Corporate Overview

October 6th, 2023
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.
Lantern’s AI platform, RADR®, is transforming the cost, pace, and timeline of cancer drug discovery and development.

| **13** | Lead drug programs* powered by AI |
| **5**  | Clinical stage lead drug candidates* |
| **95+**| Issued patents & pending applications |
| **$48.0M** | Cash/cash eq./marketable securities |
| **2.5 years** | Avg. time for new LTRN programs to Ph. 1 Trial |
| **$1.5M** | Avg. cost for new LTRN programs to Ph. 1 Trial |

* Includes drug programs being developed in collaboration
** at 6/30/2023
Only **6%** of clinical trials using traditional drug discovery approaches succeed

*Clinical Development Success Rates and Contributing Factors 2011–2020, BIO Stats

---

Current Challenges

- **Costly**: Average cost to bring a new cancer drug to market is **$2.8 billion**
- **Risky**: Out of 20,000 trials from 2012-2022, **19,200 trials failed**
- **Slow**: Early-Stage development takes **3-5+ Years**, late-stage development takes **6-12+ Years**

Current oncology drug development is being improved by **data-driven**, and **AI-enabled approaches** and technology.
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 AI-Driven Business Model has Multiple Routes Towards Success

### Areas of Focus

**1. Rescue & Reposition**
- Drug Candidates
  - Based on previous clinical data and observations, **LP-300 was rescued for never smokers with NSCLC** and is in a [Phase 2 trial](#).

**2. Discover & Develop**
- New Molecules Including ADCs
  - **LP-284’s unique mechanism of action** was predicted by RADR® and was [developed to Phase 1 trial](#) in 2 years.

**3. Accelerate & De-risk**
- Trials with Biopharma Partners
  - Predicting patient response with greater than **88% accuracy**, Lantern is accelerating the development of [Elraglusib](#).

### Successes to Date

### Targeted Clinical Trials

- **By Lantern and/or other biopharma partners**

### High-value Partnering & Licensing Opportunities

- **With biopharma and tech companies**
Response Algorithm for Drug Positioning & Rescue

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

AI-Powered RADR® Modules for Oncology Drug Discovery and Development

- **Discover mechanism of action of any compound or drug**
- **Identify/prioritize a compound's disease indications or subtypes**
- **Determine optimal drug combos to improve therapeutic potential**
- **Generate ML-driven biomarker signatures for patient selection**
- **Characterize specialized attributes of a molecule such as BBB permeability**
- **Enhance the selection of optimal combination of ADC components**
- **Discover drug combos for checkpoint inhibitors to improve therapeutic index**

**Today**

- 34+ Billion
  - Prediction Success
  - 80%+
  - Patient Records
  - 130K+
  - Advanced ML Algorithms
  - 200+
  - Data Sets

**By the end of 2023**

- 50+ Billion

Data points from oncology focused real-world patient and clinical data and preclinical studies.
Lantern Pharma is a Top 10 End-to-End AI Drug Discovery Company

According to Deep Pharma Intelligence (May 04, 2022)
RADR®’s AI Framework
RADR®’s AI framework develops actionable insights using billions of datapoints

Datatypes/Sources
- Clinical Trials
- In vitro/In vivo Studies
- Genetic Screens/Panels
- Chemical Structure
- Collaborator Studies
- Multi-Omics
- Drug Response
- Public/Private Repositories

200+ AI Algorithms
- Ensemble
- Deep Learning
- Bayesian Based
- Tree Based
- Rule Based
- Clustering
- Others

RADR AI insights

RADR® Modules (m)
- m1 MoA Discovery
- m2 Disease Indication Identification
- m3 Drug Combination Optimization
- m4 Biomarker Signature Generation
- m5 Molecule attribute Characterization
- m6 ADC Development
- m7 Immune Checkpoint Inhibitor Development
RADR® Case Study – Actuate Therapeutics

Advanced RADR® machine learning models predict clinical trial patient responses at 88% accuracy

Lantern is accelerating the development of Actuate Therapeutic’s drug candidate, Elraglusib* (9-ING-41), using AI insights produced by RADR®

