

ESPERION[®]

Welcome to R&D Day

April 24, 2025



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Leadership in Attendance



Sheldon Koenig

PRESIDENT AND CHIEF
EXECUTIVE OFFICER



Ben Halladay

CHIEF FINANCIAL OFFICER



BJ Swartz

CHIEF BUSINESS OFFICER



Stephen Pinkosky, PhD

VP, EARLY & PRE-
CLINICAL DRUG
DISCOVERY



LeAnne Bloedon, MS, RD

VP, CLINICAL
DEVELOPMENT



Satish Nachaegari

VP, GLOBAL
REGULATORY AFFAIRS

Key Opinion Leaders & Advocacy Partners



Christos Mantzoros
MD, DSc, PhD h.c. mult

PROFESSOR OF MEDICINE
HARVARD MEDICAL SCHOOL



David E. Cohen
MD, PhD

CHIEF, DIVISION OF GASTROENTEROLOGY,
HEPATOLOGY AND ENDOSCOPY, BRIGHAM
AND WOMEN'S HOSPITAL



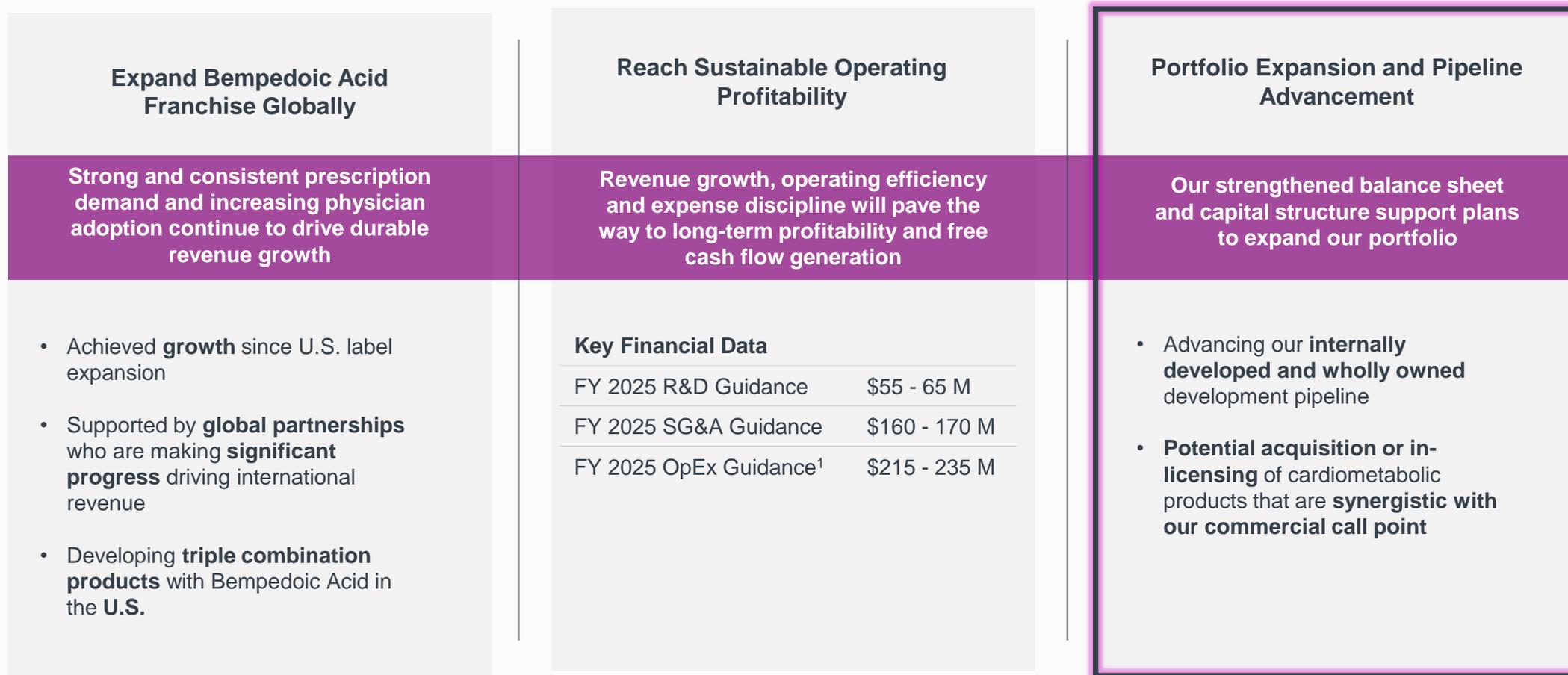
Mary Pressley Vyas
VP, STRATEGIC INITIATIVES
PSC PARTNERS

AGENDA

ESPERION R&D Day 2025

9:00 am	Welcome and Opening Remarks Sheldon Koenig, President and CEO, Esperion
9:05 am	Next Gen ACLY Inhibition Discovery Program Introduction Stephen Pinkosky, PhD, VP Early & Pre-Clinical Drug Discovery, Esperion
9:10 am	ACLY as an Energy Nexus Christos Mantzoros, MD, DSc, PhD h.c. mult, Professor of Medicine, Harvard Medical School
9:35 am	Identification of Novel ACLY Pathways Stephen Pinkosky, VP Early & Pre-Clinical Drug Discovery, Esperion
10:00 am	Primary Sclerosing Cholangitis David E. Cohen, MD, PhD Chief, Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital
10:25 am	Break
10:35 am	PSC Patient Voice: Insights from Patients and Advocates Mary Pressley Vyas, VP Strategic Initiatives, PSC Partners
10:50 am	Introduction to Lead Candidate & Market Opportunity Stephen Pinkosky, PhD, VP Early & Pre-Clinical Drug Discovery, Esperion
11:05 am	KOL Discussion Christos Mantzoros, MD, DSc, PhD h.c. mult, Professor of Medicine, Harvard Medical School David E. Cohen, MD, PhD Chief, Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital
11:30 am	Q&A
11:55 am	Closing Remarks Sheldon Koenig, President and CEO, Esperion

Three Pillar Strategy for Success



1. Includes ~\$15 million of non-cash stock-based compensation expense

Esperion's Next Generation ACLY Inhibition Discovery Program



Stephen Pinkosky, PhD

Vice President, Drug Discovery, Early Pre-Clinical Development

Expanding Our Pipeline Through ACLY Innovation and Expertise

Innovative Portfolio & Pipeline

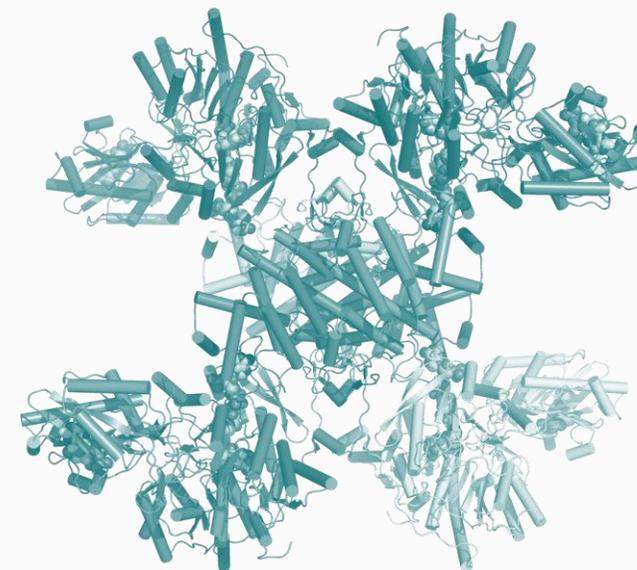
PRODUCT/PROGRAM	EXPLORATORY	LEAD ID	LEAD OPTIMIZATION	PRECLINICAL DEVELOPMENT	CLINICAL DEVELOPMENT	APPROVED / COMMERCIAL	MILESTONES
Cardiovascular Disease (LDL-C lowering / CV Risk reduction)							
NEXLETOL® bempedoic acid	Progressing	Progressing	Progressing	Progressing	Progressing	Approved	Approved 2020 Expanded label 2024
NEXLIZET® bempedoic acid and ezetimibe	Progressing	Progressing	Progressing	Progressing	Progressing	Approved	Approved 2020 Expanded label 2024
Triple Combination A bempedoic acid, ezetimibe, and atorvastatin	Progressing	Progressing	Progressing	Progressing	Not Started	Not Started	NDA: 2027
Triple Combination B bempedoic acid, ezetimibe, and rosuvastatin	Progressing	Progressing	Progressing	Progressing	Not Started	Not Started	NDA: 2027
Liver Diseases							
Primary Sclerosing Cholangitis (PSC)	Progressing	Progressing	Progressing	Not Started	Not Started	Not Started	IND: 2026
Renal Diseases							
	Progressing	Progressing	Progressing	Not Started	Not Started	Not Started	To Be Announced

ACLY: ATP citrate lyase; LDL-C: low-density lipoprotein cholesterol; CV: cardiovascular; NDA: New Drug Application; IND: Investigational New Drug

Leveraging Decades of Expertise in ACLY Inhibition

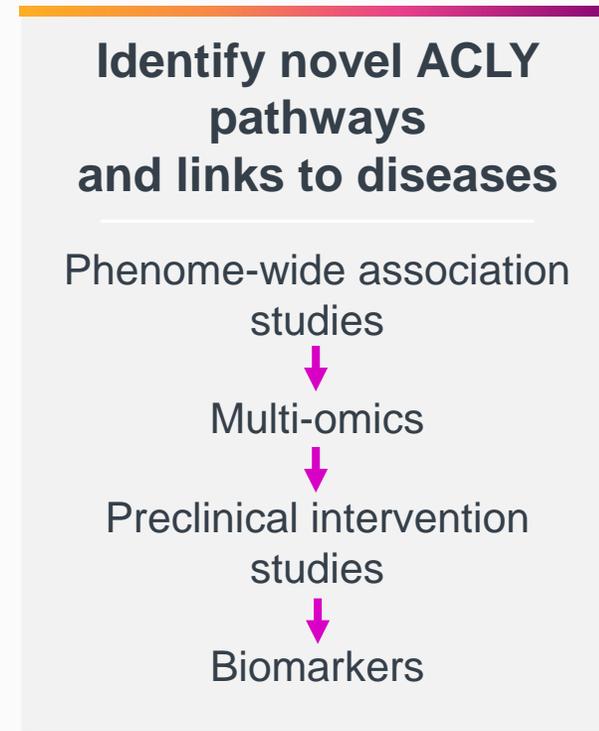
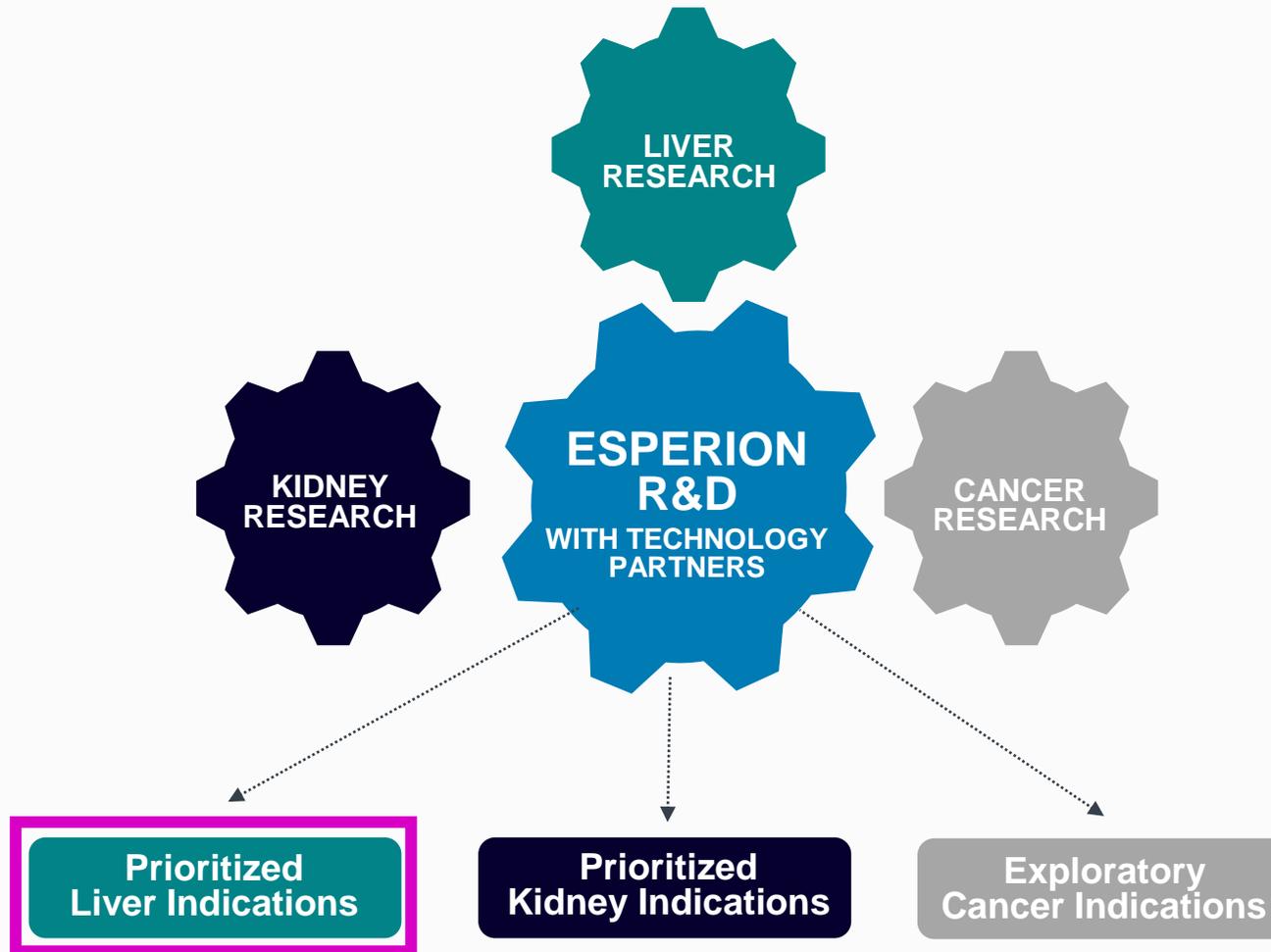
Objectives of the Next-Generation ACLY Inhibitor Discovery Program:

- **Use leading edge approaches and technology** to identify/design differentiated new chemical entity
- **Improve potency and specificity** several orders of magnitude vs current active site inhibitors
- **Target several cell types** important in disease pathogenesis
- **Identify potential indications and patient populations** using leading-edge bioinformatic approaches



ACLY
(homotetramer)

Target Validation Informs Esperion's Next-Generation Indication Selection



ACLY: ATP citrate lyase

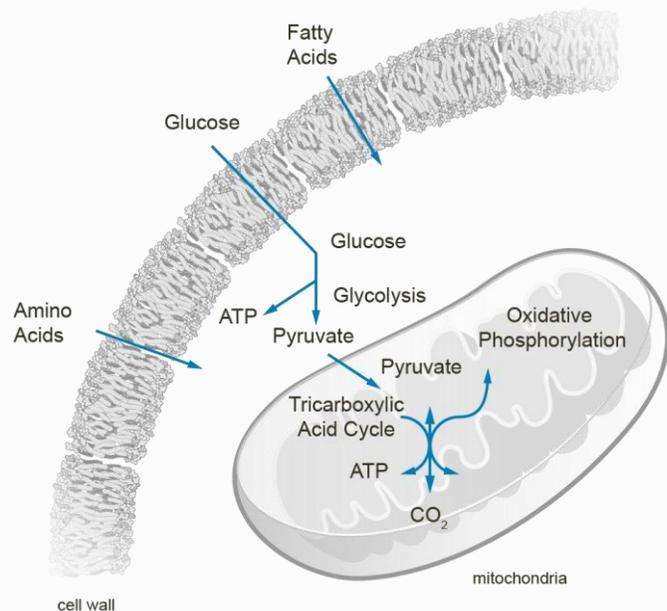
ACLY as an Energy Nexus



Christos Mantzoros MD, DSc, PhD h.c. mult
Professor of Medicine, Harvard Medical School

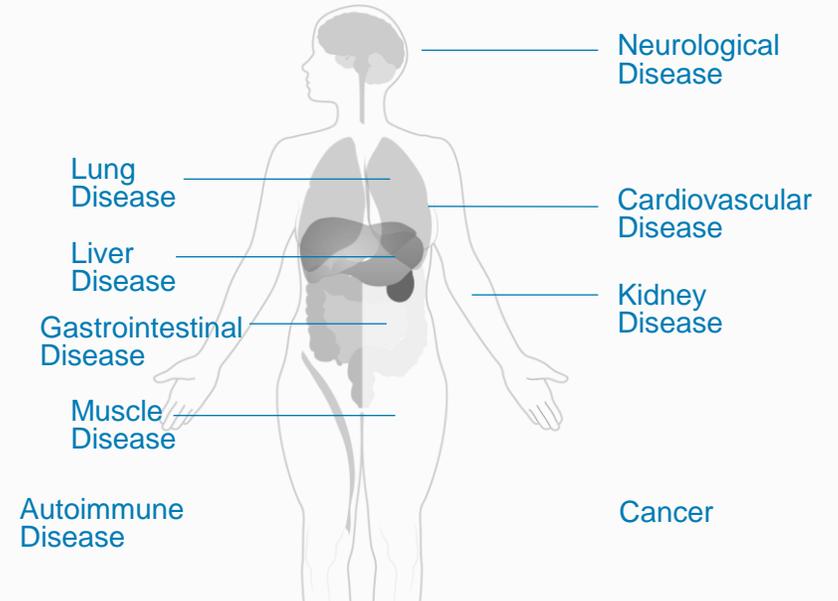
Dysregulated Cellular Energetics Drive Many Diseases¹⁻³

Metabolic Energy Pathways



Dysregulation

Development of Disease



Cellular energetics are a fundamental aspect of biology describing how cells generate and utilize energy.

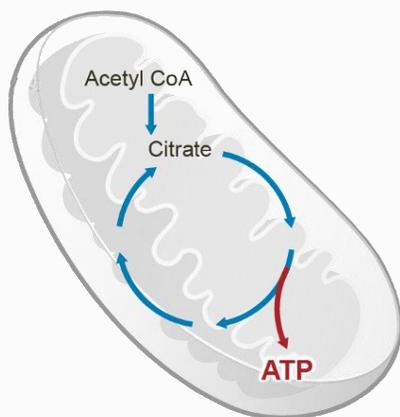
When dysregulated, there is disruption of normal energy production and utilization primarily linked to tricarboxylic acid (TCA) cycle function.

ATP: adenosine triphosphate

The Canonical and Non-Canonical TCA Cycles are Critical Metabolic Pathways in All Cells¹⁻³

There are 2 versions of the TCA cycle which differentially control acetyl CoA within the cell

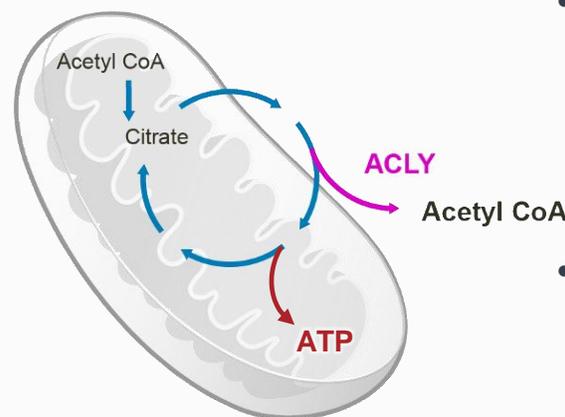
Canonical TCA (Krebs) Cycle



mitochondria

- Primarily **catabolic pathway** that consumes lipids and carbohydrates to **generate ATP—energy production**
- Occurs in **mitochondria only**

Non-Canonical TCA Cycle

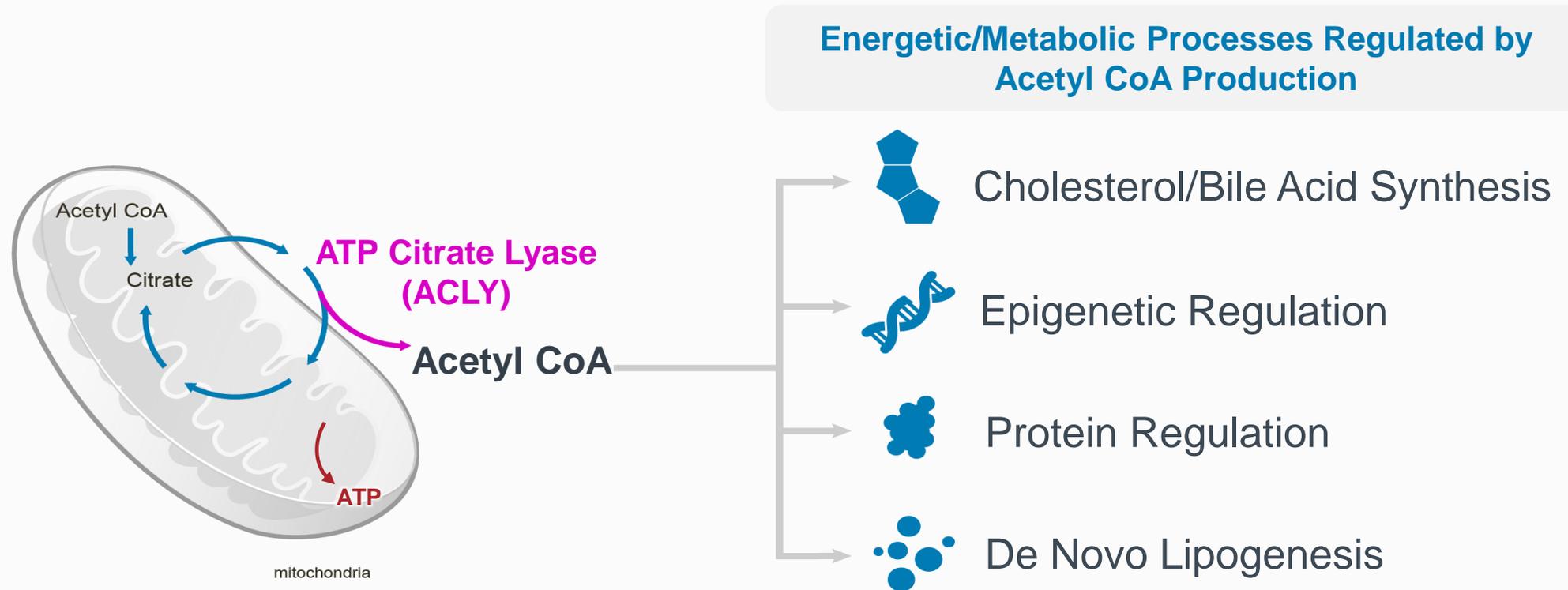


mitochondria

- Primarily **anabolic pathway** that supports cell states with high demands due to **accelerated proliferation and/or effector functions**
- Utilized by **highly proliferative cells**, cancer cells, and stem cells
- Occurs **across mitochondria, cytoplasm, and nucleus**

