Third Quarter 2022
Operating & Financial Results Conference Call / Webinar

November 7th, 2022
4:30 PM Eastern Time

Lantern Pharma

NASDAQ :LTRN

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 genomic 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 impact of the COVID-19 pandemic, (ii) the risk that our research and the research of our collaborators may not be successful, (iii) 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, (iv) the risk that no drug product based on our proprietary RADR® A.I. platform has received FDA marketing approval or otherwise been incorporated into a commercial product, and (v) those other factors set forth in the Risk Factors section in our Annual Report on Form 10-K for the year ended December 31, 2021, filed with the Securities and Exchange Commission on March 10, 2022. You may access our Annual Report on Form 10-K for the year ended December 31, 2021 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

Speakers

Panna Sharma

Chief Executive Officer,
President and Director

David Margrave

Chief Financial Officer

Host

Nicole Leber

Investor Relations

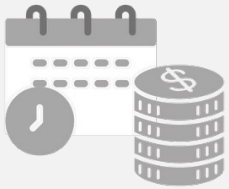
Using A.I. Lantern is Transforming Drug Discovery Timelines and Cost

Lantern has launched **8 programs** in two years, and is anticipating launching 3 Phase 1 trials in 2023

Lantern's Drug Development Model

Large Scale/Multi-omics Oncology Data

Proprietary A.I. platform RADR®



Accelerated timeline and reduced cost

Program	Indication		Discovery	Optimization	Preclinical	Pre IND	Phase I	Phase II
LP-100	Metastatic Castration-Resistant Prostate Cancer							
LP-300	Non-Small Cell Lung Cancer (NSCLC)						harmonic	
LP-184	**CNS Cancers**	Glioblastoma (GBM)						
		ATRT						
		Brain Mets						
		Pediatric Brain Cancers						
	Solid Tumors	Pancreatic Cancer						
		Bladder Cancer						
LP-284	**Non-Hodgkin's Lymphomas**	Mantle Cell						
		Double Hit						
ADC	Select Solid Tumors							

Third Quarter 2022 Highlights

LP-300 and Harmonic™ Trial

- Activated first two clinical trial sites
- First enrolled patients anticipated in Q4 2022
- New patent issued for LP-300 uses

RADR® Expansion

- RADR® continues rapid data growth & advances in functionality
- Actuate collaboration progressing for elraglusib
- RADR® driven insights on LP-184 for ATRT published

LP-184 for Solid Tumors & CNS Cancers

- Completion of IND enabling studies and filling of IND application, anticipated Q1 2023
- Phase 1 clinical trial anticipated for Q2 2023
- Poster presented at AACR Pancreatic Special Conference

Collaborations

- Productive Johns Hopkins collaboration extended
- Hosting a KOL webinar on Synthetic Lethality with leading expert Zoltan Szallasi M.D.

LP-284 for Non-Hodgkin's Lymphomas

- Completion of IND enabling studies and filing IND application, anticipated Q1 2023
- Phase 1 clinical trial anticipated for Q2 2023
- Poster presented at SOHO annual conference

Financial Updates

- $57.8 million of cash, cash equivalents, and marketable securities as of September 30, 2022
- Lantern has a cash runway into 2025

The Harmonic™ Trial for Never Smoker Patients with NSCLC

Harmonic™ for LP-300 launched in Q3 2022 and is actively enrolling trial sites and patients

harmonic **Phase 2**

Non-Small Cell Lung Cancer | Never Smokers | 90 Patients | Two arm, Open-label, Randomized Trial | Multi-Site

Primary Outcomes: Overall and progression free survival

1st patient → Interim Results

Q4 2022	Enrollment anticipated to last 12-18 months	Q4 2023

Major Updates

- Activated first two trial sites: **Northwest Oncology & Hematology**, IL; **Gabrail Cancer Center**, OH
- First patient anticipated to be enrolled in Q4 '22
- Additional sites across the US to be enrolled in Q4 '22 & Q1 '23

New US Patent Issued for LP-300

- USPTO issued U.S. Patent No. 11,471,431 for LP-300 uses
- Extends commercial protection for LP-300 uses until late 2032
- Will stimulate the opportunity for future partnering discussions with biopharma companies

Additional Value Drivers

1. Trial will collect liquid biopsies and acquire genomic/transcriptomic data from patients. Will represent one of the largest biomarker studies done on the never-smoker population.