- Predicted patient response with greater than 88% accuracy
- Identified metastatic melanoma patients resistant to PD-1 therapies may benefit from Elraglusib
- Insights and new data including RNA, ctDNA, and protein biomarkers are informing design of an upcoming Phase 2 clinical trial
- 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)

Model generation for patient response prediction

1801 Trial Patients → Iterative Neural Network Training → Final ML Model

Patient Selection and Prioritization

Data from New Clinical Contexts

Posters: AACR ASCO
**SCALE**

50 billion oncology-focused datapoints by end of 2023

**SCOPE**

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

**CAPABILITIES**

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

* Based on current operational and development plans

RADR® Road Map – Expansion of Size, Scope, and Capabilities

RADR® continues to push the boundary of AI for oncology drug discovery and development
Collaborations
Strategic collaborations that are providing unique real-world insights and accelerating timelines

World-Class Academic and Research Institutions

Biopharma Collaborations
Lantern’s Diverse & Unique AI Driven Pipeline of Drug Programs

Lantern has 13 disclosed and collaborative lead drug programs including the Phase 2 Harmonic™ trial

### Lantern Pharma (NASDAQ: LTRN)

<table>
<thead>
<tr>
<th>Lead Program</th>
<th>Indication</th>
<th>Discovery</th>
<th>Preclinical</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Orphan Designation</th>
<th>Rare Pediatric Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP-300</td>
<td>Non-Small Cell Lung Cancer for Never Smokers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP-184</td>
<td>Recurrent Advanced Solid Tumors (Pancreatic, TNBC, Bladder, Lung Cancers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP-284</td>
<td>Recurrent Non-Hodgkin’s Lymphomas (Mantle cell, Double-hit lymphomas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADC</td>
<td>Select Solid Tumors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Starlight Therapeutics (Wholly Owned Subsidiary)

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

### RADR® Collaborations

<table>
<thead>
<tr>
<th>Elraglusib owned by - Actuate Therapeutics</th>
<th>Multiple Solid Tumors</th>
<th>Collaboration partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTC-352 owned by - TTC Oncology</td>
<td>ER+ Breast Cancers</td>
<td>Collaboration partner</td>
</tr>
<tr>
<td>ADC</td>
<td>Cryptophycin Conjugate for Solid Tumors</td>
<td>Collaboration partner</td>
</tr>
</tbody>
</table>
**LP-300** for the Treatment of Non-Small Cell Lung Cancer (NSCLC) in Never Smokers

![Chemical Structure](image)

<table>
<thead>
<tr>
<th><strong>Lead Indication</strong></th>
<th>Relapsed NSCLC for Never Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Status</strong></td>
<td>Phase 2 (initial patients dosed)</td>
</tr>
<tr>
<td><strong>Market Potential</strong></td>
<td>$1.3 billion (USD)</td>
</tr>
<tr>
<td><strong>Indication Size</strong></td>
<td>20,000-40,000 Cases</td>
</tr>
<tr>
<td><strong>Target/ MOA</strong></td>
<td>Tyrosine Kinases &amp; Cell Redox Enzymes</td>
</tr>
<tr>
<td><strong>Molecule Type</strong></td>
<td>Disulfide Small Molecule</td>
</tr>
<tr>
<td><strong>Combination</strong></td>
<td>With carboplatin and pemetrexed</td>
</tr>
<tr>
<td><strong>IP Estate</strong></td>
<td>Claims extending to at least 2032</td>
</tr>
</tbody>
</table>

*Estimated Annual US
Disease Overview – NSCLC in Never Smokers – LP-300

NSCLC in never smokers is one of the largest unaddressed cancer populations

Global Annual Market Potential: $2.5+ Billion

Lung cancer is the #1 cause of death among cancer patients in the US.

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

1 in 6

20,000-40,000 never smokers will be diagnosed with NSCLC each year in the US.

Cancer.gov

NSCLC in Never Smokers is a Different Disease

Lung Cancer in never smokers has higher percentage of genetic mutations in Tyrosine Kinases (TK), a family of cancer-promoting genes, such as EGFR, ALK, ROS and MET.

