

Chinook Therapeutics Developing Precision Medicines for Kidney Diseases

ASN Kidney Week 2020 Reimagined Investor Webcast & Conference Call October 22, 2020

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Today's Presenters



Eric Dobmeier President & CEO



Richard Lafayette, MD, FACP

Associate Professor of Medicine (Nephrology) & Director of the Stanford Glomerular Disease Center at Stanford University Medical Center



Alan Glicklich, MD Chief Medical Officer



Andrew King, PhD Head of Renal Discovery & Translational Medicine





Introductio	n	Eric Dobmeier	
Overview	of IgA Nephropathy & Treatment Options	Richard Lafayette, MD, FACP	
INFO29	Phase 3, Randomized, Double-Blind, Placebo-Controlled Study of Atrasentan in Patients with IgA Nephropathy (The ALIGN Study)	Alan Glicklich, MD	
PO1843	Results of a Phase 1 Trial to Investigate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of BION-1301 in Healthy Volunteers	Andrew King, DVM, PhD	
PO1620	Discovery of CHK-336 : A First-in-Class, Liver-Targeted, Small Molecule Inhibitor of Lactate Dehydrogenase for the Treatment of Primary Hyperoxaluria		
SA-OR21	Single-Cell Transcriptomic Analysis to Define Cellular Heterogeneity in Human ADPKD		
Closing		Eric Dobmeier	
Q&A			

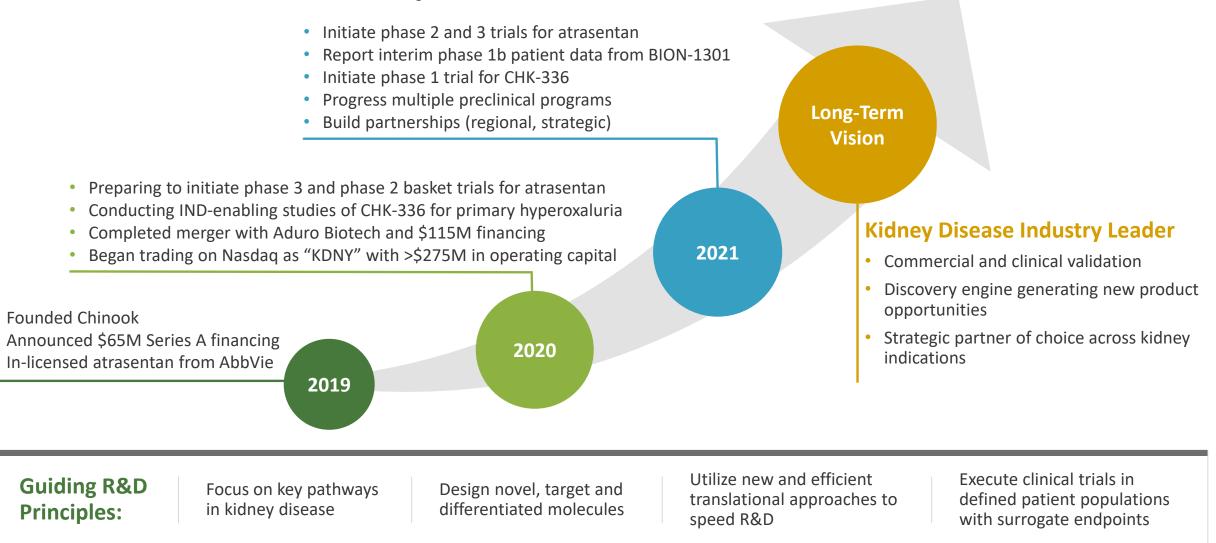




Introduction to Chinook

Advancing a pipeline of precision medicines for kidney diseases

Building the Leading Company Developing Precision Medicines for Kidney Disease





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Robust, Diversified and Focused Pipeline

Advancing pipeline of precision medicines for kidney diseases

Program	Indication	Target Validation	Lead Optimization	IND-Enabling	Phase 1	Phase 2	Phase 3	
Atvessets	IgA Nephropathy	Phase 3 initiation planned in early 2021						
Atrasentan	Basket of glomerular diseases	Phase 2 initiation planned in H1 2021						
BION-1301	IgA Nephropathy	Phase 1b ongoing						
СНК-336	Primary Hyperoxaluria	Phase 1 initiation planned in H2 2021						
Research Programs	Other rare, severe chronic kidney diseases including ADPKD							
Discovery Programs Other rare, severe kidney diseases								