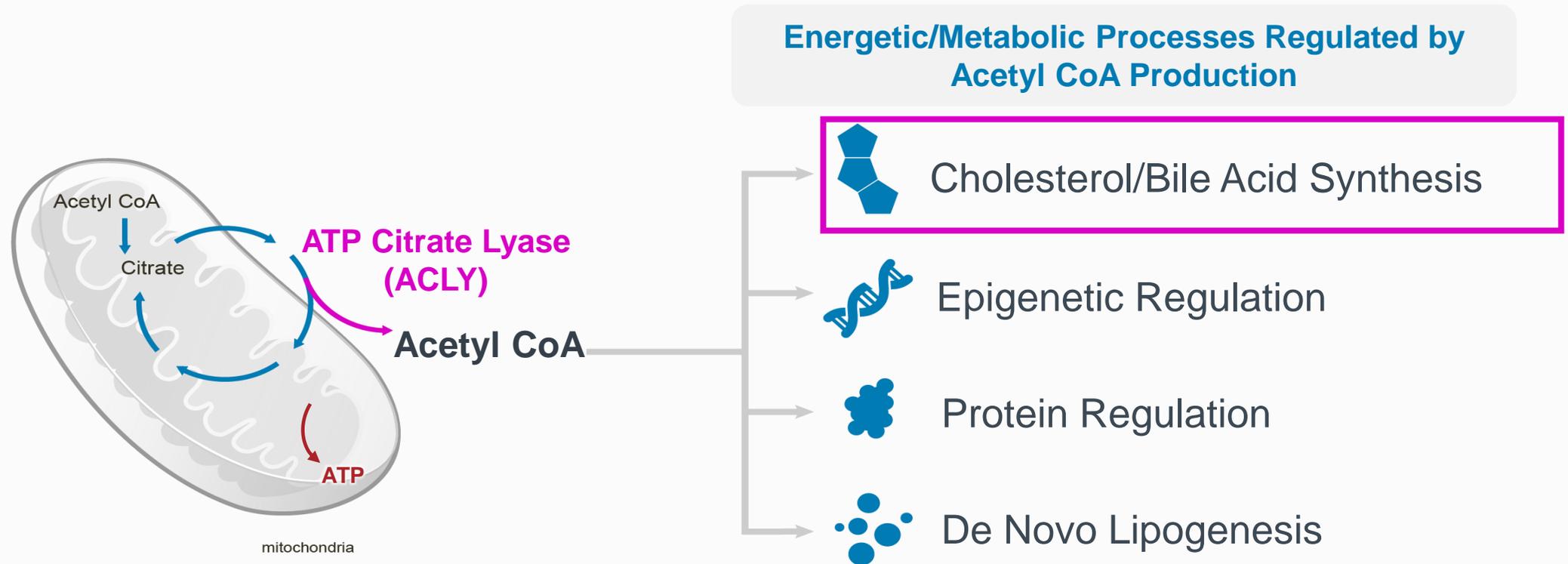
ACLY is the Key Enzyme in the Non-Canonical TCA Cycle^{1,2}

A combination of genetic and lifestyle factors promote maladaptation of the ACLY-dependent energy-sensing nexus and lead to upregulation in multiple cell types



ACLY is the Key Enzyme in the Non-Canonical TCA Cycle^{1,2}

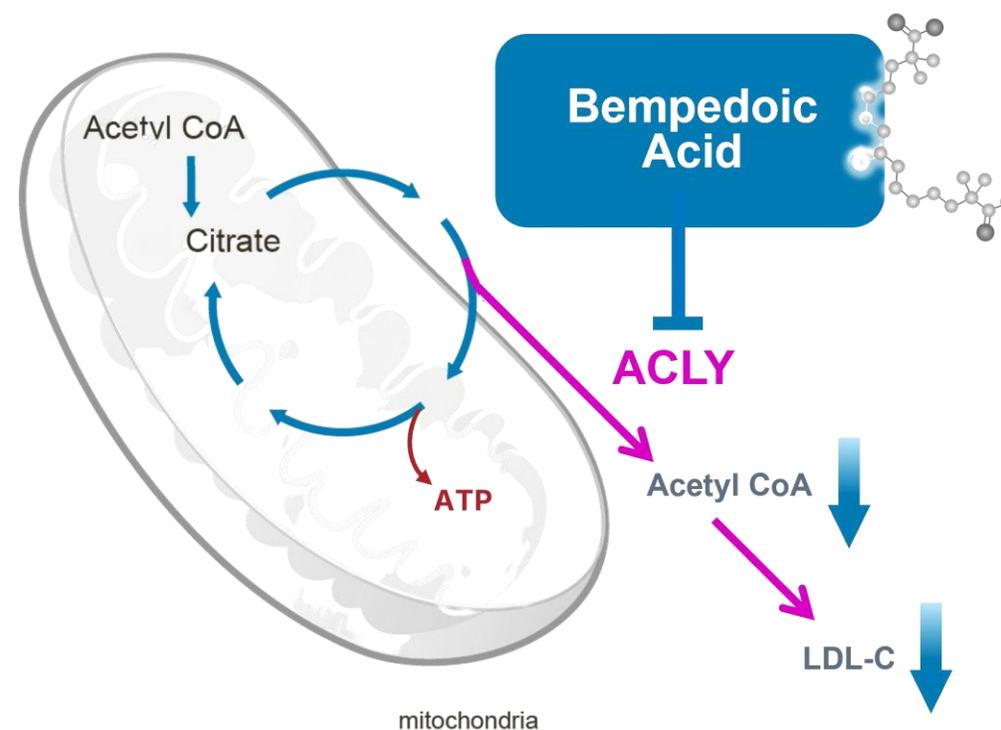
A combination of genetic and lifestyle factors promote maladaptation of the ACLY-dependent energy-sensing nexus and lead to upregulation in multiple cell types



Bempedoic Acid is an Active Site Hepatocellular ACLY Inhibitor¹⁻³

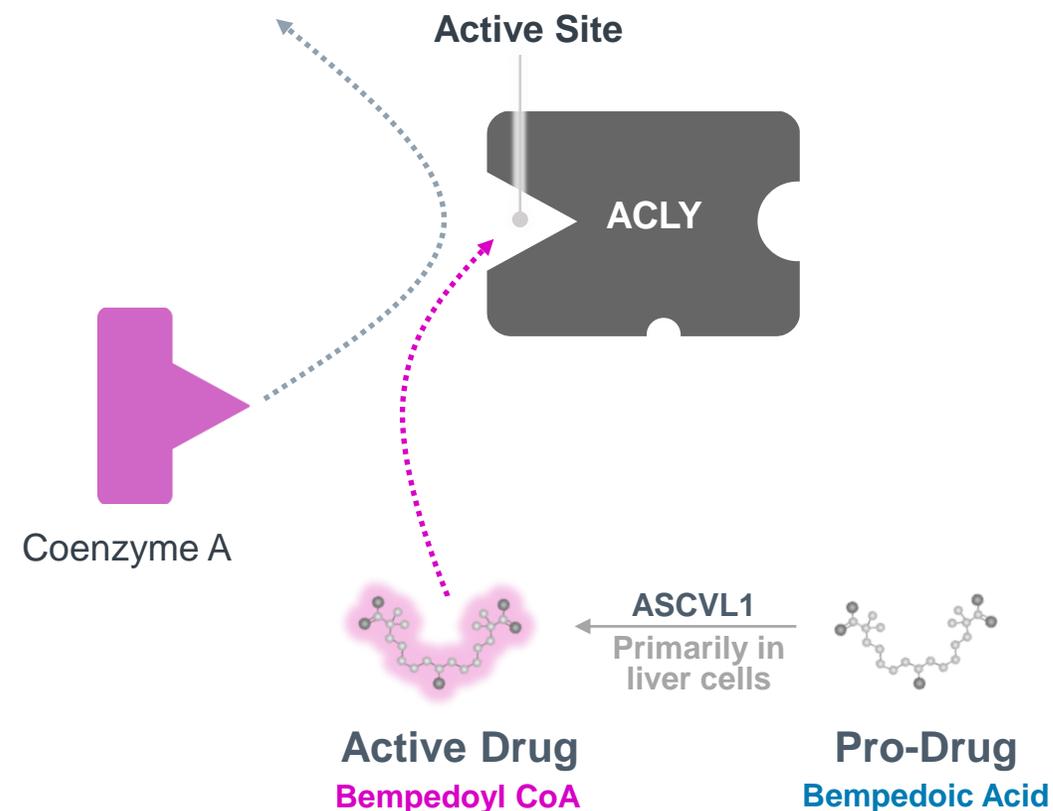
Developed by Esperion, bempedoic acid:^{1,2}

- Is the first and only approved ACLY inhibitor
- FDA-approved to lower LDL-cholesterol and to reduce the risk of MI and coronary revascularization in adults



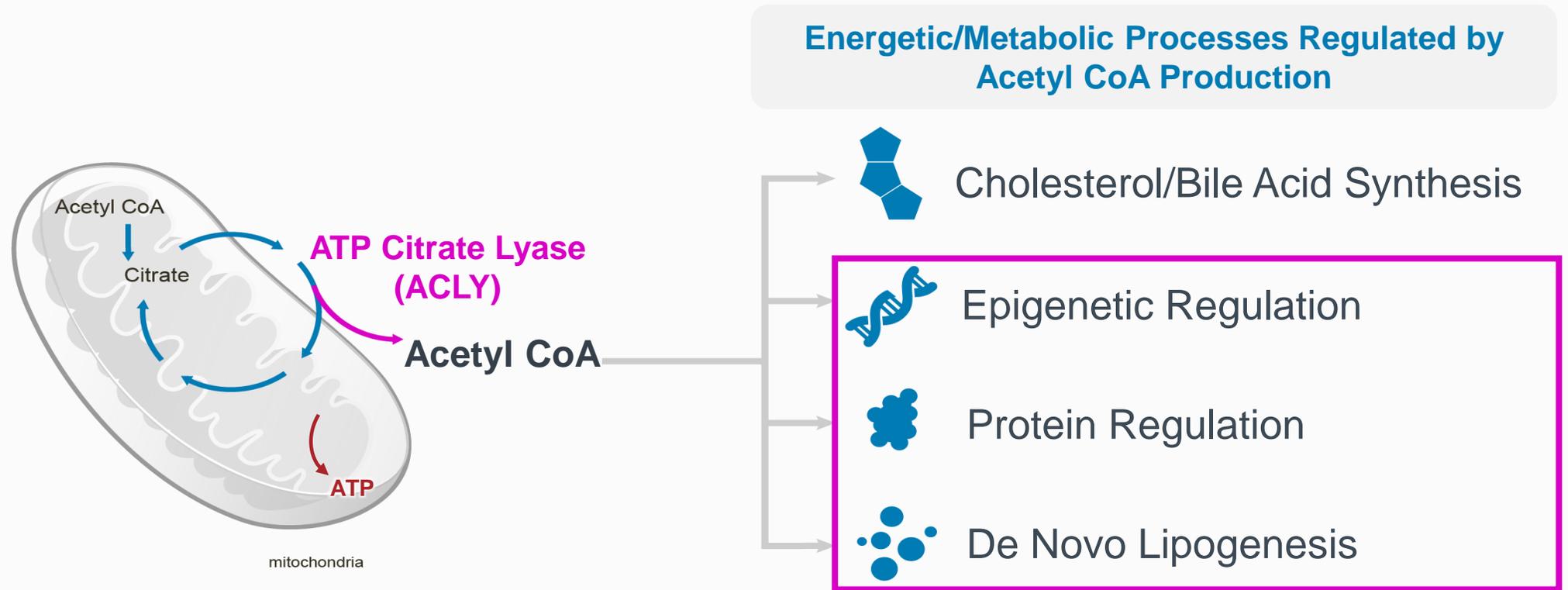
Bempedoic Acid Activity is Restricted to Hepatocytes¹⁻³

- **Bempedoic acid** is a pro-drug converted in hepatocytes to its active drug form, Bempedoyl CoA^{1,2}
- **Bempedoyl CoA** inhibits ACLY by directly competing for the active site with coenzyme A^{1,2}

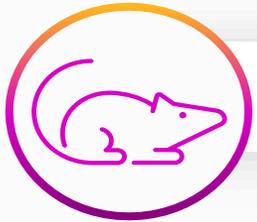


ACLY is the Key Enzyme in the Non-Canonical TCA Cycle^{1,2}

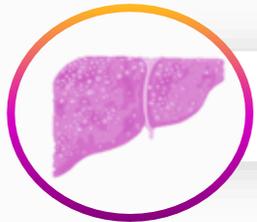
A combination of genetic and lifestyle factors promote maladaptation of the ACLY-dependent energy-sensing nexus and lead to upregulation in multiple cell types



Preclinical & Clinical Studies Demonstrate Marked Upregulation of ACLY in Metabolic Dysfunction-Associated Liver Diseases (MASLD)^{1,2}



ACLY expression is upregulated in livers of *db/db* mice with obesity, fatty liver, and T2D¹

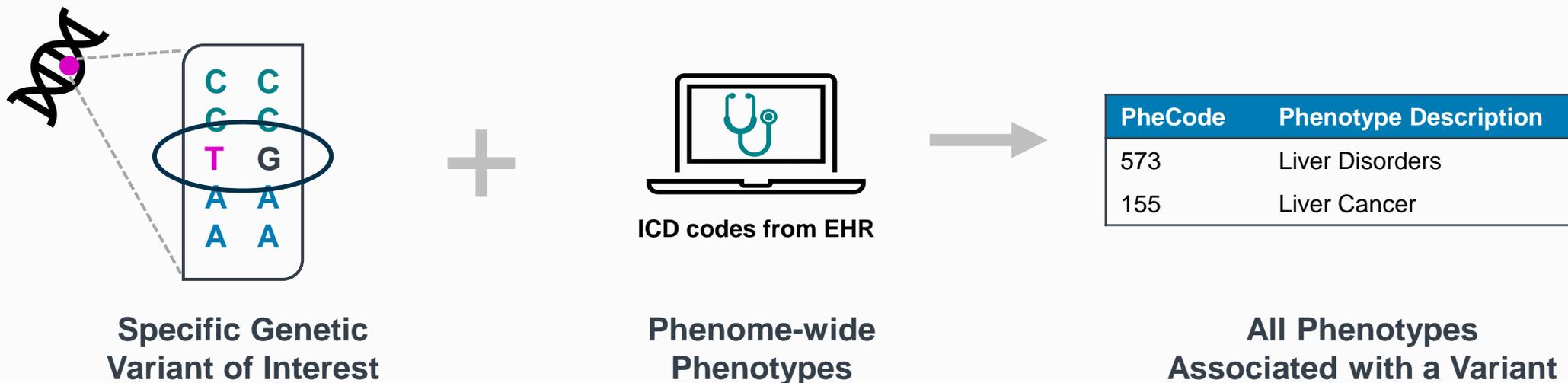


ACLY mRNA levels ~1.4-fold higher in macrophages from patients with MASH vs controls²



ACLY protein levels are increased in livers of patients with MASH & MASLD vs controls²

Mechanistic Validation of ACLY Inhibition and Identification of Potential New Therapeutic Indications



Phenome-wide association studies (PheWAS) use large data sets to search for phenotypes (an observed trait such as a disease state) associated with a specific genetic variant¹

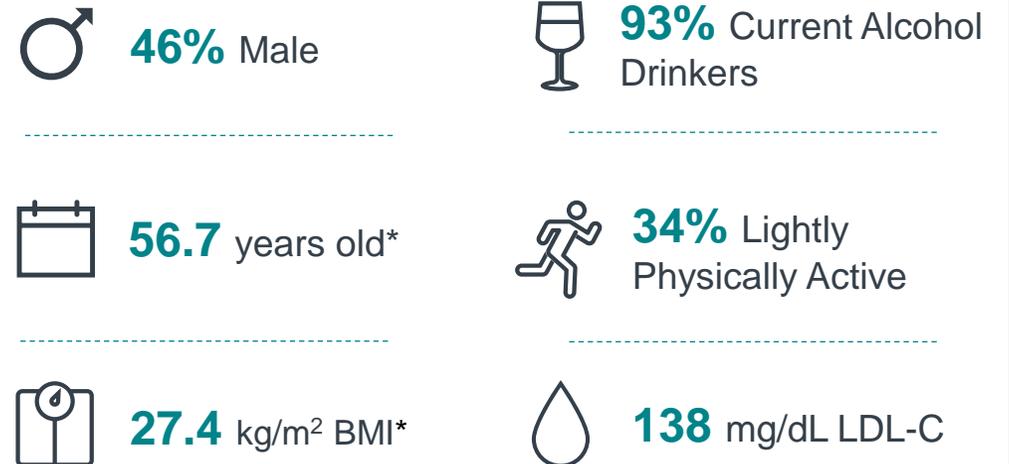
UK BioBank Allows for Mechanistic Validation of ACLY Inhibition in Liver Disease

Population-based prospective cohort study of ~500,000 adults aged 40-69 years recruited in 2006-2010

The study continues to collect extensive phenotypic and genotypic detail for a wide range of health-related outcomes¹

- Questionnaires
- Disease/Cancer registry
- Physical measures
- Hospital EHR data
- Sample assays
- Multimodal imaging
- Accelerometry

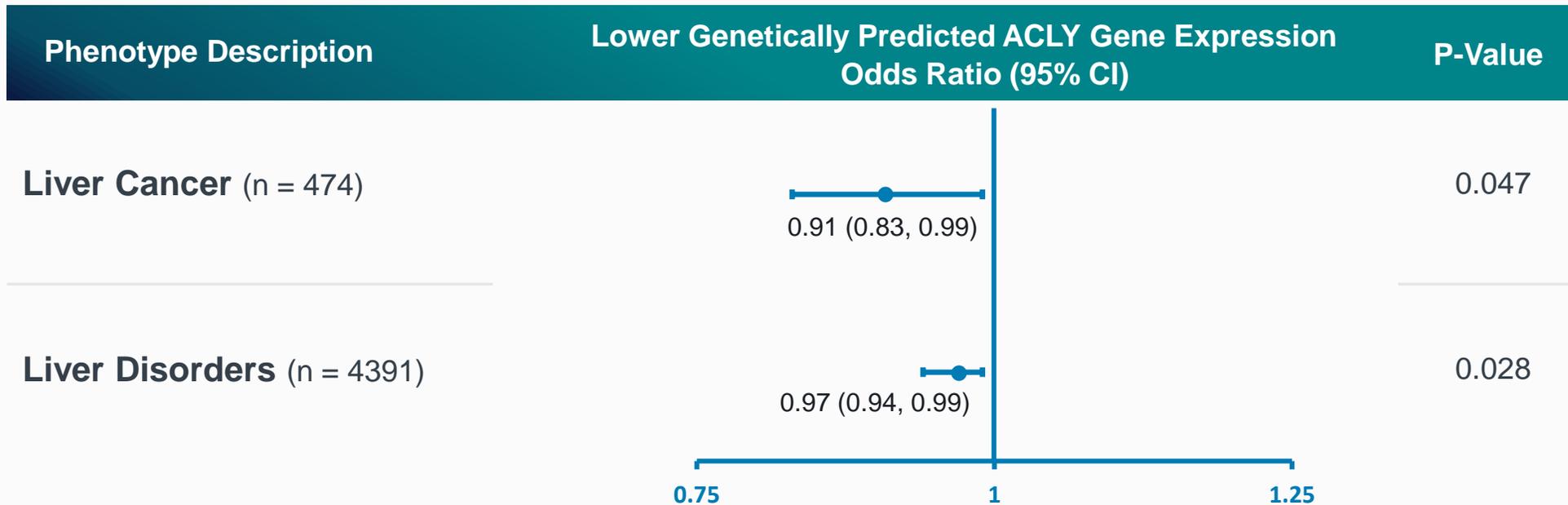
Baseline Characteristics of UK BioBank Participants



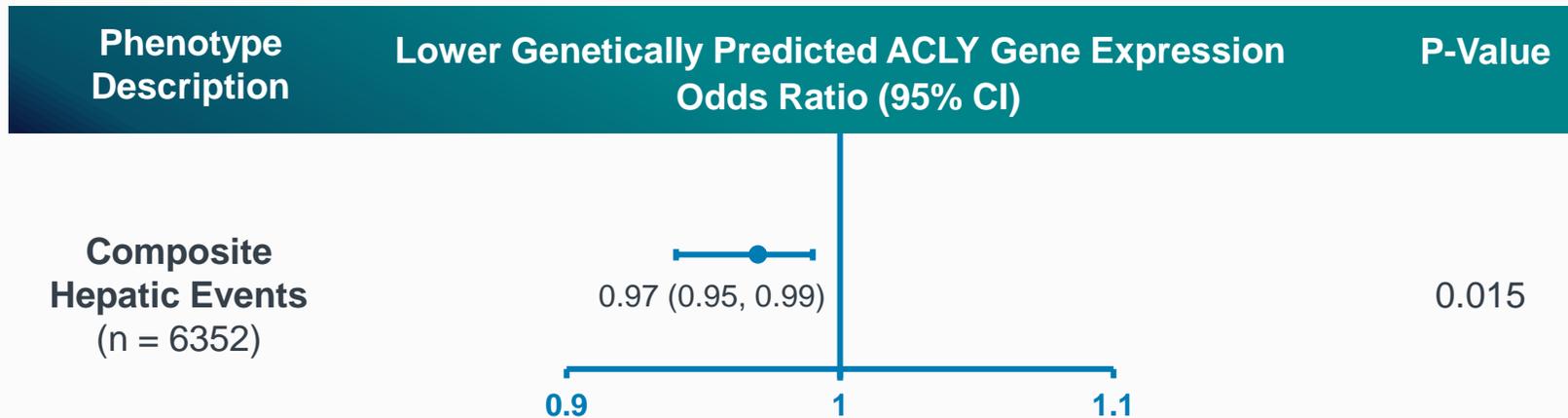
*mean; UK: United Kingdom; BMI: body mass index; EHR:electronic health record; LDL-C: low density lipoprotein cholesterol

ACLY Inhibition May Have Protective Effects on Reducing Risk of Liver Cancer and Disorders

