
Third Quarter 2023 Operating & Financial Results Conference Call / Webinar

November 8th, 2023
4:30 PM Eastern Time



Forward Looking Statements

This presentation contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements include, among other things, statements relating to: future events or our future financial performance; the potential advantages of our RADR® platform in identifying drug candidates and patient populations that are likely to respond to a drug candidate; our strategic plans to advance the development of our drug candidates and antibody drug conjugate (ADC) development program; estimates regarding the development timing for our drug candidates and ADC development program; expectations and estimates regarding clinical trial timing and patient enrollment; our research and development efforts of our internal drug discovery programs and the utilization of our RADR® platform to streamline the drug development process; our intention to leverage artificial intelligence, machine learning and biomarker data to streamline and transform the pace, risk and cost of oncology drug discovery and development and to identify patient populations that would likely respond to a drug candidate; estimates regarding patient populations, potential markets and potential market sizes; sales estimates for our drug candidates and our plans to discover and develop drug candidates and to maximize their commercial potential by advancing such drug candidates ourselves or in collaboration with others. Any statements that are not statements of historical fact (including, without limitation, statements that use words such as "anticipate," "believe," "contemplate," "could," "estimate," "expect," "intend," "seek," "may," "might," "plan," "potential," "predict," "project," "target," "model," "objective," "aim," "upcoming," "should," "will," "would," or the negative of these words or other similar expressions) should be considered forward-looking statements. There are a number of important factors that could cause our actual results to differ materially from those indicated by the forward-looking statements, such as (i) the risk that our research and the research of our collaborators may not be successful, (ii) the risk that none of our product candidates has received FDA marketing approval, and we may not be able to successfully initiate, conduct, or conclude clinical testing for or obtain marketing approval for our product candidates, (iii) the risk that no drug product based on our proprietary RADR® AI platform has received FDA marketing approval or otherwise been incorporated into a commercial product, and (iv) those other factors set forth in the Risk Factors section in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the Securities and Exchange Commission on March 20, 2023. You may access our Annual Report on Form 10-K for the year ended December 31, 2022 under the investor SEC filings tab of our website at www.lanternpharma.com or on the SEC's website at www.sec.gov. Given these risks and uncertainties, we can give no assurances that our forward-looking statements will prove to be accurate, or that any other results or events projected or contemplated by our forward-looking statements will in fact occur, and we caution investors not to place undue reliance on these statements. All forward-looking statements in this presentation represent our judgment as of the date hereof, and, except as otherwise required by law, we disclaim any obligation to update any forward-looking statements to conform the statement to actual results or changes in our expectations.