We will continue to evaluate opportunities to add additional kidney disease programs to pipeline





IgA Nephropathy (IgAN)

Chronic autoimmune kidney disease with no approved therapies

Immunoglobulin A (IgA) Nephropathy (IgAN)

A Progressive, Chronic Glomerular Disease with Limited Treatment Options

IgAN is the most common primary glomerular disease globally, but still classified as an orphan indication with ~140K patients in the US

Variable clinical presentation, ranging from asymptomatic microscopic hematuria to severe, rapidly progressive glomerulonephritis

Diagnosis requires kidney biopsy and immunofluorescence microscopy

• Dominant mesangial IgA deposits and other hallmark histological hallmarks

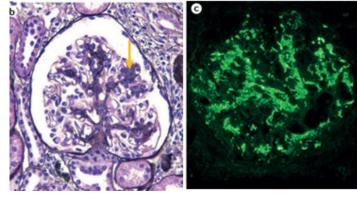
Approximately 30-45% of IgAN patients will develop end-stage kidney disease (ESKD) over a period of 20-25 years

• ESKD requires chronic dialysis or transplantation for management

No approved treatments and limited options for high-risk patients

- Renin Angiotensin System inhibition (RASi) (ACEi/ARB) is frontline (KDIGO 1B)
- Immunosuppressive agents provide inconsistent therapeutic benefit and are accompanied by significant side effects (KDIGO 2C)

Histological Diagnosis



Mesangial hypercellularity Glomerular IgA deposits

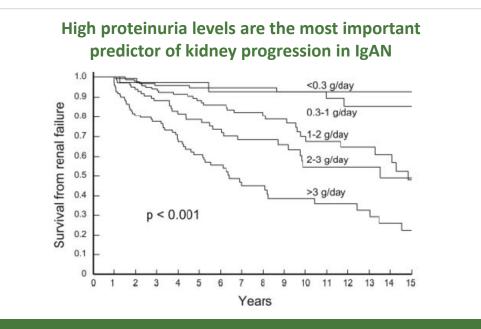
Urgent need for new treatments, in this typically young and otherwise healthy IgAN patient population at high risk for progressive kidney function loss

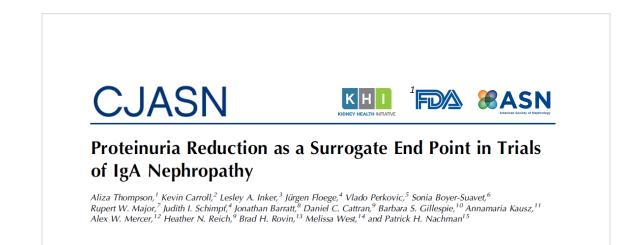
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Proteinuria Identifies IgAN Patients at Risk of Progression

Proteinuria Recognized as a Surrogate Endpoint for Accelerated Approval





Kidney progression with proteinuria >1 g/day

Sustained lowering of proteinuria to <1 g/day is associated with favorable long-term prognosis Proteinuria reduction is anticipated to be the surrogate marker to obtain accelerated approval in IgAN



Multi-Hit IgAN Pathogenesis

An Immune-mediated Primary Glomerular Disease

Initiating event thought to be an aberrant mucosal immune response

• IgAN commonly presents following a respiratory or gastrointestinal infection

Hit 1

• Increased production of Gd-IgA1 by IgA secreting plasma cells

Hit 2

• Gd-IgA1 is recognized as an autoantigen, by circulating IgG antiglycan antibodies