Mutation Frequency by Smoker Status

<table>
<thead>
<tr>
<th>Driver Gene</th>
<th>% Prevalence (Global Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGFR</td>
<td>7.6</td>
</tr>
<tr>
<td>ALK</td>
<td>0.8</td>
</tr>
<tr>
<td>ROS1</td>
<td>0.8</td>
</tr>
<tr>
<td>RET</td>
<td>0.8</td>
</tr>
<tr>
<td>TP53</td>
<td>33</td>
</tr>
<tr>
<td>KRAS</td>
<td>33</td>
</tr>
<tr>
<td>STK11</td>
<td>12</td>
</tr>
</tbody>
</table>

Smokers

Never Smokers
Mechanism of Action – LP-300

LP-300’s multimodal MoA resensitizes NSCLC to chemo in the never smoker population

1. LP-300 Directly Engages with TKI Receptors via Cysteine Modification

A-B. LP-300 adduct at Cys1235 Cys1156

C. Molecular surface of ALK with the LP-300-derived adduct at Cys1156 (yellow highlight)

D. Binding site of the LP-300-derived adduct at Cys 1235 (yellow highlight)

2. LP-300 Modulates Cellular Redox in Key Signaling Pathways in NSCLC

- Restoring apoptosis sensitivity
- Oxidative stress modulation
- Anti-angiogenesis
- Reduced DNA synthesis and gene expression
- Reduce glutathione/thioredoxin mediated tumor resistance to therapy
- Nephrotoxicity protection against chemotherapy
LP-300 Nearly Doubled Survival Outcomes for Never Smoker Subgroups with NSCLC in Previous Clinical Trial*

**+ 125% increase** in median 2 year survival

- **Median 2 year survival (%):**
  - All Patients (n=288): 25% (control), 30% (LP-300 + Chemo)
  - Never Smokers (n=87): 32% (control), 72% (LP-300 + Chemo)

**+ 91% increase** in median overall survival

- **Median overall survival (Moths):**
  - All Patients (n=288): 11.7 (control), 15.4 (LP-300 + Chemo)
  - Never Smokers (n=87): 13.2 (control), 25.2 (LP-300 + Chemo)

*Overall study did not meet clinical efficacy endpoints

*Subpopulations receiving paclitaxel/cisplatin

Clinicaltrials.gov (NCT00966914)
Clinical Trial – The Harmonic™ Phase 2 Trial for LP-300
Accelerating recruitment efforts for a growing indication with limited treatment options

Trial Design
- **60** patients will receive LP-300 with pemetrexed and carboplatin*
- **30** patients will receive standard of care (pemetrexed and carboplatin) *after progressing from TKI

Primary Outcomes: Overall and progression free survival

<table>
<thead>
<tr>
<th>1st patient</th>
<th>Estimated Interim Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2023</td>
<td>Enrollment anticipated to last 15 - 20 months</td>
</tr>
</tbody>
</table>

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 second half of 2023
- Exploring clinical trial expansion to Asian countries with a higher incidence of NSCLC in never smokers
**LP-184 for the Treatment of Advanced Solid Tumors**

- **Lead Indications**: DDR deficient solid tumors including Pancreatic cancer, Bladder cancer, and TNBC
- **Clinical Status**: Phase 1A, First patient dosed
- **Market Potential**: $14+ Billion
- **Indication Size**: 170,000 + Cases, Estimated 400,000 + Cases Global
- **Target/ MOA**: Double-stranded DNA breaks; alkylates DNA in the 3’ of Adenine
- **Molecule Type**: Acylfulvene Class
- **Combination Potential**: Checkpoint inhibitors, PARP inhibitors, Spironolactone, Chemotherapy and Radiation Therapy
- **IP Estate**: 10+ patents/pending apps., Claims extending into 2041

*Estimated Annual USA*
Disease Overview – Advanced Solid Tumors with DDR Deficiencies

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

**Annual US Market Potential: $14+ Billion**

(DDR Deficient Solid Tumors)

1 in 4 people have solid tumors with DDR Deficiencies

![Icons of Pancreatic, Triple Negative Breast, Bladder, and Lung Cancers]

**Advanced Solid Tumors**

- Advanced solid tumor cancers, having spread beyond the primary site, are often more challenging to treat than earlier stage tumors due to their advanced progression.
- Current treatment options include: surgery, chemotherapy, radiation therapy, targeted therapy, and immunotherapy

