FCGHORN® THERAPEUTICS

Unique biology
Precision therapeutics
Broad impact



Forward Looking Statements

This presentation contains forward-looking statements that are based on management's beliefs and assumptions and on information currently available to management. All statements other than statements of historical facts contained in this presentation are forwardlooking statements. In some cases, you can identify forward-looking statements by terms such as "could," "may," "might," "will," "likely," "anticipates," "intends," "plans," "seeks," "believes," "estimates," "expects," "continues," "projects" or the negative of these terms or other similar expressions, although not all forward-looking statements contain these words. Forward-looking statements include, but are not limited to, statements concerning: the potential outcomes from our collaboration agreement with Lilly; the initiation, timing, progress and results of our research and development programs and pre-clinical studies and clinical trials, including with respect to our Phase 1 dose escalation trial of FHD-909 with Lilly; our ability to advance product candidates that we may develop and to successfully complete preclinical and clinical studies; our ability to leverage our initial programs to develop additional product candidates using our Gene Traffic Control Platform®; the impact of exogeneous factors, including macroeconomic and geopolitical circumstances, on our and our collaborators' business operations, including our research and development programs and pre-clinical studies; developments related to our competitors and our industry; our ability to expand the target populations of our programs and the availability of patients for clinical testing; our ability to obtain regulatory approval for FHD-909 and any future product candidates from the FDA and other regulatory authorities; our ability to identify and enter into future license agreements and collaborations; our ability to continue to rely on our CDMOs and CROs for our manufacturing and research needs; regulatory developments in the United States and foreign countries; our ability to attract and retain key scientific and management personnel; the scope of protection we are able to establish, maintain and enforce for intellectual property rights covering FHD-909, our future products and our Gene Traffic Control Platform; and our use of proceeds from capital-raising transactions, estimates of our expenses, capital requirements, and needs for additional financing. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this presentation. Additional important factors to be considered in connection with forward-looking statements are described in the Company's filings with the Securities and Exchange Commission, including withing the section entitled "Risk Factors" in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2023. Any forward-looking statements represent the Company's views only as of the date of this presentation and should not be relied upon as representing its views as of any subsequent date. The Company explicitly disclaims any obligation to update any forward-looking statements. The Company's business is subject to substantial risks and uncertainties.

Foghorn is a Leader in Chromatin Biology, Successfully Drugging Challenging Targets

Pioneers in Targeting
Chromatin Biology

Chromatin Regulation is Implicated in up to 50% of Tumors

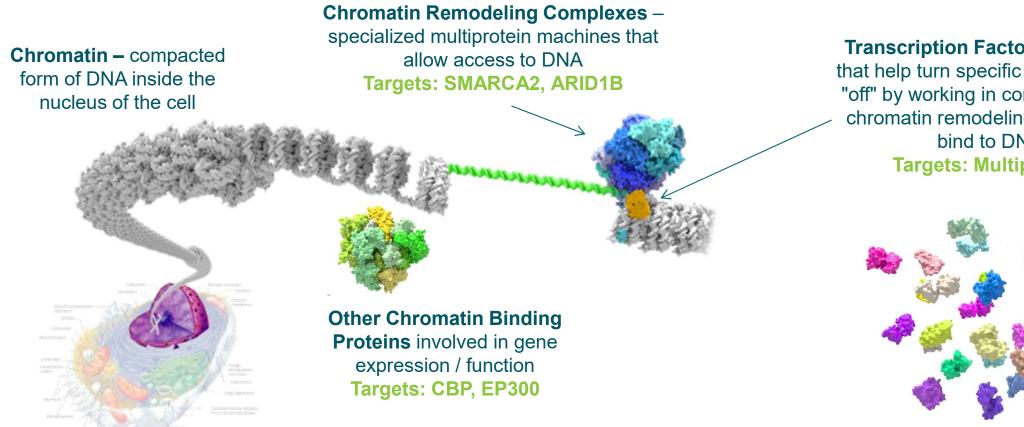
Foghorn has Unlocked Previously <u>Undruggable</u>
<u>Targets</u>

Leaders in Targeted Protein Degradation

Opening New Biology with Induced Proximity

Chromatin Regulatory System Orchestrates Gene Expression: Multiple Opportunities for Targets and Therapeutics

Chromatin Regulatory System genes are **implicated** across a **wide range of cancers**



Transcription Factors – proteins that help turn specific genes "on" or "off" by working in concert with the chromatin remodeling complex to bind to DNA

Targets: Multiple TFs



Foghorn Has Progressed Multiple Programs Against Challenging Targets

SMARCA2: Potential in up to 10% of NSCLC and up to 5% of all solid

tumors

Challenge: Industry has failed to develop a selective inhibitor

CBP: Role in bladder, colorectal, breast, gastric, lung cancers
Challenge: Toxicities with dual inhibition, difficulty engineering selectivity

EP300: Role in both solid and heme malignancies

Challenge: Toxicities with dual inhibition, difficulty engineering selectivity

ARID1B: Role in ovarian, endometrial, colorectal cancer. Potential in up to 5% of all solid tumors

Challenge: Industry has had no success with selective target engagement

FHD-909

First selective inhibitor in the clinic

Selective CBP Degrader IND expected H1 2026

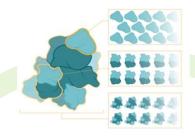
Selective EP300 Degrader IND expected in H2 2026

Selective ARID1B Degrader
Degradation achieved; Program
update expected in 2025

... and more.



Foghorn's Gene Traffic Control® Platform Designed to Deliver Precision, First-in-Class Therapeutics: Integrated, Scalable, Efficient, Repeatable

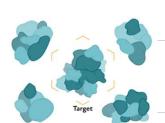


2. Assays & Biochemistry Capabilities

Engineering selectivity via unique assays and protein capabilities

- Protein purification, production & interrogation
- High fidelity, difficult to make proteins
- In silico modeling and computational chemistry

"Where to Drug"



1. Chromatin Biology

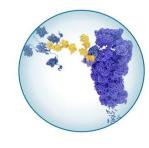
Deep mechanistic understanding of chromatin regulatory system

- Bioinformatics
- Genomics

Identify Dependencies

Epigenomics

"What to Drug"



3. Chemistry & Drugging

Biology first, small molecule modality agnostic

- Selective, small molecules (inhibitors, protein degraders, TF disruptors)
- Protein degradation platform
- Formulation & long-acting delivery

"How to Drug"

Legend: Patents | Know How / Trade Secret



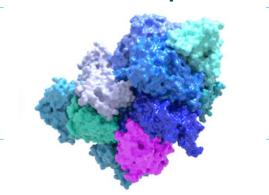
Foghorn's Unique Platform Capabilities Evolved From Drugging a Specific Chromatin Remodeling Complex (BAF)*

Challenge: produce, manipulate, study, and drug a 1.5 megadalton multi-protein complex

Assays and Biochemistry Capabilities

- Purification & recombinant production of large proteins and protein complexes
- Biochemistry & biophysics of intrinsically disordered proteins
- High throughput screening for binders and inhibitors

BAF Chromatin Remodeling Complex



Challenge: drug highly similar proteins that have no enzymatic function

Protein Degrader Platform

- Proprietary linker library
- Suite of assays specific to degradation (i.e. synthesis kinetics, degradation kinetics)
- Optimal E3 ligase pairing
- Ternary complex modeling
- Long-acting formulation technology

Current and Future Applications

- Selectively drugging highly similar proteins / hard to drug proteins
- Disease area expansion
- Going beyond chromatin novel biology with complex proteins
- Payloads for ADCs*

Platform of Proprietary Tools and Unique Know-How Enables Development of Best-in-Class Degraders

Proprietary E3 Ligase Libraries

- Proprietary E3 ligase binders
 - ~ 15 -17 in internal library
 - o UBR5

Computational Chemistry

(ML, AI, Virtual Screens)

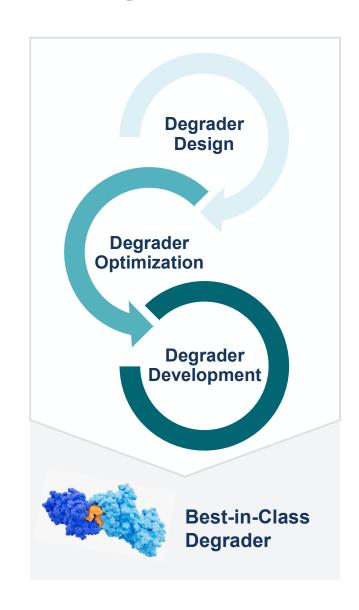
 Structural prediction/ docking

Linker Toolkit

- Well-developed toolkit
- Flexibility-rigidity
- Charge
- Hydrophobicity

Binder Discovery

- Commercial and proprietary covalent and fragment screening libraries
- Target binders



Degrader Mechanics

- Specificity / Selectivity (global proteomics)
- Kinetics (Dmax/DC50)
- Cooperativity (e.g. ternary complex)
- Permeability
- MoA characterization
- Cellular and permeability assays