Liquid biopsies taken at 4 time points

Potential Future Clinical Trial Design & Companion Dx

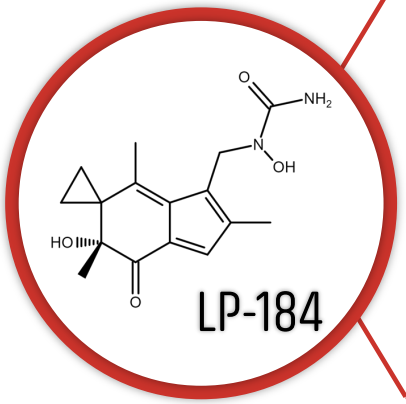
2. Exploring global partnering discussions, for areas with high prevalence of never smokers with NSCLC

*"… higher in East Asia, approximately **one third** of all lung cancer patients are never smokers (39.7% in China, 38% in South Korea, and 32.8% in Japan)"*

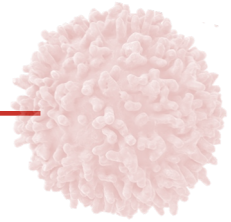
(Zhou & Zhou, 2018)

LP-184 has Potent Efficacy Across Multiple Solid Tumors and CNS Cancers

Across all programs LP-184 has the potential to be valued at over $6 billion

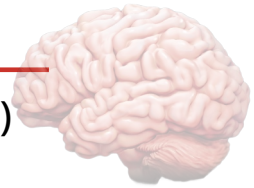


Solid Tumors



- Pancreatic Cancer
- Bladder Cancer
- Breast Cancer
- Lung Cancer

CNS Cancers



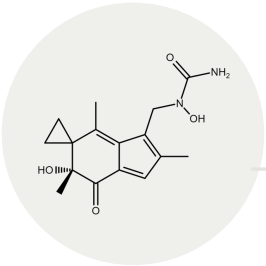
- Glioblastoma (GBM)
- Brain Metastases
- Atypical Teratoid Rhabdoid Tumor (ATRT)
- Pediatric Cancers
- Other High-Grade Glioma (HGG)

Program Highlights

- **Unique Mechanism of Action:**
  - Synthetic lethality
    - Overexpression of PTGR1
    - Deficiencies in **D**NA **D**amage **R**epair (DDR) pathway
- **Nanomolar Potency:**
  - Low nanomolar anti-cancer potency, healthy cells largely unaffected at these concentrations
- **Strong Growing IP Estate:**
  - 10+ issued or pending patents & patent applications
  - Extensive portfolio filings in major global markets
  - Includes applications expiring in 2041 or later, if granted
- **Several FDA Designations / Grants**
  - **Orphan Drug Designations**
    - GBM, Pancreatic Cancer, and ATRT
  - **Rare Pediatric Disease Designation**
    - ATRT
  - **Increase Commercial Protection and Value**

First-in-human Phase 1 Clinical Trials are Anticipated in Early 2023 for LP-184

World-class collaborators have accelerated the path towards first-in-human clinical trials



LP-184 Phase 1 Trials in 2023*

**Anticipated Timeline*

	Q4 2022	Q1 2023	Q2 2023
Solid Tumors	Complete IND enabling studies and file IND		Phase 1 Trial
CNS Cancers	Complete IND enabling studies and file IND		Phase 1 trial

World-class collaborators

Johns Hopkins Medicine — CNS Cancers

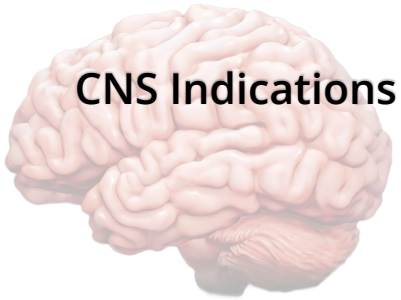
Fox Chase Cancer Center, Temple Health — Solid Tumors