**DNA Damage Response (DDR) Deficiency**

DDR is essential for maintaining genomic stability by repairing different types of DNA damage. Inhibition of DDR has been shown to increase the effectiveness of anticancer immunotherapies

**Cancer cells** with high underlying levels of DNA damage are **more dependent on DDR** for survival when compared to normal cells

**DDR Deficiencies** result in the accumulation of DNA damage, which produces an “Achilles Heel” for drugs leveraging synthetic lethality
Mechanism of Action – LP-184

LP-184 has a unique mechanism of action – leveraging synthetic lethality.
AI insights generated by RADR® – LP-184

LP-184’s MoA was predicted by RADR® and validated with *in vitro* and *in vivo* studies

**In silico**

Using RADR®, PTGR1 was Identified as a Biomarker that Predicts LP-184 Response

- **Prostaglandin Reductase 1 (PTGR1)** is an oxidoreductase enzyme that is frequently elevated in cancers
- PTGR1 activates LP-184 into its highly potent and cytotoxic form
- RADR® insights predicted that LP-184 activity positively correlates with PTGR1 transcript levels in the NCI60 cancer cell line panel

**In vitro**

Validated using CRISPR Experiments

- CRISPR-mediated depletion of PTGR1 expression in a pancreatic cancer cell line is sufficient to **fully diminish LP-184 activity**
- This **confirmed the RADR® insights** and that LP-184 was highly potent in cells with PTGR1
Clinical Trial – LP-184 Phase 1 Basket Trial

Launched Phase 1 basket trial for a blockbuster molecule with a market potential of $10+ billion in annual sales

First-In-Human Trial for LP-184

- June 2023: IND application cleared by FDA
- July 2023: Trial launch and initial sites activated
- Sep 2023: First patient dosed

Phase 1A Trial Design

- Dose Levels 1-4 (n ≥ 3, BOIN*)
- Dose Level 5 (n ≥ 3, BOIN)
- Dose Level 8 (n ≥ 3, BOIN)
- Dose Level 7 (n=10 total)
- Dose Level 8 (n=10 total)

MTD*/MAD*

*BOIN: Bayesian Optimal Interval

Recommended Dose Range of LP-184

Clinicaltrials.gov (NCT05933265)
Preclinical Results – LP-184
LP-184 treatment results in complete regression in DDR deficient pancreatic cancer PDX models

Pancreatic Cancer

In-vitro PDX pancreatic mouse models treated with LP-184 - CTG-1522 and CTG-1643 models showed a tumor growth inhibition of >100%

A. Vehicle 
CTG-1522 Tumors
CTG-1643 Tumors

LP-184 
CTG-1522 – ATR Frameshift mutation, non responder to FOLFIRINOX
CTG-1643 - BRCA1 Frameshift mutation

B. Control Treatment

LP-184 Treatment

Triple Negative Breast Cancer (TNBC)

Across 10 TNBC PDX mouse models (All 10 TNBC PDX models were HR deficient) LP-184 treatment resulted in 107-141% tumor growth inhibition

A. Preclinical Results
– LP-184 treatment results in complete regression in DDR deficient pancreatic cancer PDX models

B. CTG-1522 – ATR Frameshift mutation, non responder to FOLFIRINOX
– CTG-1643 - BRCA1 Frameshift mutation

In collab. with FOX CHASE CANCER CENTER TEMPLE HEALTH

Poster: AACR

– LP-184 exhibits nanomolar potency in PTGR1 overexpressing tumors with DDR deficiencies
– Positioned for 2nd and 3rd line treatment, where there is unmet need for novel therapies
– FDA Orphan Drug Designation granted for LP-184 to treat pancreatic cancer
– Combination therapy potential with SOC agents: Spironolactone, PARP inhibitors, Gemcitabine, Irinotecan, and Oxaliplatin
Preclinical Results – LP-184
Cancer models with common DNA damage response deficiencies are highly sensitive to LP-184 treatment

LP-184 in **NERD** Cancers

- **LP-184 shows exquisite potency** in cancers with deficiencies in Nucleotide Excision Repair (NERD) pathways
- There are currently **no approved therapies** for NERD cancers