Exploratory Biology

- In Vitro efficacy
- Indication selection
- Combinations
- Resistance mechanisms

In Vivo Validation (Efficacy and Safety)

- In Vivo models
- PK/PD determination, modeling and dose prediction

Proprietary Formulation & Delivery Platform

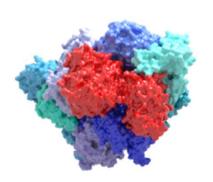
Oral, IV and LAI formulation for drug delivery

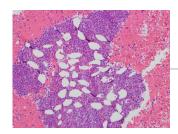


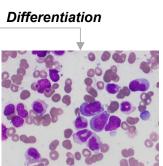
The Next Foghorn Chapter: Delivering Multiple Potential Blockbusters Into the Clinic

Pioneering BAF and Chromatin Biology (2016 – 2020) POC, Platform & Pipeline Expansion (2021 – 2024)

Progress Multiple High Value Assets into the Clinic (2025 – 2027)









- Built platform and developed deep understanding of biology
- Producing BAF and transcription factors at scale
- Demonstrated druggability of chromatin regulatory system

- Lilly strategic collaboration
- ✓ Developed first-in-class Selective SMARCA2 inhibitor, FHD-909, and SMARCA2 degrader
- Advanced Selective CBP degrader, Selective EP300 degrader and Selective ARID1B degrader
- Expanded protein degrader platform, new applications for Induced Proximity

- FHD-909 advancing in Phase 1 trial
- ARID1B degradation achieved program update expected in 2025
- Potential for 5 additional INDs; Pipeline, platform, disease area expansion

Foghorn is Advancing a Pipeline of First-in-Class Precision Therapeutics With Potential for Broad Application in Oncology...

Modality	Program	Disease	Discovery	Pre-Clinical	Phase 1	Phase 2 / 3	Commercial Rights
Enzyme Inhibitors	FHD-909* (Selective SMARCA2) Partnered Undisclosed	SMARCA4 mutant cancers (e.g., NSCLC, bladder, endometrial, colorectal) Undisclosed					Lilly FUGHORN' THERAPEUTICS
	Selective SMARCA2	SMARCA4 mutant cancers (e.g., NSCLC, bladder, endometrial, colorectal)					Liley FCGHORN' THERAPEUTICS
Drotain	Selective CBP	EP300 mutant cancers (e.g., bladder, gastric, breast, NSCLC, colorectal)					FCGHORN THERAPEUTICS
Protein Degraders	Selective EP300	EP300 dependent cancers (e.g., prostate, DLBCL), CBP mutant cancers (e.g., NSCLC, bladder)					FCGHORN THERAPEUTICS
	Selective ARID1B	ARID1A mutant cancers (e.g., ovarian, endometrial, colorectal)					FCGHORN' THERAPEUTICS
Transcription Factor Disruptors	Undisclosed	Undisclosed					FCGHORN' THERAPEUTICS
3 Discovery Programs	Undisclosed	Undisclosed					Silly FCGHORN THERAPEUTICS



...With Multiple Near-Term Value Inflection Points Through 2026

FHD-909 (LY4050784) (Selective SMARCA2 Inhibitor)

Selective SMARCA2 Degrader

Selective CBP Degrader

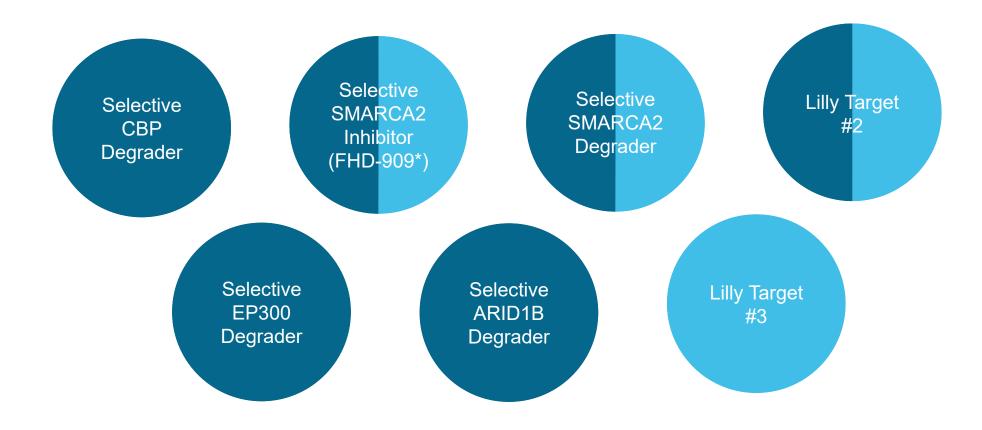
Lilly Target #2

Selective EP300 Degrader

Selective ARID1B Degrader

Preclinical Combination Data	April 2025 (AACR)
Phase 1 Dose Escalation Data	Confidential
IND / Phase 1 Initiation	Confidential
IND / Phase 1 Initiation	2026
Target Disclosure and IND	Confidential
IND / Phase 1 Initiation	2026
Selective Degradation Achieved	Program Update 2025

Potential Multi-Billion Dollar Opportunities in Oncology



Foghorn Owned

Partnered w Lilly

Platform has potential for therapeutic area expansion (e.g., immunology and inflammation)



Clinical & Preclinical Programs

- FHD-909 (LY4050784) Selective SMARCA2 Inhibitor
- Selective CBP Degrader
- Selective EP300 Degrader
- Selective ARID1B Degrader

Selective SMARCA2 Inhibitor and Degrader

For SMARCA4 Mutated Cancers

FHD-909 Selective SMARCA2 Inhibitor in Phase 1 Trial; Preclinical Combination Data at AACR 2025

Selective SMARCA2 Inhibitor FHD-909*

Selective SMARCA2 Degrader

Biology

Exploit the synthetic lethal relationship between SMARCA2 and mutated SMARCA4

Stage / Next Milestone

Phase 1 dose escalation trial ongoing;
Preclinical combination data with
pembrolizumab, KRAS and chemo at AACR

Advancing through late preclinical development

Opportunity

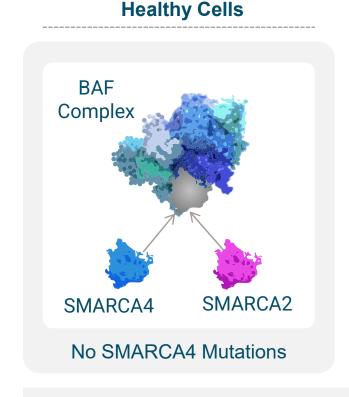
SMARCA4 mutated cancer including ~10% of NSCLC and up to 5% of all solid tumors

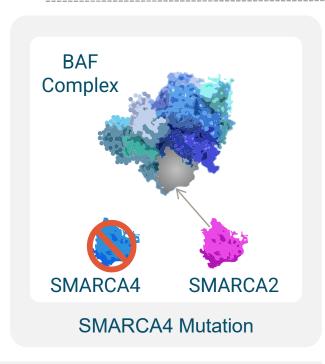
Lilly Partnership

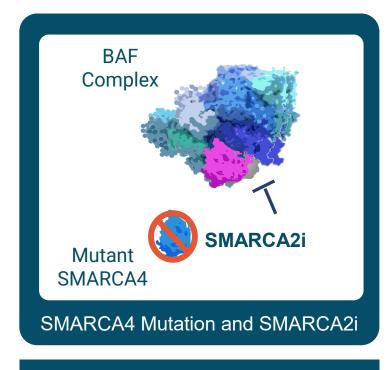
50/50 global R&D cost share | 50/50 U.S. economics | tiered ex-U.S. royalties starting in the low double-digit range and escalating into the twenties

Selective SMARCA2 Inhibition: Promising Strategy to Exploit Synthetic Lethal Relationship Between SMARCA2 and Mutant SMARCA4

Cancer Cells





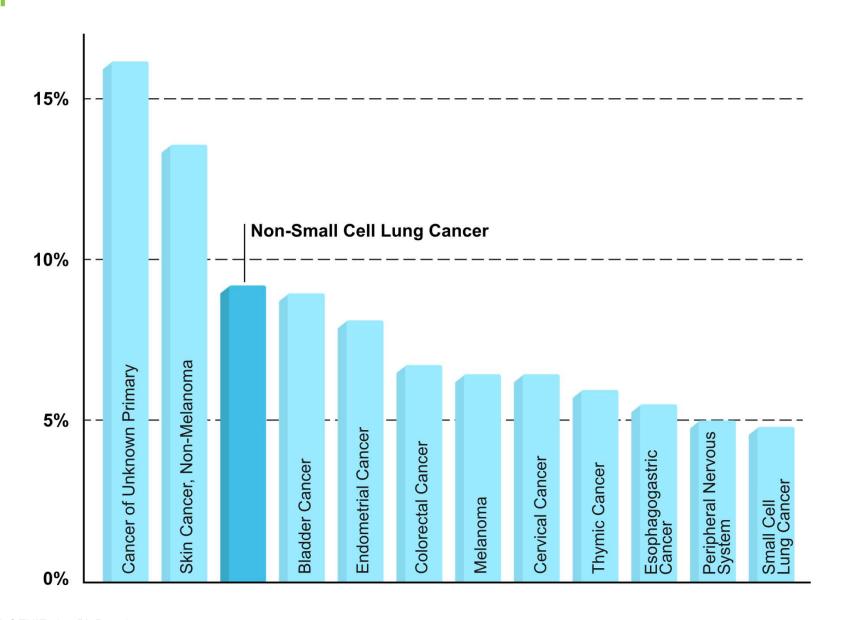


Cell Survival

Cell Death

Precision medicine targeting synthetic lethal relationships is a proven clinical approach now used in multiple cancers (e.g., PARP inhibitors)

