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# First Quarter 2023 Operating & Financial Results Conference Call / Webinar

May 9<sup>th</sup>, 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 and ADC 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 and ADC candidates and to maximize their commercial potential by advancing such 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® AI 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, 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](http://www.lanternpharma.com) or on the SEC’s website at [www.sec.gov](http://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.

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- 04 Scientific Highlights
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## Speakers

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**Panna Sharma**

Chief Executive Officer,  
President and Director



**David Margrave**

Chief Financial Officer

## Host

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**Nicole Leber**

Investor Relations

# Using AI, Lantern is Transforming Drug Discovery Timelines and Cost

Lantern has launched **9 programs** in two years, and is anticipating launching Multiple Phase 1 trials in 2023

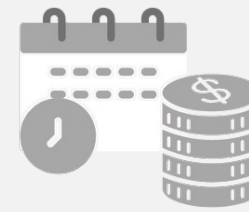
## Lantern's Drug Development Model



Large Scale/Multi-omics  
Oncology Data



Proprietary AI  
platform RADR®



Accelerated timeline  
and reduced cost

### Transforming Early-Stage Discovery & Development

Traditional Model



3 - 5 + Years



\$10 - 50 + Million

Reduces  
**Significant**  
Time & Cost

Lantern's Model

2 Years

\$1-5 Million

*"In around **two years**, Lantern has progressed its GBM program from initial RADR® insights, to wet lab validation, to late stage IND enabling studies - significantly cutting typical drug development timelines and cost"*