Contents

- 01 Introduction
- 02 Q3 2023 Highlights
- 03 Financial Highlights
- 04 Q&A

Speakers

Panna Sharma

CEO and President



David Margrave

CFO

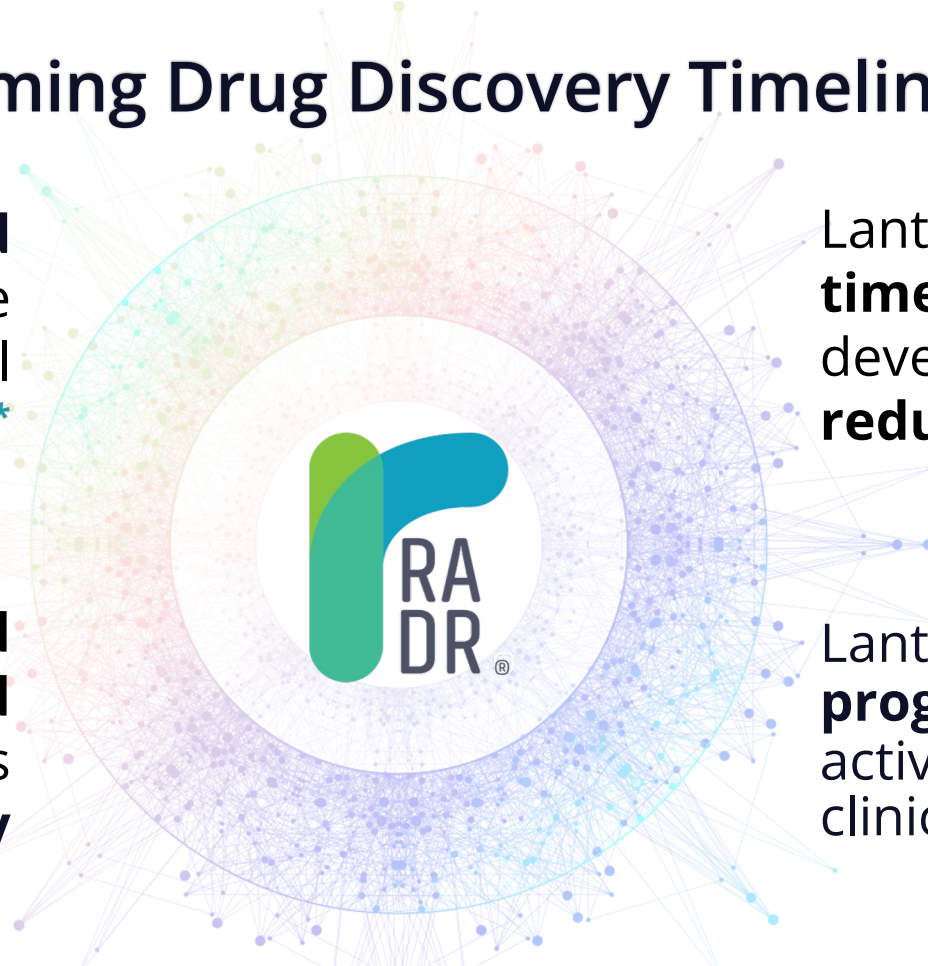


Lantern is Transforming Drug Discovery Timelines & Costs with AI

AI insights and biomarkers can increase the odds of clinical trial success by **12X***

(*Parker et al., 2021)

RADR® can **predict and stratify real-world patients** for clinical trials with **88% accuracy**



Lantern can **compress the timeline** of early-stage drug development by **70%** and **reduce the cost** by **80%**

Lantern has launched **10 new programs in 2 years**, and has active ongoing ph.1 and ph.2 clinical trials

LANTERN'S DRUG DEVELOPMENT MODEL AND OBJECTIVES



Large Scale/Multi-omics
Oncology Data



Proprietary AI
platform RADR®



Accelerated
timelines; reduced
costs and risks

Lantern's diverse & unique AI-driven pipeline of 13 lead drug programs including the Phase 2 Harmonic™ trial and RADR® collaborations

Lantern Pharma (NASDAQ: LTRN)								
Lead Program	Indication	Discovery	Preclinical	Phase I	Phase II	Orphan Designation	Rare Pediatric Disease	
LP-300	Non-Small Cell Lung Cancer for Never Smokers	<div></div>	<div></div>	<div></div>	<div></div>			
LP-184	Recurrent Advanced Solid Tumors (Pancreatic, TNBC, Bladder, and Other Solid Tumors)	<div></div>	<div></div>	<div></div>		<div></div> *for Pancreatic		
LP-284	Recurrent Non-Hodgkin's Lymphomas (Mantle cell, Double-hit lymphomas, and HGBL)	<div></div>	<div></div>	<div></div>		<div></div> *for Mantle Cell		
ADC	Select Solid Tumors	<div></div>	<div></div>					

Starlight Therapeutics (Wholly Owned Subsidiary)



STAR-001 <i>(LP-184 for CNS and Brain Cancers Only)</i>	Glioblastoma (GBM)	<div></div>	<div></div>			<div></div>	
	Brain Mets (Lung, Breast, Skin)	<div></div>	<div></div>				
	Atypical Teratoid Rhabdoid Tumor (ATRT)	<div></div>	<div></div>			<div></div>	<div></div>
	Pediatric Brain Cancers	<div></div>	<div></div>				

RADR® Collaborations



Elraglusib <i>owned by – Actuate Therapeutics</i>	Multiple Solid Tumors	<div></div>	<div></div>	<div></div>		Collaboration partner	
TTC-352 <i>owned by- TTC Oncology</i>	ER+ Breast Cancers	<div></div>	<div></div>	<div></div>		Collaboration partner	
ADC	Cryptophycin Conjugate for Solid Tumors	<div></div>	<div></div>			Collaboration partner	

2023 3rd Quarter Highlights

1 of 2



NASDAQ: LTRN

- ✓ Received IND clearance from FDA to initiate **Phase 1 clinical trial for LP-284**, a first-in-human trial for advanced, refractory **non-Hodgkin's lymphomas** (NHL).
- ✓ Dosed initial patient in **Phase 1 with LP-184**, a clinical trial for multiple advanced **solid tumors** that are refractory to standard-of-care therapies.
- ✓ Progressed **Phase 2 LP-300 Harmonic™ clinical trial** towards enrollment in East Asian countries where 30-35+% of all lung cancer cases occur in never-smokers with NSCLC; continued expansion of additional clinical trial sites in the US and increased focus on recruitment activity with advocacy groups.