UT Health San Antonio, Greehey Children's Cancer Research Institute — Pediatric Cancers

Danish Cancer Society — Solid Tumors

Lantern's CNS Programs have Multi-Billion Dollar Stand-Alone Potential

LP-184 has hallmark molecular characteristics for development in CNS cancers



CNS Indications and programs

Indication	Program	R&D	Preclinical	Phase I
Glioblastoma	**LP-184**			
Brain Mets. (Lung)	**LP-184**			
Brain Mets. (Breast)	**LP-184**			
ATRT	**LP-184**			
Other HGGs	**LP-184**			

1. Blood Brain Barrier Permeable
   Comparable to approved SOC agents
2. Higher Availability in Brain Tumor vs. Surrounding Brain Tissues (2:1)
3. Synergistic Approved Drugs Identified
   Spironolactone + LP-184 Significantly Enhances Anti-Tumor Activity
4. No drug therapies have been approved for GBM over the last 17 years

Total Market Potential* in CNS Cancers

$5+ Billion

Glioblastoma

$1.5-2 Billion

Annual US Cases 13K

Brain Mets. (Lung, Breast)

$3 Billion

Annual US Cases 100K

ATRT & Pediatric CNS

$0.1 Billion

ATRT Annual US Cases 600+

Other HGGs

$1.2 Billion

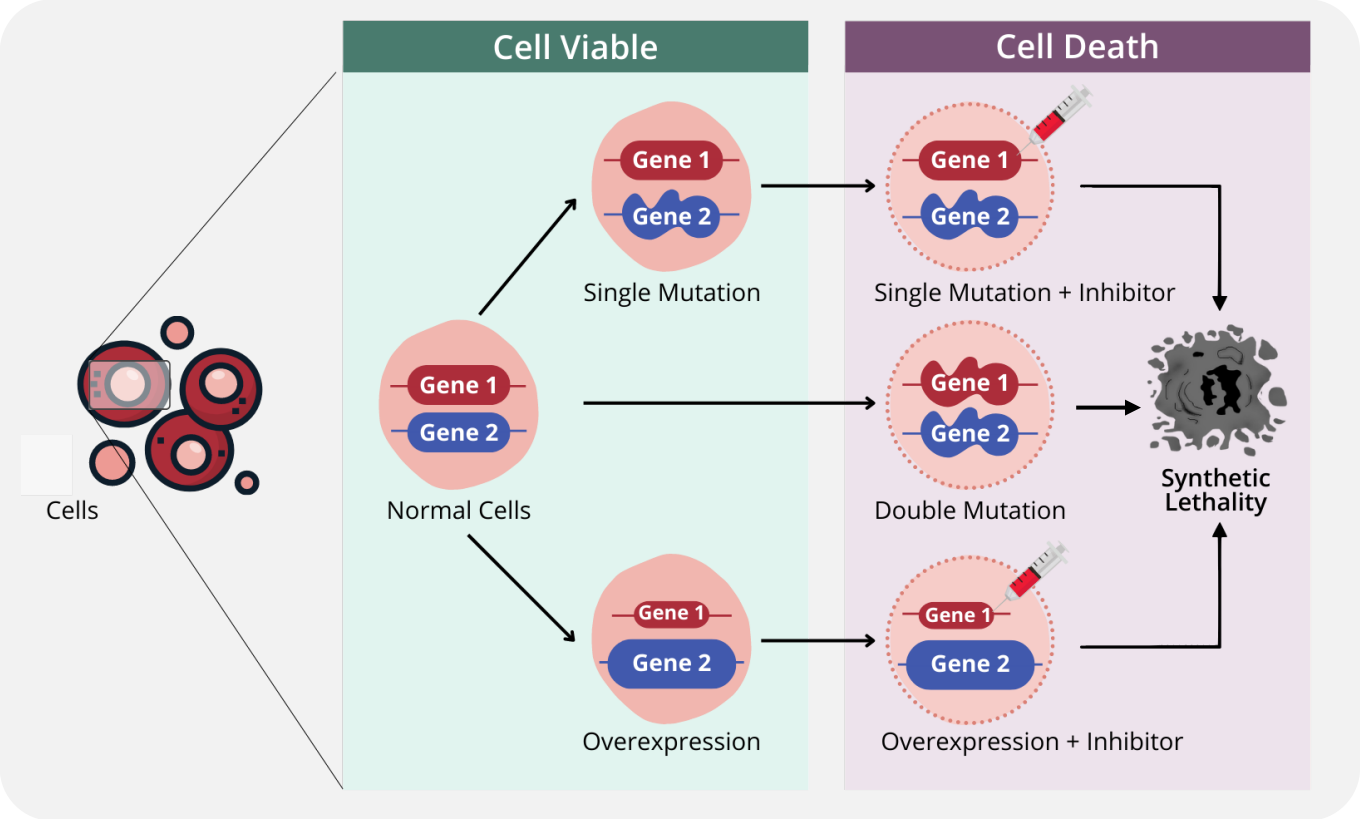
Annual US Cases 22K

**Estimated market potential*

LP-184 has a Unique Mechanism of Action Leveraging Synthetic Lethality

Genetic factors contributing to LP-184's Synthetic Lethality