*(Biopharmatrend, 2022)*

### Sharpening Later-Stage Clinical Trials

Traditional Model



6 - 12 + Years



\$100 - 500 + Million

Reduces  
**Significant**  
Time & Cost

Lantern's Model

3-5 Years

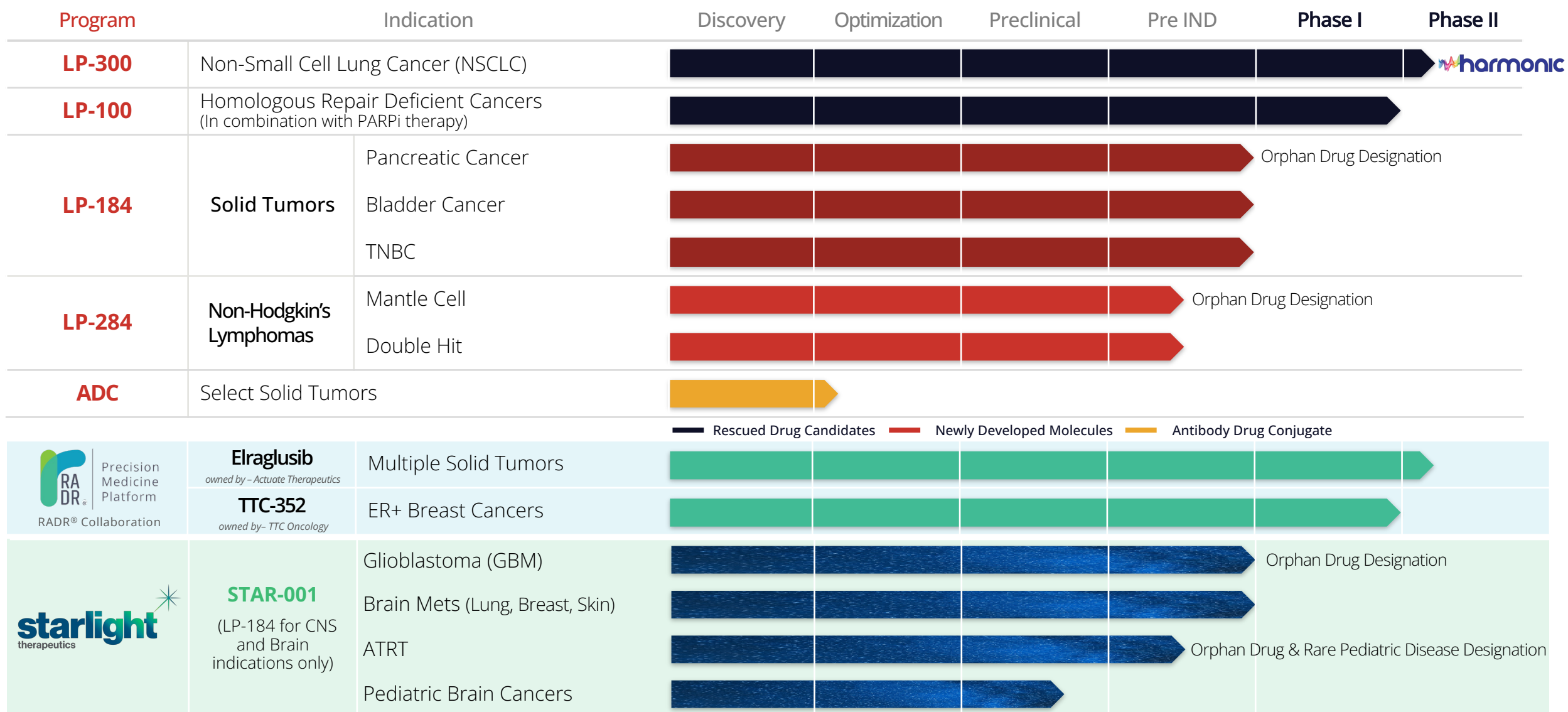
\$25-100 Million

*"AI-driven patient stratification helps to focus clinical trials with potentially fewer and more select patients, which are more likely to respond, ultimately saving time and money"*

*(Panna Sharma)*

# Lantern's Diverse & Unique AI Driven Pipeline of Drug Programs

Lantern has 14 disclosed and collaborative drug programs including the Phase 2 Harmonic™ trial

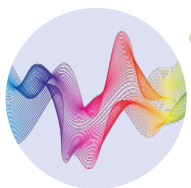


# First Quarter 2023 Highlights



## RADR® AI Platform Updates

- Developed industry-leading AI algorithms to predict any compound's BBB permeability
- Breakthrough AI algorithms developed with Actuate Therapeutics to accurately predict patient response
- RADR® continues rapid data growth & advances in functionality; expect to reach 50 bn data points in 2023
- Advancing AI-powered antibody-drug conjugate (ADC) product development roadmap



## LP-300 and Harmonic™ Trial

- First patient dosed in March 2023
- Five clinical trial sites activated across twelve locations (NY, CA, IL, OH, TX) and multiple additional sites anticipated
- Actively screening patients for potential trial enrollment
- Launched first-of-their-kind iPhone apps for patients, physicians, and caregivers
- Engaging advocacy groups for increased patient awareness



## LP-184 for Solid Tumors

- Filing of the IND application anticipated in early May
- Phase 1 clinical trial anticipated in mid-2023
- Presented poster at AACR annual meeting on the synthetic lethality of LP-184 across multiple cancers
- Exploring combination regimens with other FDA approved agents



## LP-284 for Non-Hodgkin's Lymphomas

- Completion of IND enabling studies anticipated mid-2023
- Submission of the IND application and launch of Phase 1 clinical trial targeted for second half of 2023
- Granted composition of matter patent allowance by USPTO



## Financial Updates

- \$51.5 million of cash, cash equivalents, and marketable securities as of March 31, 2023
- Lantern has operating capital into 2025