Hit 3

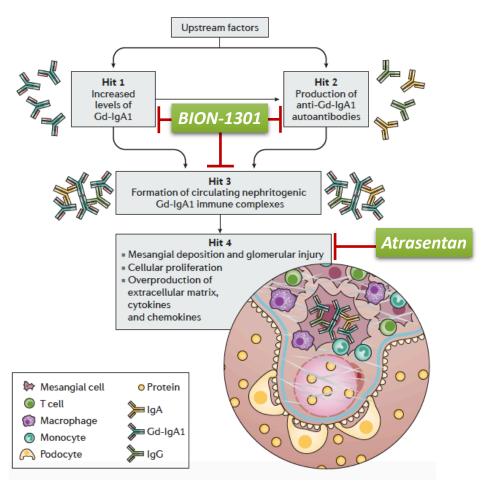
• Immune recognition results in the formation of immune complexes (ICs)

Hit 4

- Immune complexes deposit in the kidney, activating glomerular mesangial cell proliferation and production of extracellular matrix and inflammatory mediators
- Cellular crosstalk results in proteinuria, tubulointerstitial inflammation and fibrosis, leading to progressive kidney function loss

New treatments are needed to target the formation of IgA ICs (Hits 1-3) and the kidney's pathogenic response to deposition of ICs (Hit 4)

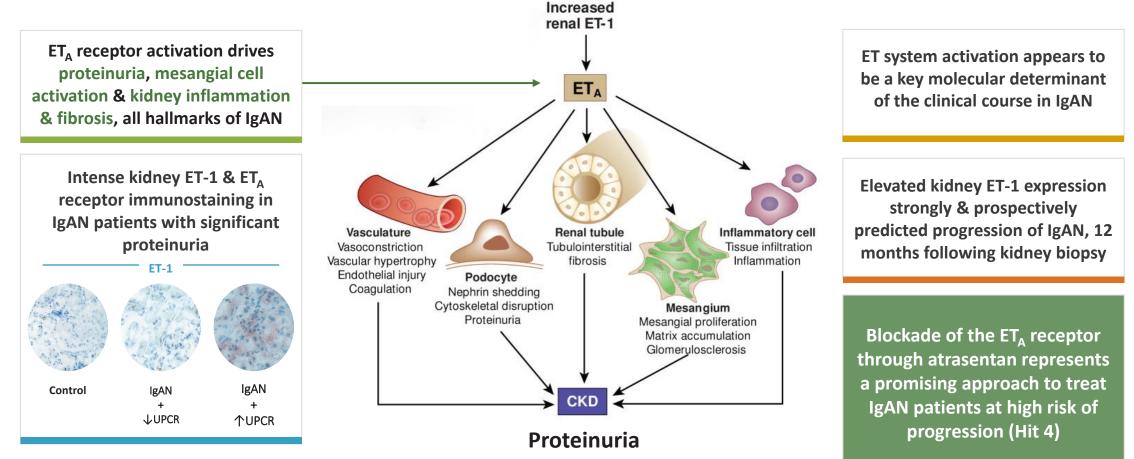
Atrasentan & BION-1301 target distinct and complementary mechanisms of IgAN





Atrasentan: A Potent and Selective ET_A antagonist

ET_A Activation Drives IgAN Progression Through Multiple Potential Mechanisms (Hit 4)

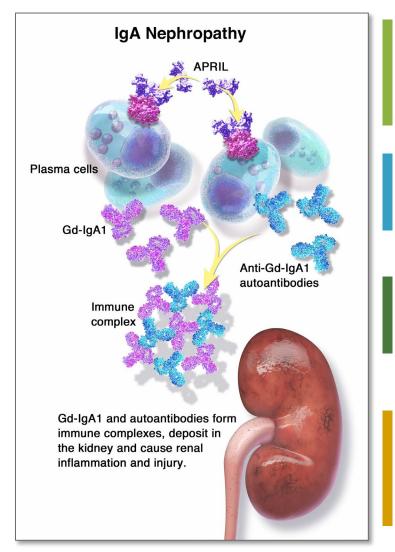


Inflammation & Fibrosis



BION-1301: A Humanized Anti-APRIL Monoclonal Antibody

A Potentially Disease Modifying Approach to Reduce IgA Immune Complex Formation (Hits 1-3)



A proliferation-inducing ligand (APRIL), is a cytokine that promotes IgA classswitching and survival of IgA-producing plasma cells, by activating its receptors, TACI & BCMA, and has been shown to increase Gd-IgA1 secretion ¹

In a study of IgAN patients, high plasma APRIL levels associated with higher Gd-IgA1 and proteinuria and lower estimated glomerular filtration rates ²

