

Next generation processes

Gen 3 (16-day) process

Core biopsy

Expand TIL into new regimens

IOV-3001 IL-2 analog licensed from Novartis: IND enabling studies

1. Ritthipichai et al., ESMO 2020
2. Natarajan, et al., AACR 2022
3. Cubas et al., ESMO IO 2021

Corporate Summary & Milestones

Well-Capitalized in Pursuit of TIL Commercialization

December 31, 2022	In millions
Common shares outstanding	187.8
Preferred shares outstanding	2.9[1]
Stock options and restricted stock units outstanding	17.7
Cash, cash equivalents, investments, restricted cash	$478.3[2]
February 24, 2023	**In millions (unaudited)**
Common shares outstanding	224.3
Cash, cash equivalents, investments, restricted cash	$669.8[2]

Cash runway is sufficient into the second half of 2024

1. Preferred shares are shown on an as-converted basis
2. Includes Restricted Cash of $6.4 million as of December 31, 2022 and February 24, 2023

Broad, Iovance-Owned IP Around TIL Therapy

1 Tumor Sample Procurement

TIL from:
- Tumor
- Marrow infiltrating lymphocytes
- Peripheral blood lymphocytes
- Frozen tumor technologies
- Remnant TIL and digest processes

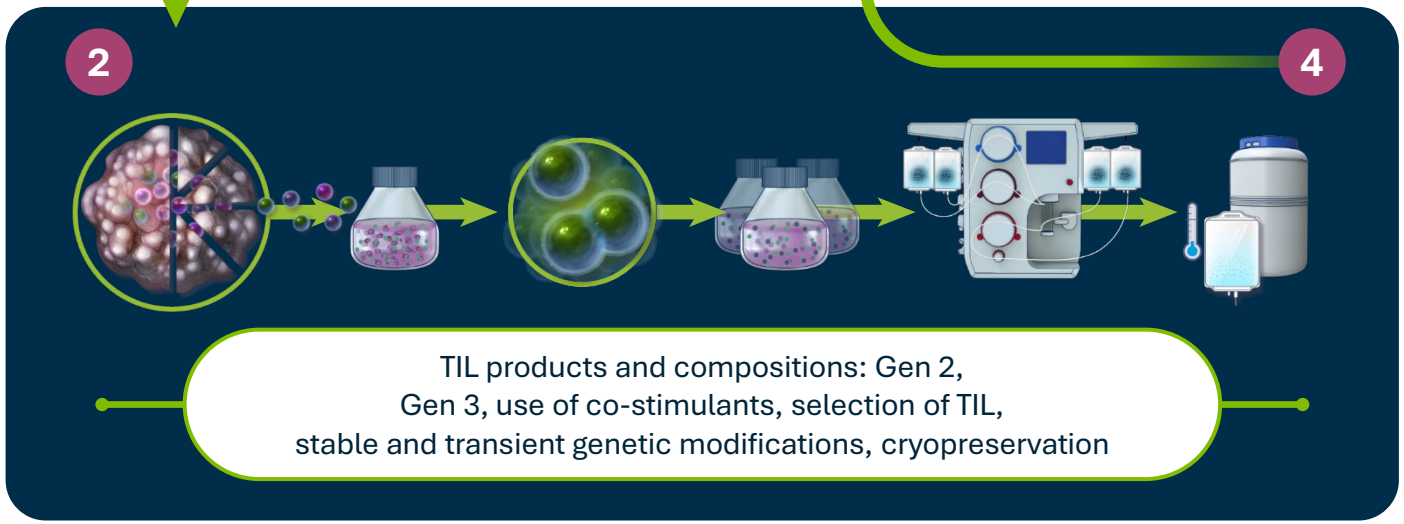
3 NMA-LD

4 TIL Infusion

- **Combination of TIL and ICIs including PD-1 antibodies**
- **Patient subpopulations**

5 IL-2 Infusions

IL-2 variants and regimens



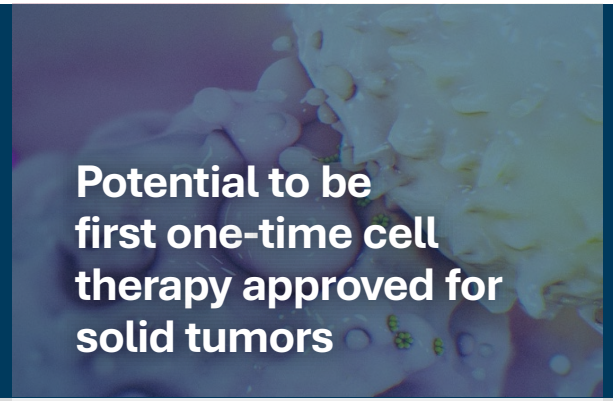
- ✓ 60+ granted or allowed US and international patents
- ✓ Compositions of matter for TIL products
- ✓ Methods of treatment in a broad range of cancers
- ✓ Manufacturing processes

Investment Highlights

Pioneering a Transformational Approach to Cure Cancer

Large market opportunity & strong unmet need

- Initial focus in post-ICI solid tumors
- Expansion into combinations, earlier lines of therapy, and genetic modification(s)
- Key late-stage trials in melanoma, cervical, and NSCLC
- First-in-human trial of genetically modified TIL (PD-1 inactivated)



Potential to be first one-time cell therapy approved for solid tumors

- BLA submission on track to complete in 1Q23
- Phase 3 frontline advanced melanoma confirmatory trial (FTD)
- Accelerated path to approval in melanoma (RMAT) and cervical cancer (BTD)
- Defined registration strategy in cervical cancer

Efficient & scalable proprietary manufacturing

- Iovance Cell Therapy Center (*i*CTC) in-house manufacturing
- Additional capacity with contract manufacturers
- Rapid 22-day Gen 2 manufacturing with 90%+ success rate
- >600 patients treated with Iovance proprietary process

Infrastructure for commercial success

- Fully integrated
- Experienced cross-functional cell therapy team
- Partnering with leading U.S. Cancer Centers to develop TIL service-line capabilities
- IovanceCares™ proprietary platform
- Proleukin® integration (pending close)

Abbreviations: BLA=Biologics License Application; BTD=breakthrough therapy designation; FTD=fast track designation; ; ICI=immune checkpoint inhibitor; NSCLC=non-small cell lung cancer; PD-1=programmed cell death protein-1; RMAT=Regenerative Medicines Advanced Therapy; TIL=tumor infiltrating lymphocytes

Anticipated 2023 Milestones

REGULATORY	BLA: Complete rolling BLA submission for lifileucel in post-anti-PD-1 advanced melanoma in Q1 2023
	BLA: Obtain FDA approval
PIPELINE	Melanoma: enroll patients in frontline advanced melanoma Phase 3 confirmatory trial
	NSCLC: report data and continue to enroll IOV-LUN-202, IOV-COM-202, IOV-GM1-201 trials
	Cervical: enroll additional patients in registrational Cohort 2
	PD-1 inactivated TIL (IOV-4001): complete Phase 1 safety portion and proceed to Phase 2 portion of IOV-GM1-201 trial
	Research: advance new products toward clinic, including additional genetically-modified TIL therapies
MANUFACTURING	Execute GMP commercial readiness activities to support BLA approval and supply lifileucel at launch
COMMERCIAL	Prepare for and execute commercial launch
	Close transaction and successfully integrate Proleukin® business

IOVANCE BIOTHERAPEUTICS

Thank You

ADVANCING IMMUNO-ONCOLOGY