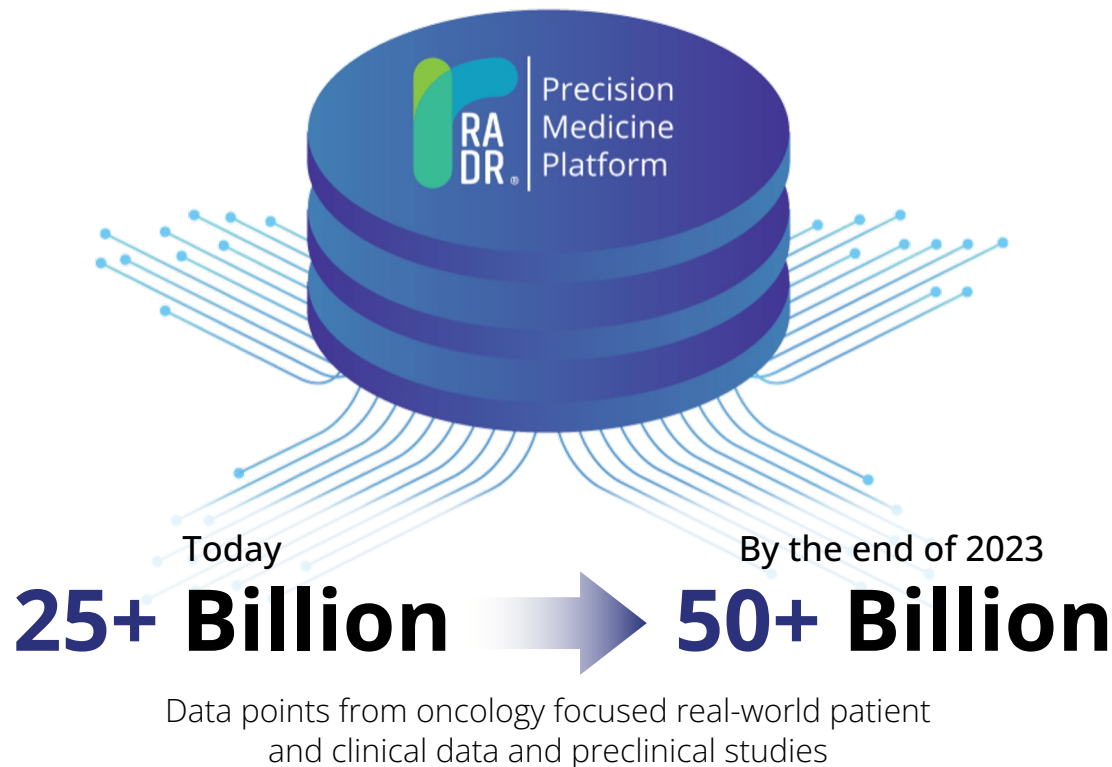
# RADR<sup>®</sup> is Lantern's AI and Machine-Learning Platform that Powers Oncology Drug Discovery and Development



Precision  
Medicine  
Platform

## Response Algorithm for Drug Positioning & Rescue

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



**80%+**

Prediction  
Success

**130K+**

Patient  
Records

**154+**

Drug-tumor  
interactions

**200+**

Advanced ML  
Algorithms

## RADR<sup>®</sup>'s Multi-Faceted AI Modules

Discover Mechanism of Action of Any  
Compound or Drug

Identify and Prioritize a Compound's Disease  
Indications or Subtypes

Determine Optimal Drug Combinations to  
Improve Therapeutic Potential

Generate Machine Learning-Driven Biomarker  
Signatures for Clinical Trial Patient Selection

Characterize Specialized Attributes of a  
Molecule - Including Predicting Blood Brain  
Barrier Permeability

# RADR<sup>®</sup> Solves one of the Most Challenging Problems in Brain Cancer Drug Discovery – Predicting any Compound’s Blood Brain Barrier Permeability

## What is the Blood-Brain-Barrier (BBB)?

**Blood-brain-barrier (BBB)** is a highly selective border that can prevent drugs from entering brain tissues. The BBB prevents an estimated **98%** of drugs from entering the brain, which presents **a major hurdle** for developing drugs to treat brain and central nervous system (CNS) cancers.