SMARCA4 is Mutated in Up to 10% of NSCLC; Up to 5% of Solid Tumors



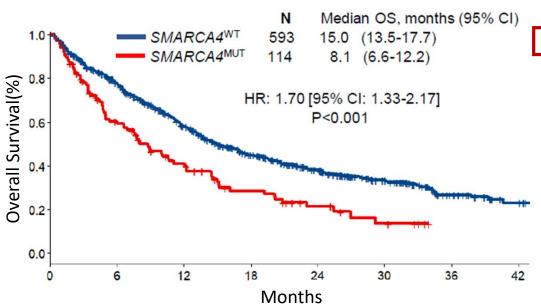
SMARCA4 mutated across a broad range of tumors

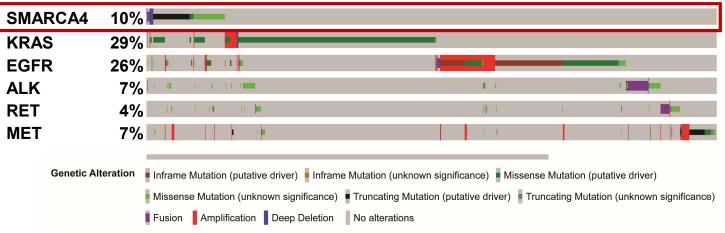
Accounts for ~5% of solid tumors

Patients With NSCLC Harboring SMARCA4 Mutations Have Significantly Worse Clinical Outcomes and Define a High Unmet Need Patient Population

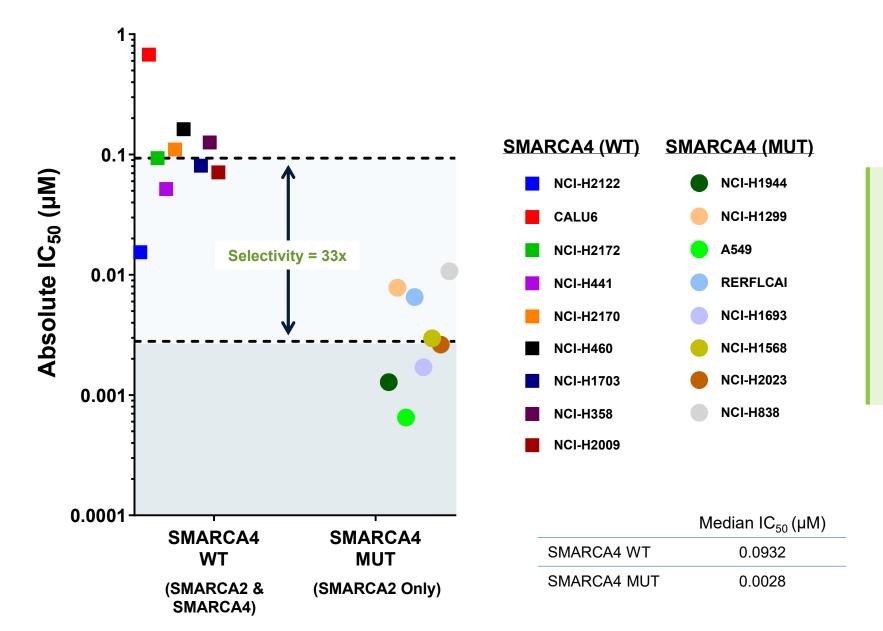
Overall Survival for SMARCA4wt vs SMARCA4mut¹

SMARCA4 Mutated in Up to 10% of NSCLC Tumors, Minimal Overlap With Other Mutations²





FHD-909 Demonstrated Approximately 33-fold Selectivity Across 17 SMARCA4 Mutant and Wild-Type Cell Lines *In Vivo*

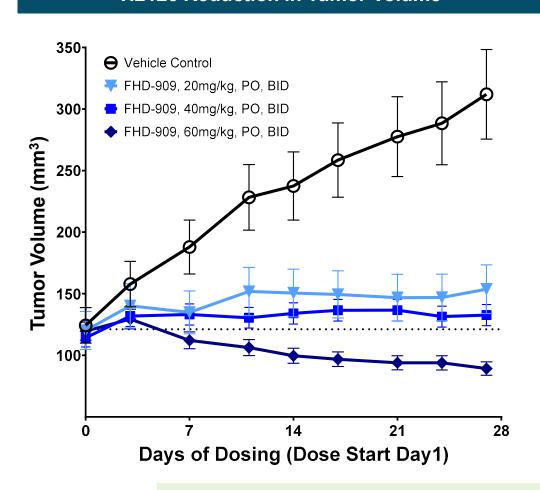


Spread in potency for wild type versus mutant cell lines indicates

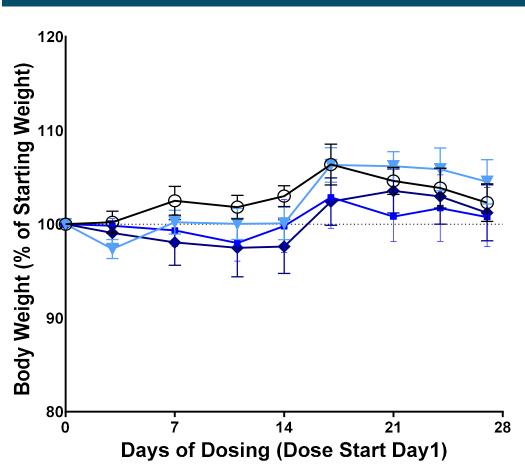
33-fold selectivity observed

FHD-909 Monotherapy Demonstrated Regression *In Vivo* in H2126 SMARCA4 Mutant NSCLC Model and Was Well Tolerated

H2126 Reduction in Tumor Volume



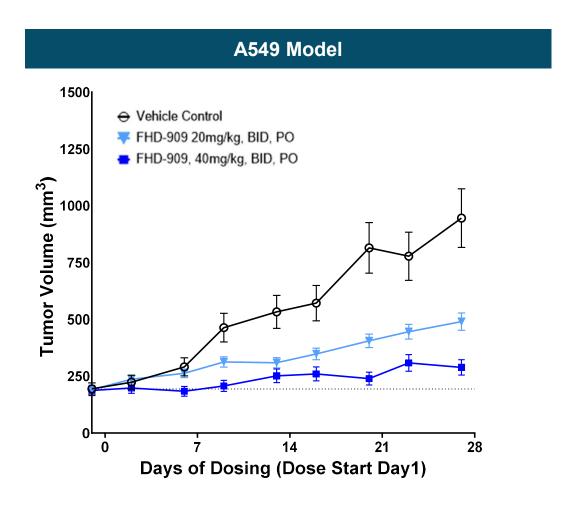
H2126 Body Weight



Genetic Background: SMARCA4 W764R, TP53 E62*, STK11-/-, CDKN2A-/-, KEAP1 R272C

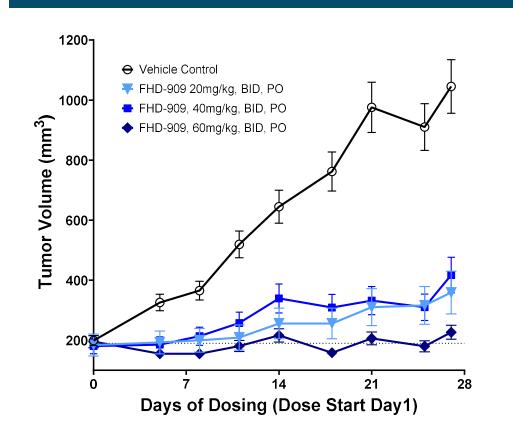


FHD-909 Monotherapy Demonstrated 96% TGI in A549 and Tumor Stasis in RERF-LC-Al Mutant NSCLC Models



Genetic Background: SMARCA4, Q729fs / H736Y, KRAS G12S, STK11-/-, CDKN2A-/-, KEAP1 G333C