Individual-level data (n=385,917) from the UK BioBank was utilized to infer lifelong effects of ACLY inhibition across a range of liver outcomes through PheWAS



Genetically Predicted ACLY Inhibition is Significantly Associated with Decreased Risk of Composite Hepatic Events



Composite Hepatic Events Components

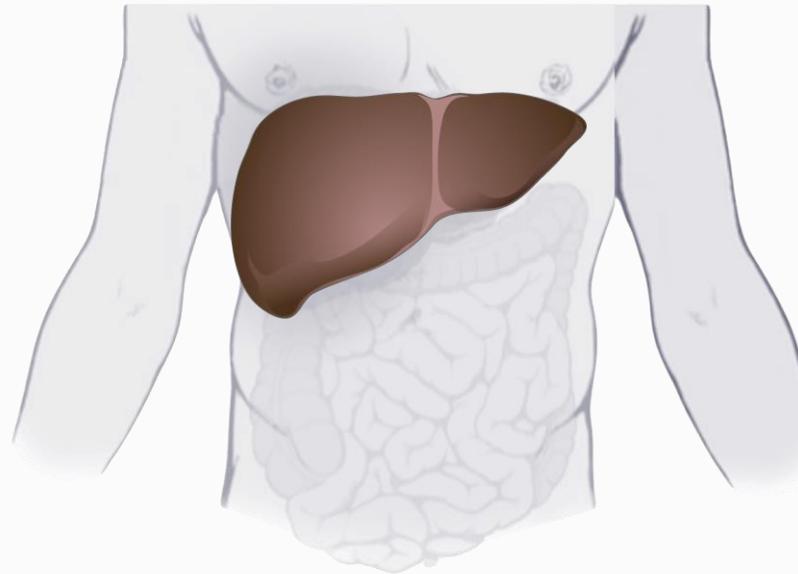
- Hepatic Encephalopathy
- Hepatic Decompensation
- New-Onset or Deterioration of Ascites
- Variceal Bleeding
- Acute-on-Chronic Liver Failure
- Hepatocellular Carcinoma

PheWAS Data Supports the Causal Role of ACLY Dysregulation in Multiple Liver Disorders

Examples from the Liver Disorders PheWAS Code¹

Metabolic Dysfunction-Associated
Steatotic Liver Disease

Chronic Active Hepatitis

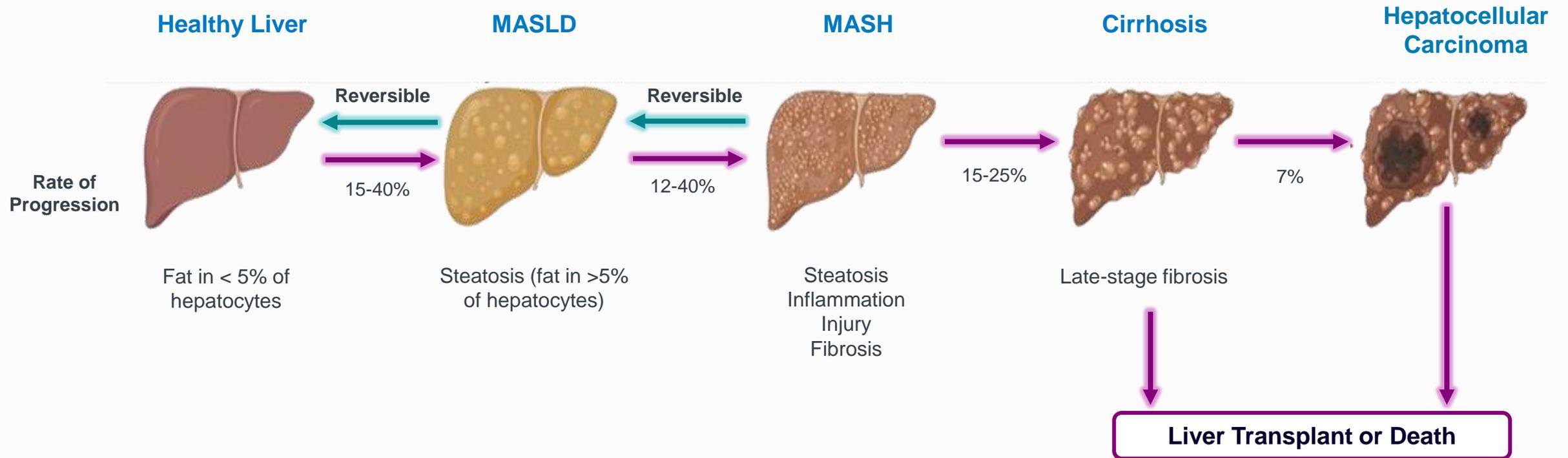


Hepatopulmonary
Syndrome

Liver Transplant

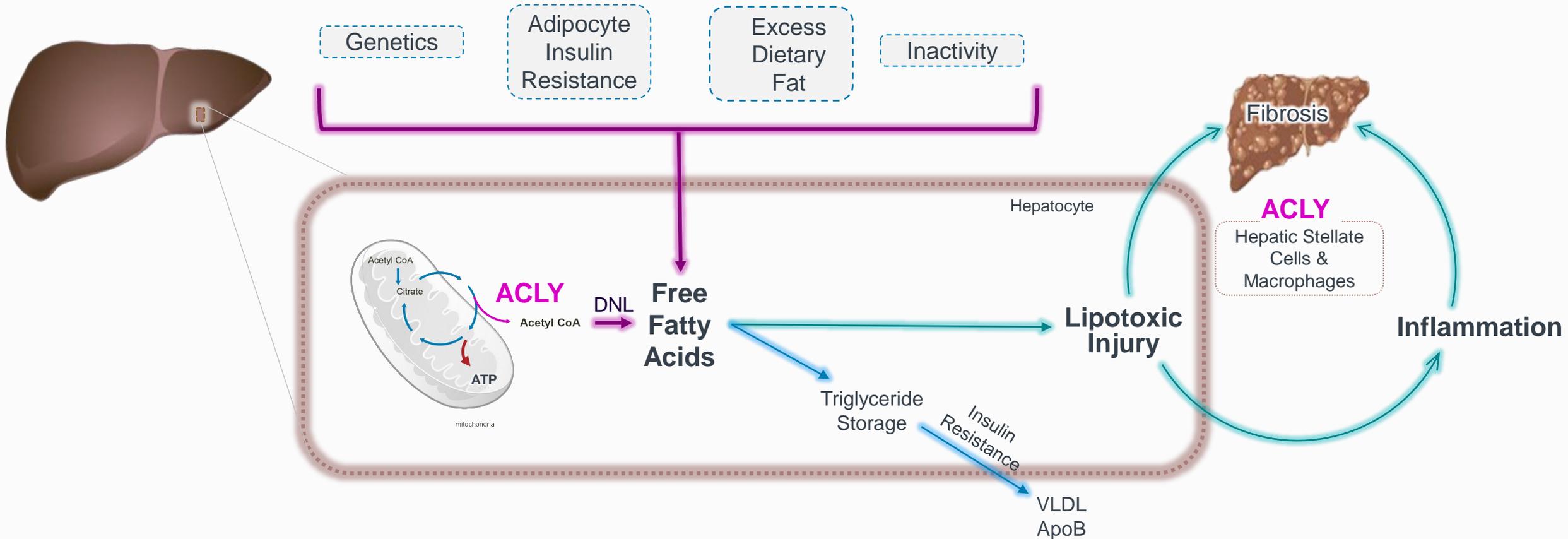
MASLD Provides Broad Population to Mechanistically Validate ACLY Inhibition in Liver Disease

Inflammation, oxidative stress, insulin resistance, altered lipid metabolism, and fibrosis contribute to the progression of MASLD



ACLY: ATP citrate lyase; MASH: metabolic dysfunction-associated steatohepatitis, MASLD: metabolic-associated steatotic liver disease

Proposed Pathophysiologic Role of ACLY in Progression of MASLD/MASH



ACLY: ATP citrate lyase; DNL: de novo lipogenesis; VLDL: very low-density lipoprotein; ApoB: Apolipoprotein B; MASH: metabolic dysfunction-associated steatohepatitis, MASLD: metabolic-associated steatotic liver disease; Acetyl CoA: acetyl coenzyme A

In normal liver physiology, these are bidirectional processes to maintain homeostasis

1. Valenzuela-Vallenjo L, Guatibona-Garcia V, Mantzoros CS. *Metabolism*. 2022 Nov;136:155248.

ACLY Inhibition has Broad Applicability to Reduce Liver Disease

ACLY is the key enzyme in the non-canonical TCA cycle, an energy nexus in all cells

Genetically predicted associations of decreased risk of liver disorders through ACLY inhibition justifies deeper investigation through multi-omic analyses

MASLD provides a broad population to investigate novel connections of ACLY to liver disease

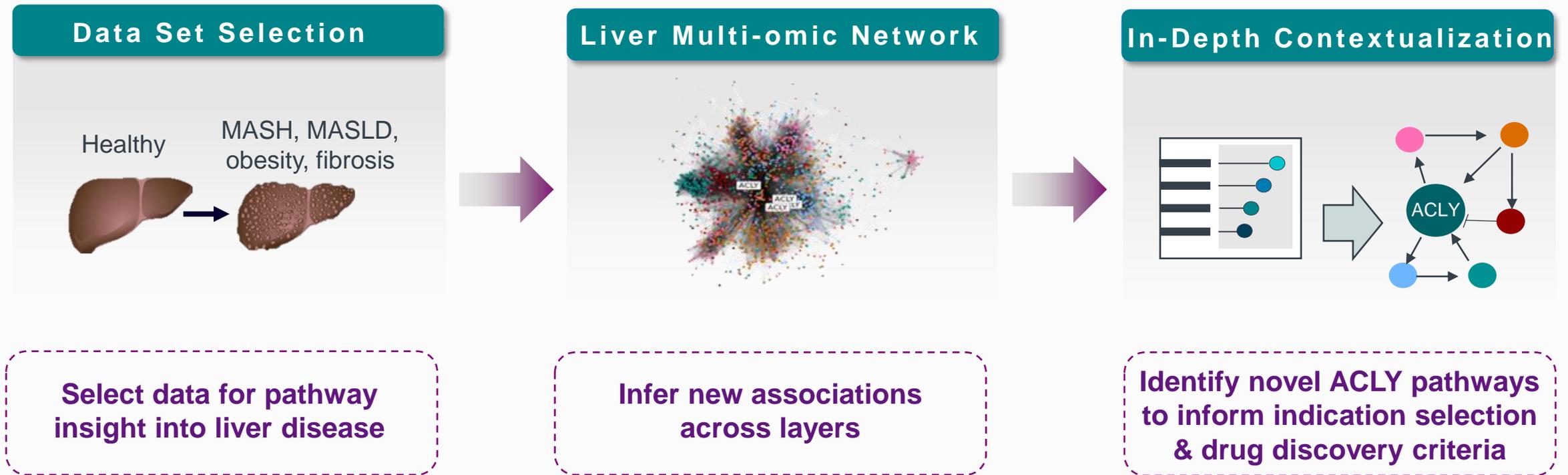
Identification of Novel ACLY Pathways and New Indications Using Human Multi-omics



Stephen Pinkosky, PhD

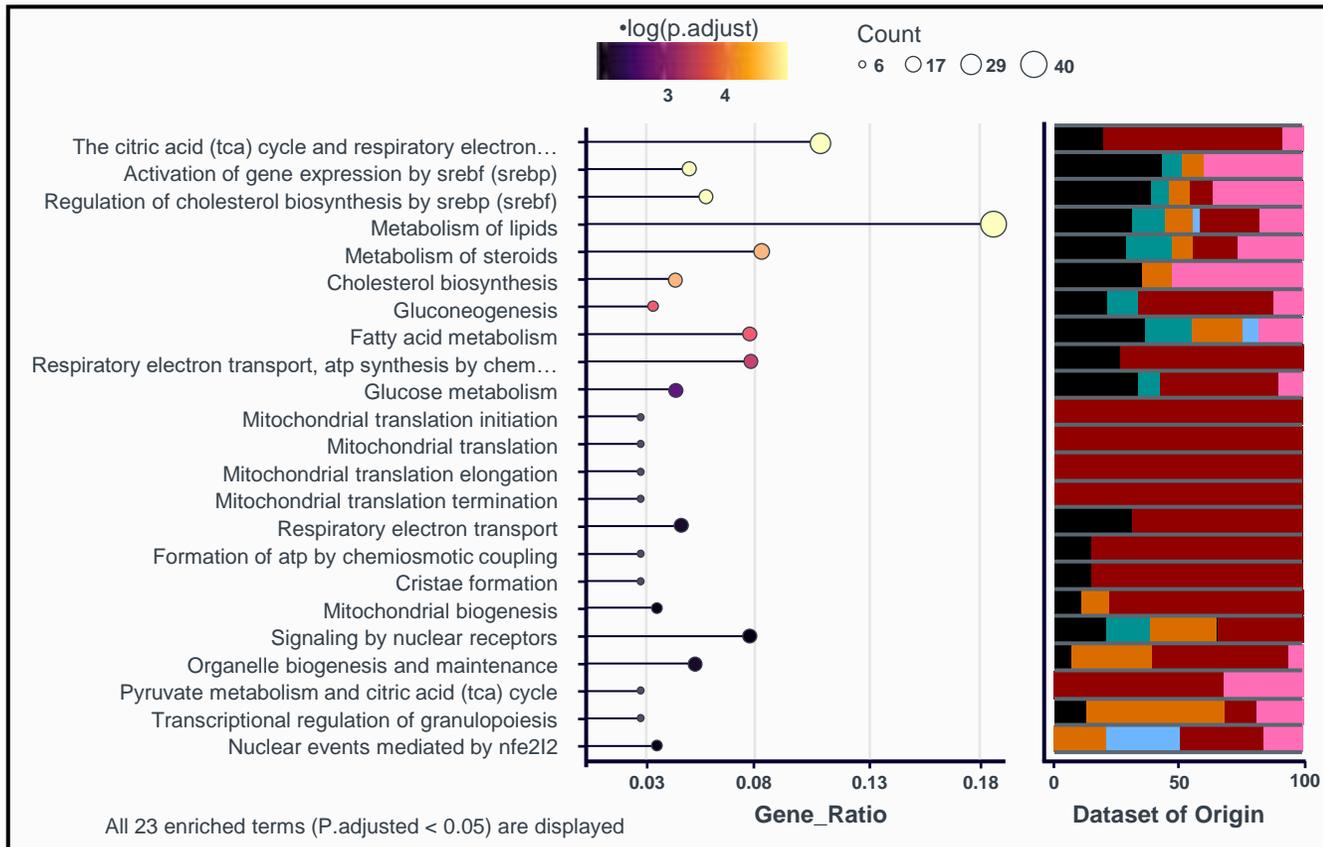
Vice President, Drug Discovery, Early Pre-Clinical Development

Novel Insights into ACLY Biology and Disease Associations Using Multi-omics Methodology



ACLY: ATP citrate lyase; MASH: metabolic dysfunction-associated steatohepatitis, MASLD: metabolic-associated steatotic liver disease

Multi-omics Network Identifies Known and Novel Pathways Connected to ACLY in Liver Disease



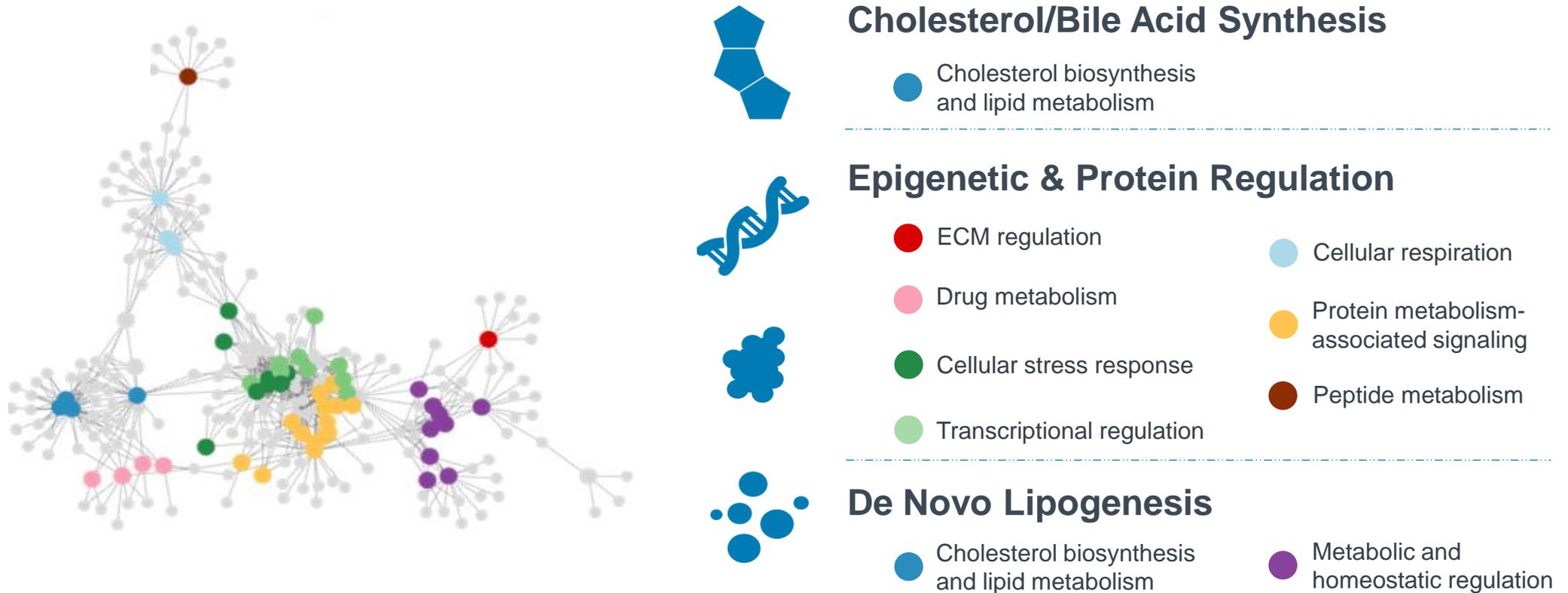
- Liver bulk RNA-Seq
- Cirrhosis cholangiocytes scRNA-seq
- Serum proteomics
- Obesity microarray
- Obesity/fibrosis fibroblasts snRNA-seq

Pathway Enrichment: ACLY Connections in Liver Disease

- Multiple expected pathways validated
- Several novel pathways identified
- Cholangiocyte** data set enriched for numerous novel connections

ACLY: ATP citrate lyase; RNA: ribonucleic acid

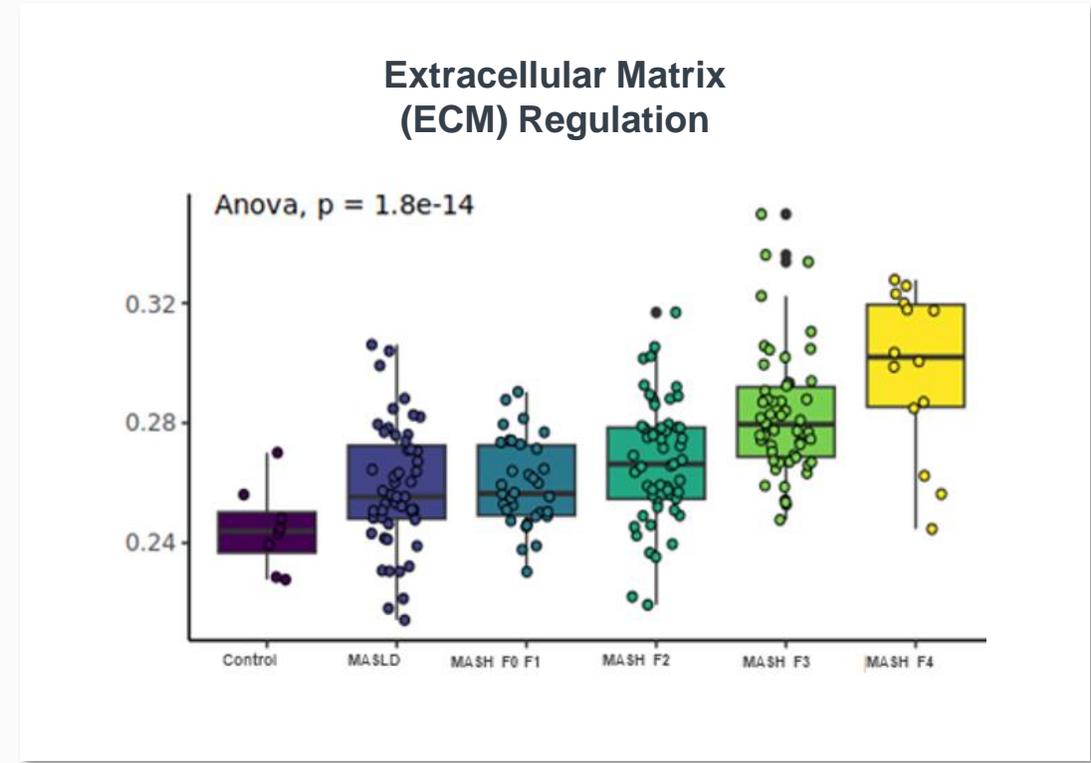
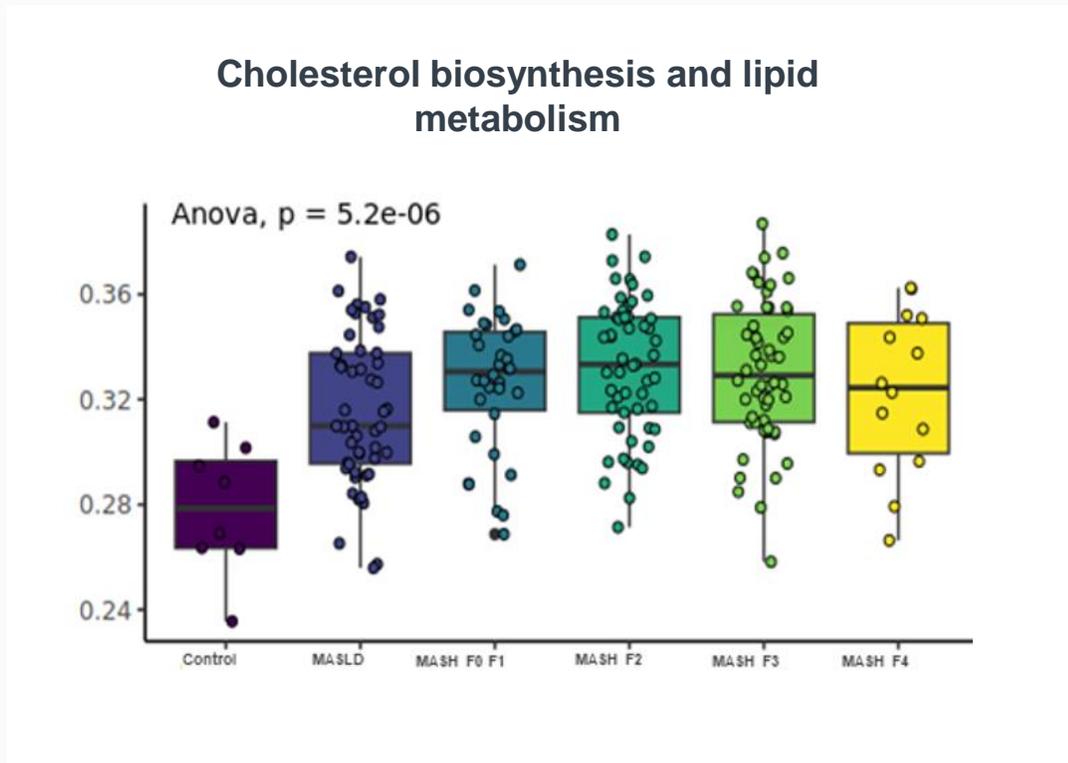
Interrogating New ACLY Signatures Through Known and Novel Disease Pathway Connections