Lantern Developed Industry Leading and Top Ranked AI Algorithms to Predict BBB Permeability of Any Compound

**TOP 4**

Best performing BBB prediction algorithms by The Therapeutic Commons (TDC)

**89-92%**

Highly accurate BBB permeability predictions

**Ultra Fast**

Prediction generation time in ~1 minute

**Scalable**

Capable of rapidly screening thousands of compounds simultaneously



**BBB drug prediction challenge conducted by [Therapeutics Data Commons \(TDC\)](#),**

### Leaderboard

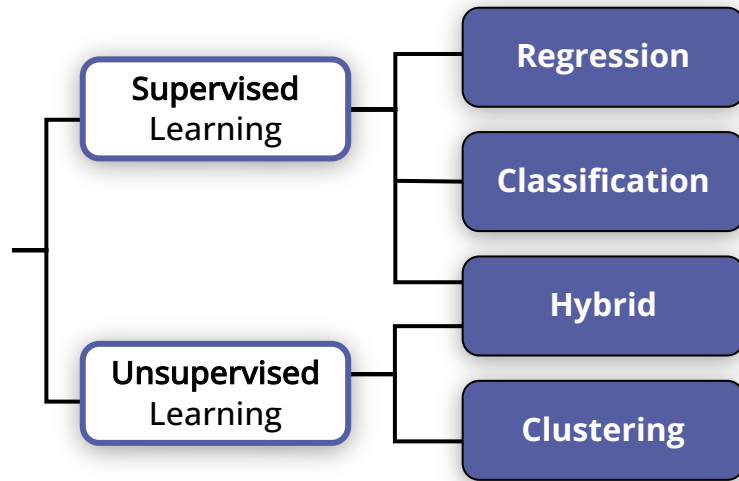
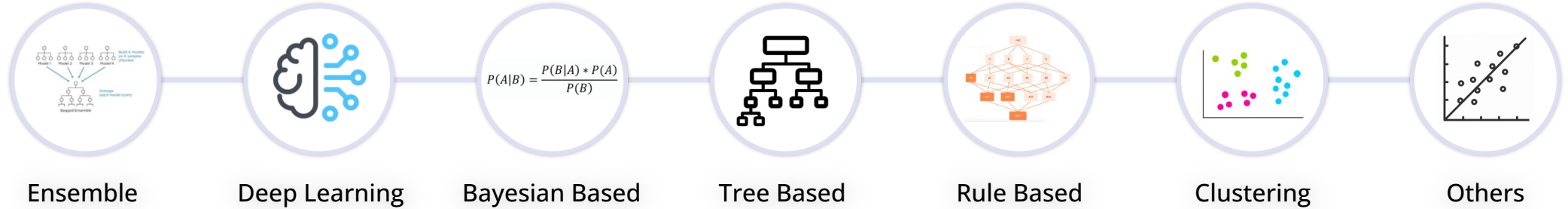
Rank	Model	Contact	Link	#Params	AUROC ↑
1	Lantern RADR Ensemble	<a href="#">Rick Fontenot</a>	<a href="#">GitHub, Paper</a>	267,439	0.962 ± 0.003
2	Lantern RADR Logistic Regression	<a href="#">Rick Fontenot</a>	<a href="#">GitHub, Paper</a>	456	0.956 ± 0.006
3	Lantern RADR Deep Neural Network	<a href="#">Rick Fontenot</a>	<a href="#">GitHub, Paper</a>	266,881	0.949 ± 0.004
4	Lantern RADR Random Forest	<a href="#">Rick Fontenot</a>	<a href="#">GitHub, Paper</a>	319	0.928 ± 0.002
5	ZairaChem	<a href="#">Gemma Turon</a>	<a href="#">GitHub, Paper</a>	N/A	0.910 ± 0.024

Lantern’s AI BBB permeability prediction algorithms were evaluated and scored in the [BBB drug prediction challenge](#) conducted by [Therapeutics Data Commons \(TDC\)](#), a coordinated initiative to evaluate AI capabilities across therapeutic modalities and stages of discovery.