RERF-LC-Al Model

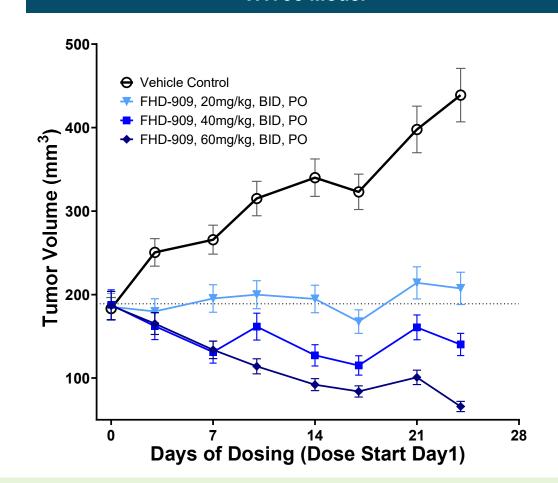


Genetic Background: SMARCA4 mut p.E1496*, TP53 p.Q104*, NF1 p.E1699*



FHD-909 Monotherapy Demonstrated Regression in H1793 SMARCA4 Mutant NSCLC Model

H1793 Model



- FHD-909 delivered across range of SMARCA4 mut xenograft models
- Results ranging from impressive
 TGI to regression as monotherapy
- All doses across all four models were well tolerated

Genetic Background: SMARCA4, E514*, TP53 R209* R273H, ARID1A C884*

FHD-909 (LY4050784) Trial Design

Dose Escalation

- Restricted to SMARCA4 mutated tumors
- SMARCA4 mutant status confirmed by standard NGS panel
- Further enrichment for NSCLC patients as trial progresses
- Tumor histology agnostic
- Enrolling in US and Japan

Dose Expansion

- Arm 1: SMARCA4 mutant NSCLC
- Arm 2: Other SMARCA4 mutant tumors (e.g., bladder, endometrial, colorectal)
- Potential for combination arm(s)

FHD-909 preclinical combination data with pembrolizumab, KRAS inhibitors and chemo to be presented at the AACR Annual Meeting, April 2025

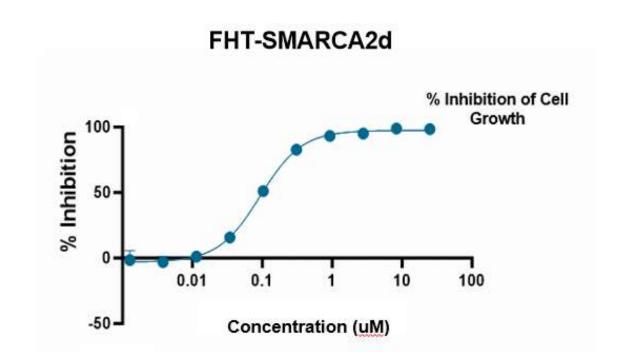


Selective SMARCA2 Degrader Achieved Complete SMARCA2 Degradation and Cell Growth Inhibition *In Vitro*

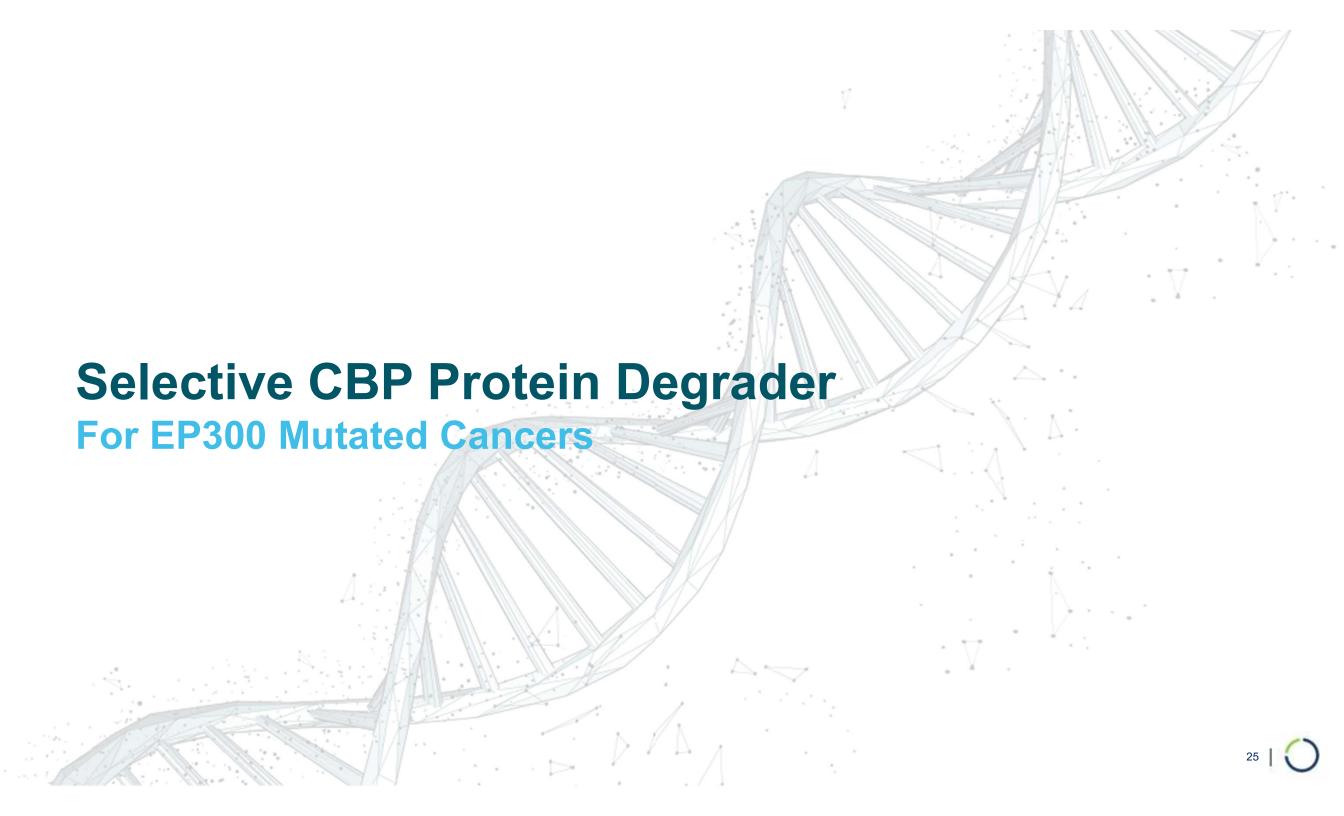
SMARCA2 / SMARCA4 HIBIT Data

100 SMARCA2 75 50 25 SMARCA4 1E-3 0.01 0.1 1 10 Concentration (uM)

A549 Ten-Day Proliferation Assay



Degraders Caused Time- and Dose-Dependent SMARCA2 Degradation Antiproliferative Effects in A549 Mutant NSCLC Model



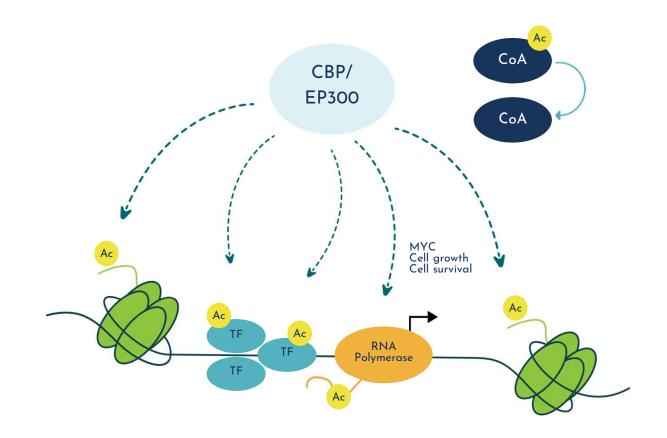
CBP and EP300 Proteins – A Decades Long Challenge in Selectivity

CBP and EP300 Biology

- CBP and EP300 are highly homologous, paralog histone acetyltransferases regulating enhancer-mediated transcription and protein stability
- Dysregulation of CBP and EP300 has been implicated in multiple cancers
- Dual targeting has revealed tolerability and safety issues

Foghorn's Solution... Highly Selective Degradation

- Achieved selective targeting which results in improved tolerability and efficacy
- Advancing two separate programs with defined dependencies and patient populations