2023 3rd Quarter Highlights

2_{of 2}



NASDAQ: LTRN

- ✓ Developed initial proof-of-concept and preclinical evidence with our collaborators for **a novel cryptophycin-based ADC** (antibody-drug conjugate); initial data is planned to be shared in January 2024.
- ✓ Furthered development of Lantern's **AI platform, RADR®**, to include modules for the streamlined development of ADCs and the prediction of ideal drug combinations with existing approved checkpoint inhibitors.
- ✓ Approximately **\$45 million** in cash, cash equivalents, and marketable securities as of September 30, 2023, anticipated to provide a cash runway into at least Q3 of 2025.

Financial Updates Q3 2023

Solid financial position and capital efficiency fuel continued growth anticipated to provide a cash runway into at least Q3 of 2025

Summary Results of Operations

	Three Months Ended September 30, (unaudited)	
	2023	2022
Operating expenses:		
General and administrative	\$ 1,313,727	\$ 1,442,961
Research and development	2,209,894	702,296
Total operating expenses	3,523,621	2,145,257
Loss from operations	(3,523,621)	(2,145,257)
Interest + Other income, net	362,171	(119,424)
NET LOSS	\$ (3,161,450)	\$ (2,264,681)
Net loss per common share, basic and diluted	\$ (0.29)	\$ (0.21)
Weighted Avg. Common Shares Outstanding - Basic and Diluted	10,857,366	10,838,888

Balance Sheet Highlights & Summary

	09/30/2023 (unaudited)	12/31/2022
Cash, Cash Equivalents & Marketable Securities	\$44,925,580	\$55,196,085
Prepaid Expenses & Other Current Assets	\$2,500,401	\$2,985,472
Total Assets	\$47,771,508	\$58,836,321
Total Liabilities	\$2,359,828	\$2,798,297
Total Stockholders' Equity	\$45,411,680	\$56,038,024

“ We believe our solid financial position will fuel continued growth and evolution of our RADR® AI platform, accelerate the development of our portfolio of targeted oncology drug candidates and allow us to introduce additional targeted product and collaboration opportunities in a capital efficient manner. ”

LP-284: Ph. 1 trial launched in Q4 for recurrent NHLs with scarce therapeutic options & market potential of \$4+ billion in annual global sales

First-In-Human
Trial for **LP-284**

Phase 1



Non-Hodgkin's
Lymphomas

\$4.0Bn

Estimated global annual
market potential in NHL

375k

Estimated global annual
patients in NHL

**Q2
2023**

Completed IND
enabling studies

**Sep
2023**

IND application
cleared by FDA

**Q4
2023**

Launched
phase 1 trial

Recent Highlights

- Received notice of allowance from the USPTO for the composition of matter patent, no. 17/192,838, covering the molecule LP-284, extending commercial protection into early **2039**