# RADR<sup>®</sup>'s Library of Over 200+ Advanced Algorithms Powers its Drug Development Capabilities

## Example RADR<sup>®</sup> Algorithms



### Examples

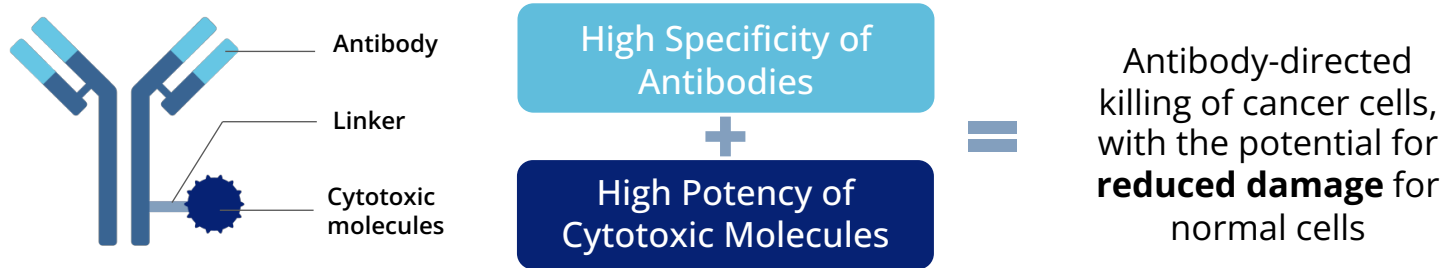
- Predicting drug sensitivity values, e.g. IC50
- Predicting blood brain barrier (BBB) permeability of a compound
- Predicting synergy values by combining compounds
- Identifying patient populations that can be targeted through a MoA
- Stratifying patients as responder, partial-responder, or non-responder
- Biomarker pattern-based patient clustering
- Predicting outcomes for companion diagnostic usage in a clinical trial

- Diversity of algorithms allow us to handle various input data types and solve different biological problems
- Lantern has filed patents for ensemble algorithms in cancer drug development

# ADCs are one of the Fastest Growing Drug Segments and can be Developed Faster and More Effectively with AI

## What are Antibody Drug Conjugates (ADCs)?

Antibody drug conjugates (ADCs) are highly specific cancer-targeted antibodies linked to potent anti-tumor small molecules and designed for the treatment of cancer



Rapidly growing global ADC market

currently  
valued at

**\$4+ billion**

projected  
value by 2027

**\$14+ billion**

RADR® has the potential to assist in advancing ADC drug candidates from the discovery phase to first-in-human clinical trials in approximately **2 years or less** by ...



Precision  
Medicine  
Platform

1. **Significantly enhancing the selection of optimal combination ADC components including:**  
Targeted antibodies, Antibody linkers, and Cytotoxic payloads
2. **Predicting ADC antibody targeting, or immunogenicity**
3. **Determining ADC biomarker signatures to predict patient selection**

# The Harmonic™ Trial for Never Smoker Patients with NSCLC



Phase 2



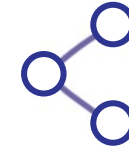
Non-Small Cell Lung Cancer



Never Smokers

90

Patients



Two arm, Open-label, Randomized Trial



Multi-Site

## Major Updates

- **First patient dosed in March 2023**
- Activated 5 sites across 12 different locations in the US:
  - Gabrail Cancer Center
  - Northwest Oncology
  - New York Cancer and Blood Specialists
  - Texas Oncology
  - Cancer and Blood Specialty Clinic



- Multiple additional patients + sites anticipated to be enrolled in Q2

## Additional Value Drivers

### ① Harmonic™ iPhone App

First of their kind **iPhone apps launched** for the Harmonic™ clinical trial

- The new Harmonic™ trial apps provide physicians, patients, caregivers, and the cancer community with mobile access to up-to date information

### ② Liquid Biopsies

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



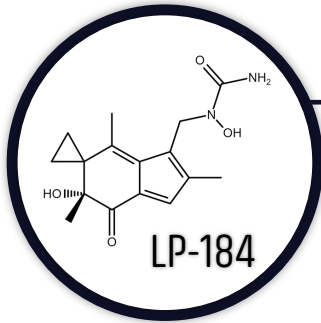
Liquid biopsies taken at 4 time points



Potential Future Clinical Trial Design & Companion Dx



# LP-184 has Blockbuster Potential Across Multiple Cancers as a Single Agent or in Combination Therapy



## Solid Tumors

DDR Deficient Tumors Including:

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

**\$6-7 billion**

Global annual market potential

## Phase 1 trial in 2023\*

Q2 2023	2023
IND application to be filed with the FDA	Phase 1 Trial Launch

*\*Anticipated Timeline*

## World-class collaborators



## Program Highlights

### 1. Unique Mechanism of Action:

- Synthetic lethality
  - Overexpression of PTGR1
  - Deficiencies in **DNA Damage Repair (DDR)** pathway

### 2. Nanomolar Potency:

- Low nanomolar anti-cancer potency, healthy cells largely unaffected at these concentrations

### 3. 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

### 4. FDA Orphan Drug Designation

- Pancreatic cancer
- **Increases commercial protection and value**

### 5. Actively Exploring Combination Therapies:

- FDA Approved Agents – Spironolactone, Olaparib
- Other modalities - Radiation Therapy

# LP-184 Clinical Trial Updates and Design of Phase 1A Trial

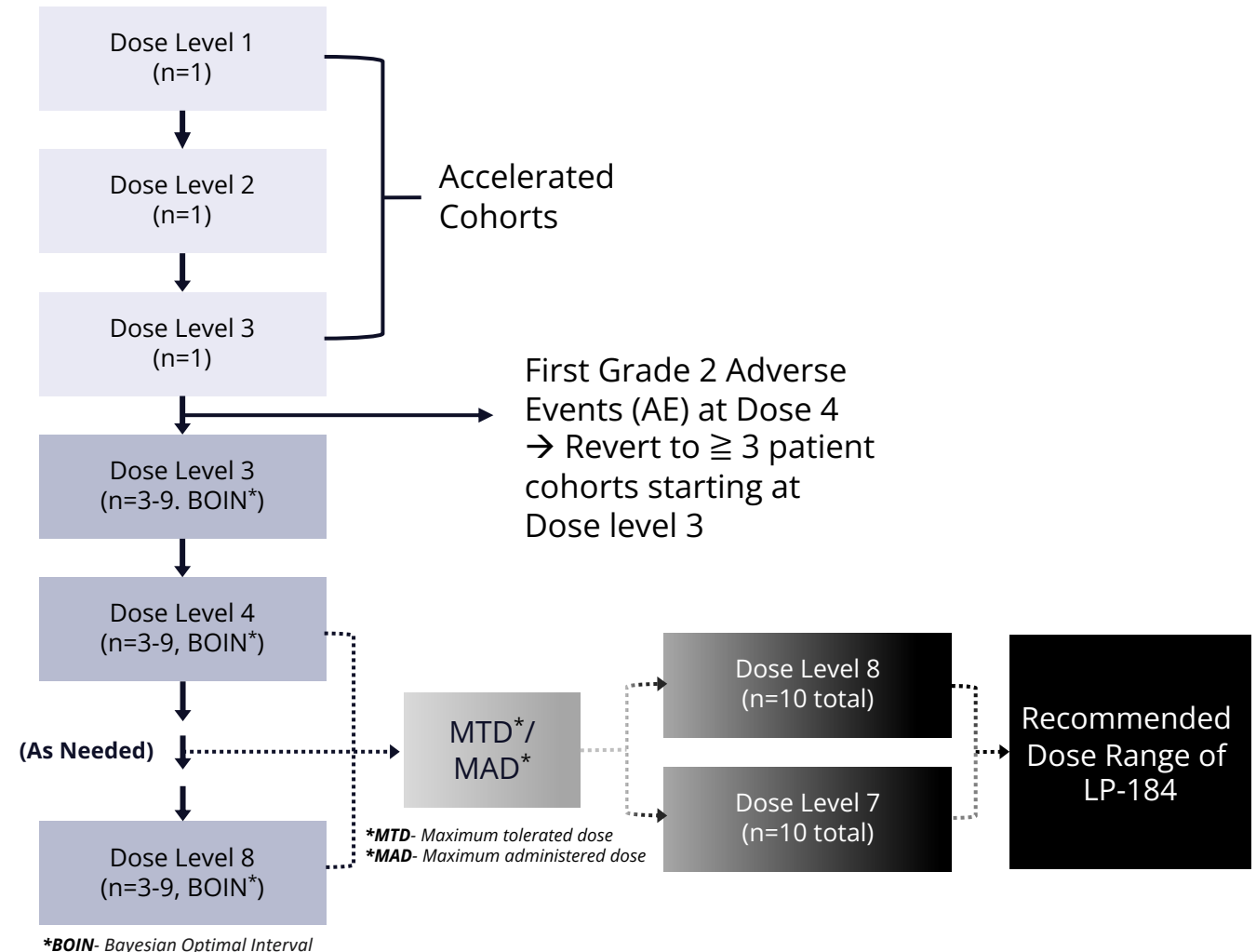
## LP-184 Phase 1A Clinical Trial Updates & Design