LP-184 in **HRD** Cancers

- PDX-derived cell lines with mutations in key HR and NER genes are **highly sensitive to LP-184**
- Only 1 model was not highly sensitive to LP-184 (highlighted in blue)
Preclinical Data on Combination Therapy – LP-184
In-vivo LP-184 has synergy with several SOC agents including spironolactone, radiation therapy, and others

LP-184 + Spironolactone in GBM in vivo mouse model

- **Spironolactone** is an FDA approved agent that can impair DNA damage repair pathways in tumor cells
- **Combination** of LP-184 or LP-284 with Spironolactone:
  1) Enhances potency
  2) Decreases expected dose needed for treatment
  3) Exploits MoA of both drugs

LP-184 + Radiation in the Panc03.27 CDX Model

- Terminal tumor volumes from the RT + LP-184 treatment group are significantly (**p < 0.01) smaller than treated with RT or LP-184 alone
- Mean tumor volumes of RT + LP184 were **1.8 fold lower** than tumors treated with LP-184 alone
LP-284 for the Treatment of B-cell Non-Hodgkin’s Lymphomas (NHL)

**Lead Indications**
Mantle Cell, Double Hit Lymphomas, DDR Deficient Non-Hodgkin’s Lymphomas

**Clinical Status**
IND Approved. Phase 1 Anticipated in Q4 2023

**Market Potential**
$3.75 - 4 Billion

**Indication Size**
375,000+

**Target/ MOA**
Synthetic Lethality

**Molecule Type**
Acylfulvene Class

**Designations**
Orphan Drug - Mantle Cell Lymphoma

**Combination Potential**
Rituximab and Spironolactone

**IP Estate**
Claims extending into 2039

*Estimated Annual Global*
Disease Overview – B-cell Non-Hodgkin’s Lymphomas

Superior responses to LP-284 are observed in several B-cell lymphomas

B-cell Non-Hodgkin’s Lymphomas

- NHL is a cancer of the lymphatic system and occurs when normal B-cells, T-cells, or Natural Killer (NK)-cells grow out of control
- There are over 30 subtypes of NHL including mantle cell lymphoma (MCL), high-grade b-cell lymphoma (HGBL), and diffuse large B-cell lymphoma

Mantle Cell Lymphoma (MCL)

- A rare, aggressive type of B-cell NHL distinguished by overexpression of CCND1
- Small-medium size cancer cells in the lymph nodes, spleen, bone marrow, blood, and gastrointestinal system
- Rarely curable with current standard-of-care treatments and poor prognosis

High-Grade B-Cell Lymphoma (HGBL)

- A rare, aggressive type of B-cell NHL characterized by rearrangements of MYC and BCL2 and/or BCL6 genes
- Often occurs in neck, armpit, groins and can spread to central nervous system
- No standard treatment approach and poor prognosis.
Clinical Trial – LP-284 Phase 1 Trial
Ph. 1 trial anticipated to launch in Q4 for recurrent NHLs with scarce therapeutic options

First-In-Human Trial for LP-284

- Completed IND enabling studies Q2 2023
- IND application cleared by FDA Sep 2023
- Initiate Phase 1 Trial Q4 2023*

Phase 1
- Non-Hodgkin’s Lymphomas
- Estimated global annual market potential in NHL
- Estimated global annual patients in NHL $4.0Bn 375k

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 lymphoma (MCL) and high-grade b-cell lymphoma (HGBL)
- FDA granted Orphan Drug Designation for mantle cell lymphoma
- In-vivo LP-284 can rescue MCL xenograft tumors resistant to Ibrutinib and Bortezomib
- Enhanced potency when used in combination with rituximab in HGBL xenograft models

* anticipated
Preclinical Results – LP-284

Superior responses to LP-284 are observed in several NHLs including those resistant to SOC agents

LP-284 has drastically reduced MCL Tumor Volumes in Mice compared to FDA Approved Agents

A. Vehicle  LP-284 (2 mg/kg)  LP-284 (4 mg/kg)  Bortezomib (1 mg/kg)  Ibrutinib (50 mg/kg)

LP-284 reduced the volume of tumors resistant to Ibrutinib and Bortezomib

B. Bortezomib Resistant Tumors  Ibrutinib Resistant Tumors

Nearly all MCL Patients Relapse from SOC Therapies

In cell-derived xenograft MCL models, LP-284 can completely reduce tumors that are resistant to Ibrutinib and Bortezomib
Preclinical Data on Combination Therapy – LP-284

LP-284 showed enhanced potency when used in combination with rituximab in HGBL xenograft models.