Program Highlights

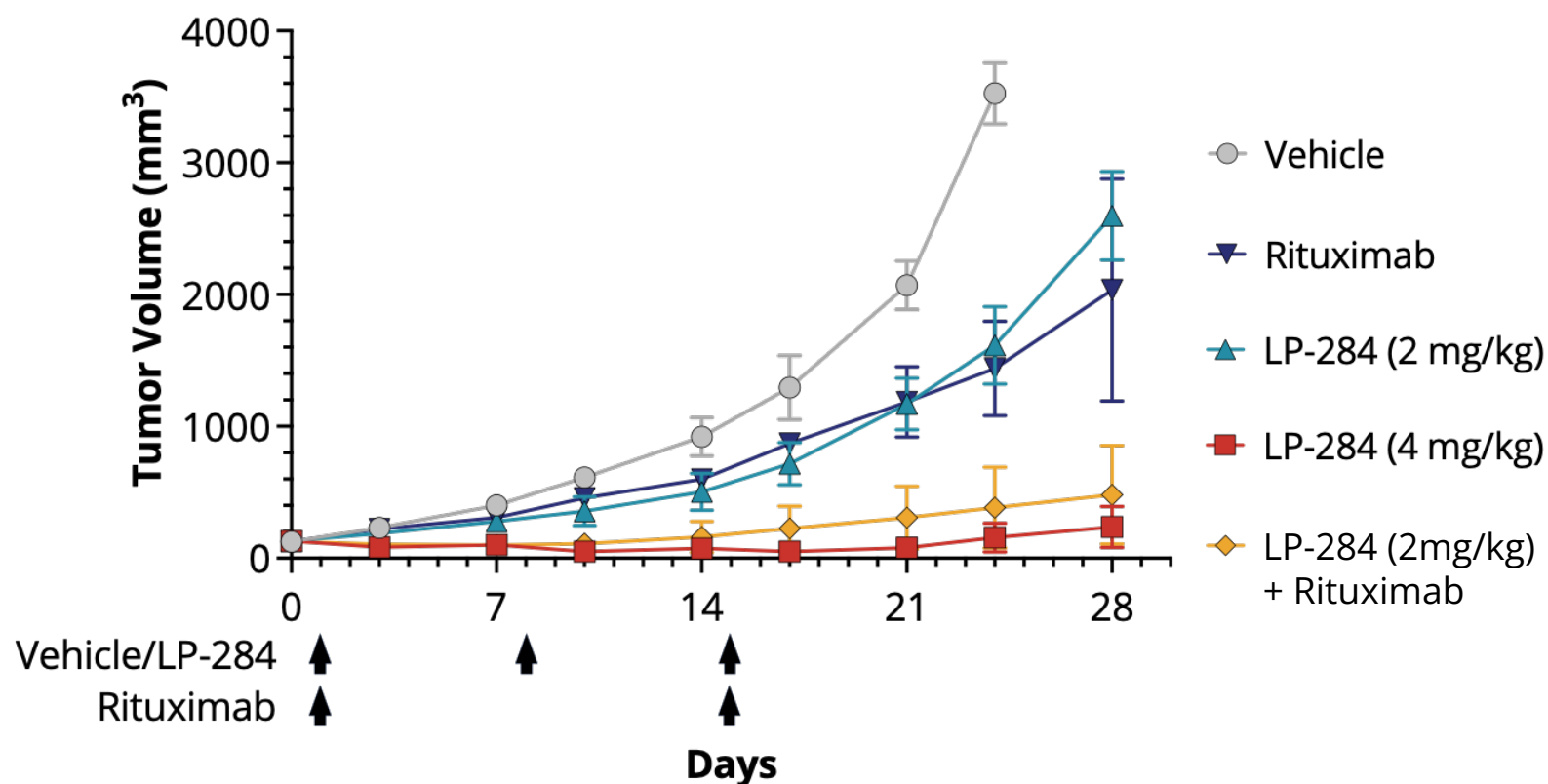
- LP-284 has nanomolar potency against several aggressive non-Hodgkin's lymphomas (NHL) including mantle cell and double hit lymphomas
- FDA granted Orphan Drug Designation for mantle cell lymphoma
- In-vivo LP-284 can rescue tumors resistant to MCL standard-of-care agents Ibrutinib and Bortezomib
- Enhanced potency when used in combination with other approved agents like Spironolactone

Preclinical Data on Combination Therapy – LP-284

LP-284 was highly synergistic when used in combination with rituximab in HGBL xenograft models

High Grade B-cell Lymphoma (HGBL) Tumor Volumes in Mice LP-284 – in combination with rituximab

HGBL have universally poor prognosis after chemotherapy, such as EPOCH, Hyper CVAD, and CODOX-M/IVAC - all are given with Rituximab. Novel agents are critically needed for more effective treatments in HGBL



LP-284 treatment led to **near complete tumor growth** inhibition and showed synergistic effects with the FDA-approved agent rituximab

At half of the optimal dose (2mg/kg v. 4mg/kg) **LP-284 when combined with rituximab led to a 63% improvement** in anti-cancer activity (as measured by tumor volumes) versus rituximab alone

- ▼ Rituximab alone = 57% TGI
- ◆ LP-284+ Rituximab = 93% TGI

Results presented at:



Phase 1A dose-escalation safety study of LP-184 for patients with locally advanced or metastatic solid tumors or unresectable or recurrent glioblastoma multiforme (GBM) and other high-grade gliomas



1 in 4

people have solid tumors with DDR Deficiencies



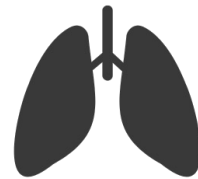
Pancreatic Cancer



Triple Negative Breast Cancer



Bladder Cancer



Lung Cancer

Annual US Market Potential: \$14+ Billion
(DDR Deficient Solid Tumors)

Trial Updates

- Trial launched and multiple US sites activated
- First patient dosed in September 2023
- Multiple additional sites across the US including industry-leading institutes like Fox Chase Cancer Center to be enrolled

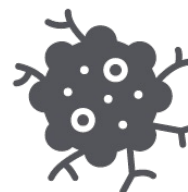
Future Directions

- Following determination of the maximum tolerated dose (MTD) and/or recommended phase 2 dose (RP2D), the dose will be confirmed prior to initiating enrollment in Phase 1B
- **Potential future studies: Phase 2 in GBM (through Starlight) and Phase 1b/2 in other solid tumors** to be initiated after determination of MTD

LP-184: Launched Phase 1 basket trial for a blockbuster molecule with a market potential of \$14+ billion in annual sales