EP300 Degrader Approach

Focus on EP300 Lineage
Dependent Cancers

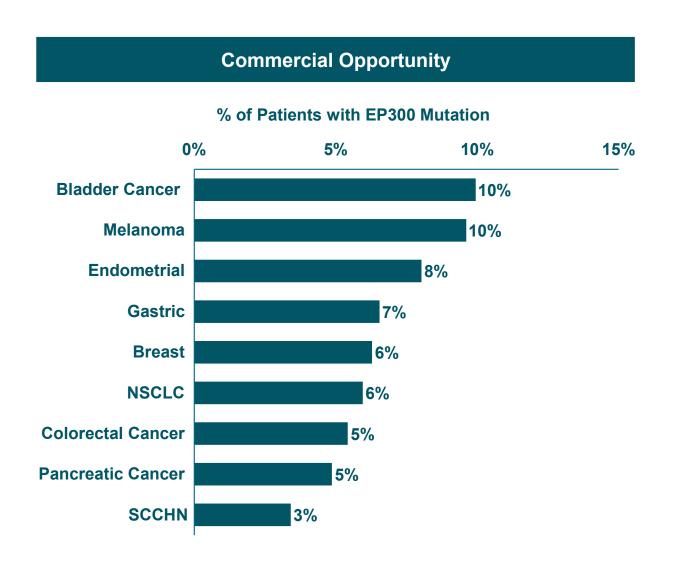
CBP Degrader Approach

Focus on EP300 Mutant
Cancers via Synthetic Lethality



Summary: Selective CBP Protein Degrader for EP300 Mutated Cancers

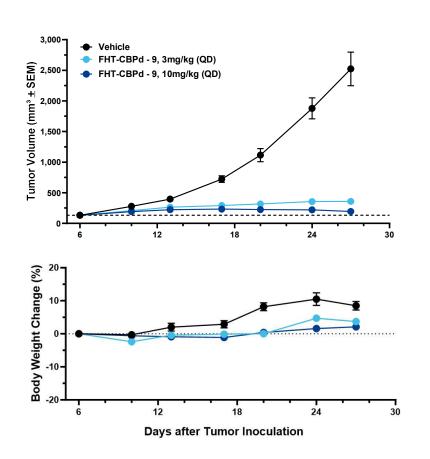
Target / Approach	CREB binding protein (CBP)Targeted protein degrader
Initial Indication	 EP300 mutated cancers (e.g., subsets of bladder, colorectal, breast, gastric and lung cancers)
Mutation / Aberration	EP300 mutated cancers
Stage / Next Milestone	PreclinicalIND planned for 2026
New Patients Impacted / Year*	 Up to 10% of patients have an EP300 mutation across solid tumors representing ~ 100K addressable population
Key Differentiation	 Highly selective and potent Increased tolerability relative to non-selective compounds Long-acting formulation targets Q2-4W dosing Compelling combination potential



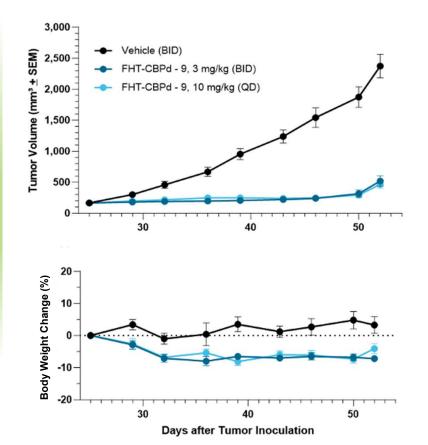


Selective CBP Degradation Results in Significant Anti-Tumor Activity in EP300mut Solid Tumor Models

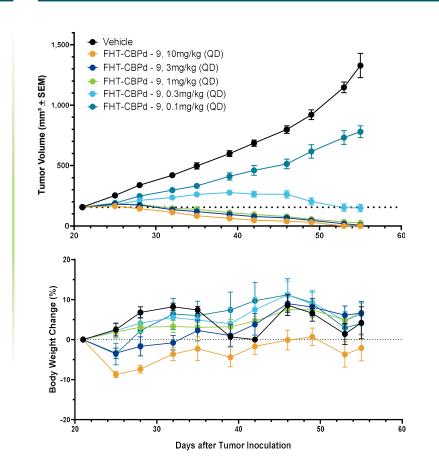
EP300mut Lung Cancer CDX (LU99)



EP300mut Bladder Cancer CDX (639V)



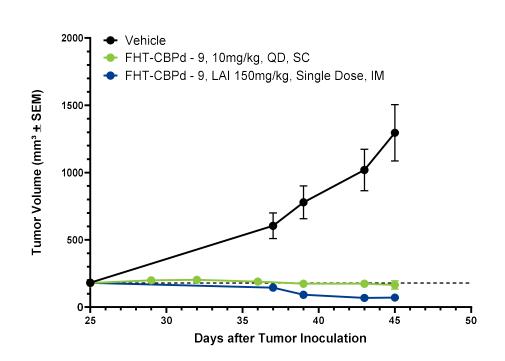
EP300mut Gastric Cancer CDX (AGS)



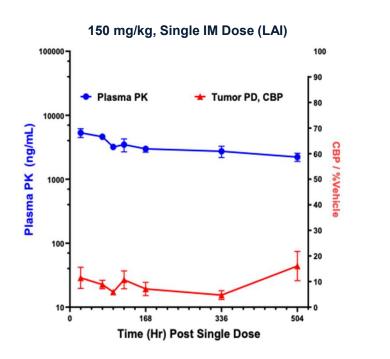
Long-Acting Injectable (LAI) Formulation Provides Sustained Target Coverage, Anti-Tumor Activity and Tolerability With a Single Injection

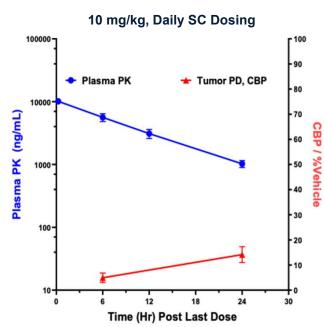
EP300mut (639V) Bladder CDX

(Daily Dosing and Single Injection of LAI Formulation)



Plasma PK and Tumor PD (CBP) Measured From Bladder CDX Efficacy



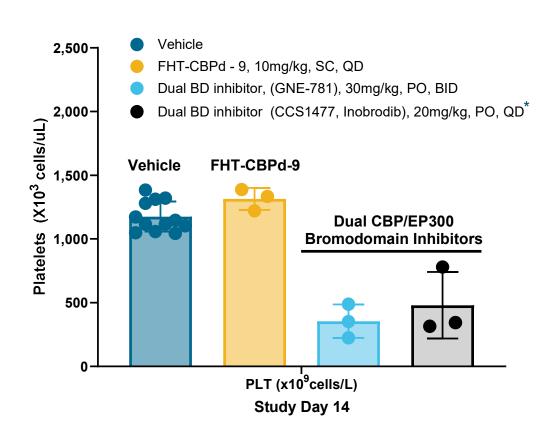


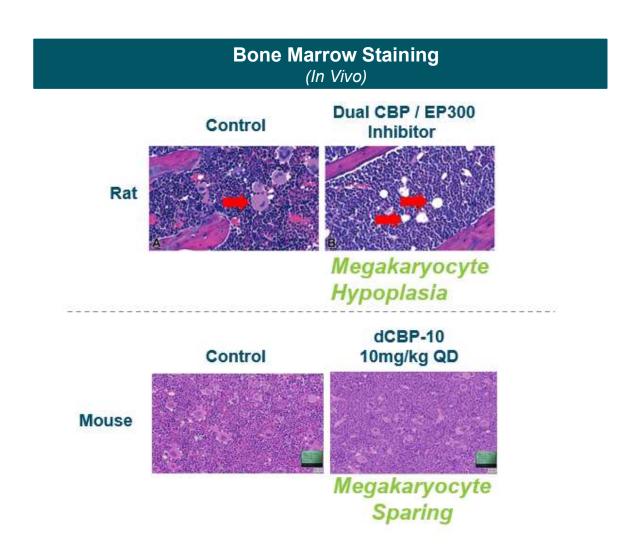
- Single injection of FHT-CBPd-9 in a LAI resulted in sustained plasma exposure (PK) and CBP degradation (PD) throughout the 3-week experiment, ultimately leading to tumor regressions
- No thrombocytopenia was observed through end of study