No standard treatment was established for HGBL.

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

Results presented at: [Soho2023]

HGBL Tumor Volumes in Mice LP-284 – in combination with Rituximab

[Graph showing tumor volume changes over time for different treatments]
Born from Billions of Datapoints & AI, Starlight has Blockbuster Potential to Provide New Treatment Options for 500,000+ Patients

There are over **120 types of central nervous system (CNS) and brain cancers** and a majority have **no effective treatment options**

- No effective single-agent therapies have been approved for glioblastoma (GBM) in over 17 years
- Effective therapies are needed to improve outcomes for brain mets. patients
- There are no approved therapies for atypical teratoid rhabdoid tumors (ATRT)

**5 Year Survival Rates of CNS And Brain Cancers Remain Low Despite Advances in Cancer Therapies**

- **7%** GBM
- **10%** BRAIN METS. (TNBC)
- **32%** ATRT

**500,000+ Potential CNS Patients Globally**

- **Multiple Clinical-stage** CNS Cancer Indications
- STAR-001 has been Granted **FDA Orphan Drug Designation for GBM & ATRT and Rare Pediatric Disease Designation for ATRT**
- **World Class Collaborators** from Johns Hopkins and UT Health San Antonio
- **4 US Patents & Patent Applications and 10+** Foreign Pending Patent Applications

*Estimated Annual Global Numbers
Multiple Clinical Trials are Planned for STAR-001

STAR-001 has Multi-billion Market Potential In CNS Cancers

$5-6 billion (USD)

Global Annual Estimated Market Potential

- **Glioblastoma**
  - $1.5-2 billion
  - Annual US Cases 13K

- **Other HGGs**
  - $1.2 billion
  - Annual US Cases 22K

- **Brain Mets. (Lung, Breast)**
  - $3 billion
  - Annual US Cases 100K

- **ATRT & Pediatric CNS**
  - $0.1 billion
  - ATRT Annual US Cases 600+

- **ADULT CNS CANCERS**
  - Glioblastoma (GBM)
  - Other High-Grade Gliomas (HGG)
  - Brain Mets. (Triple Negative Breast Cancer)
  - Brain Mets. (Non-Small Cell Lung Cancer)
  - Brain Mets. (Melanoma)

- **PEDIATRIC CNS CANCERS**
  - Atypical Teratoid Rhabdoid Tumors (ATRT)
  - Diffuse Intrinsic Pontine Glioma (DIPG)

• **Nanomolar potency** gives multiple shots on goal in CNS cancers
• **Excellent blood brain barrier permeability** as predicted by top-performing AI Algorithm and proven in vivo
• **Improved bioavailability** over current SOC Agents

• Target CNS indications **have limited or no effective therapies**
• Upcoming **Phase 2 trials** for adult CNS cancers
• Upcoming **Phase 1 trial** for pediatric CNS cancers

Pediatric CNS indications will enter clinical trial after the Adult Phase 1 trials begin.
IP Portfolio

95+ Issued Patents & Pending Applications

5 Families
Drug Sensitivity & Response Signatures using Biomarkers

7 Families
Methods of Use

2 Families
Composition of Matter

LP-300
- Acquired
- Recent patent (no. 11,471,431)
- Claims extending to at least 2032

LP-184
- In-licensed
- Internally developed
- Claims extending into 2041

LP-284
- Internally developed
- Composition of matter patent (no. 11,739,043)
- Claims extending into 2039

RADR®

Additional Commercial Protections

FDA Orphan Drug Designation
- Provides 7 years of market exclusivity
- Complements patent protections
- Reduces costs or provides waivers for marketing/registration fees
- Reduces annual product fees
- Assistance for expedited program development

Pediatric Rare Disease Designation
- Granted in Jan. 2022 for ATRT
- Eligibility for potential priority review voucher if applicable and approved
- Priority review voucher can sell in marketplace for $100-$120 million
Artificial intelligence platform, RADR® aids in the discovery of DNA damaging agent for the ultra-rare cancer Atypical Teratoid Rhabdoid Tumors.