First-In-Human Trial for LP-184

Phase 1A



Solid Tumors



Brain & CNS Cancers

30-35

Patients expected to be enrolled

June
2023

IND application cleared by FDA

July
2023

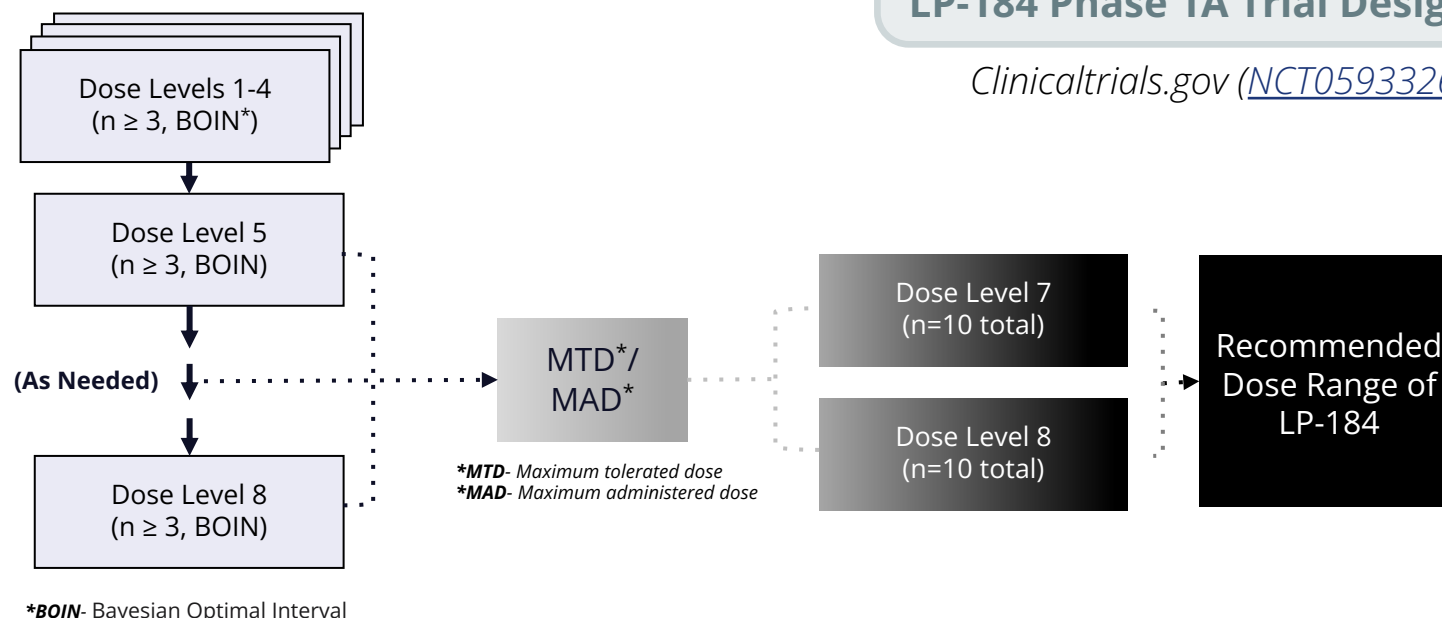
Trial launch and initial sites activated

Sep
2023

First patient dosed

LP-184 Phase 1A Trial Design

Clinicaltrials.gov ([NCT05933265](https://clinicaltrials.gov/ct2/show/study/NCT05933265))



Harmonic™: Accelerating recruitment efforts for a growing indication with limited treatment options and an annual global market potential of \$2.6+ bn