ACLY: ATP citrate lyase; ECM: extracellular matrix

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Newly Identified ECM Mechanism of ACLY is Associated with Progression of Liver Fibrosis

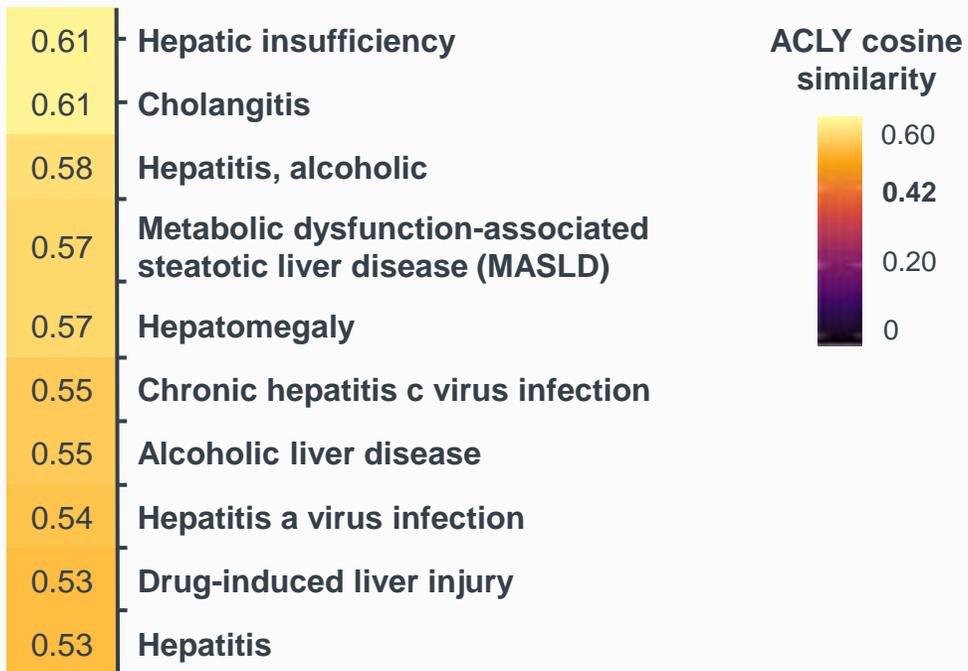


Development of fibrosis resulting from liver injury, inflammation and immune cell recruitment is the culminative process in liver disease progression

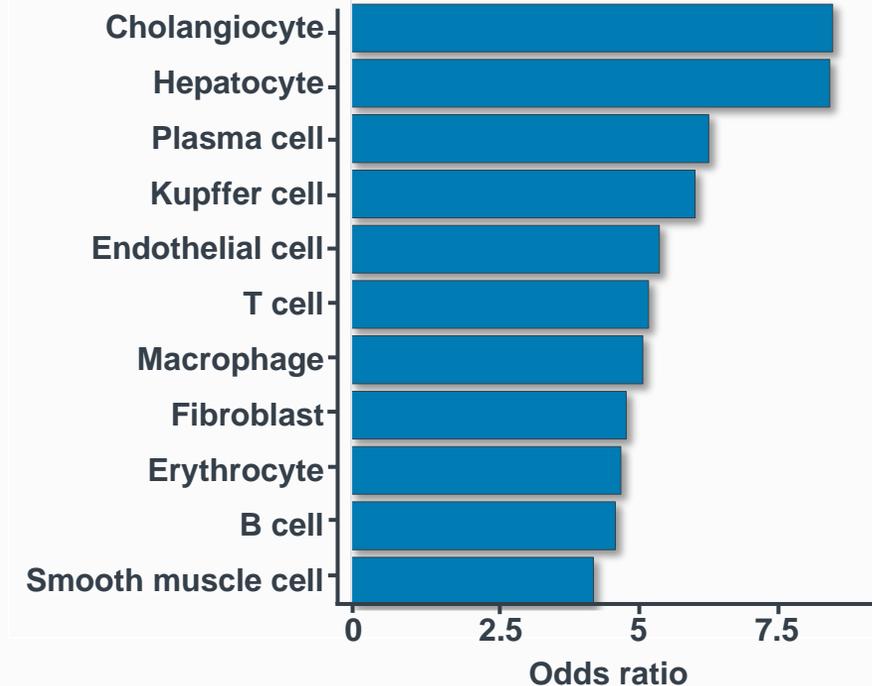
Analyses were conducted using liver bulk RNA-Seq; ACLY: ATP citrate lyase; ECM: extracellular matrix; ANOVA: analysis of covariance

Multi-component Mechanism of ACLY is Relevant in Multiple Liver Diseases

Top Disease Associations

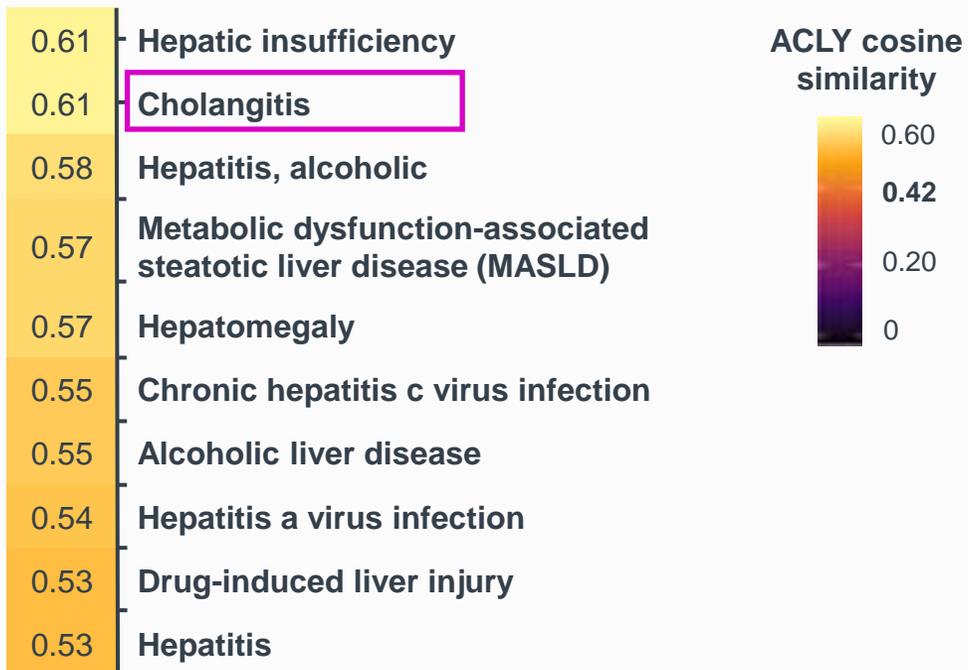


Key Cell Types Responsible for Mediating ACLY Effects

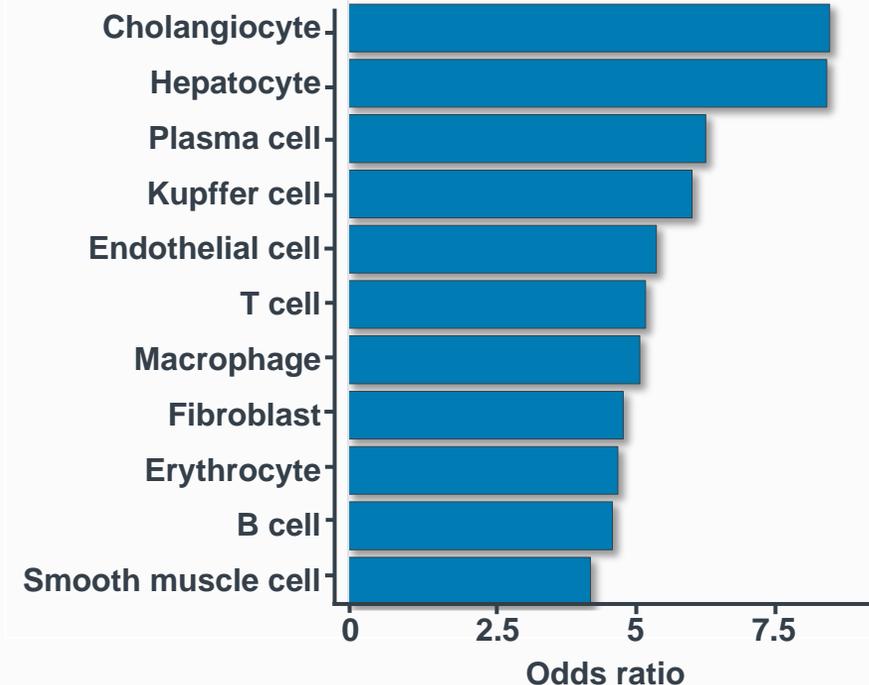


Multi-omics Analysis Indicates Cholangitis and MASLD are Highly Associated with ACLY Pathways

Top Disease Associations

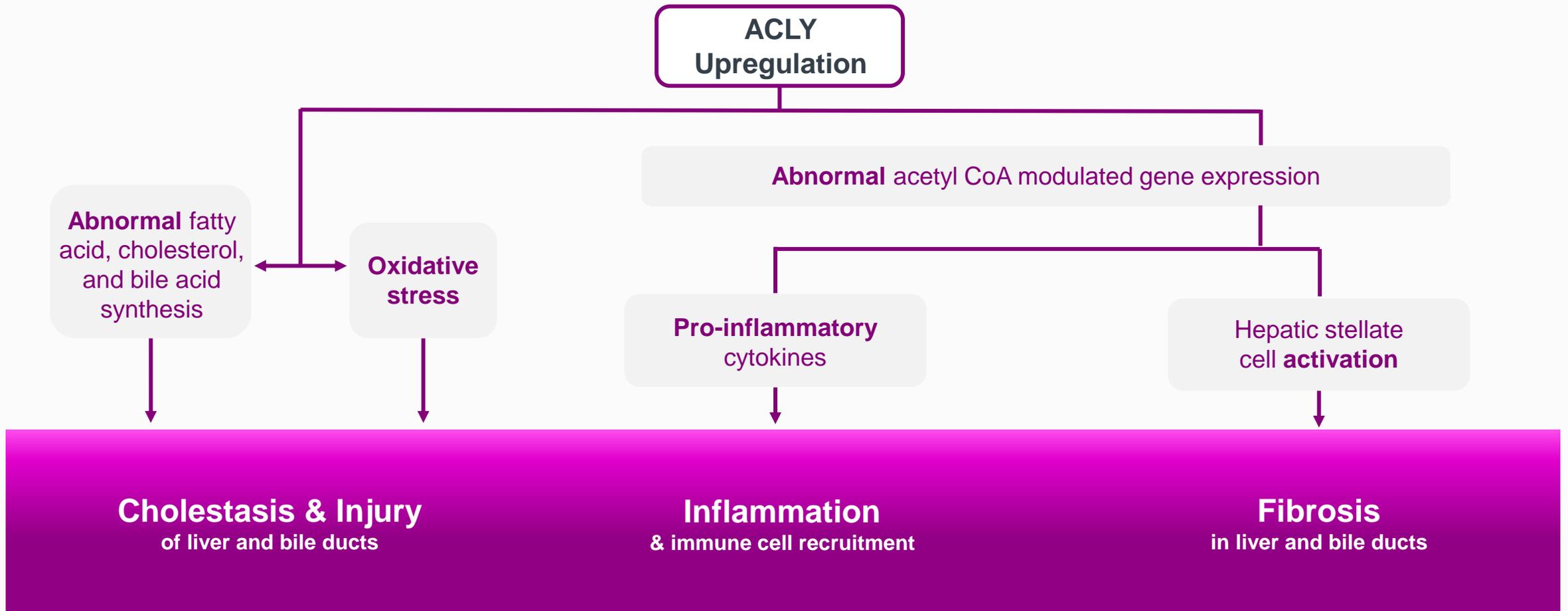


Key Cell Types Responsible for Mediating ACLY Effects



Strong rationale for prioritizing PSC given ACLY gene networks link to cholangitis via chronic immune and bile acid-related mechanisms

ACLY Upregulation is Directly Related to Multiple Mechanisms of PSC Progression



Accumulating Evidence Suggest ACLY Inhibition is a Rational Target for PSC

Human genetic evidence link ACLY to multiple liver disorders

New pathway connections, including fibrosis, were identified along with known ACLY mechanisms

Cell types with roles in liver disease progression (e.g. cholangiocytes, hepatocytes, Kupffer cells) mediate ACLY pathways and effects

ACLY upregulation is related to mechanisms of PSC progression (liver cholestasis and injury, inflammation, and fibrosis)

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Independent Validation of ACLY in Hepatic Stellate Cell Activation



David E. Cohen MD, PhD

Chief, Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital

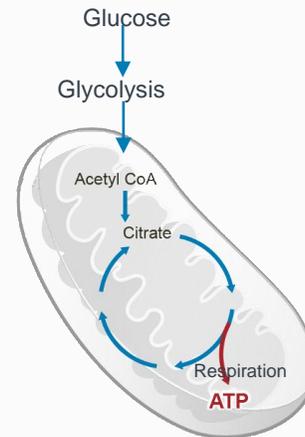
Research Collaboration Established to Deepen the Connection Between ACLY Biology and Fibrosis in PSC

Activation of hepatic stellate cells (HSC) is coupled to non-canonical TCA cycle and is dependent on ACLY activity

Activation of HSCs requires upregulation of glycolysis and respiration to fuel fibrogenesis and proliferation

Activation of HSCs via injury signals is a primary driver of liver fibrosis in PSC

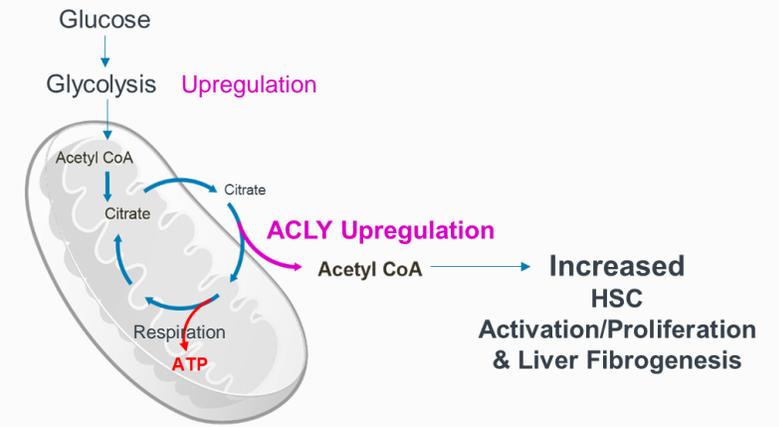
Canonical TCA pathway



Quiescent HSC
(Baseline energy demand)

PSC-related injury signals (e.g. TGFβ)

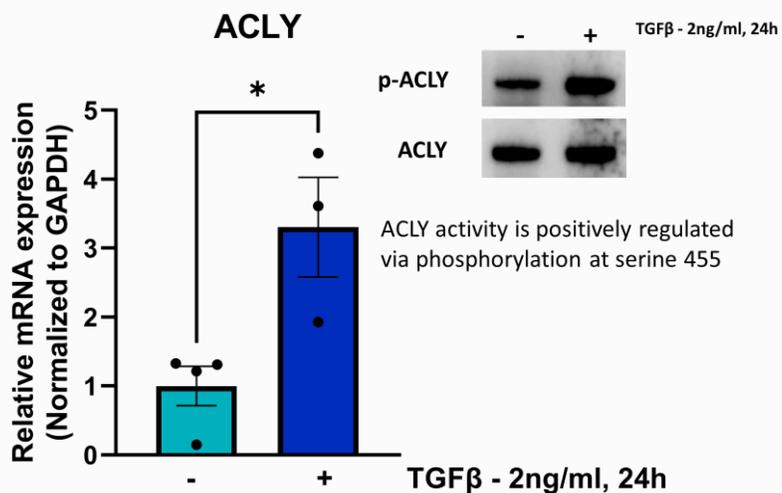
Non-canonical TCA pathway



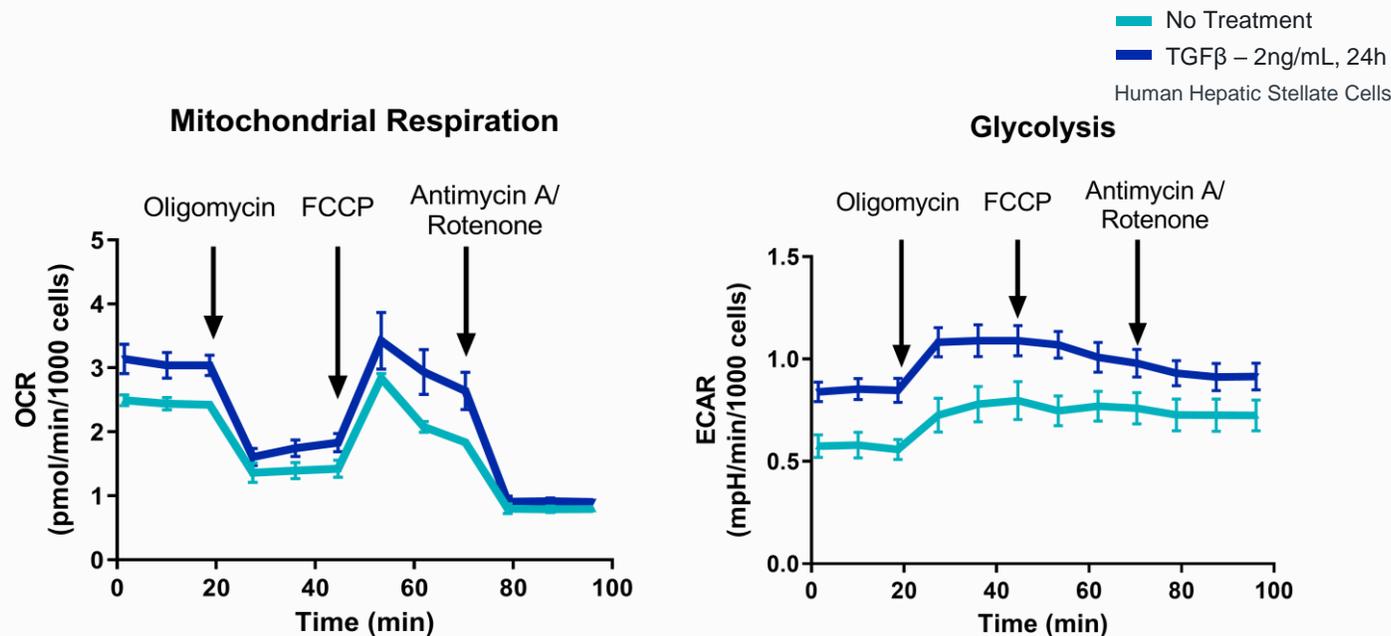
Activated HSC
(Increased energy and substrate demand)

Hypothesis: ACLY-dependent changes in cell energy metabolism drives hepatic stellate cell (HSC) activation via injury/fibrosis signals

Mimicking Inflammation and Injury, TGFβ Upregulates ACLY Expression & Activity

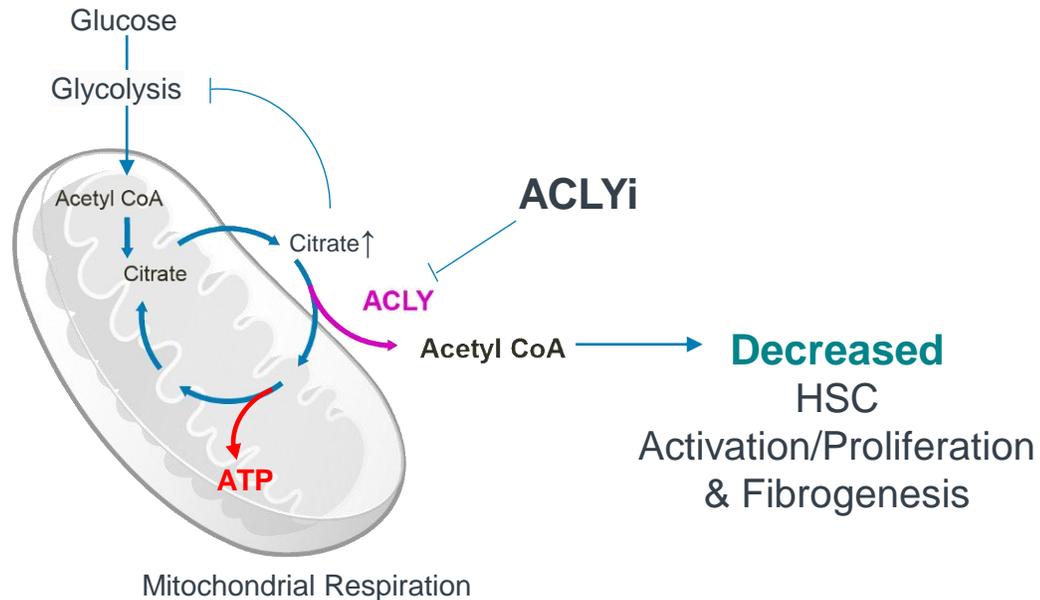


TGFβ stimulates ACLY upregulation



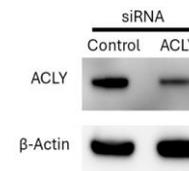
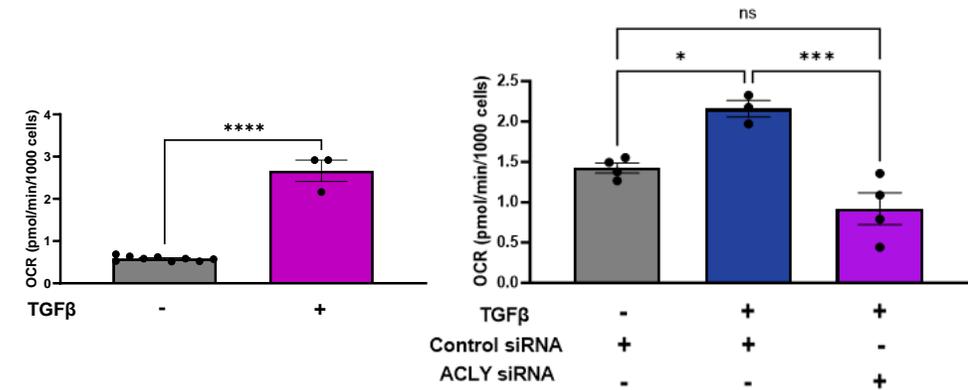
TGFβ activation increases basal and maximal values of mitochondrial respiration and glycolysis