### Anticipated Phase 1A Clinical Trial Dates

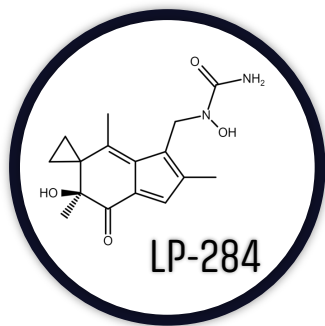
- IND application submission – Mid-May 2023
- Study-start up – Q2 2023
- 1<sup>st</sup> patient dosed – Summer 2023

### Clinical Trial Design

- Bayesian optimal interval (**BOIN**) design
- Anticipated starting dose of 0.015 mg/kg, based off IND enabling studies in dogs.
- Targeting up to 30-35 patients
- Future clinical trial sites anticipated at top comprehensive centers in the US:
  - Fox Chase Cancer Center
  - Johns Hopkins
  - Multiple additional sites



# 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

**\$1.2 billion**

U.S. & Europe  
annual market potential

### 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 MCL standard-of-care agents Ibrutinib and Bortezomib
- Enhanced potency when used in combination with other approved agents like Spironolactone
- FDA granted Orphan Drug Designation for mantle cell lymphoma
- Results from preclinical studies have been published at ASH 2021, ASH 2022, and SOHO 2022
- Received notice of allowance from the USPTO for the composition of matter patent, no. 17/192,838, covering the molecule LP-284

### Phase 1 Trial Launch in 2023\*

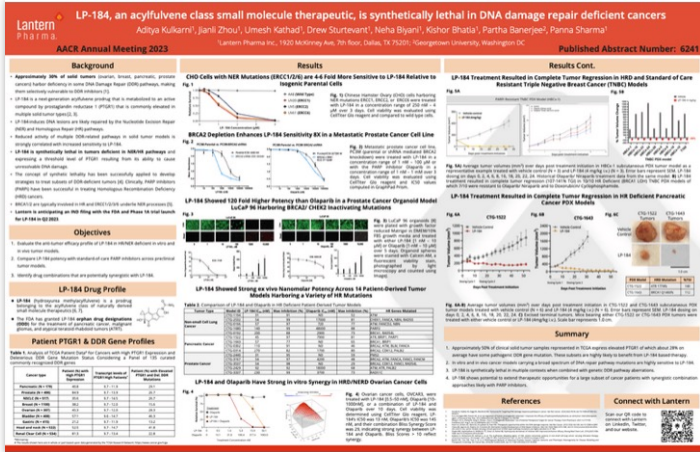
Q2 2023	Q3 2023	2023
Complete IND enabling studies and file IND application with the FDA		Phase 1 Trial Launch

*\*Anticipated Timeline*



# Presented Multiple Posters at the AACR Annual Meeting 2023

Posters highlighted RADR® advancements for patient response prediction and LP-184's synthetic lethality MoA