Synthetic Lethality for LP-184



- PTGR1 activates LP-184 into its highly potent and cytotoxic form
- Cancers with deficiencies in DNA damage repair (DDR) pathways have increased sensitivity to LP-184

KOL Webinar on Synthetic Lethality

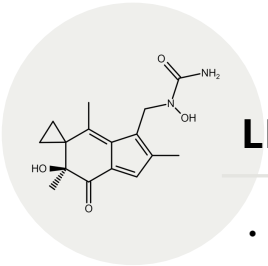
Dr. Zoltan Szallasi, M.D.

Principal investigator at Danish Cancer Society Research Center
Assistant Professor of Pediatrics at Boston Children's Hospital affiliated with Harvard Medical School.

Danish Cancer Society

Boston Children's Hospital
Until every child is well™

LP-284 was Developed from RADR® Insights to Late-Stage IND Enabling Studies in Less Than 2 Years for Non-Hodgkin's Lymphomas



LP-284 for non-Hodgkin's B-cell lymphomas

- Mantle Cell Lymphoma
- Double Hit Lymphoma

Current Market Size of Mantle Cell & Double Hit Lymphomas

$1.0 Billion Annual US Cases 5K

Program Highlights

- LP-284 has nanomolar potency against several aggressive Non-Hodgkin's Lymphomas (NHL) including Mantle Cell and Double Hit
- In-vivo LP-284 can rescue tumors resistant to SOC agents Ibrutinib and Bortezomib
- Enhanced potency when used in combination with other approved agents like Spironolactone

Phase 1 Trial Launch in 2023*

Q4 2022	Q1 2023	Q2/Q3 2023
Complete IND enabling studies and file IND		Phase 1 Trial