Phase 2



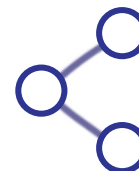
Non-Small Cell
Lung Cancer



Never Smokers

90

Patients



Two arm, Open-label,
Randomized Trial



Multi-Site

1 in 6

lung cancer deaths will occur in patients
that are never smokers with NSCLC

20,000-40,000

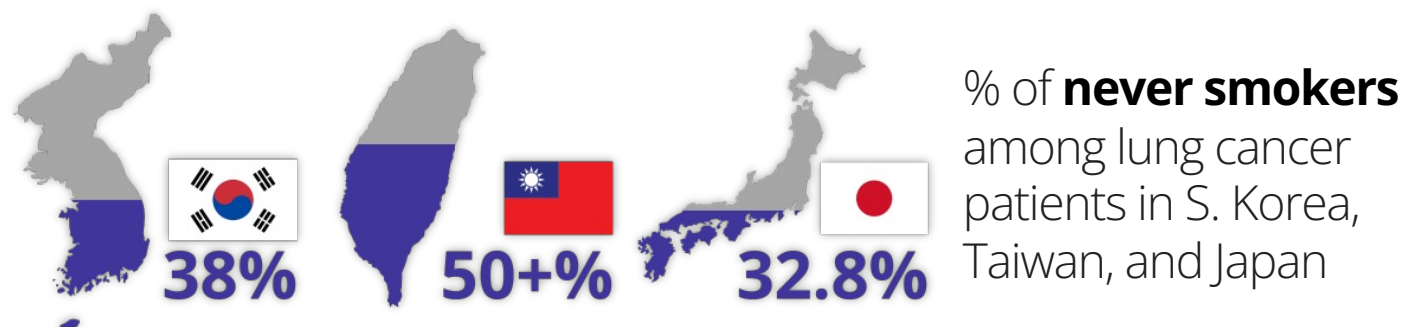
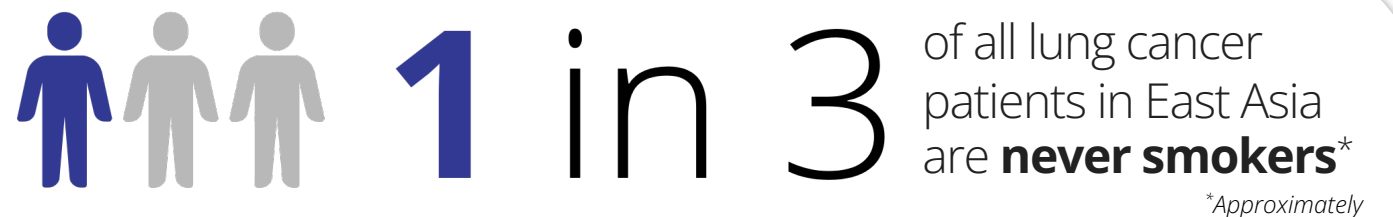
never smokers will be diagnosed with NSCLC each year
Cancer.gov

Annual Market Potential (global) : \$2.6+ Billion

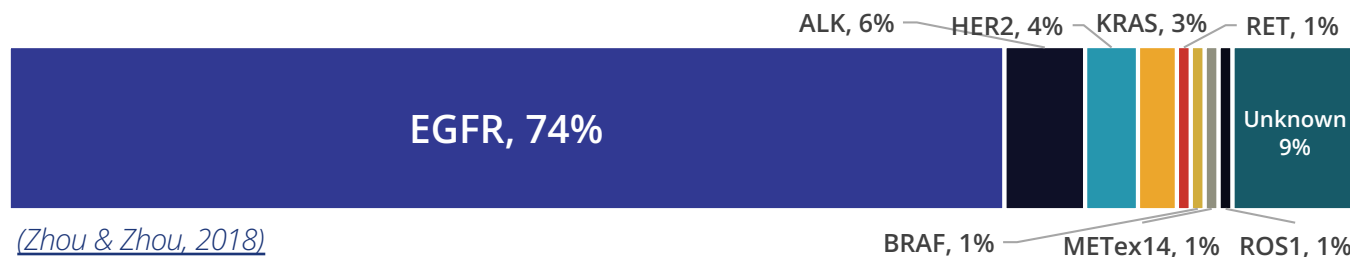
Trial Updates

- Dr. Joseph Treat, MD of Fox Chase Cancer Center: appointed lead principal investigator for the Harmonic™ study
- Initial patients dosed in first half of 2023, enrollment anticipated to last 18-24 months
- Multiple additional patients and sites across the US anticipated to be enrolled during remainder of 2023
- Expanding trial to Asia (South Korea, Japan, and Taiwan) in countries with a higher incidence of NSCLC in never smokers

Expanding the Phase 2 Clinical Trial to East Asia: Boosting Patient Enrollment in Countries with High Incidences of NSCLC in Never Smokers



Lung cancer in East Asian never-smokers is a **distinct subtype** that can be largely defined by targetable mutations



Highlights

- Expanding trial to South Korea, Taiwan, and Japan
- East Asian populations have higher rates of NSCLC never smoker population of EGFR and TKI mutations

Q4 2023

Regulatory and Country Submissions

Q1+Q2 2024*

Launch the Harmonic™ trial in South Korea, Taiwan and Japan

*anticipated

Initiated RADR® collaboration w/ Bielefeld Univ. to develop breakthrough cryptophycin ADCs - an entirely new treatment modality

Rapidly growing global ADC market

currently valued at

\$4+ billion



projected value by 2027

\$14+ billion



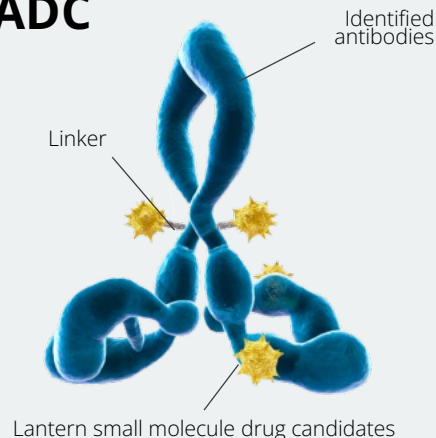
UNIVERSITÄT
BIELEFELD



Led by Professor
Norbert Sewald, Ph.D.