ACLY Inhibition: A Potential Therapeutic Target in Fibrosis via HSC Activation Pathways



Hypothesis: ACLY inhibition decreases HSC activation/proliferation and liver fibrogenesis

Maximal Respiratory Capacity

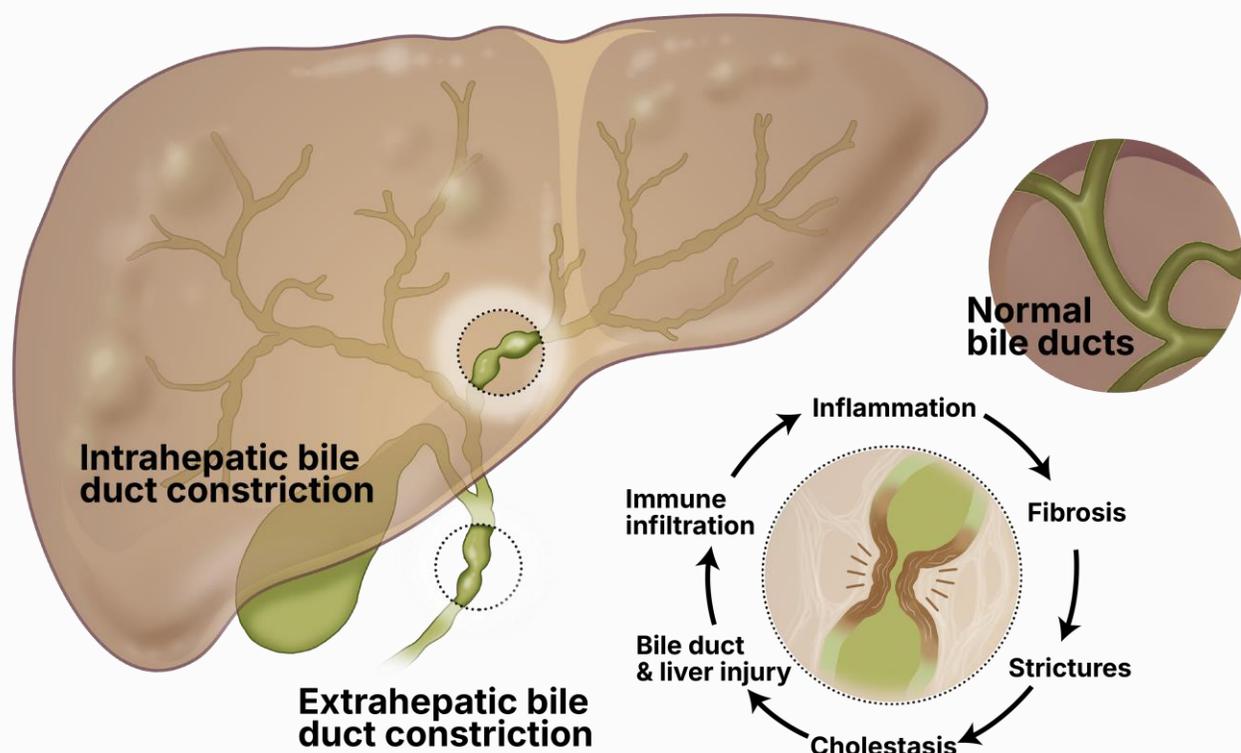


Conclusion: Knockdown of ACLY blunts metabolic response (mitochondrial respiration) of HSC activation/proliferation by TGFβ

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Primary Sclerosing Cholangitis (PSC)

PSC: A Complex Disease with Great Unmet Need



Progressive inflammatory and fibrotic disease that injures bile ducts¹

The etiology of PSC is unclear but likely due to multiple mechanisms¹

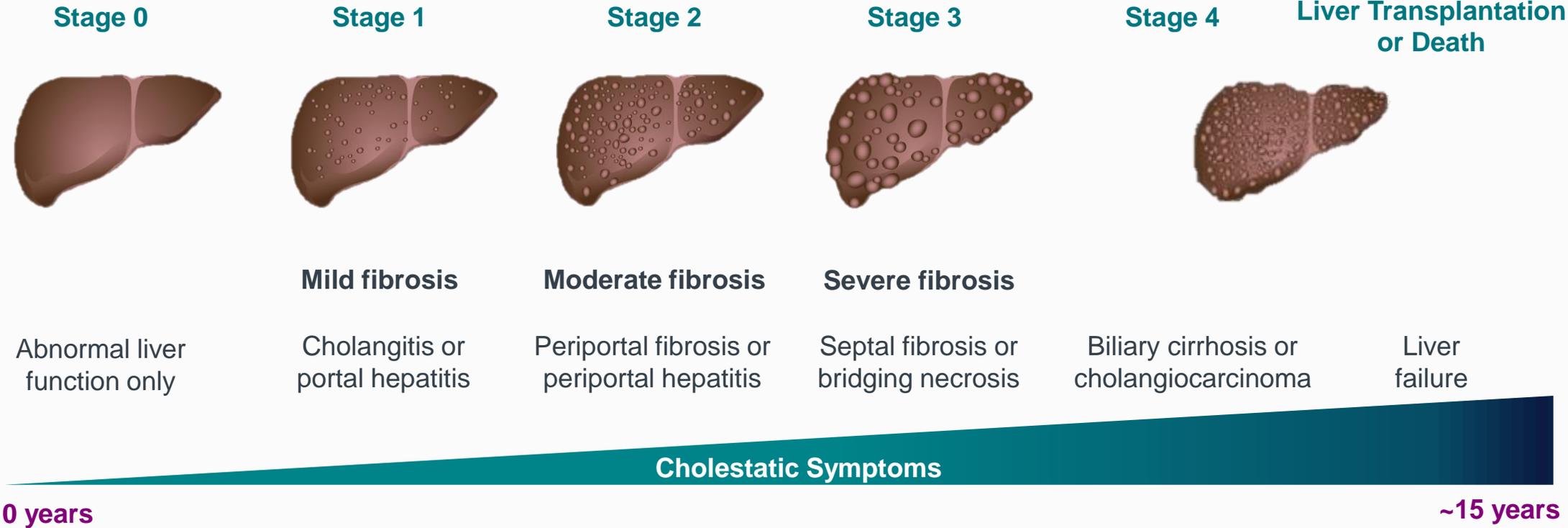
No approved therapies to cure or halt PSC progression¹

Death or liver transplantation expected within 1-2 decades after diagnosis²

PSC Progression: From Silent Onset to Rapid Decline¹⁻⁷

The average time between PSC diagnosis and liver transplant or death is 10 to 20 years

Addressable PSC Population: Stages 0-3



1. Steele IL, et al. *MedGenMed*. 2007;9(2):20.; 2. Rupp C, et al. *United European Gastroenterol J*. 2018;6(2):255-262.; 3. Singh S, Talwalkar JA. *Clin Gastroenterol Hepatol*. 2013;11(8):898-907.; 4. Karlsen TH, et al. *J Hepatol*. 2017;67(6):1298-1323; 5. Skarby AJ, et al. *JHEP Rep*. 2024;6(1):100609.; 6. Thylin M, et al. *Liver Int*. 2024;44(9):2351-2358.; 7. Hilscher MB, et al. *Hepatol Commun*. 2018;2(7):836-844.

PSC is a Rare Disease[±] with Increasing Prevalence

6-16 cases per 100,000 estimated in North America and Western Europe¹



~46,000

patients diagnosed with PSC across **United States**²⁻³



~30,000

patients diagnosed with PSC across **Europe**⁴⁻⁷



70% of PSC cases are diagnosed in men¹

25 to 45 years of age
peak incidence of PSC is during the most productive years of life¹

[±]The FDA defines a rare disease as a disease or condition that affects less than 200,000 people in the United States.

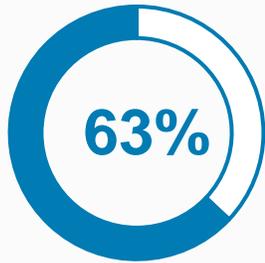
PSC: primary sclerosing cholangitis

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1. Bowlus C, Arrivé L, Bergquist A, et al. *Hepatology*. 2023;77(2):659-702; 2. Bakhshi Z, et al. *J Gastroenterol*. 2020 May;55(5):523-532; 3. Nguyen A, et al. *Front Gastroenterol (Lausanne)*. 2022;1:1076788.; 4. Liang H, et al. *Medicine (Baltimore)*. 2017;96(24):e71116.
5. Boonstra K, et al. *Hepatology*. 2013;58(6):2045-55; 6. Krampe J, et al. Poster presented at: ISPOR 2024; Nov 2, 2024; Barcelona, Spain; 7. Lindkvist B, et al. *Hepatology*. 2010;52(2):571-7..

ESPERION

Pediatric Patients with PSC Currently Face a Lifetime of Disease Without Treatment Options



Children with PSC who experience clinical complications* within 10 years of diagnosis¹⁻²

**~1.5 cases
per 100,000**

Estimated in United States pediatrics³⁻⁴



Children with PSC who require liver transplant within 10 years of diagnosis⁵

Example Pediatric to Early Adulthood Disease Progression Timeline



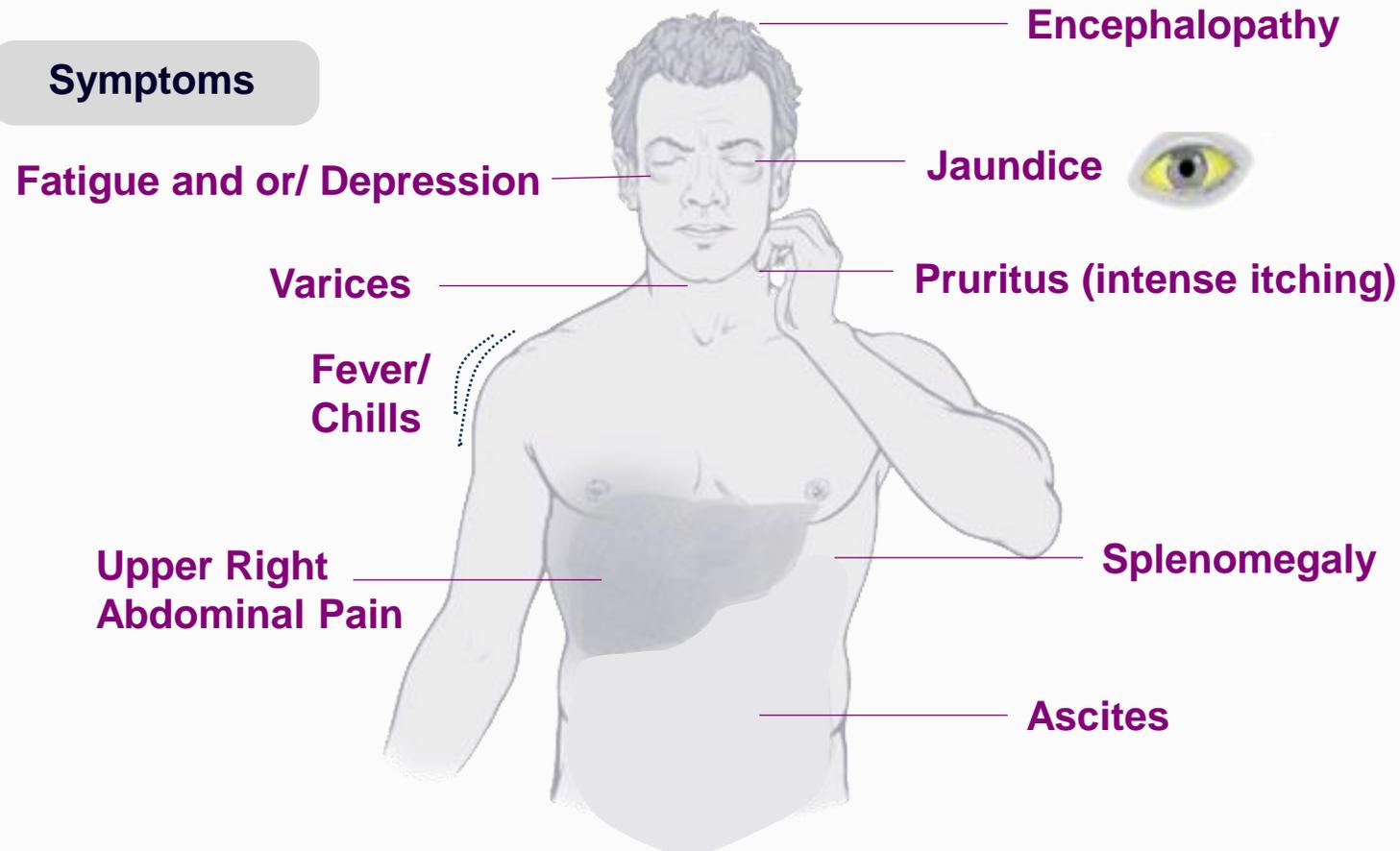
PSC: primary sclerosing cholangitis

1. Fuchs Y, Valentino PL. Clin Liver Dis (Hoboken). 2023 Jan 13;21(2):47-51; 2. Deneau MR, et al. Hepatology 2017;66:518-27; 3. Deneau M, et al. Hepatology. 2013 Oct;58(4):1392-400. Epub 2013 Aug 13; 4. Kaplan GG, Am J Gastroenterol. 2007;102:10429; 5. Laborda TJ. World J Hepatol 2019; 11(1): 19-36

Living with PSC: Balancing Life and Disease

With no available treatments to slow or reverse PSC progression, *the standard of care is to treat the symptoms of disease*¹

Symptoms

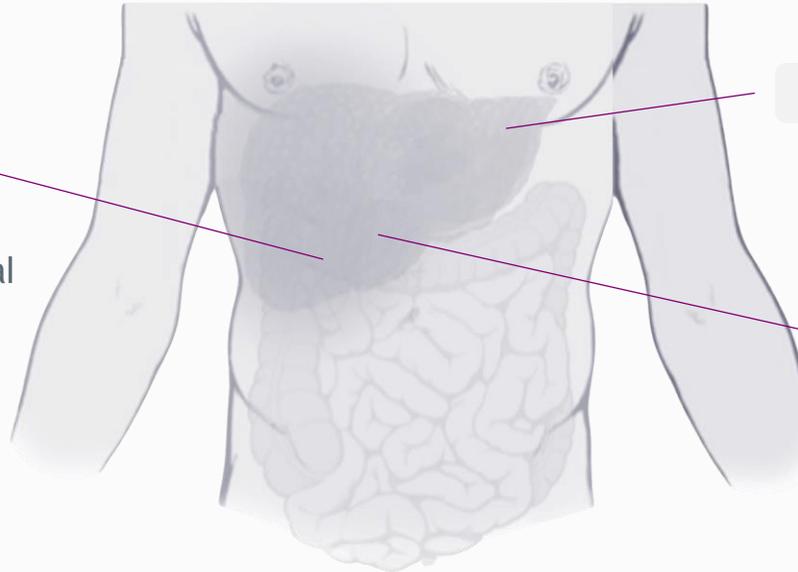


PSC is Undoubtedly a Premalignant Condition¹

Patients with PSC have *40 times the risk* of a primary hepatobiliary cancer compared to the general population¹. Unfortunately, these cancers are also challenging to diagnose.

Gallbladder Carcinoma

- 1%-3.5% lifetime incidence
- 10x the risk compared to general population



Hepatocellular Carcinoma (HCC)

- 0.3%-2.8% lifetime incidence

Cholangiocarcinoma (CCA)

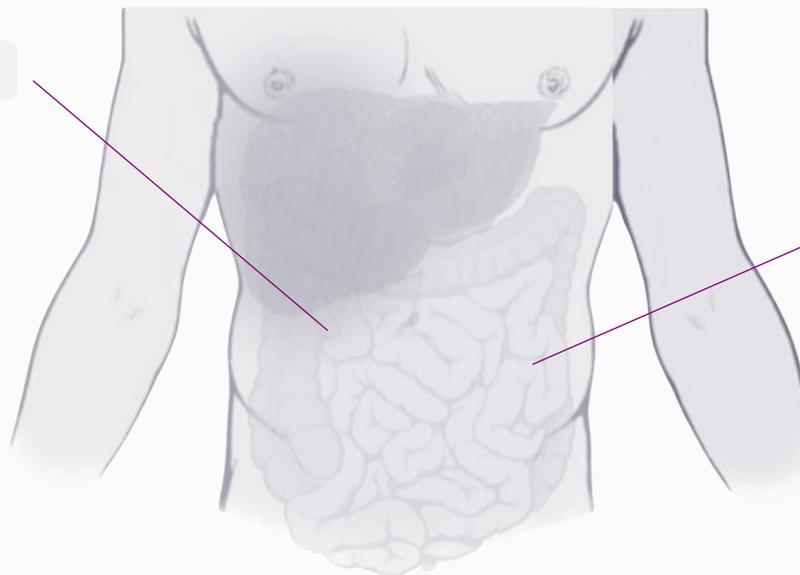
- Up to 20% lifetime incidence
- 400-1500x risk compared to general population

PSC & Inflammatory Bowel Disease: Closely Linked Conditions¹

PSC-associated IBD is more likely to progress to colorectal malignancy

Inflammatory Bowel Disease (IBD)

- Over 70% of patients with PSC have IBD with 2 of 3 diagnosed with ulcerative colitis (UC)



Colorectal Cancer (CRC)

In patients with both PSC and IBD:

- 20-30% lifetime risk
- 10x the risk compared to general population
- 4x the risk compared to those with UC alone

PSC Places Continual Physical and Psychological Burden on Patients

Routine Monitoring^{1,2}



Blood Draws Every 3-6 Months



Ultrasounds Every 6-12 Months



Colonoscopy Every 1-2 Years



Yearly Magnetic Resonance Cholangiography



Invasive Endoscopic Procedure (ERCP) as needed



7-12 PSC related hospital days annually^{3,4}

Hospitalized PSC patients are acutely ill⁴

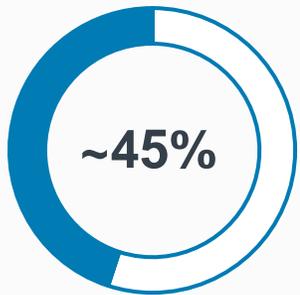
- 83% with major/extreme severity of illness
- 60% with major/extreme risk of dying

Frequency of monitoring may vary based on disease progression and complications, patient status, and clinical decision making.

Ongoing Need to Develop Disease Modifying Therapies for PSC

Despite severity of illness, the vast majority of the 46,000 US patients living with PSC do not meet current criteria to receive liver transplantation.