BION-1301 is a humanized IgG4 monoclonal antibody, that binds APRIL and functionally blocks APRIL binding to both of its receptors, BCMA and TACI

Blocking APRIL is a distinct approach to address the underlying cause of IgAN by reducing circulating levels of IgA, Gd-IgA1, anti-Gd-IgA1 autoantibodies and immune complex formation (Hits 1-3)





Phase 3, Randomized, Double-Blind, Placebo-Controlled Study of Atrasentan in Patients with IgA Nephropathy (The ALIGN Study)

Hiddo J. L Heerspink¹, Donald E. Kohan², Richard A. Lafayette³, Adeera Levin⁴, Vlado Perkovic⁵, Hong Zhang⁶, Andrew J. King⁷, Alan Glicklich⁷, Jonathan Barratt⁸

1. University Medical Center Groningen, Groningen, Netherlands. 2. The University of British Columbia Faculty of Medicine, Vancouver, BC, Canada. 3. University of Utah Health, Salt Lake City, UT, United States. 4. Chinook Therapeutics, Seattle, WA, United States. 5. Peking University First Hospital, Beijing, Beijing, China. 6. Stanford Medicine, Stanford, CA, United States. 7. University of New South Wales Faculty of Medicine, Sydney, NSW, Australia. 8. University of Leicester Medical School, Leicester, Leicester, United Kingdom.

Atrasentan is an Investigational Potent, Highly-Selective ET_A Inhibitor with Extensive Clinical Data in CKD

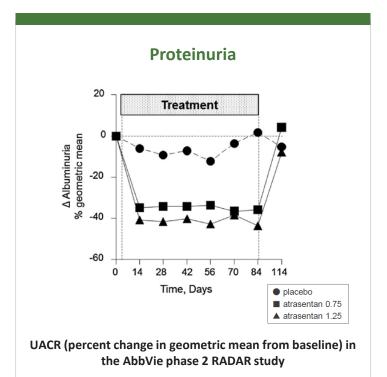
Potential to benefit IgA Nephropathy patients with a rapid registration pathway

Previously developed by AbbVie

- Extensive clinical data in >5,300 diabetic kidney disease (DKD) patients, including improved clinical outcomes in the global SONAR phase 3 study
- Rapid/sustained proteinuria reduction and preserved kidney function observed in clinical trials
- Well-characterized safety profile (dosed up to 5 years in trials)
- Optimal dose of 0.75 mg daily established via detailed PK / PD modelling
- Picomolar potency and highly selective for ET_A (1860-fold vs. ET_B)

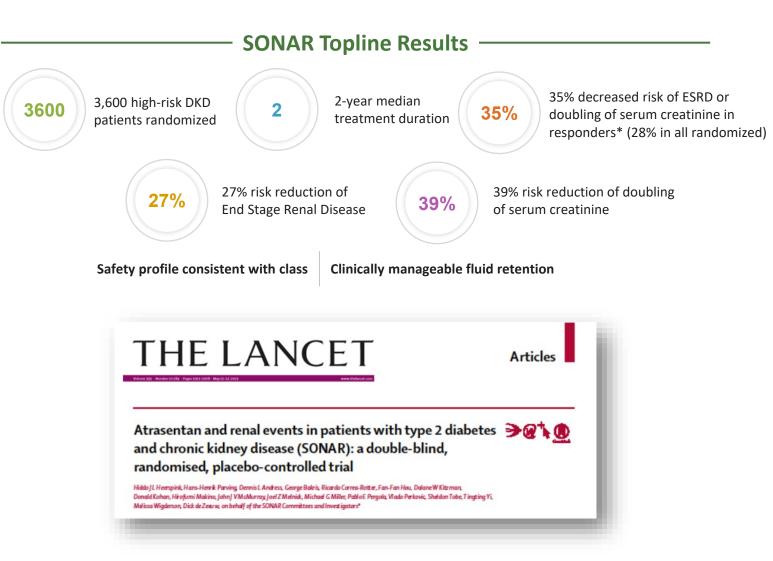
Strong rationale for development in IgAN

- Potential to seek accelerated approval on proteinuria reduction as surrogate endpoint
- Patient population that is otherwise **younger** and **healthier** than DKD
- Endorsement from KOLs supporting the potential of ET_A inhibition in IgAN
- Exclusivity period based on IP and potential for orphan designation
- Unmet medical need creates strong commercial opportunity





AbbVie Global SONAR Phase 3 Outcome Trial in DKD



"These data support a potential role for selective endothelin receptor antagonists in protecting renal function in patients with type 2 diabetes at high risk of developing end-stage kidney disease."