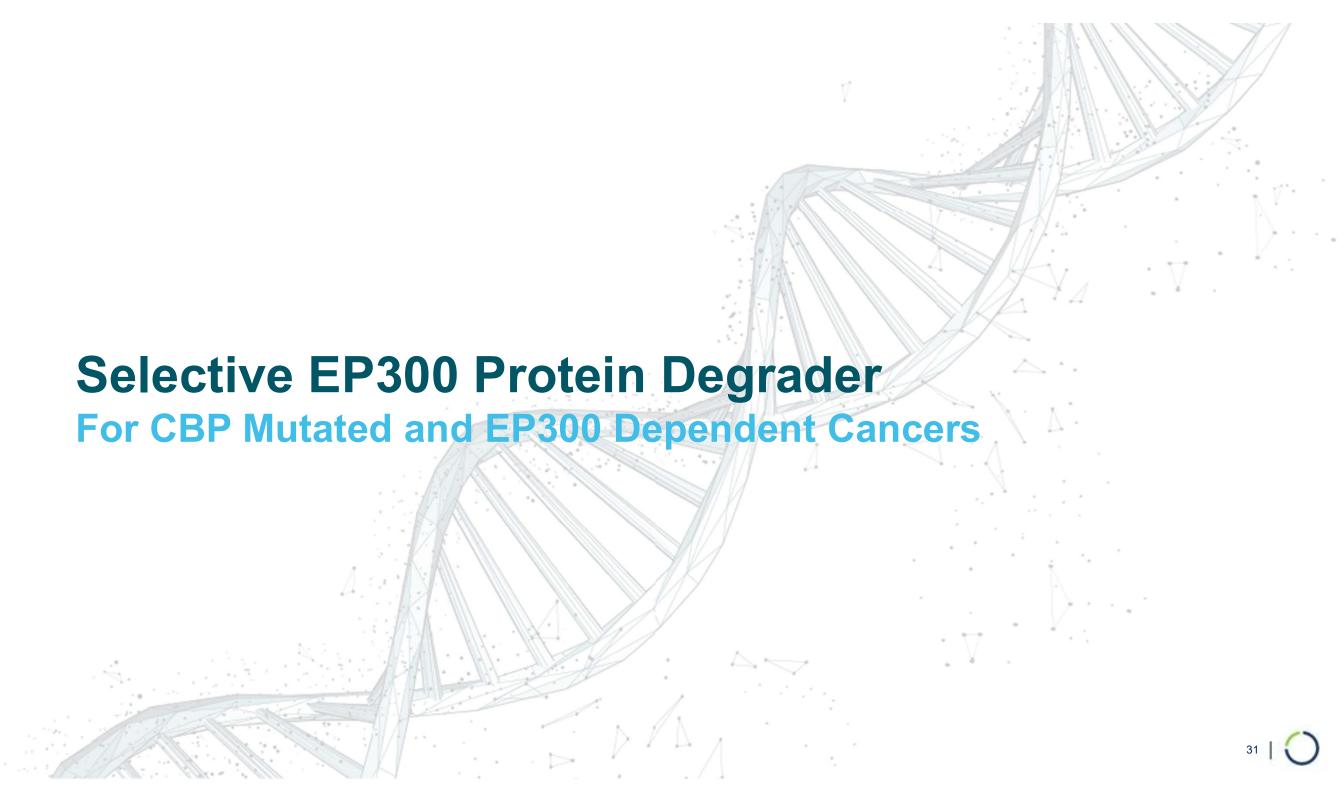


Preclinical Studies Indicate Selective CBP Degradation Did Not Show Thrombocytopenia and Spared Megakaryocytes *In Vivo*

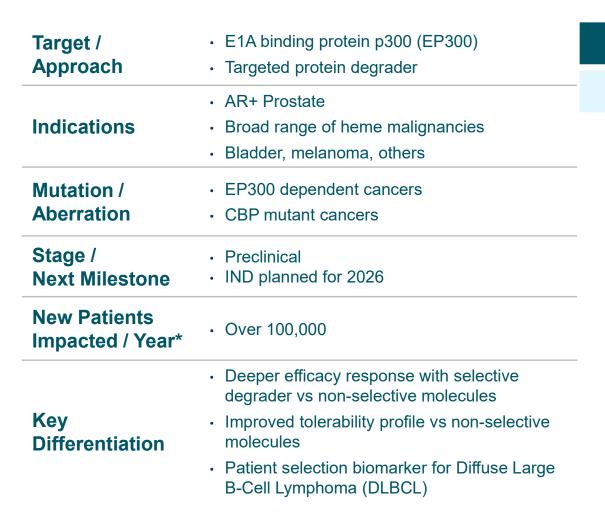
Platelet Counts Post Two Weeks of Dosing (In Vivo Mice Models)







Summary: Selective EP300 Protein Degrader for CBP Mutant & EP300 Dependent Cancers



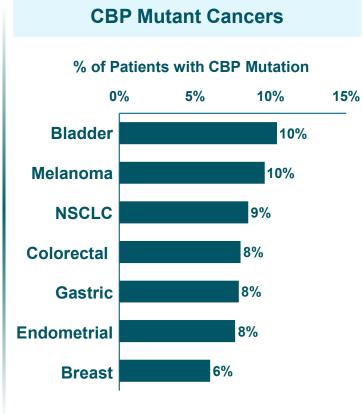
Commercial Opportunity

Solid Tumors

- AR+ mCRPC
- HR+ breast
- Hematologic malignancies

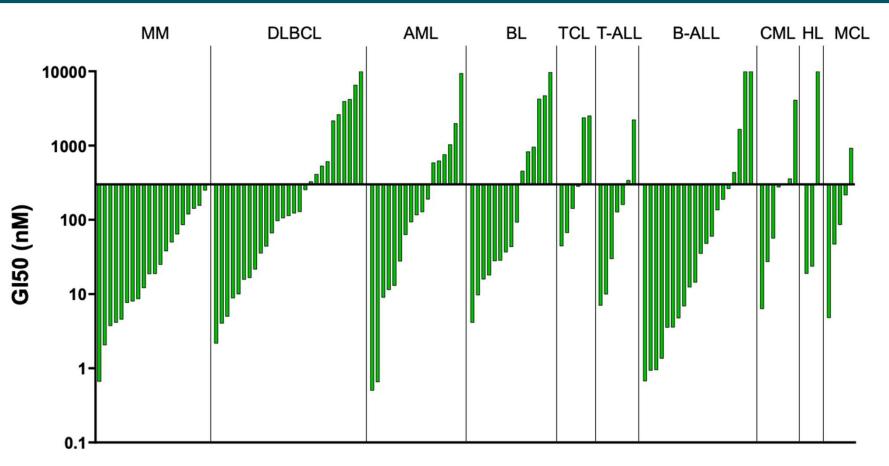
EP300 Dependent Cancers

- DLBCL
- Multiple Myeloma



EP300 Degradation Shows Anti-Proliferative Activity in Broad Range of Hematological Malignancies

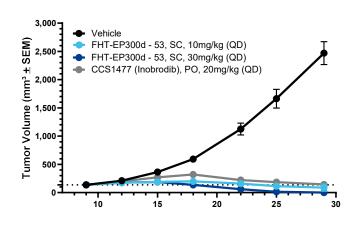


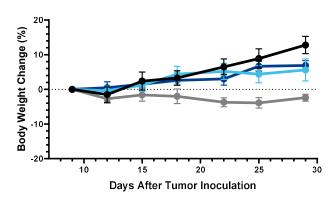




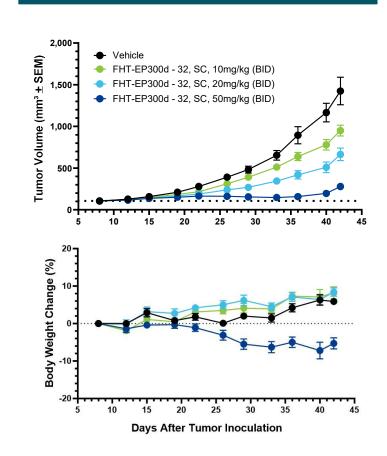
EP300 Degradation Results in Significant Tumor Growth Inhibition in Multiple Myeloma, DLBCL and Prostate Models

Multiple Myeloma (MM1S) CDX

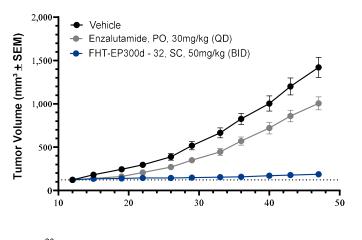


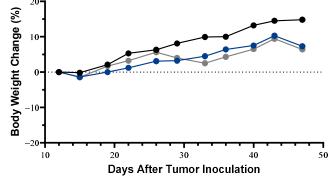


DLBCL (KARPAS422) CDX



AR+ Prostate (VCaP) CDX

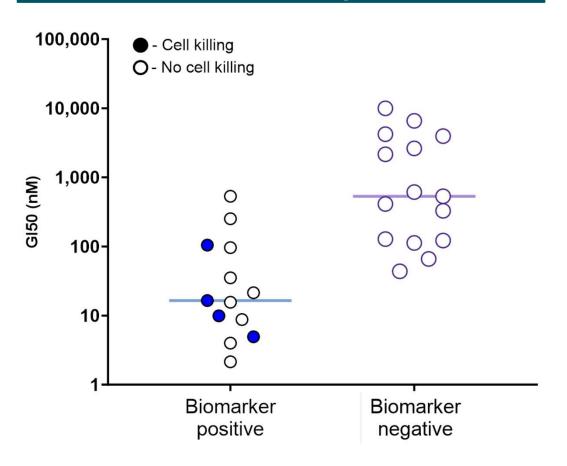






Identification of a Patient Selection Biomarker in DLBCL

In Vitro Anti-Proliferation Screen Using Selective EP300 Degrader

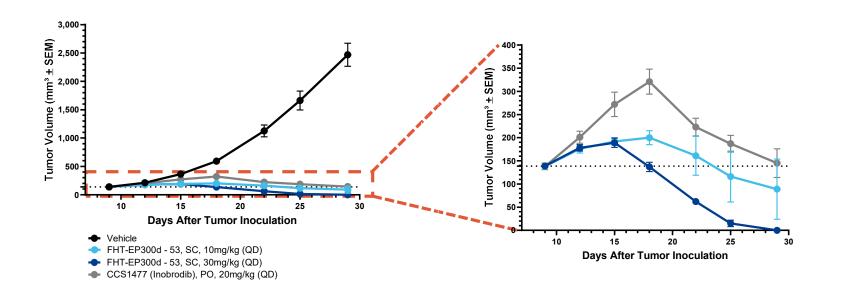


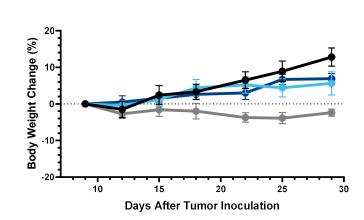
- Screened 27 DLBCL cell lines; ~60% are sensitive
- Two-step biomarker of sensitivity:
 - EP300 present (no high-impact mutations in EP300) and
 - One of two other mutations
- Mechanistic hypothesis being further validated