Only
387
PSC-related
liver transplants¹
(in 2024, United States)



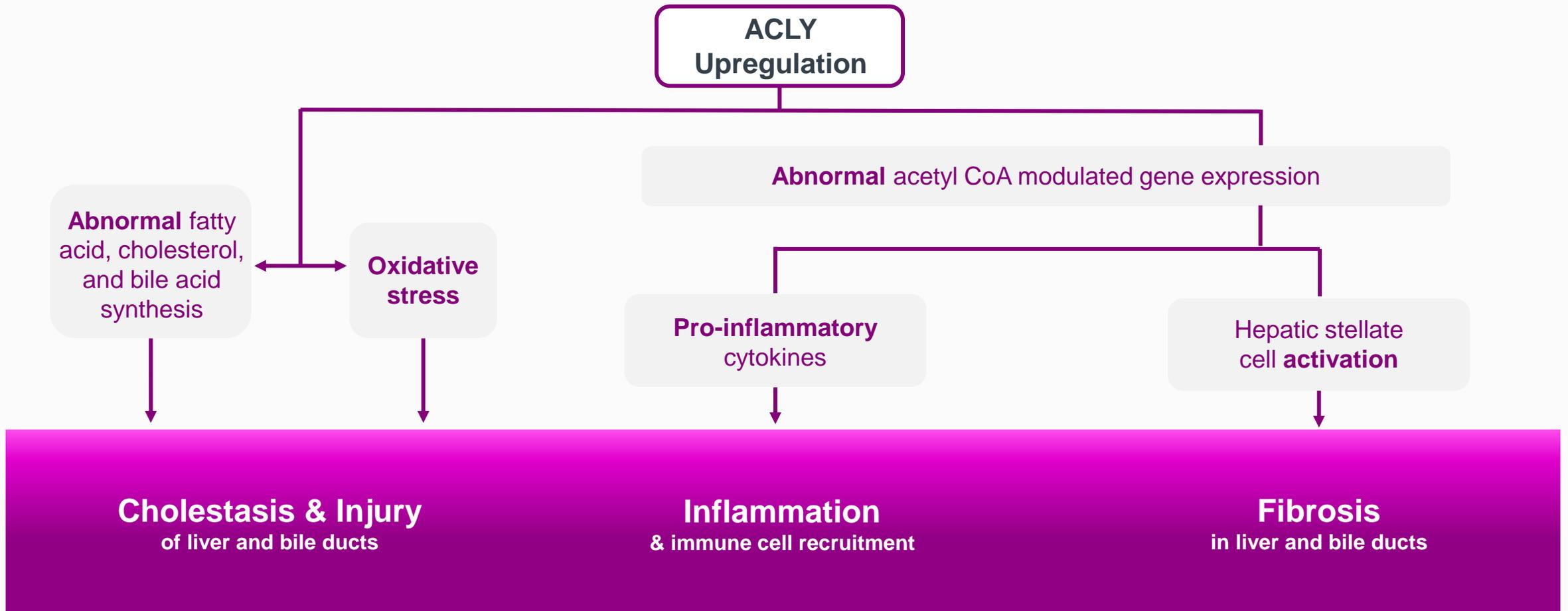
Die within 10 years
without a liver
transplant²⁻⁵

30% of liver transplant
recipients die within 10 years⁶



Patients who receive a
liver transplant experience
recurrent PSC⁷

ACLY Upregulation is Directly Related to Multiple Mechanisms of PSC Progression



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Break

(10-min)



The PSC Patient Voice: Insights from Patients and Advocates



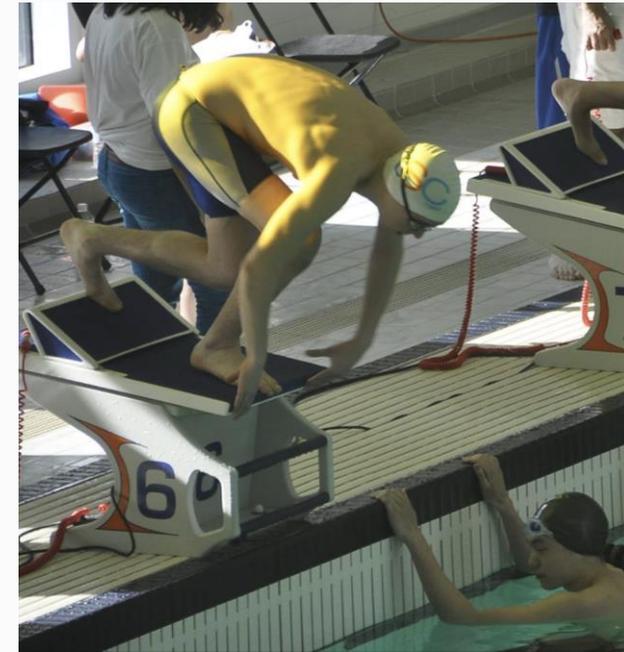
Mary Pressley Vyas

VP, Strategic Initiatives, PSC Partners

Our PSC Journey



10 Years Ago



Our PSC Journey

DIAGNOSIS



TESTS

- Blood
- Ultrasound
- MRCP
- Liver biopsy
- Scopes
- ERCP
- Bile duct brushings
- Bone density

DIAGNOSIS

- PSC
- Fibrosis
- Autoimmune hepatitis
- Ulcerative colitis

RISKS

- Cholangiocarcinoma
- Hepatocellular cancer
- Colectomy
- Cirrhosis
- End-stage liver disease

CONCERNS

- Chronic & progressive
- No cure, no proven treatments
- No reliable prognostic models (10-20 years)
- Organ system deprioritizes PSC patients
- High chance of PSC returning post liver transplant (~30%)

SYMPTOMS

Highly variable across the PSC population, but in this case

- Weight loss
- Brain fog
- Debilitating fatigue

PSC Partners Seeking a Cure



Mission Statement

To drive research to identify treatments and a cure for PSC while providing education and support for those impacted by this rare disease

Established and impactful patient advocacy organization dedicated to working with an engaged and actively participating PSC patient community, industry, and global organizations to find treatment solutions

Prioritize and support drug development by providing impactful ways to de-risk and support clinical trials through various initiatives, including novel regulatory-grade real-world data

Founded in 2005 by Ricky Safer after being diagnosed with PSC herself

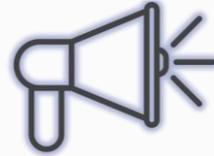
Located in Denver, CO and Toronto, ON

Initiatives to Support the PSC Community



Support & Education

- PSCPartners.org website
- Annual Conference
- Webinars & Online Support
- Mentorship Program



Advocacy

- PSC Forum at the Center for Collaborative Research
- Pediatric Cholestatic Liver Disease Forum
- Patient Focused Drug Development with FDA
- Engagement with rare disease networks
- Critical Path Innovation Meeting (Regulatory Engagement)



Research Programs

- WIND-PSC Prospective Synthetic Cohort
- Research Grants Program
- Patient Registry
- International Collaborative Research Network
- PSC Symptom Assessment Project
- Cholangiocarcinoma Patient Survey
- Acute Cholangitis Patient Survey

WIND-PSC: A Strategic Advantage for PSC Drug Development



A Study Design That Improves on Natural History Cohorts

- **Global**, prospective, multi-center, observational cohort with patients followed up to 5 years
- Up to **2,000 patients** will be enrolled in **North America and Europe** by **2027**
- Data collection system is **compliant** with **FDA standards** for submission
 - Liver-related endpoints consistent with current FDA guidance
 - Medical records, laboratory tests, procedures and medications

Uniquely Designed for Regulatory Purposes

- **Provides regulatory-grade, adjudicated longitudinal data to support accelerated clinical trial study design**
- Enables use as a **synthetic placebo arm** for Phase 4 or open label extension trials following initial accelerated approval
- Creates a large clinical and biomarker data set to **establish individual and/or composite surrogate endpoints** for eventual use in an accelerated approval pathway

Esperion's Lead PSC Candidate



Stephen Pinkosky, PhD

Vice President, Drug Discovery, Early Pre-Clinical Development

No Approved Therapy with Proven Efficacy to Cure or Halt PSC Progression

Esperion's oral next generation ACLY inhibitor has the potential to be the only agent to directly inhibit all 3 mechanisms of PSC disease progression

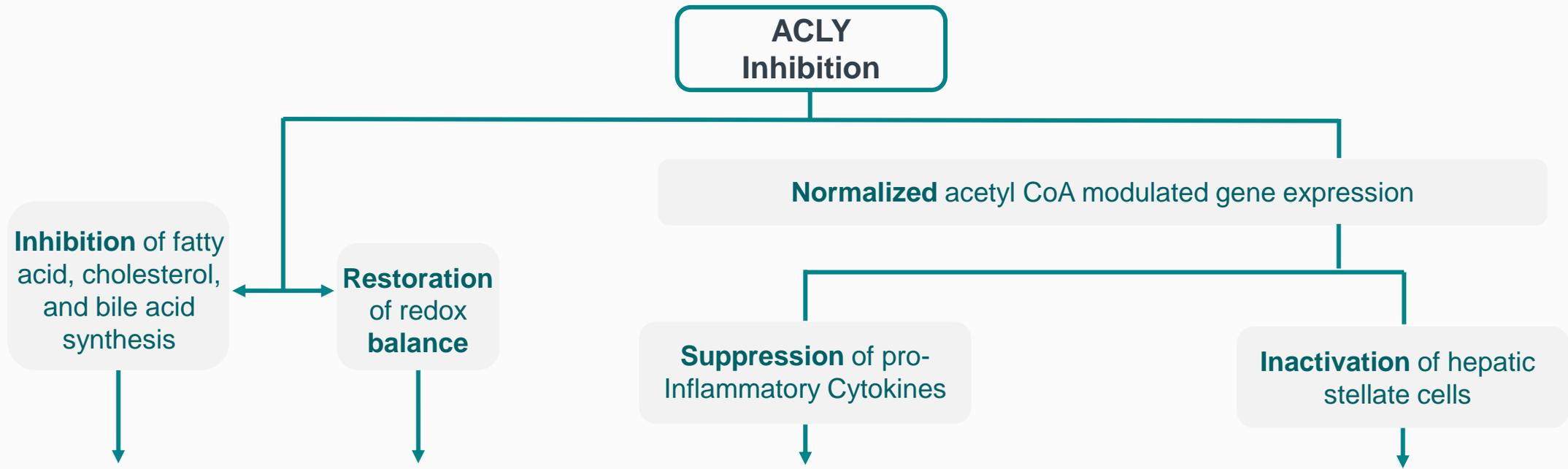


 **Cholestasis & Injury**
of liver and bile ducts

 **Inflammation**
& immune cell recruitment

 **Fibrosis**
in liver and bile ducts

ACLY Inhibition is a Rational Therapeutic Target to Halt Multiple Mechanisms of PSC Progression



Cholestasis & Injury
of liver and bile ducts

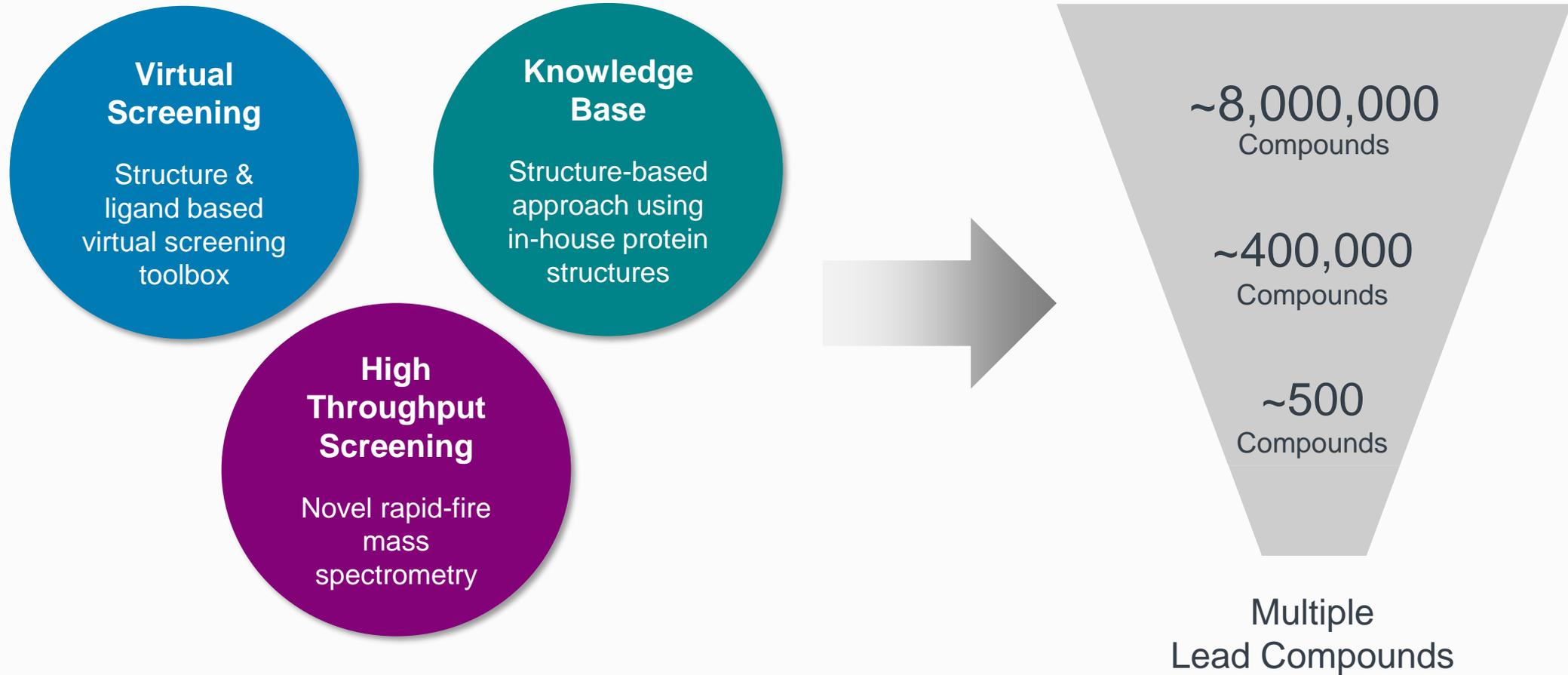


Inflammation
& immune cell recruitment



Fibrosis
in liver and bile ducts

Identification of Lead Candidates for PSC



Lead Candidates Will Leverage Advantages of Allosteric Inhibition

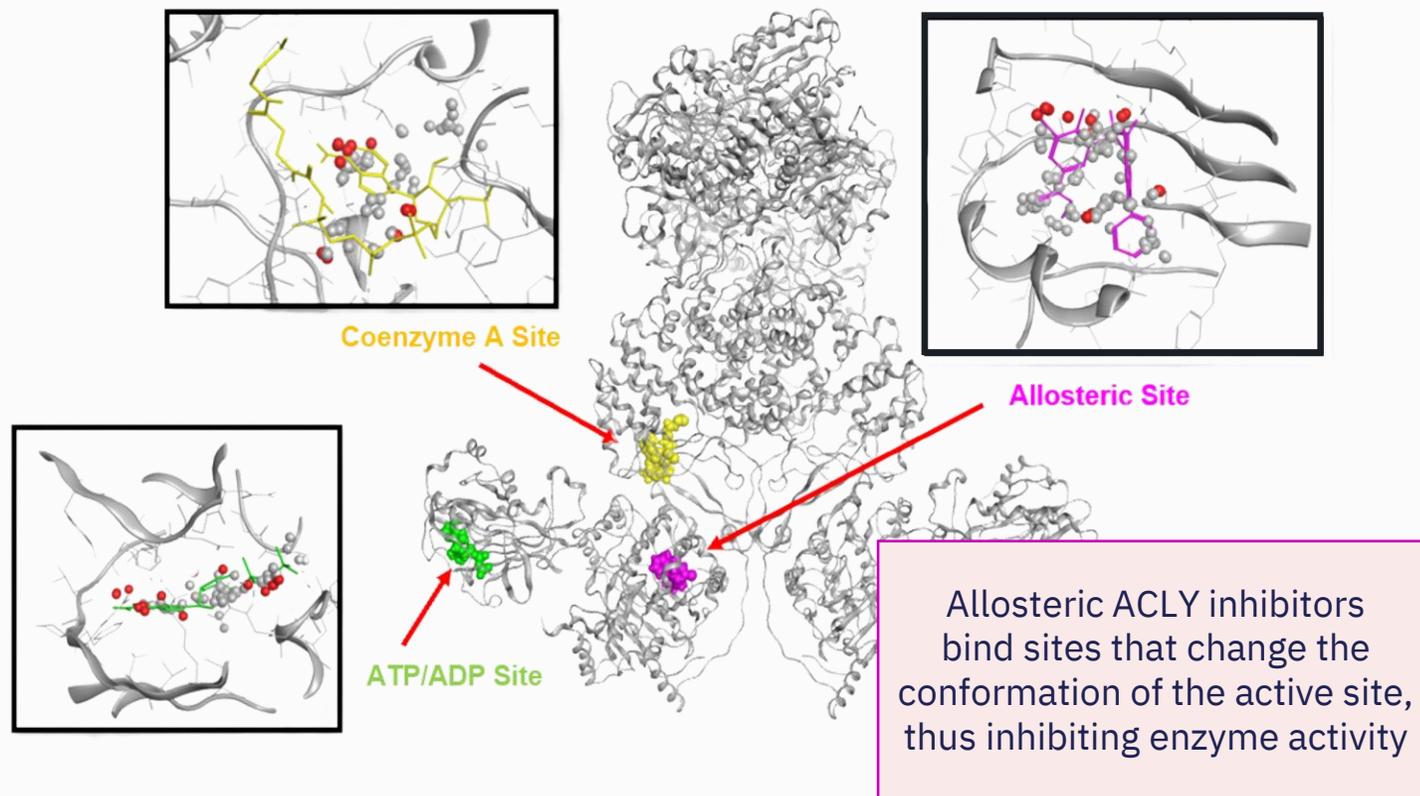
Potential Advantages of Allosteric Inhibition

Improved Potency

Enhanced Specificity

Fewer Side Effects

Less Drug Resistance



Identification of Lead Candidates for PSC

World-Class Approach

- ✓ nM biochemical and cellular potency
- ✓ Compound activity confirmed using orthogonal readouts
- ✓ Ligand-bound cryo-EM structure
- ✓ Direct binding demonstrated
- ✓ Strong (multiple log) SAR
- ✓ Highly differentiated from bempedoic acid
- ✓ Established high-quality assay suite and screening cascade for subsequent optimization

Virtual Screening

Structure & ligand based virtual screening toolbox

Knowledge Base

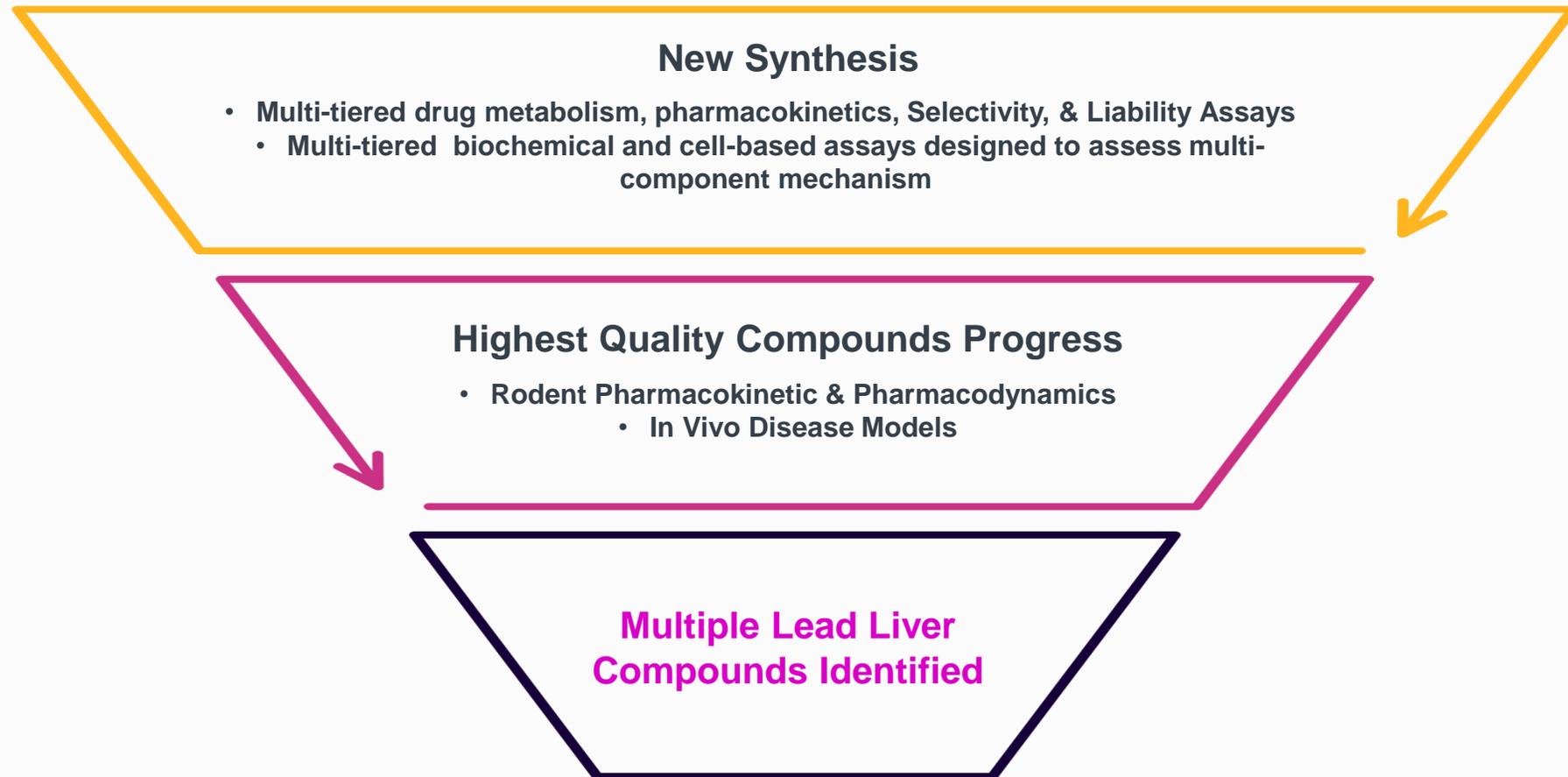
Structure-based approach using in-house protein structures

High Throughput Screening

Novel rapid-fire mass spectrometry

Esperion's Liver-Targeted Multi-tiered Activity and Liability Screening Cascade

Activity Optimization and Liability Counterscreening



Stringent Acceptance Criteria Ensure Selection of the Highest Quality Compounds

Metrics Used to Assess

Safety

Toxicity

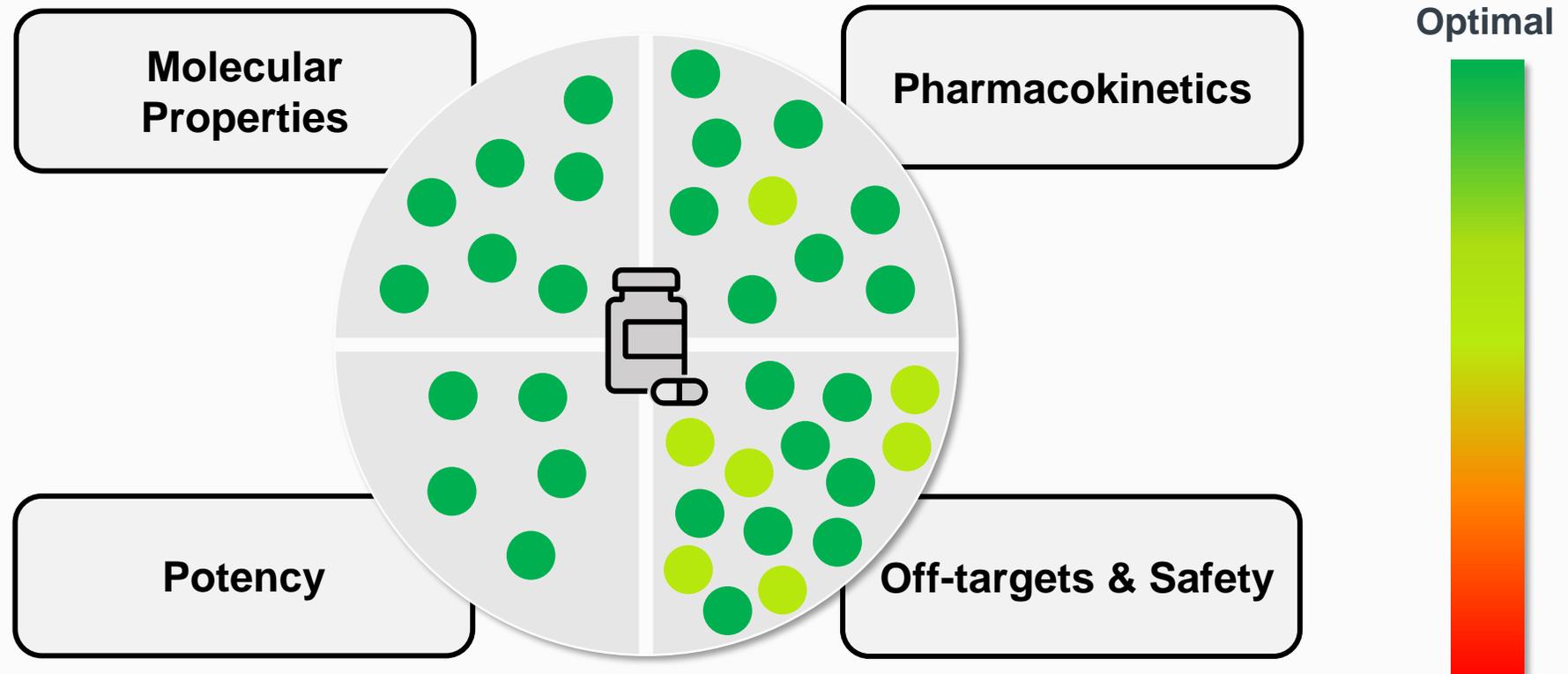
Off-Target Liability

Potency/Specificity

Efficacy in Disease Models

A few **high-quality lead compounds** identified for advancement into pre-IND de-risking activities