- **RADR® ADC module** will be leveraged to develop novel and potent cryptophycin-ADCs
- **Lantern received exclusive worldwide option** to license IP from Bielefeld University related to, or generated from, collaboration

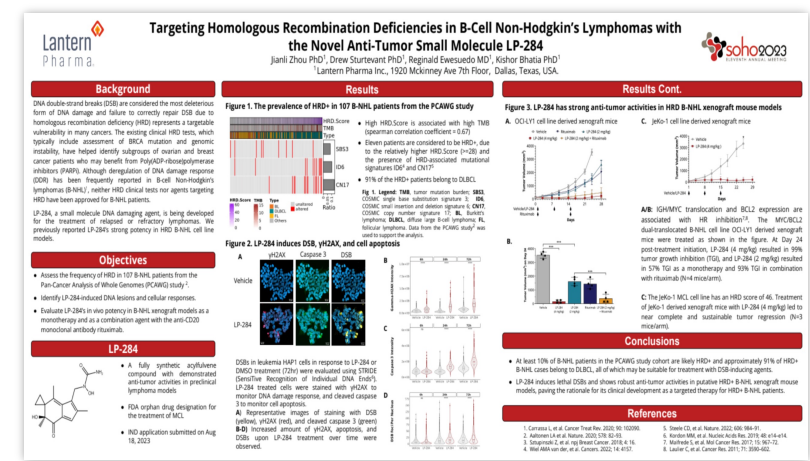
ADC



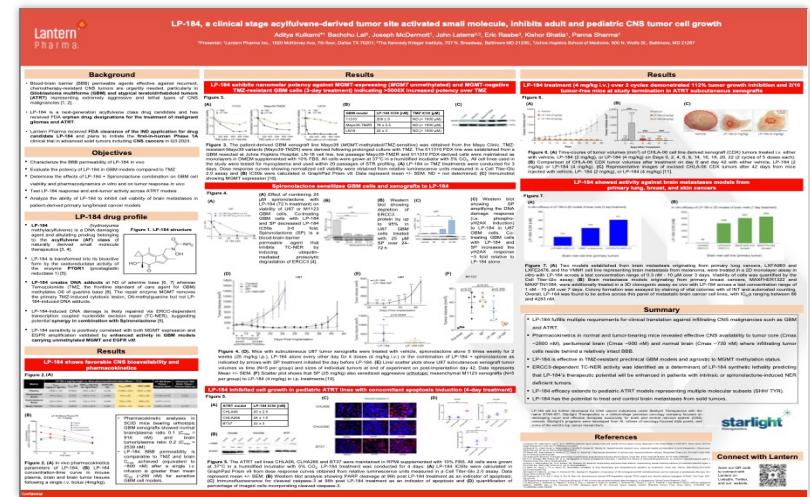
Collaboration Updates

- Successful generation of cryptophycin conjugated ADC with a drug antibody ratio (DAR) ranging between 2 to 8
- Cryptophycin-ADCs exhibited in vitro sensitivity across six cancer indications
- This data provides a rationale for further development as one of our future clinical candidates, allowing us to rapidly move to preclinical toxicology studies
- Ongoing discussion for potential development using cryptophycins in conjunction with two of the highly ranked targets from the RADR® AI platform development module

Recent Posters Highlighting the Strong Validation of RADR® Insights, De-risking the Development of Lantern's Drug Candidates



Soho 2023 Annual Meeting
Targeting homologous recombination deficiencies in B-cell non-Hodgkin's lymphomas with the novel anti-tumor small molecule LP-284
September, 2023