Selective EP300 Degrader Demonstrated Complete Response (Tumor Regression) in Multiple Myeloma Model

Multiple Myeloma CDX Treated With dEP300 - VHL

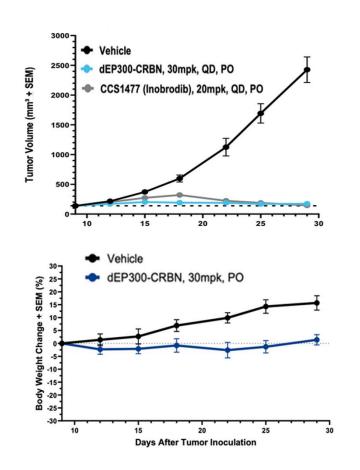


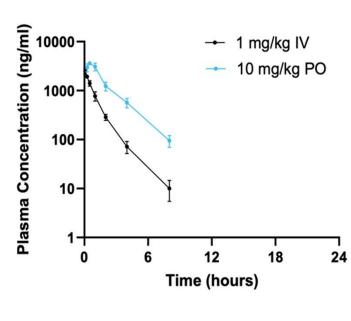


- Non-selective dual CBP/EP300 inhibitor shows tumor stasis, but clinical safety (i.e., thrombocytopenia) resulted in dosing holidays
- Selective EP300 degrader can achieve deeper responses (complete tumor regression) with no thrombocytopenia
- Selective EP300 degrader with improved therapeutic window enables sustained target coverage and improved efficacy

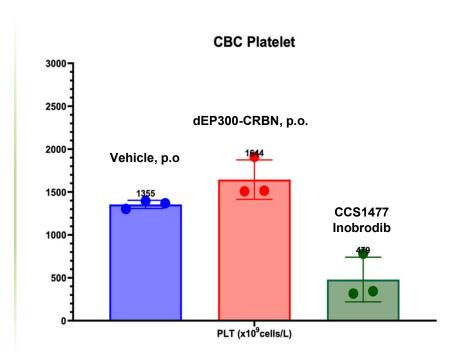
Oral EP300 Selective Degrader Shows Promising Efficacy; Well Tolerated With No Thrombocytopenia

Multiple Myeloma CDX Treated With dEP300 - CRBN



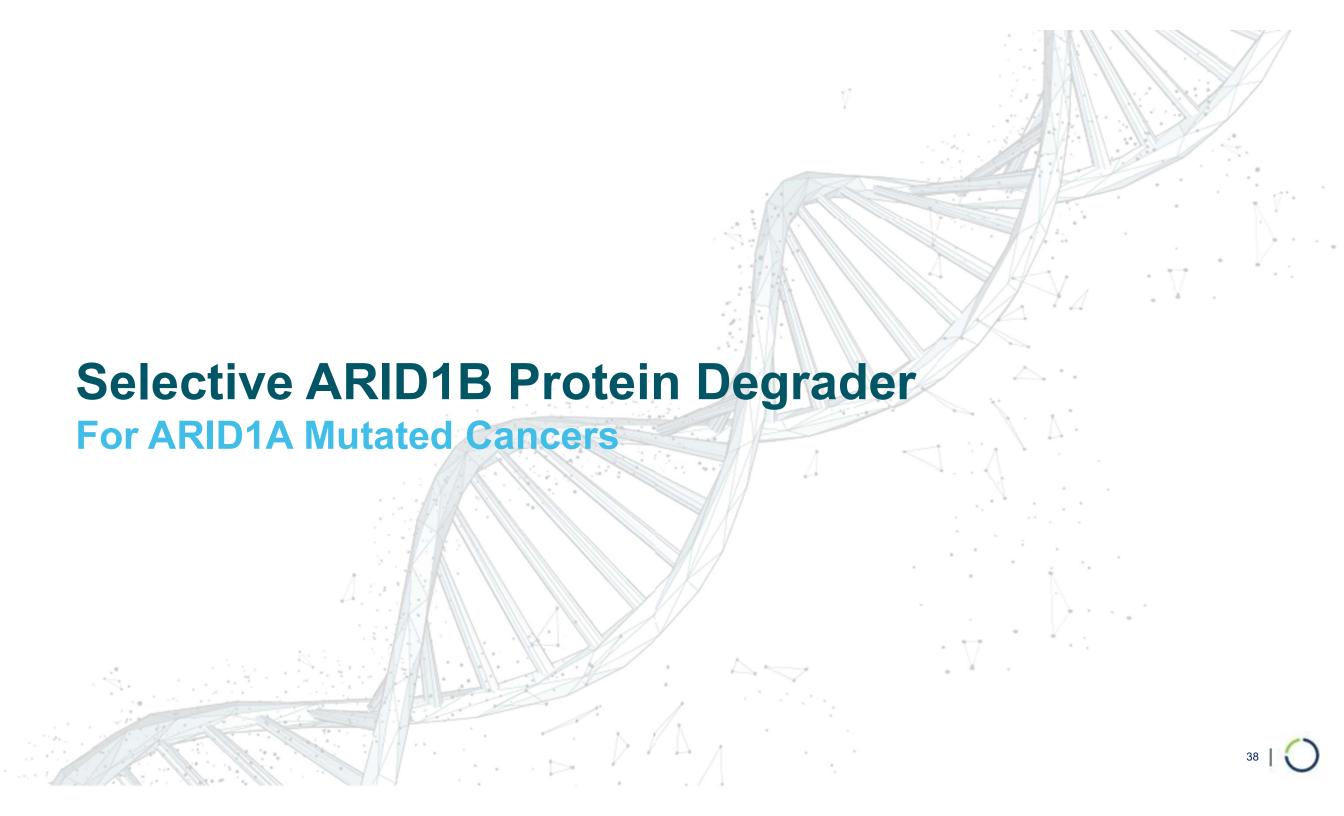






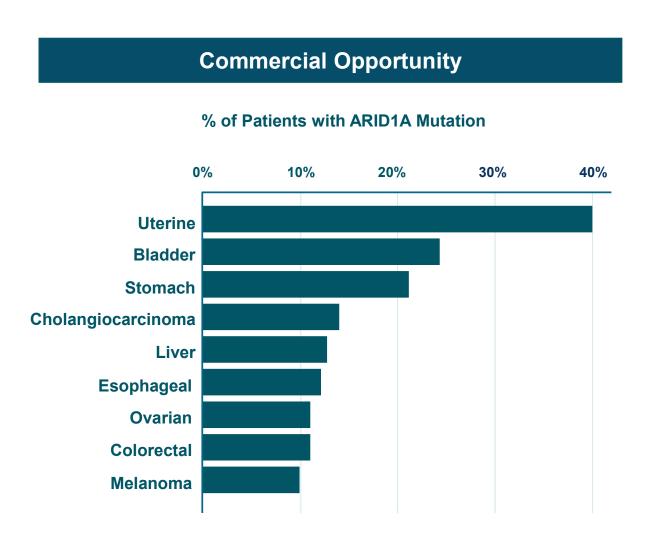
Degrader Selectivity
FHT-EP300d-CRBN DC50 @24h

CBP 50 nM EP300 0.2 nM Fold Selectivity 250x



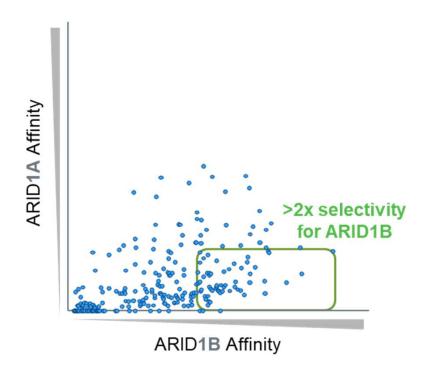
ARID1B is a Major Synthetic Lethal Target With Potential in Up To 5% of All Solid Tumors; Degradation Achieved, Program Update in 2025