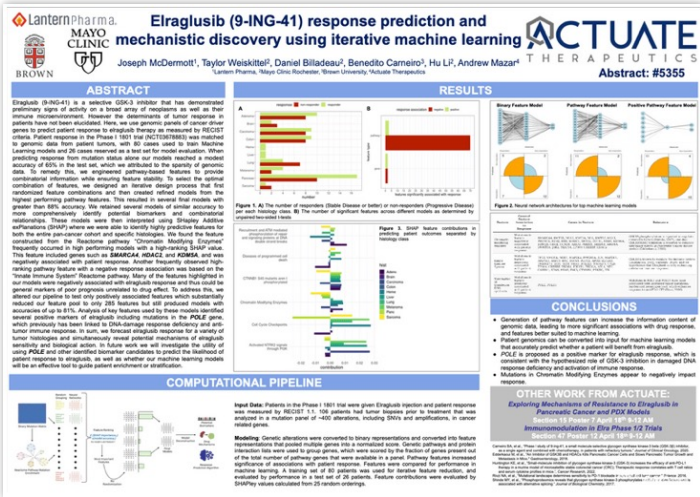


## AACR American Association for Cancer Research

### LP-184, an acylfulvene class small molecule therapeutic, is synthetically lethal in DNA damage repair deficient cancers

Aditya Kulkarni, Jianli Zhou, Umesh Kathad, Drew Sturtevant, Neha Biyani, Kishor Bhatia, Partha Banerjee, Panna Sharma

Click the image to view the full poster



## AACR American Association for Cancer Research

### Elraglusib (9-ING-41) response prediction and mechanistic discovery using iterative machine learning

Joseph McDermott, Taylor Weiskittel, Daniel Billadeau, Benedito Carneiro, Hu Li, Andrew Mazar

Click the image to view the full poster

# Financial Updates Q1 2023

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

## Summary Results of Operations

	Three Months Ended March 31, (unaudited)	
	2023	2022
<b>Operating expenses:</b>		
General and administrative	\$ 1,733,321	\$ 1,406,160
Research and development	2,552,947	2,660,237
Total operating expenses	4,286,268	4,066,397
<b>Loss from operations</b>	<b>(4,286,268)</b>	<b>(4,066,397)</b>
Interest + Other income, net	418,503	(55,377)
<b>NET LOSS</b>	<b>\$ (3,867,765)</b>	<b>\$ (4,121,774)</b>
Net loss per common share, basic and diluted	\$ (0.36)	\$ (0.38)
Weighted Avg. Common Shares Outstanding - Basic and Diluted	10,857,040	10,875,777

## Balance Sheet Highlights & Summary

	03/31/2023 (unaudited)	12/31/2022
<b>Cash, Cash Equivalents &amp; Marketable Securities</b>	<b>\$51,540,051</b>	<b>\$55,196,085</b>
Prepaid Expenses & Other Current Assets	\$3,086,331	\$2,985,472
<b>Total Assets</b>	<b>\$55,509,317</b>	<b>\$58,836,321</b>
<b>Total Liabilities</b>	<b>\$2,933,819</b>	<b>\$2,798,297</b>
<b>Total Stockholders' Equity</b>	<b>\$52,575,498</b>	<b>\$56,038,024</b>

“

*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.*

”

# 2023 Objectives

## A Transformational year for Lantern

- Advance enrollment of **The Harmonic™ Trial** & increase patient/clinician awareness
- Launch clinical trials for LP-184 and LP-284
- Progress LP-184 (STAR-001) towards Ph. 1 / 2 pediatric clinical trial, including ATRT
- Advance ADC preclinical development to support future Phase 1 launch and/or partnership
- Explore combinations for LP-100, LP-184, LP-284, and LP-300 with other existing approved drugs
- Expand RADR® AI platform to 50 billion datapoints
- Establish additional RADR® based collaborations with companies and research partners
- Explore licensing and partnership opportunities with biopharma companies
- Continue disciplined fiscal management





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