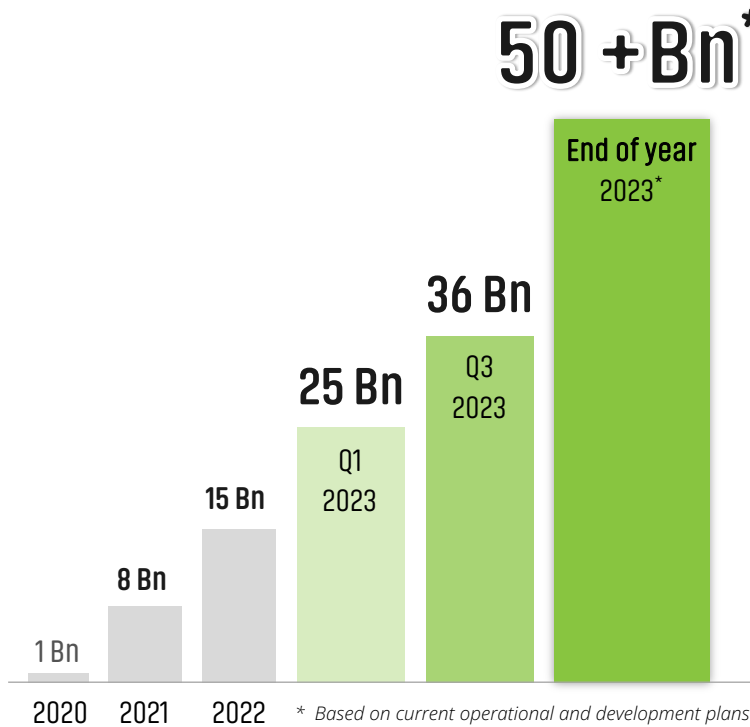


SNO/ASCO CNS Cancer Conference
LP-184, a clinical stage acylfulvene-derived tumor site activated small molecule, inhibits adult and pediatric CNS tumor cell growth
August, 2023

RADR®'s expansion of size, scope, and capabilities continues to push the boundary of AI for oncology drug discovery and development

SCALE

50 billion oncology-focused datapoints by end of 2023



SCOPE

- Additional classes of compounds including antibodies, checkpoint inhibitors, DNA damaging agents, and ADCs



IO
drugs



ADCs



DNA damaging
agents

CAPABILITIES

- BBB permeability prediction
- Immune checkpoint inhibitor prediction
- Next-generation ADCs development



BBB

Checkpoint
Inhibitors

ADC Design



Lantern Pharma's Proactive Engagement in Patient Outreach Initiatives

Past Events



Glioblastoma Awareness Day

Social media campaign

July 2023



World Lung Cancer Day

White ribbon building @ Plano office

August 2023



GO2 for Lung Cancer 5K Run in LA

Sponsor

October 2023



BOHKY White Ribbon 5K Run

Sponsor

October 2023

Upcoming Event



HOPE 4 ATRT RALLY

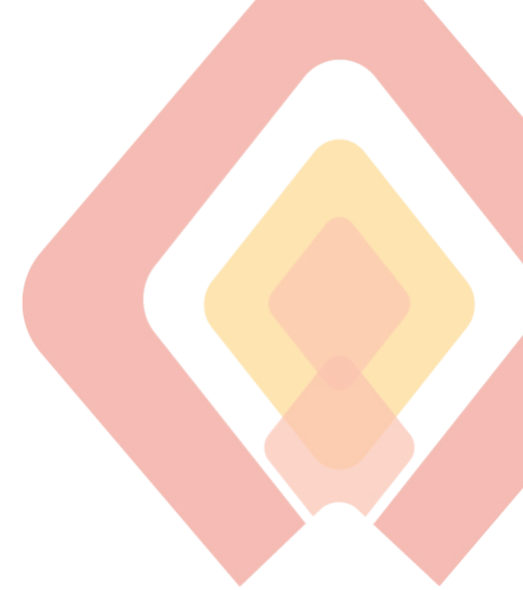
Dr. Reggie Ewesuedo (VP, Clinical Development) presenting / attending

November 10th, 2023

*"We are committed to including patients in our mission to develop cancer drugs **faster, cheaper, and with greater precision**. By actively engaging with patient advocacy groups, we are more effective in working towards the goal of **driving awareness** and improving our understanding of the clinical need, while **building stronger connections** with the cancer community."*

2023-24 Objectives

A Transformational Year for Lantern



T
O
P

- Continue disciplined fiscal management
 - Explore licensing and partnership opportunities with biopharma companies
 - Establish additional RADR® based collaborations with corporate and research partners
 - Accelerate enrollment of **The Harmonic™ Trial** & advance towards enrollment in Asia
 - Advance phase 1A basket clinical trial for LP-184 & achieve dosing levels for future phases
 - Advance first-in-human clinical trial for LP-284 in NHL
- T
E
N
- Progress Starlight Therapeutics towards Ph. 1 / 2 adult & pediatric clinical trials
 - Further ADC preclinical and IND development to support future Phase 1 launch and/or partnership
 - Develop combination programs for LP-184, LP-284, and LP-300 with existing approved drugs
 - Expand RADR® AI platform to 50+ billion datapoints



IR Contact:
IR@lanternpharma.com
1-972-277-1136

 www.lanternpharma.com

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