- Heerspink et al.

sonar

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*Responders classified as patients who achieved >30% reduction in proteinuria

Atrasentan Clinical and Regulatory Plan

Phase 3 Targeting IgAN patients at High Risk for Disease Progression



- ⊘ Biopsy-proven IgAN
- ⊘ Patients on maximally-tolerated, optimized and stable dose of RASi or RASi intolerant
- \odot Proteinuria >1 g/day and eGFR > 30 ml/min
- \odot ~320 pts, 1:1 placebo randomization
- \odot Global study with ~140 sites
- ⊘ 6-month proteinuria primary endpoint (accelerated approval)
- \odot 2.5 year eGFR secondary endpoint (full approval)

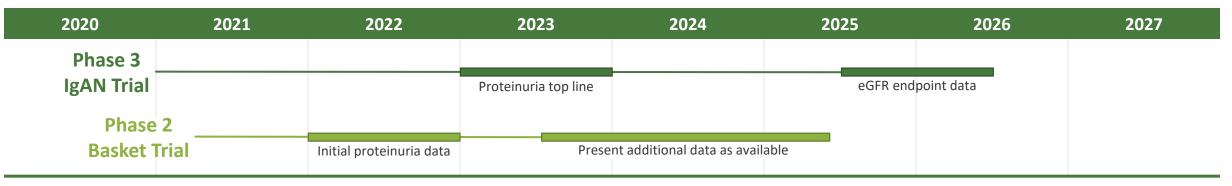
Phase 2 Basket Trial to Expand Potential Across Multiple Indications



- ⊘ ~20 patients / cohort
- Overlap with phase 3 sites to support enrollment

Cohorts include:

- \odot IgAN with proteinuria 0.5 <1 g/day
- Sector FSGS
- ⊘ Alport Syndrome
- ⊘ DKD as add on to SGLT2 inhibitors





AFFINI



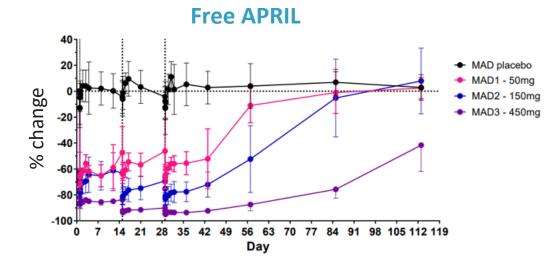
Results of a Phase 1 Trial to Investigate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of BION-1301 in Healthy Volunteers (encore)

Jeannette Lo,¹ Sharon Yavrom,¹ Jessy Fan,¹ Aaron N. Endsley,² Tamara Schroeder,¹ Jonathan Barratt,⁴ David M. Essayan.³

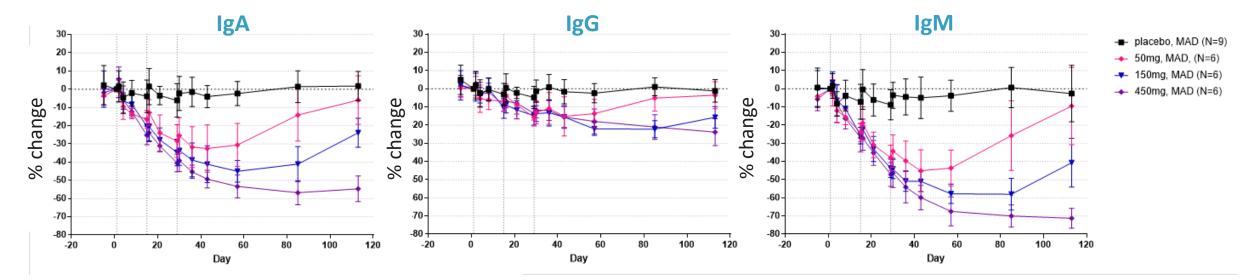
1. Chinook Therapeutics, Inc., Berkeley, CA;

- 2. Certara LP, Princeton, NJ;
- 3. ONCORD, Inc., Westlake Village, CA;
- 4. University of Leicester, Leicester, United Kingdom.