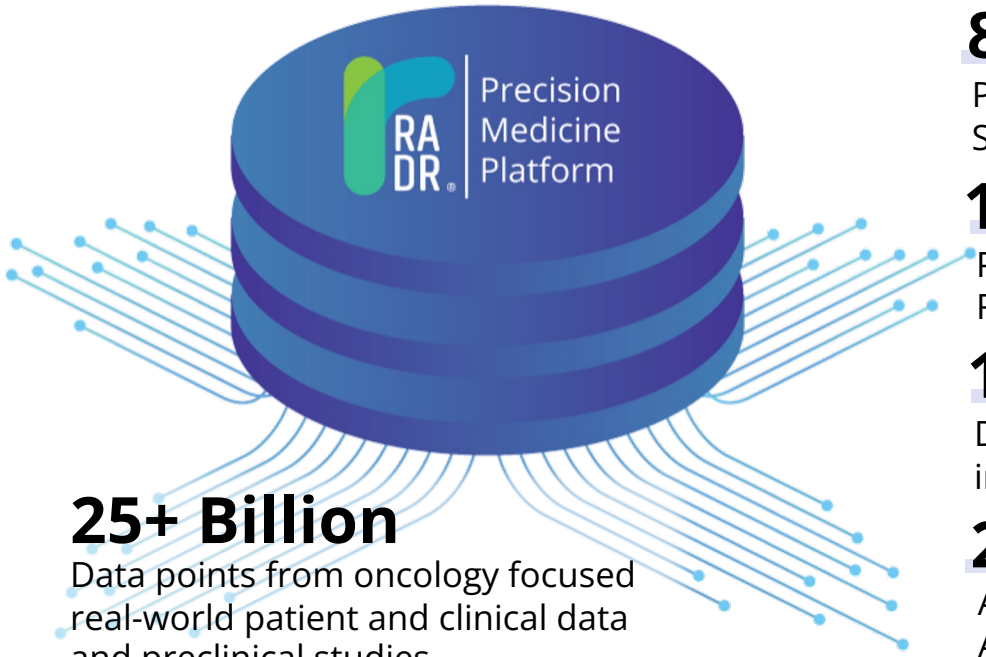
Anticipated Timeline

RADR® is Lantern's A.I. and M.L. Platform that Powers Oncology Drug Discovery and Development

RADR® Precision Medicine Platform

Response **A**lgorithm for **D**rug Positioning & **R**escue

A proprietary integrated data analytics, experimental biology, oncology-focused, machine-learning-based platform focused on drug development



25+ Billion
Data points from oncology focused real-world patient and clinical data and preclinical studies

80%+
Prediction Success

130K+
Patient Records

154+
Drug-tumor interactions

200+
Advanced ML Algorithms

- **Leverages** cutting edge machine-learning approaches and techniques to generate powerful data-driven insights
- **Enables** rapid informatics based hypothesis generation which can be validated in wet-lab
- **Uses** biology driven machine-learning algorithms to achieve higher prediction accuracy in real world settings
- **Employs** a platform that is scalable, robust, expanding and replicable to support a range of drug development needs

Lantern's Collaborators are Leveraging RADR® to Accelerate Their Drug Development

Actuate Therapeutics is actively applying RADR® insights for Phase 2 development of its drug candidate elraglusib

ACTUATE THERAPEUTICS

Actuate Therapeutics, Inc. is a private clinical stage biopharmaceutical company focused on the development of compounds for use in the treatment of cancer, and inflammatory diseases leading to fibrosis.

Key RADR® A.I. insights for elraglusib (9-ING-41)*

- Developed a model of patient sensitivity to identify potential responders and non-responders
- Discovered actionable genetic biomarkers
- Insights and biomarkers are informing design of an upcoming Phase 2 clinical trial

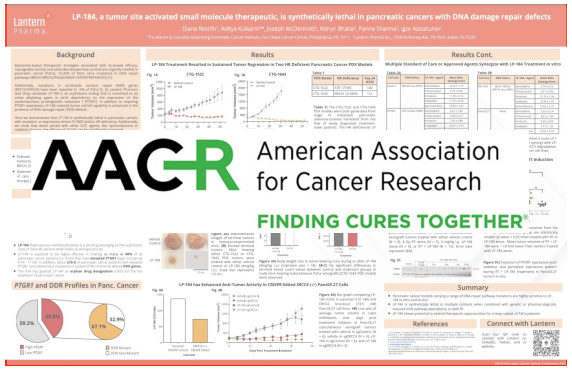
Future directions of collaboration

- Highlights from the ongoing success of this collaboration are planned to be shared in an upcoming webinar
- Development and application of novel RADR® algorithms and computational methods
- Incorporation of new elraglusib patient data including: RNA, ctDNA, and protein biomarkers
- Lantern received equity in Actuate as part of the collaboration