Target / Approach	ARID1BTargeted protein degrader
Initial Indication	 ARID1A mutated cancers (e.g. ovarian, endometrial, colorectal, bladder and other cancers)
Mutation / Aberration	ARID1A mutations
Stage / Next Milestone	PreclinicalProgram update in 2025
New Patients Impacted / Year*	 ARID1A is one of the most mutated protein in cancers (~ 5% of all solid tumors) representing 175K addressable patients across solid tumors
Key Differentiation	 Multiple ARID1B binders with nM affinity and selectivity ARID1B degradation achieved



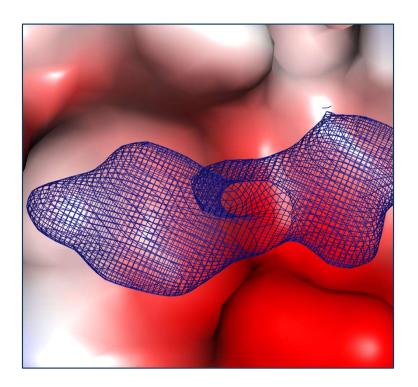
Compound Screening and Structure-Based Optimization Yielded Selective ARID1B Binders

Identification of Selective ARID1B Binders



- Mapped and purified several potential ligandable regions of ARID, which were then screened against various compound libraries
- Characterized binding using multiple biochemical and biophysical techniques: e.g. DSF, ASMS, NMR, and SPR

X-Ray Crystal Structures Detail Selective ARID1B Binding



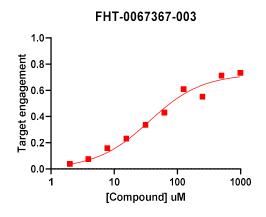
- Determined X-ray crystal structure of ARID ligandable domains with specific binders
- Leveraged these structures to drive binding affinities and expand binding chemotypes

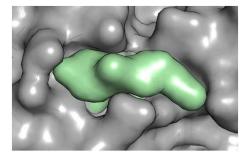


Structure-Based Optimization Drove Improved ARID1B Binding Affinity From 100 uM to Less Than 200 nM

Gen 1: Screening Hit

ARIDb-1 ARID1B Kd: 100 uM

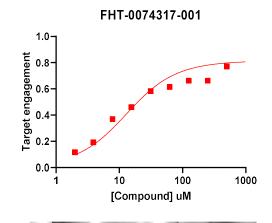


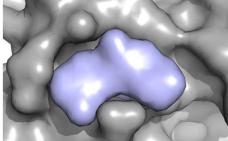


1.4 Å co-xtal structure

Gen 2: Early Optimization

ARIDb-2 ARID1B Kd: 15 uM

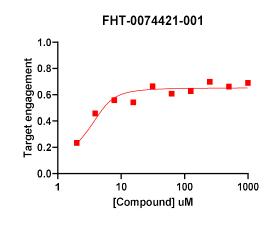


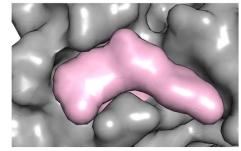


2.0 Å soak structure

Gen 3: Sub-uM Affinity

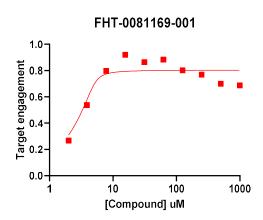
ARIDb-3 ARID1B Kd: 0.5 uM

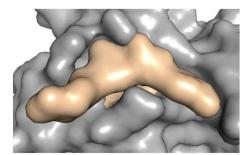




1.9 Å co-xtal structure

ARIDb-9 ARID1B Kd: 0.2 uM



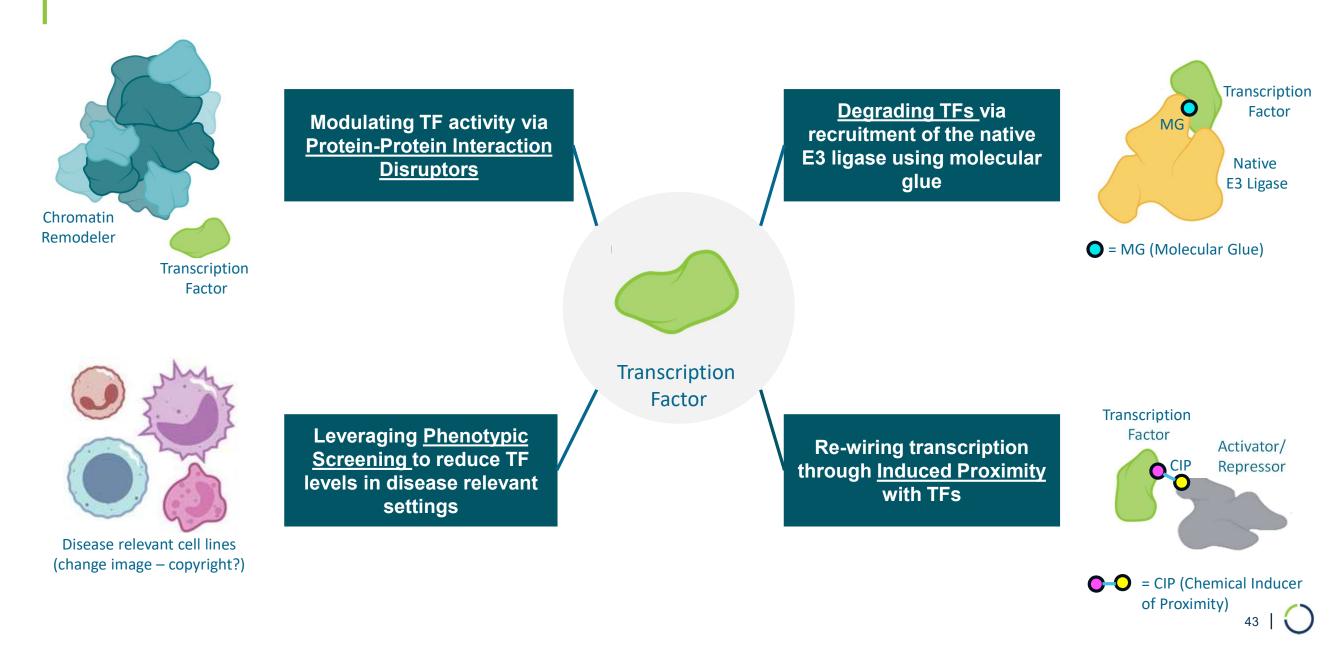


1.7 Å soak structure





Foghorn's Transcription Factor Platform: 4 Approaches



Multiple Near-Term Value Inflection Points Through 2026

FHD-909 (LY4050784) (Selective SMARCA2 Inhibitor)

Selective SMARCA2 Degrader

Selective CBP Degrader

Lilly Target #2

Selective EP300 Degrader

Selective ARID1B Degrader

Preclinical Combination Data	April 2025 (AACR)
Phase 1 Dose Escalation Data	Confidential
IND / Phase 1 Initiation	Confidential
IND / Phase 1 Initiation	2026
Target Disclosure and IND	Confidential
IND / Phase 1 Initiation	2026
Selective Degradation Achieved	Program Update 2025

Developing First-in-Class Precision Medicines Targeting Major Unmet Needs in Cancer



Leader in Unique Area of Cancer Biology

Foghorn is a leader in targeting chromatin biology, which has the potential to address underlying dependencies of many genetically defined cancers

Platform with initial focus in oncology, therapeutic area expansion potential



Large Market Potential

Chromatin biology is implicated in up to 50% of tumors, potentially impacting ~2.5 million patients

Foghorn's current pipeline potentially addresses more than 500,000 of these patients

Broad pipeline across a range of targets and small molecule modalities



Well-Funded

\$243.8 million in cash and equivalents (unaudited)

(as of 12/31/2024)

Cash runway into 2027

Shares outstanding: approximately 62.5M*



Value Drivers

Selective SMARCA2 Inhibitor, FHD-909, partnered with Lilly, in **Phase 1 trial**

Advancement of preclinical assets (Selective SMARCA2 Degrader, CBP, EP300, ARID1B) towards INDs

Protein degrader platform with expansion into induced proximity



Major Strategic Collaboration

Strategic collaboration with Lilly; **\$380 million upfront;** 50/50 U.S. economic split on two lead programs



FCGHORN® THERAPEUTICS

Unique biology
Precision therapeutics
Broad impact



Lilly Collaboration Validates Foghorn Approach: Significant Upfront and Deal Economics



\$380 Million Up-front

\$300 million cash

\$80 million in Foghorn common stock at a price of \$20 per share



50/50 U.S. Economics on Two Programs

50/50 U.S. economic split on SMARCA2-Selective and another undisclosed program

Tiered ex-U.S. royalties starting in the low double-digit range and escalating into the twenties based on revenue levels



Three Undisclosed Discovery Programs

Option to participate in a percentage of the U.S. economics

Tiered ex-U.S. royalties from the mid-single digit to lowdouble digit range

\$1.3 billion in potential milestones