BION-1301 Demonstrated IgA Reductions in a Phase 1 Healthy Volunteer Study



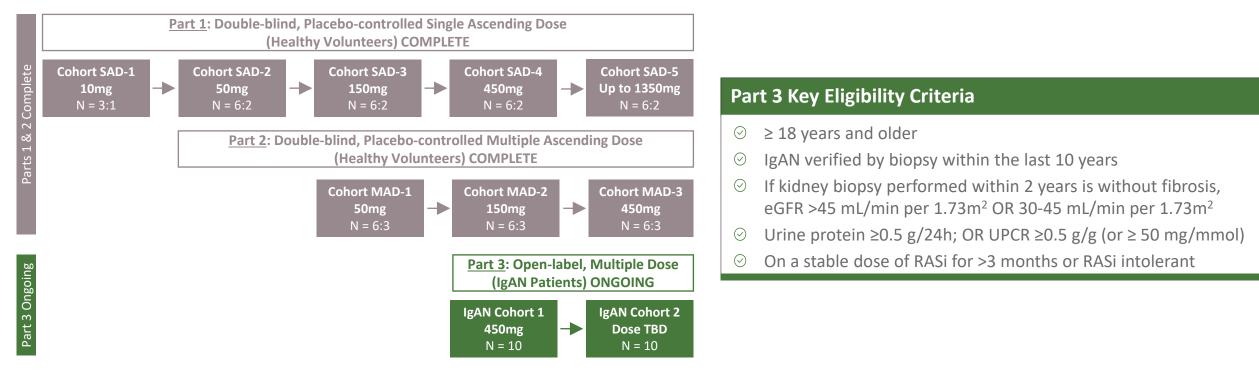
- BION-1301 was well-tolerated with low incidence of non-neutralizing ADAs reported
- Dose-dependent and durable reductions in free APRIL, IgA, IgM, and to a lesser extent, IgG
- Target of **~50-60% IgA reduction** achieved with 150-450 mg IV q2w
- PK profile was well-behaved, generally dose-proportional and demonstrated a half-life that supports the potential to be administered by monthly dosing
- Some accumulation observed, leading to greater & sustained PD responses with repeat dosing





BION-1301 Phase 1 in IgAN Patients Ongoing

- Part 3 currently enrolling IgAN patients
- BION-1301 administered by IV infusion every 2-4 weeks for 12 weeks
- Patients completing Part 3 may be eligible for a long-term extension trial for an additional 2 years
- Phase 1 IV/SC bioavailability study in healthy volunteers ongoing with potential transition to SC administration in the longterm extension and phase 2 studies







Discovery of CHK-336: A First-in-Class, Liver-Targeted, Small Molecule Inhibitor of Lactate Dehydrogenase for the Treatment of Primary Hyperoxaluria

Jennifer H. Cox¹, Marc-Olivier Boily¹, Alex Caron¹, Amandine Chefson¹, Oliver Chong¹, Jim Ding¹, Valerie Dumais¹, Samuel Gaudreault¹, Robert Gomez¹, James Guthrie¹, Ross P. Holmes², Andrew J. King¹, John Knight², Jeff Lester¹, W. Todd Lowther³, Renata Oballa¹, Michael D. Percival¹, Tao Sheng¹, Jayakumar Surendradoss¹, Joyce Wu¹, David A. Powell¹

- 1. Chinook Therapeutics Canada, Inc., Vancouver, BC, Canada
- 2. University of Alabama at Birmingham, Birmingham, AL, United States
- 3. Wake Forest School of Medicine, Winston-Salem, NC, United States

Primary Hyperoxaluria (PH)

Rare and severe disorder leading to excess oxalate and end stage renal disease (ESRD)