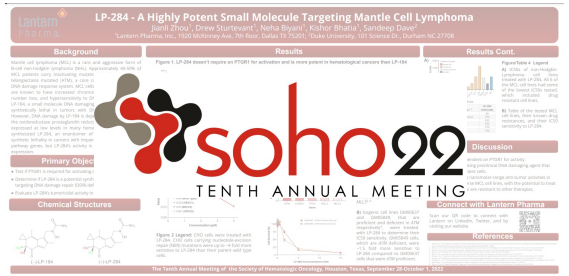
elraglusib is a widely researched GSK-3β inhibitor. Currently, elraglusib is in multiple active Phase I/II clinical trials as a monotherapy and in combination with other agents (NCT03678883)

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

Recent Posters/ Publications



LP-184, a tumor site activated small molecule therapeutic, is synthetically lethal in pancreatic cancers with DNA damage repair defects



LP-284 - A Highly Potent Small Molecule Targeting Mantle Cell Lymphoma

Artificial intelligence platform, RADR®, aids in the discovery of DNA damaging agent for the ultra-rare cancer Atypical Teratoid Rhabdoid Tumors

Upcoming Scientific Conferences

SNO Society for NeuroOncology

Society of Neuro Oncology Annual Meeting
Tampa, FL
Nov. 16-20, 2022

SAN ANTONIO BREAST CANCER SYMPOSIUM

San Antonio Breast Cancer Symposium
San Antonio, TX
Dec. 6-10, 2022

American Society of Hematology

American Society of Hematology Annual Meeting
New Orleans, LA
Dec. 10-13, 2022

> *RADR® insights continue to power growth across Lantern's entire pipeline of drug programs*

Financial Updates Q3 2022

Solid financial position and capital efficiency fuel continued growth and give Lantern cash runway into 2025

Summary Results of Operations

	Three Months Ended September 30, (unaudited) 2022	2021
Operating expenses:		
General and administrative	$ 1,442,961	$ 1,184,486
Research and development	702,296	2,964,391
Total operating expenses	2,145,257	4,148,877
Loss from operations	**(2,145,257)**	**(4,148,877)**
Interest + Other income, net	(119,424)	94,898
NET LOSS	**$ (2,264,681)**	**$ (4,053,979)**
Net loss per common share, basic and diluted	$ (0.21)	$ (0.36)
Weighted Avg. Common Shares Outstanding - Basic and Diluted	10,838,888	11,186,259

Balance Sheet Highlights & Summary

	(unaudited) 9/30/2022	12/31/2021
Cash, Cash Equivalents & Marketable Securities	**$ 57,826,612**	**$ 70,725,447**
Prepaid Expenses & Other Current Assets	$ 3,651,968	$ 1,990,953
Total Assets	**$ 62,164,380**	**$ 73,950,477**
Total Liabilities	**$ 3,138,995**	**$ 2,379,057**
Total Stockholders' Equity	**$ 59,025,385**	**$ 71,571,420**

> *We believe our **solid financial position** will fuel continued growth and evolution of our RADR® A.I. 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.***

2022-23 Objectives

A **Transformational** year for Lantern

- Advance enrollment of **The Harmonic™ Trial** & increase patient/clinician awareness
- Finalize IND-Enabling studies & clinical trial design for LP-184
- Design Ph. 2 clinical trial for LP-184 in GBM
- Progress LP-184 towards Ph. 1 / 2 pediatric clinical trial, including ATRT
- Finalize additional LP-284 studies to support Ph.1 launch in early 2023
- Advance ADC preclinical studies to support future Phase 1 launch
- Explore potential combinations for LP-100, LP-184, LP-284 & LP-300 with other existing approved drugs
- Grow RADR® A.I. platform to 25 billion datapoints
- Launch a new clinical indication with existing drug candidates
- Explore licensing and partnership opportunities
- Assess future LP-100 clinical development path, including improvements to focus on LP-100 in conjunction with PARPi

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