American Society of Hematology LP-184, an acylfulvene class small molecule therapeutic, is synthetically lethal in HR deficient and PARP inhibitor resistant triple negative breast cancer.

Development of a Potent DNA Damaging Agent LP-284 for Treatment of Mantle Cell Lymphoma.

LP-284, a small molecule acylfulvene, exerts potent antitumor activity in preclinical non-Hodgkin's lymphoma models and in cells deficient in DNA damage repair.

LP-284, a small molecule acylfulvene, exerts potent antitumor activity in preclinical non-Hodgkin's lymphoma models and in cells deficient in DNA damage repair.

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

Targeting homologous recombination deficiencies in B-cell non-Hodgkin’s lymphomas with the novel anti-tumor small molecule LP-284.

Recent Posters/ Publications
Highlighting the strong validation of RADR® insights, de-risking the development of Lantern’s drug candidates.

Targeting homologous recombination deficiencies in B-cell non-Hodgkin’s lymphomas with the novel anti-tumor small molecule LP-284

LP-284, a small molecule acylfulvene, exerts potent antitumor activity in preclinical non-Hodgkin's lymphoma models and in cells deficient in DNA damage repair

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

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

Development of a Potent DNA Damaging Agent LP-284 for Treatment of Mantle Cell Lymphoma

LP-184, an acylfulvene class small molecule therapeutic, is synthetically lethal in HR deficient and PARP inhibitor resistant triple negative breast cancer

American Society of Hematology

LP-284, a small molecule acylfulvene, exerts potent antitumor activity in preclinical non-Hodgkin's lymphoma models and in cells deficient in DNA damage repair

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

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

Oct 2022

Dec 2022

Sep 2023

June 2023

Apr 2023

Oct 2022
Financial Highlights And Cap Table

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

- Approx. $48.0 M of cash, cash equivalents and marketable securities as of June 30th, 2023
- Committed to creating enduring growth and value for LTRN shareholders

<table>
<thead>
<tr>
<th>LANTERN PHARMA INC. (LTRN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange</td>
</tr>
<tr>
<td>52 Week Per Share Price Range (through 10/5/23)</td>
</tr>
<tr>
<td>Common Shares Outstanding (6/30/23)</td>
</tr>
<tr>
<td>Warrants (6/30/23)</td>
</tr>
<tr>
<td>Options (Employees, Management and Directors) (6/30/23)</td>
</tr>
<tr>
<td>Fully Diluted Shares Outstanding (6/30/23)</td>
</tr>
</tbody>
</table>
Leadership

PANNA SHARMA
Chief Executive Officer & President

PRIOR:
- President & CEO, Cancer Genetics (CGIX)
- CEO & Managing Partner, TSG Partners
- Managing Member, Oncospire Genomics (Joint Venture with Mayo Clinic)
- CSO, iXl Services

KISHOR BHATIA, Ph.D.
Chief Scientific Officer

PRIOR:
- 40+ years experience in cancer research
- Director, Children’s cancer Center Riyadh
- Director Office of AIDS Malignancy Program, NCI

REGINALD EWESUEDO, M.D., M.S.c., MBA
VP of Clinical Development

PRIOR:
- VP, Kymera Therapeutics
- VP, Tesaro/GSK
- VP, Pfizer

DAVID MARGRAVE
Chief Financial Officer

PRIOR:
- 20+ years of oncology focused management experience
- Chairman, Texas Healthcare & Bioscience Institute (current)
- President & CAO, BioNumerik Pharmaceuticals

PETER CARR
Principal Software Architect

PRIOR:
- Sr. Software Engineer, Broad Institute Cancer Program
- Sr. Programmer/Analyst, Boston Univ Science & Math Education Center