Lead Compounds are Well-Characterized with Data In Vitro and In Vivo Supporting Once Daily Oral Dosing



No Anticipated Liabilities

ESPERION[®]

**Esperion Lead Candidate
ESP-1336: Specificity In Vitro
and In Vivo**

ESP-1336 Transcriptomics Demonstrate Expected Metabolic Processes by ACLYi in Primary Human Liver Cells

Expected Metabolic Mechanisms



Cholesterol/ Bile Acid Synthesis



Epigenetic Regulation



Protein Regulation



De Novo Lipogenesis

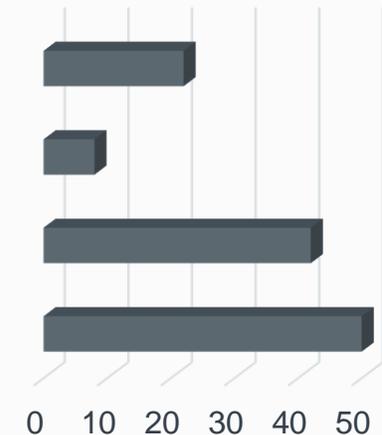
Expected Metabolic Pathway Counts

Cholesterol

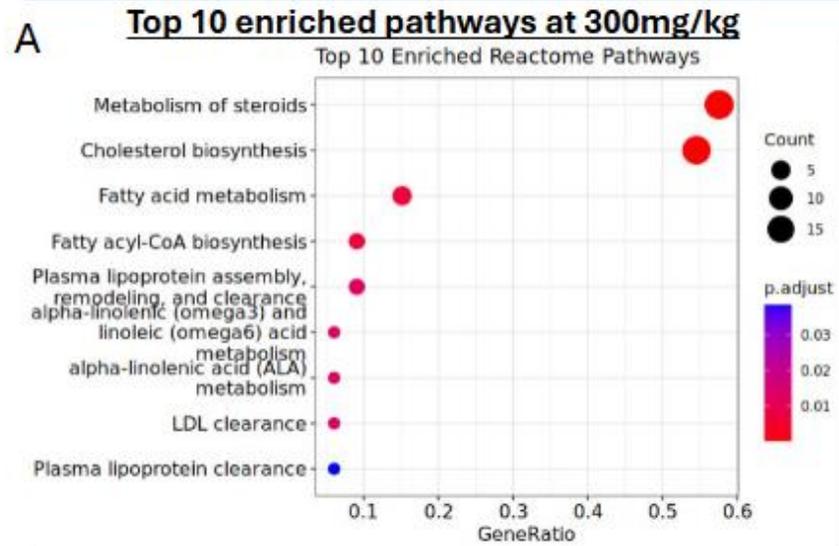
Chromatin

Lipid & Metabolism

Mitochondria

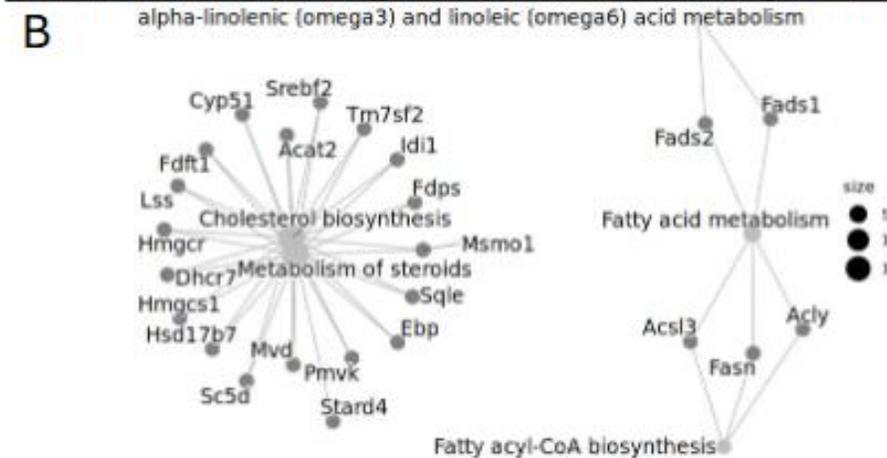


Transcriptional Response With ESP-1336 Confirms ACLY Specificity at High Doses In Vivo



Effects of ESP-1336 are on-target for fatty acid and cholesterol metabolism/synthesis and lipoprotein metabolism

B Networks connecting the enriched pathways from Figure A



These enriched pathways of ACLY inhibition cluster into fatty acid and cholesterol synthesis inhibition as predicted

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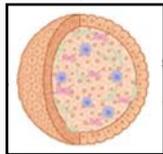
Characterizing ESP-1336 in Preclinical Disease Models

ESP-1336 Reduces Fibrosis in Human Liver Microtissues

ACLY inhibition results in concentration-dependent reduction in fibrosis, unlike ACC inhibitors

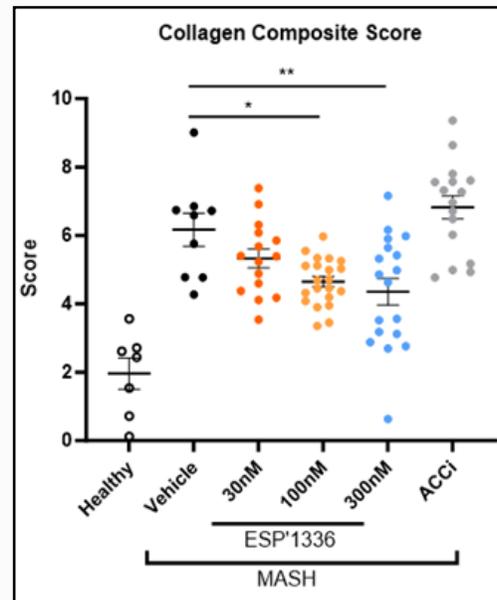
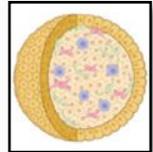
Hepatocytes
Liver Endothelial Cells
Kupffer Cells
Stellate Cells

Aggregation

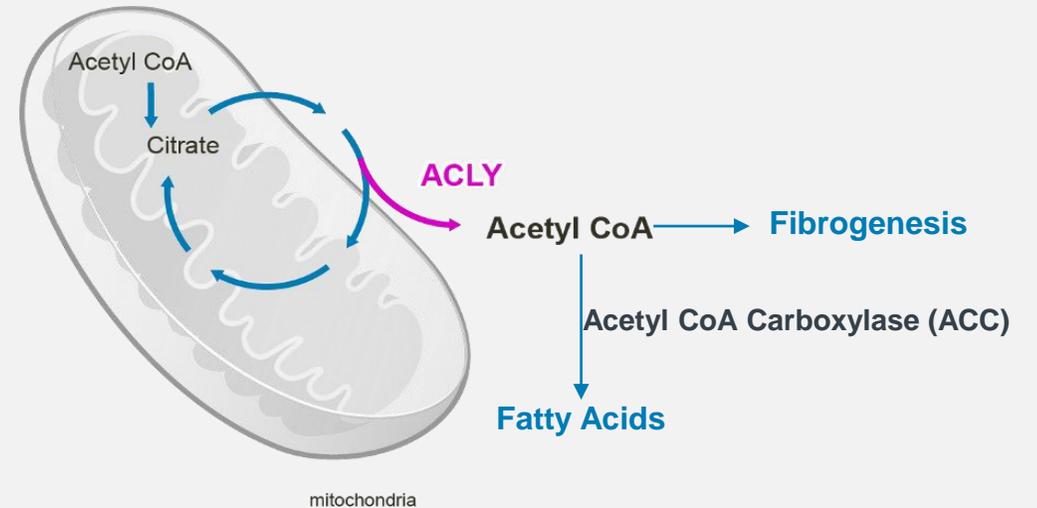


MASH stimulus

Fibrosis

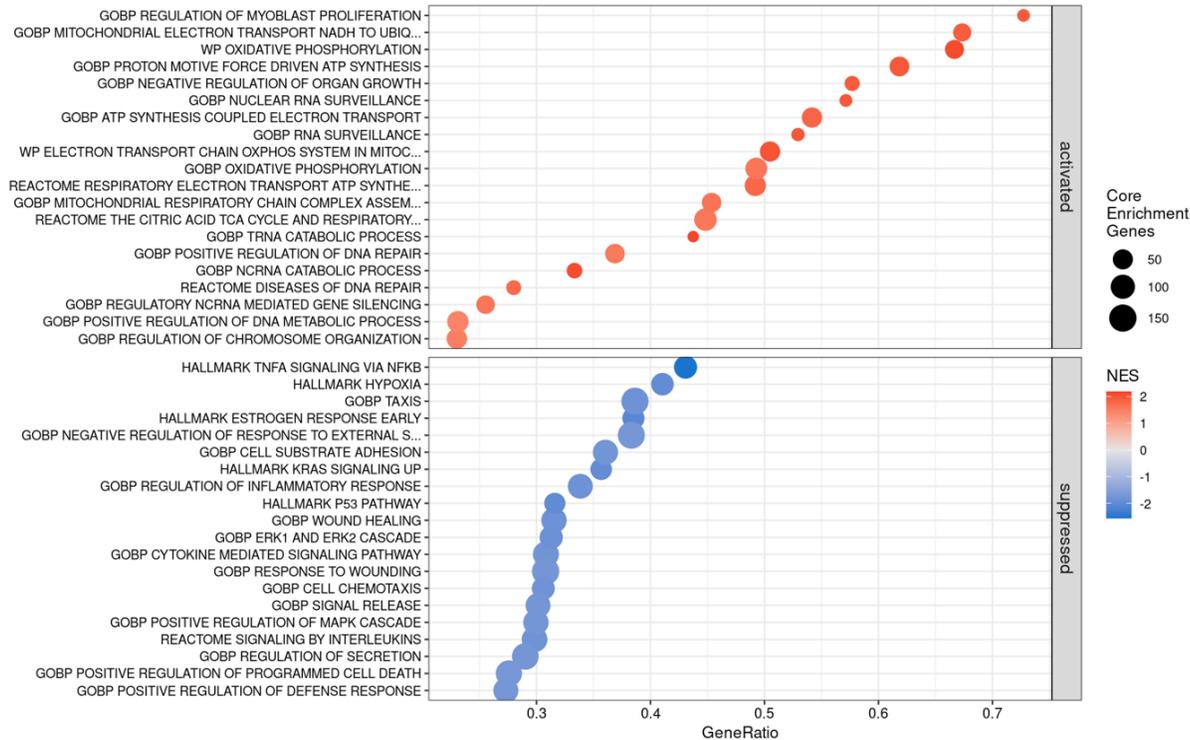


ACLYi and ACCi have opposite effects on Acetyl CoA



ESP-1336 Effects Pathways of Injury, Inflammation, and Fibrosis in Primary Human Liver Microtissues

ESP-1336 Impact on Gene Expression: Gene Set Enrichment Analysis



Fibrosis in bile and liver ducts

- Wound healing
- Myofibroblast proliferation

Inflammation & immune cell recruitment

- Inflammatory Signaling
 - TNF α
 - NFkB
 - Interleukin
- Cell chemotaxis

Cholestasis & Injury of bile and liver ducts

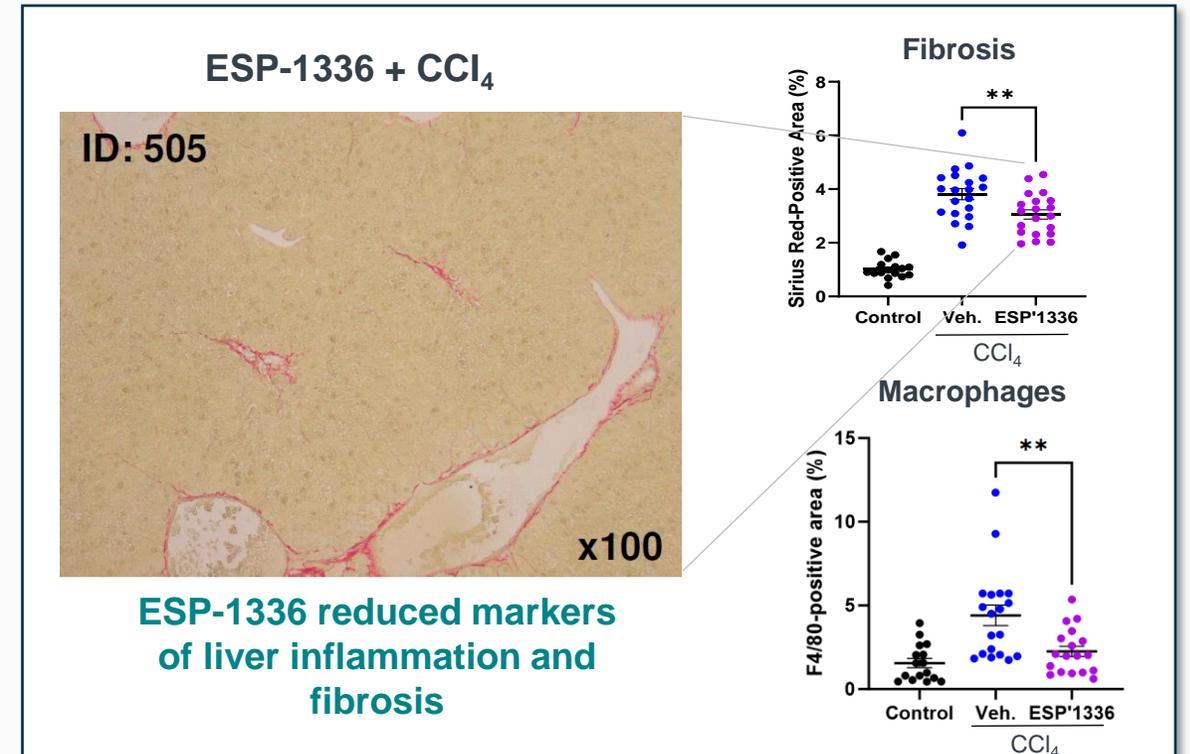
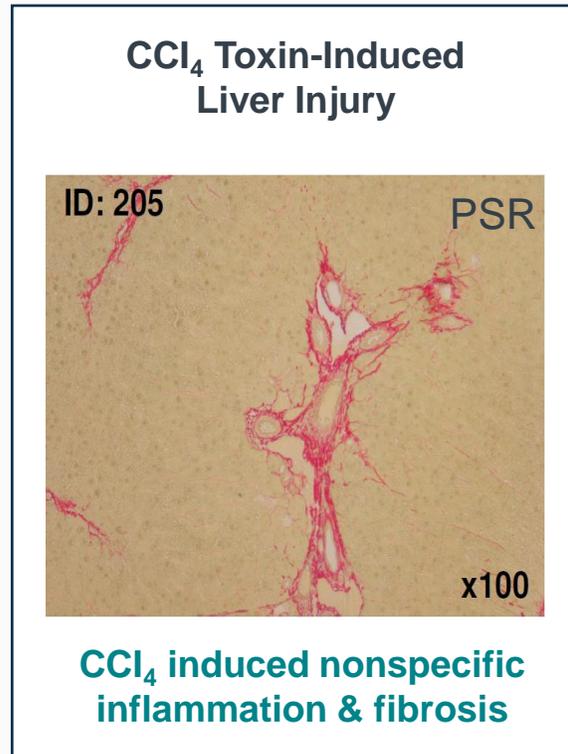
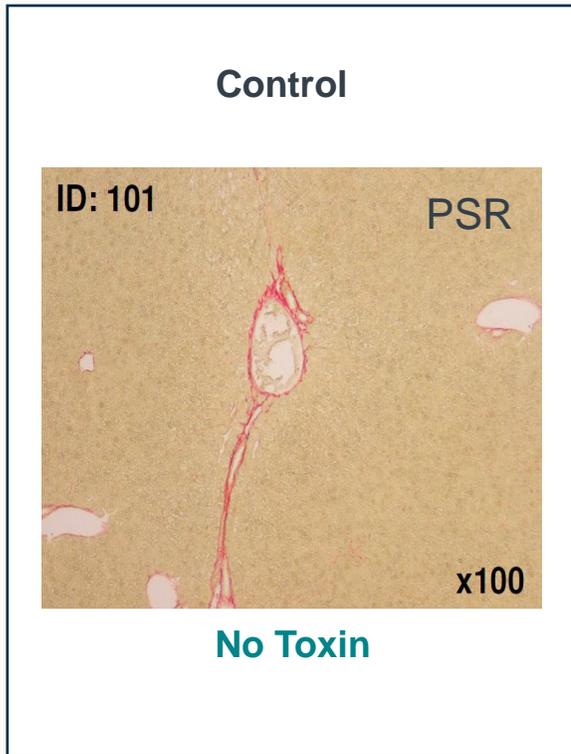
- Respiration/oxidative phosphorylation
- TCA cycle
- Cholesterol biosynthesis
- Apoptosis

TCA: tricarboxylic acid ;TNF α : Tumor necrosis factor alpha; NFkB: Nuclear factor kappa-light-chain-enhancer of activated B cells

ESP-1336 Reduces Liver Inflammation and Fibrosis in a Chemical-Induced Injury Model

 **Inflammation**
& immune cell recruitment

 **Fibrosis**
in bile and liver ducts

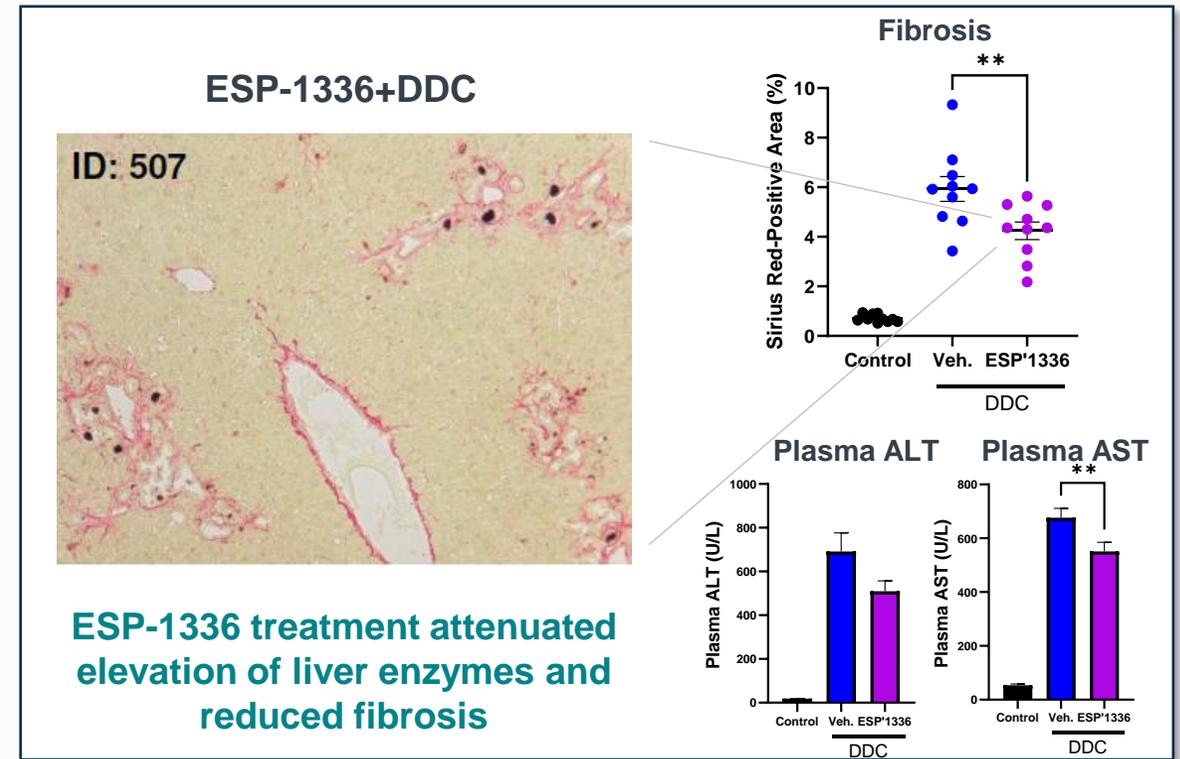
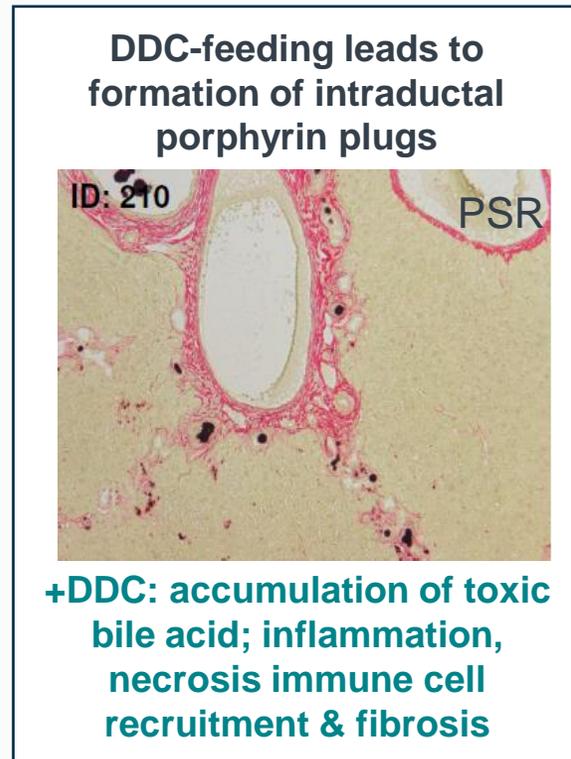
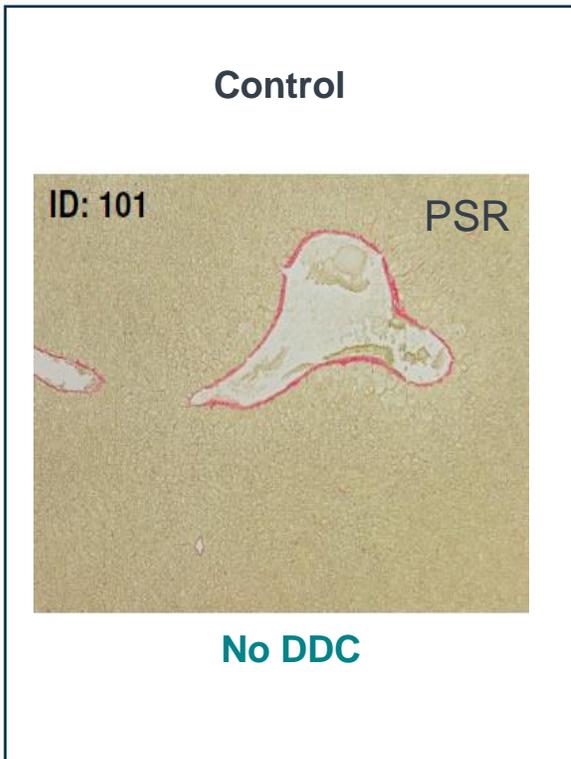