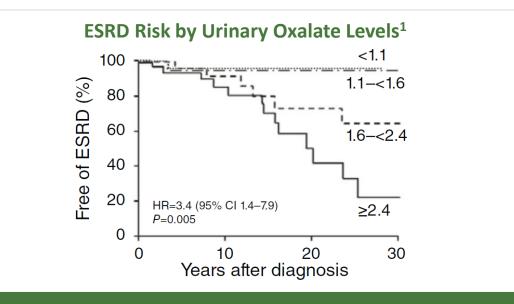
Genetic liver enzyme deficiency resulting in excess oxalate

- Patients form many calcium oxalate kidney stones
- Median age of kidney failure in PH1 is 23 years
- Only curative treatment is dual kidney-liver transplant; no approved drug therapies

Lower urinary oxalate (UOx) levels associated with reduced risk of ESRD

Clinical proof of concept achieved by injectable siRNA agents (GO-siRNA for PH1 and LDHA-siRNA for PH1/PH2)

No oral, small molecule therapies with potential to treat patients with all types of PH have been reported

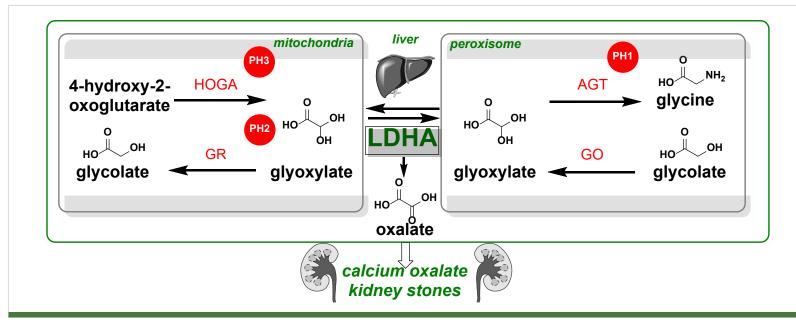


Disease Progression of PH

- Abnormal liver metabolism of glyoxylate produces excess oxalate
- Calcium oxalate crystals form in the kidneys
- Decline in kidney function results in systemic **oxalosis**
- Onset of kidney failure
- Dialysis awaiting dual liver / kidney transplant



Targeting LDHA Addresses All PH-Causing Mutations and Pathways



Three types of PH caused by different mutations:

- PH1: AGXT (AGT protein)
- PH2: GRHPR (GR protein)
- PH3: HOGA1 (HOGA protein)

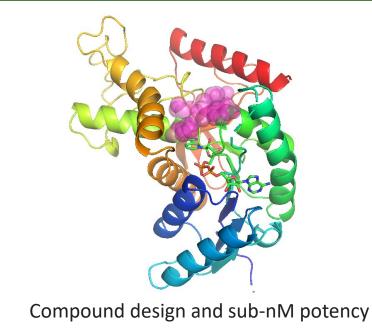
Lactate dehydrogenase (LDHA) is the final and committed step in production of oxalate from glyoxylate in the liver

- Represents a potential therapeutic target for all forms of PH, as well as other disorders arising from excess oxalate
- Complete loss-of-function of LDHA in humans results in exercise-induced muscle symptoms¹, therefore liver-targeting with low systemic levels is needed
- Liver-specific LDHA inhibition is expected to be safe and well tolerated

Chinook designed, synthesized and characterized hundreds of LDHA inhibitors with the goal of identifying a potent and selective compound with a liver-targeted tissue distribution profile for the treatment of all types of PH



CHK-336 is a Potent LDHA Inhibitor in Enzyme and Hepatocyte Assays Across Multiple Species



guided by structural biology and X-ray crystallography of LDHA-inhibitor complexes

CHK-336 demonstrates potent inhibition of LDHA in enzyme assays ($IC_{50} = 0.1-0.4 \text{ nM}$) and primary hepatocyte assays across multiple species ($IC_{50} = 52-293 \text{ nM}$)

	ASSAY	СНК-336 IC ₅₀
Enzyme	Human LDHA	0.4 nM
	Mouse LDHA	0.1 nM
Hepatocyte	Mouse Fresh Hepatocytes	52 nM
	Mouse Cryopreserved Hepatocytes	80 nM
	Rat Cryopreserved Hepatocytes	130 nM
	Monkey Cryopreserved Hepatocytes	130 nM
	Human Cryopreserved Hepatocytes	131 nM
PH1 Cell	Mouse Agxt Knockdown Hepatocytes (Oxalate Production)	293 nM