ERNEST KITT
Head of Clinical Operations

PRIOR:
- Project Lead, Onyx/Amgen
- VP, Aptose Biosciences
- Executive Director, Head of Clinical Operations Oncology, Biosplice
Investment Highlights
Lantern Pharma (NASDAQ: LTRN)

- Active drug rescue process and in the clinic with 2 compounds and accelerating additional compounds and combinations to clinical trials...potentially saving tens of millions of dollars and years of development

- Growing AI based platform with clear roadmap to 50+ Bn. datapoints focused exquisitely on cancer therapeutic development and companion Dx in a high growth, high demand $12+ Bn. market

- Focused on cancer drug market segments with clear clinical need, understood mechanisms, targeted patient populations that exceed 1 million, and multi-billion USD in annual sales potential

- A novel ADC platform with the potential to develop and out-license or partner ADC assets in early phases

- Several compounds in place with multiple targeted indications, including LP-184 (received Orphan Disease Designations in pancreatic and GBM & Rare Pediatric Disease Designation for ATRT), which can help accelerate development

- Proven and growing library of AI & machine-learning methodologies published at ASCO, AACR, and SNO used to generate novel IP & patents and accelerate discovery by potentially years

- Experienced and innovative management team w/ 70+ years experience in cancer and a passion to change the cost and outcome for cancer patients by using AI and genomics – paradigm changing technologies

- Industry leading collaborations with Georgetown, Johns Hopkins, UT Health San Antonio, Fox Chase Cancer Center, and University of Bielefeld
IR Contact:
IR@lanternpharma.com
1-972-277-1136

www.lanternpharma.com
@LanternPharma
Sign up for the spark Newsletter
https://lantern-pharma.read.axioshq.com/signup/lantern-pharma-newsletter
RADR® – ADC Collaboration

Initiated 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

Professor Norbert Sewald, Ph.D.

• Professor of Organic and Bioorganic Chemistry at Bielefeld University (Bielefeld, Germany)
• Lead investigator of the European consortium Magicbullet::reloaded
• Research Focus: Development of antibody-drug and peptide-drug conjugates, Isolation and total synthesis of natural products, Chemical modification of bioactive peptides, and Biocatalytic halogenation of amino acids, peptides, and proteins.

Collaboration Highlights

• 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

ADCs have commanded the highest deal value in oncology for past 5 years

• **Merck** acquired 7 preclinical assets from Sichuan Kelun for $9.5 bn
• **Amgen** entered a collab and license agreement with LegoChem Biosciences for $1.25

A1

$4+ billion

Rapidly growing global ADC market

currently valued at

$4+ billion

projected value by 2027

$14+ billion

Professor Norbert Sewald, Ph.D.

• Professor of Organic and Bioorganic Chemistry at Bielefeld University (Bielefeld, Germany)
• Lead investigator of the European consortium Magicbullet::reloaded
• Research Focus: Development of antibody-drug and peptide-drug conjugates, Isolation and total synthesis of natural products, Chemical modification of bioactive peptides, and Biocatalytic halogenation of amino acids, peptides, and proteins.

Collaboration Highlights

• 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

A1
What is the Blood-Brain-Barrier (BBB)?

The 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

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.
LP-300 – 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
     1. How NSCLC is different in never-smokers
     2. What taking part in the Harmonic™ trial involves
     3. How to contact the Harmonic™ clinical trial team
     4. Information on the investigational new drug, LP-300
     5. Locations of all currently active clinical trial sites
     6. Education & awareness for the NSCLC community

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.

3. Global Partnering Opportunities
   - 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)
2023 Investment Highlights

Recent Milestones

- Dosed initial patients in the Harmonic™ clinical trial
- Launched Phase 1A basket trial for LP-184 and dosed initial patient
- Received IND clearance from FDA for LP-284, trial launched in July '23.
- Established new collaboration with Bielefeld University to develop breakthrough ADCs using AI.
- Developed industry leading AI algorithms to predict any compound's ability to cross the BBB.
- RADR® machine learning models advanced to predict patient responses with 88% accuracy.

Upcoming Milestones

- Advance enrollment of The Harmonic™ Trial & increase patient/clinician awareness
- Launch and advance clinical trials for LP-184 and LP-284
- Advance ADC preclinical development to support future Phase 1 launch and/or partnership
- 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