**One-way ANOVA vs. Vehicle p<0.01

ACLY Improves Liver Injury and Fibrosis in a Model of Progressive Biliary Obstruction

X Cholestasis & Injury
of bile and liver ducts

X Fibrosis
in bile and liver ducts



N=10; One-way ANOVA vs. Vehicle **; p<0.01

ACLYi: ATP citrate lyase; DDC: 3,5-diethoxycarbonyl-1, 4-dihydrocollidine; AST: aspartate aminotransferase; ALT: alanine aminotransferase

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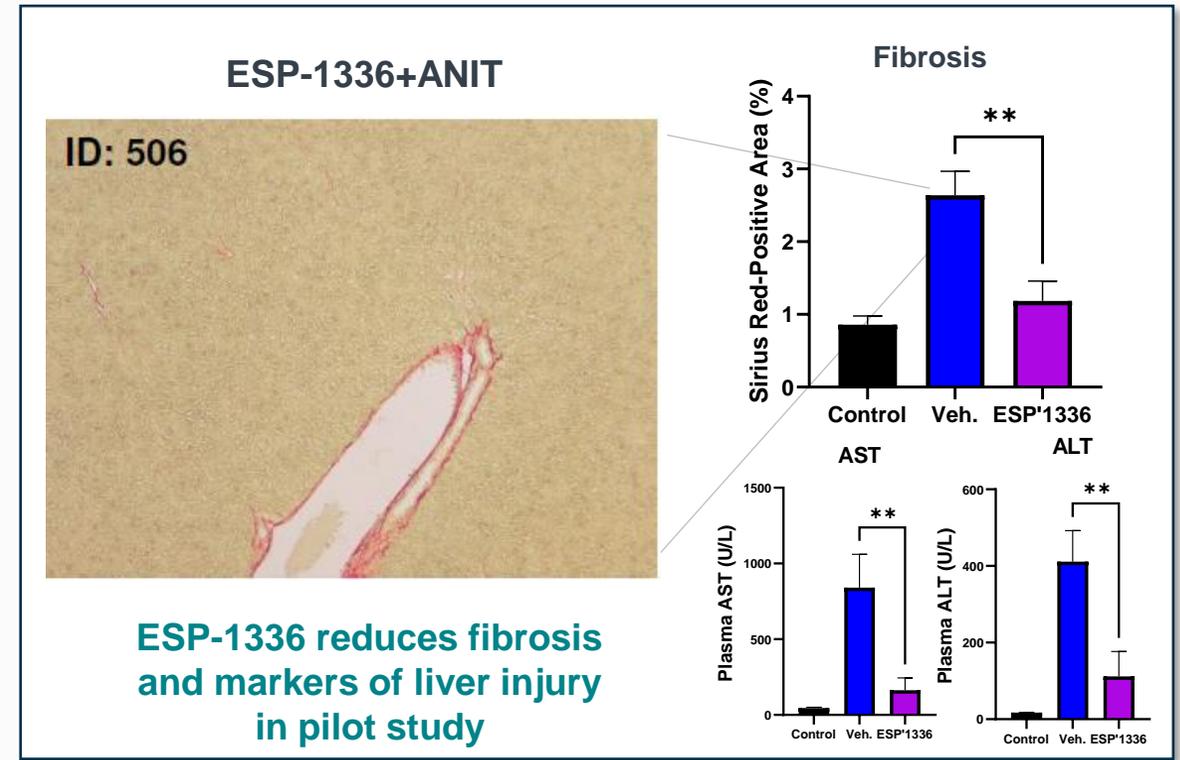
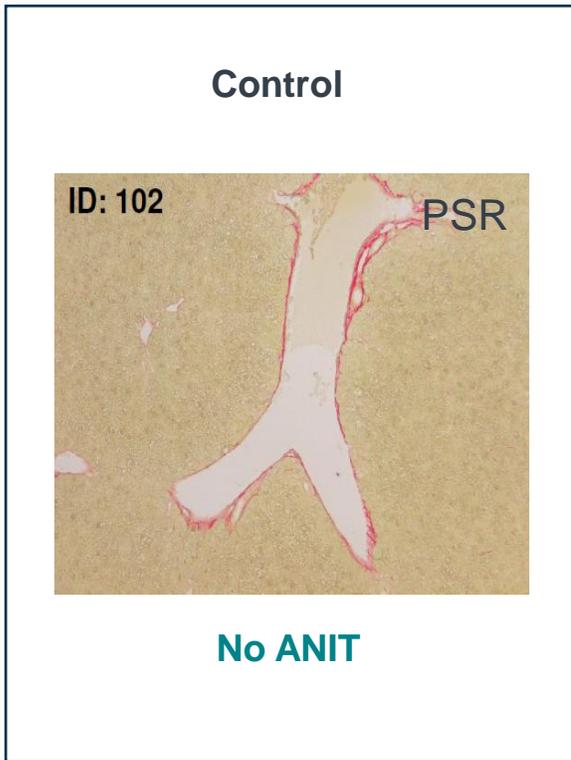
ESP-1336 Improves Liver Injury and Fibrosis in a Model of Hepatic Inflammation



Cholestasis & Injury
of bile and liver ducts



Fibrosis
in bile and liver ducts



**One-way ANOVA vs. Vehicle p<0.01

ACLYi: ATP citrate lyase inhibitor; ANIT: alpha-naphthylisothiocyanate; AST: aspartate aminotransferase; ALT: alanine aminotransferase

ESP-1336 Improves Liver Injury, Immune Cell Recruitment, and Fibrosis in a Severe Obstructive Model of Cholestasis



Cholestasis & Injury
of bile and liver ducts

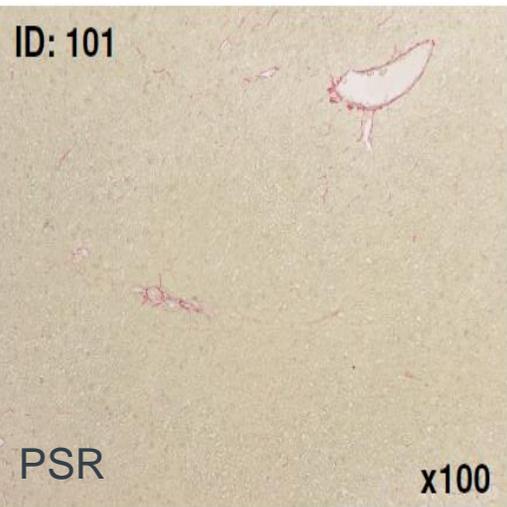


Inflammation
& immune cell recruitment



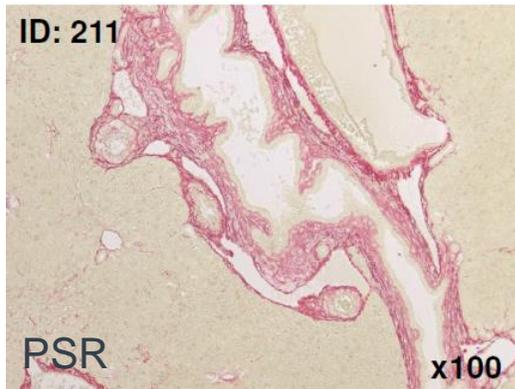
Fibrosis
in bile and liver ducts

Control



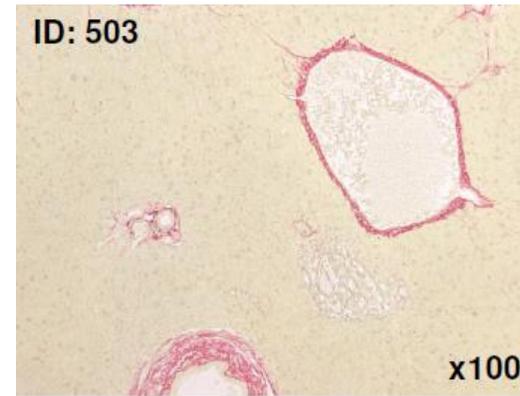
No Damage

Bile duct ligation
(BDL): accumulation of
toxic bile acid

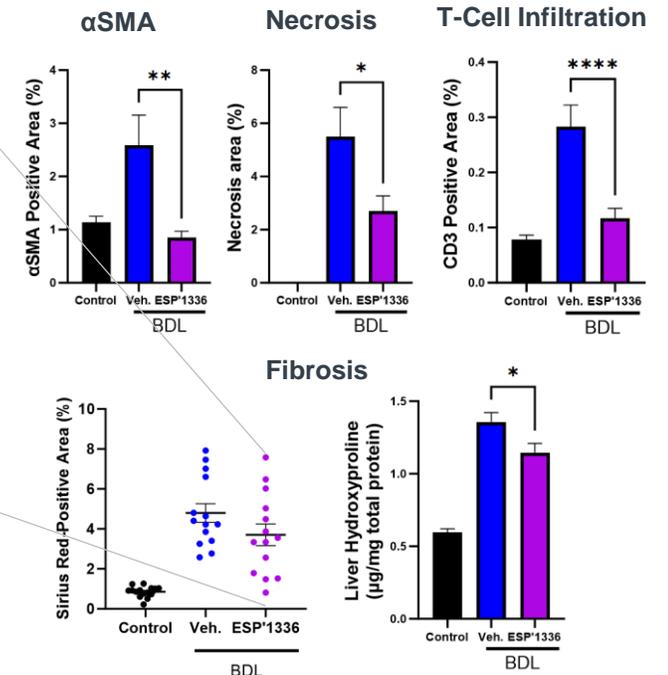


BDL induced inflammation,
necrosis, immune cell
recruitment & fibrosis

ESP-1336 + BDL



ESP-1336 reduces liver
necrosis, T-cell infiltration,
and markers of fibrosis/
myofibroblast formation



N=14-15; One-way ANOVA vs. Vehicle *: p<0.05, **: p<0.01, ****: p<0.0001

ACLYi: ATP citrate lyase inhibitor; CCl₄: carbon tetrachloride; α SMA: alpha-smooth muscle actin

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Innovative ACLY Inhibitor Discovery Program Designed for PSC

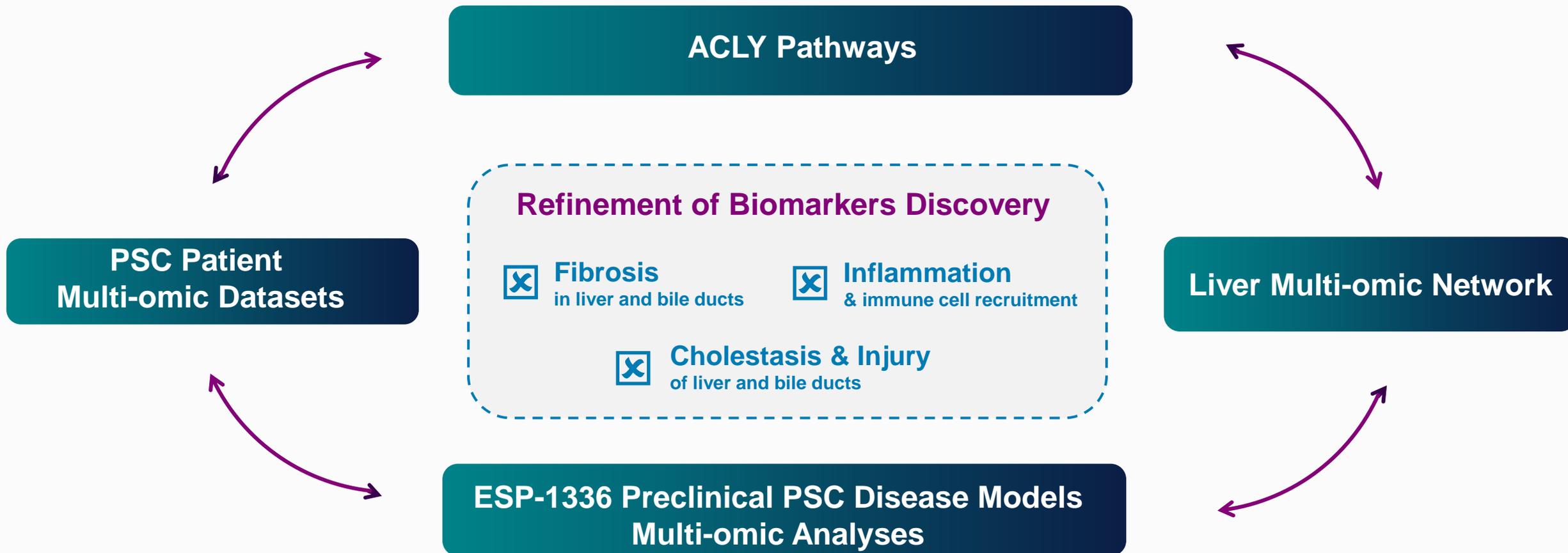
Optimization for PSC-specific mechanisms

- Applied advanced discovery approaches and technology to design the next generation of differentiated ACLY inhibitors
- Leveraged multi-omic data and human genetics to identify novel ACLY pathways relevant to liver disease
- Developed a custom screening cascade to optimize compound activity for PSC-specific mechanisms

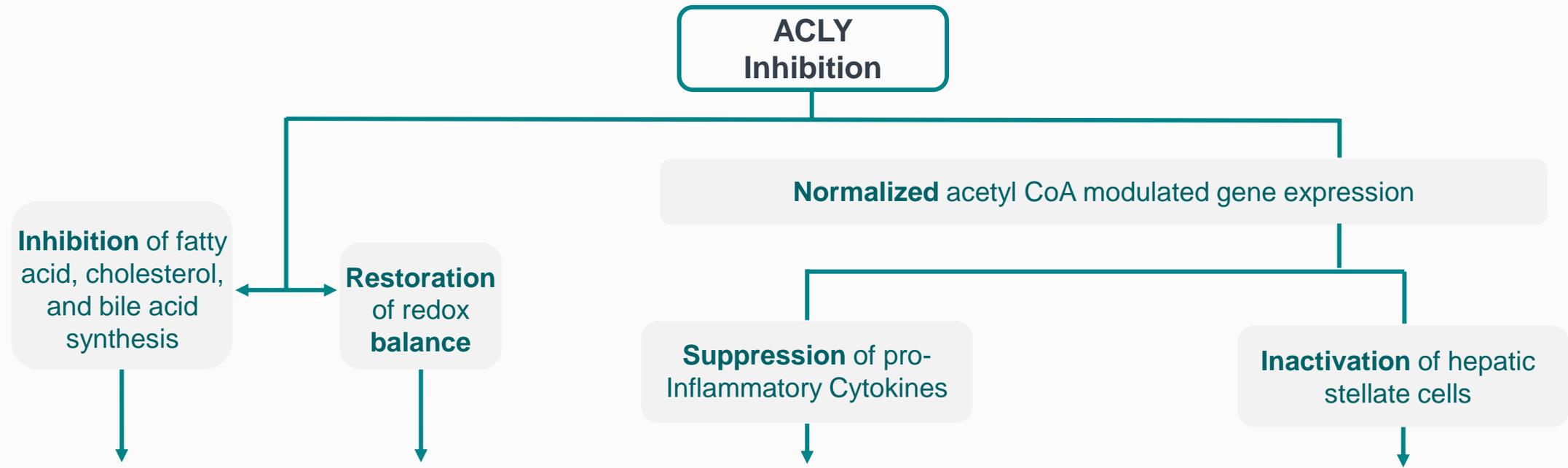
Strong Preclinical Profile

- De-risked, highly potent and specific allosteric ACLY inhibitor leads and backups selected
- Pharmacokinetic properties enable convenient once-daily oral dosing
- Compelling preclinical evidence confirm reductions in liver injury, inflammation and fibrosis in multiple PSC-relevant models, reinforcing therapeutic potential

Ensuring Success: Utilizing Data Integration to Identify Early Biomarkers



ACLY Inhibition is a Rational Therapeutic Target to Halt Multiple Mechanisms of PSC Progression



Cholestasis & Injury
of liver and bile ducts



Inflammation
& immune cell recruitment



Fibrosis
in liver and bile ducts

No Approved Therapy with Proven Efficacy to Halt PSC Progression

Esperion's oral next generation ACLY inhibitor has the potential to be the only agent to directly inhibit all 3 mechanisms of PSC disease progression



Cholestasis & Injury
of liver and bile ducts

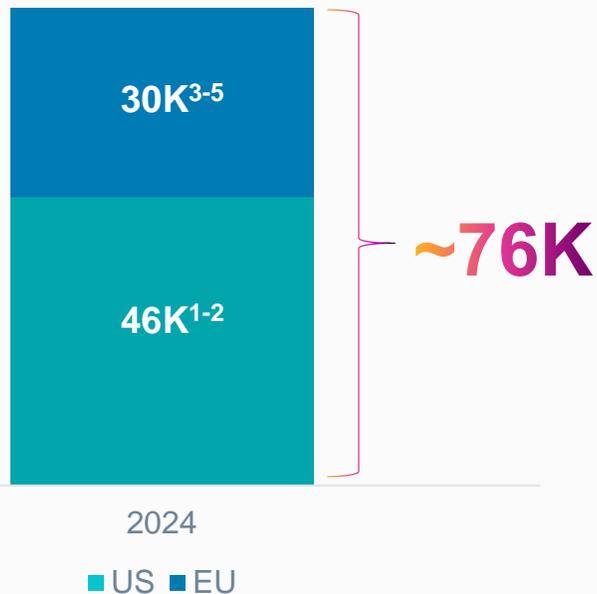
Inflammation
& immune cell recruitment

Fibrosis
in liver and bile ducts

High Unmet Need Driving Significant Market Opportunity

PSC: A Rare and Progressive Liver Disease

Diagnosed Prevalence of PSC



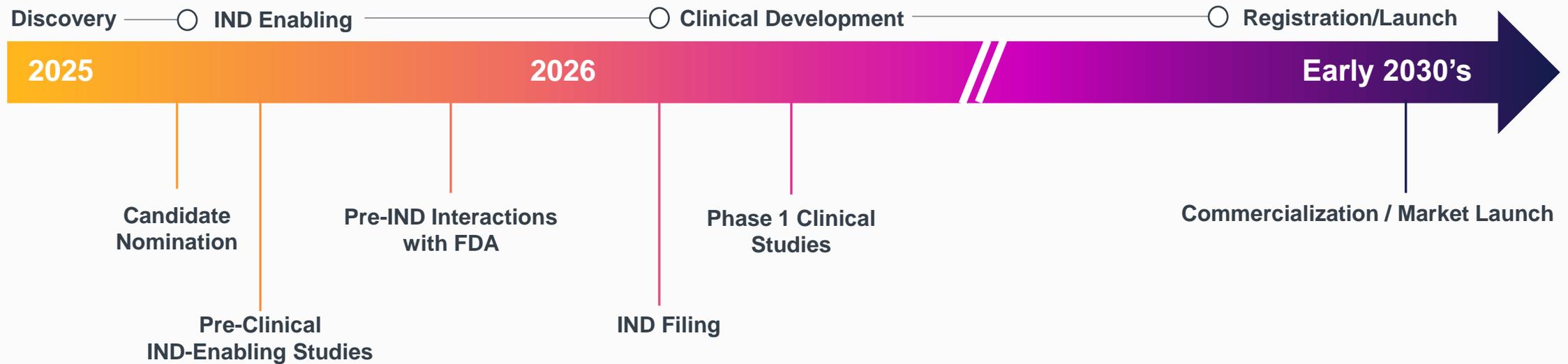
>\$1B Annual Market Opportunity Estimate

- **No approved therapies** with proven efficacy to cure or halt PSC progression
- **High healthcare burden** from hospitalization, transplants, and long-term management costs
- **Death or liver transplantation expected** within 1-2 decades after diagnosis
- Potential **Orphan Drug Designation & Fast Track Approval**
- Discovery program is **internally developed and wholly-owned globally**

PSC: primary sclerosing cholangitis

1. Bakhshi Z, et al. *J Gastroenterol*. 2020 May;55(5):523-532.; 2. Nguyen A, et al. *Front Gastroenterol (Lausanne)*. 2022;1:1076788.; 3. Liang H, et al. *Medicine (Baltimore)*. 2017;96(24):e71116.; 4. Boonstra K, et al. *Hepatology*. 2013;58(6):2045-55.; 5. Krampe, J, et al. Poster presented at: ISPOR 2024; Nov 2, 2024; Barcelona, Spain

We're Off to a Strong Start



IND: Investigational New Drug; FDA: Food and Drug Administration

ESPERION[®]

KOL Discussion

ESPERION[®]

Q&A Session

ESPERION[®]

Closing

Why Esperion Will Succeed

Patient-Focused Strategy



- Targeting a disease with **no approved therapies** to slow progression
- Committed to delivering real therapeutic impact in an area of **profound unmet need**
- **Strengthened ties** with **PSC patients** by working closely with PSC-focused advocacy groups
- Potential for **rare and orphan drug designation**, proving opportunities to deliver the therapy to patients sooner

Scientific Edge



- **Deep expertise** in ACLY biology and inhibition
- **Novel and differentiated** mechanism of action with broad liver disease application
- Targeting **multiple mechanisms of PSC progression**: injury, inflammation and fibrosis
- **Strong partnerships and research collaborations** enhancing execution

Experienced Leadership



- **First to discover**, develop, and globally commercialize ACLYi therapy
- Decades of **end-to-end drug discovery, development, and commercialization experience**, including in orphan and rare diseases
- **Fully built organization** with all core functions in place

ESPERION[®]

Thank You