CHK-336 also demonstrated tight LDHA binding with a very slow off-rate (hours-days)



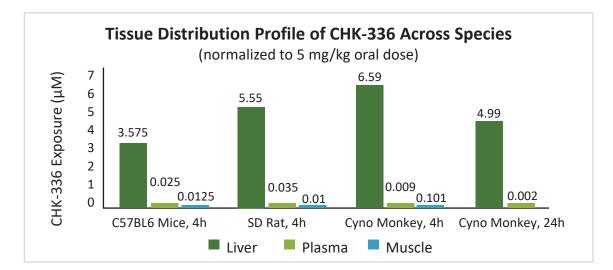
Pharmacokinetic and Pharmacodynamic Properties of CHK-336

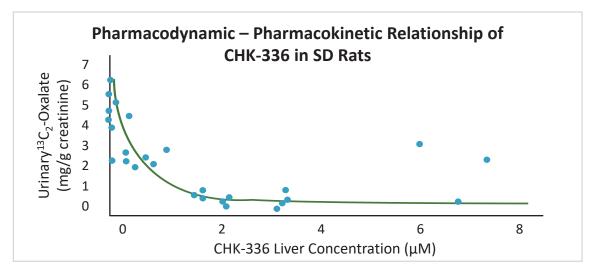
CHK-336 exhibits a liver-targeted tissue distribution profile in mice, rats and monkey with high liver concentrations and low extra-hepatic tissue exposures

Long liver half-life observed across species; driven by good metabolic stability and tight, slow-off rate binding of CHK-336 to LDHA in the liver

Well-profiled pharmacodynamic effect in mice and rats driven by liver concentrations: liver EC₅₀ of \approx 3 µM

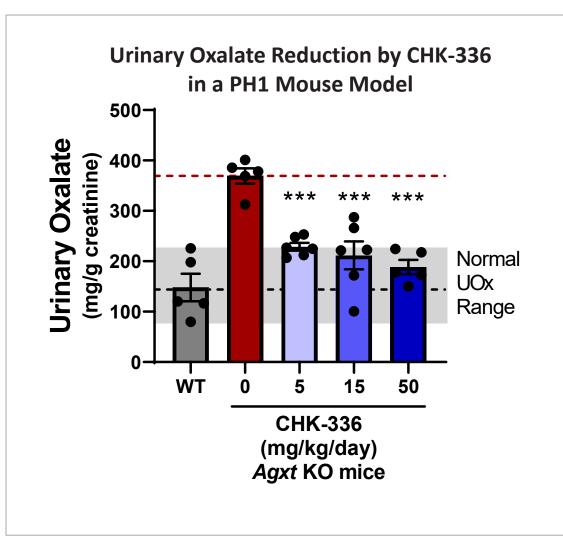
Human PK predictions suggest CHK-336 has the potential to be a low, once-daily oral dose in humans







CHK-336 Produced Significant and Dose-dependent Reductions in Urinary Oxalate in a PH1 Mouse Model



- A mouse model of PH1 was generated by CRISPR-Cas9 deletion of exons 3-8 of Agxt; these mice exhibited elevated urinary oxalate as expected
- CHK-336 was dosed orally, once-daily for 7 days in male Agxt KO mice and urinary oxalate concentrations were compared to a vehicle control group
- Low, oral, once-daily doses of CHK-336 significantly reduced urinary oxalate; majority of treated mice reached the normal range observed in wild-type mice
- Analysis of liver concentrations of CHK-336 resulted in a PK/PD relationship with a liver EC_{50} of $1-5 \mu M$ CHK-336, consistent with rat liver PD values
- Similar data generated in a mouse Agxt knockdown model of PH1



Non-Clinical Safety Assessment Supports Continued Advancement of CHK-336 into IND-enabling Studies

Excellent in vitro Safety Profile

- Low risk of hERG mediated QT prolongation (IC₅₀ > 30 μ M)
- Non-mutagenic (negative in 5-strain AMES up to 5000 μg/well)
- Excellent off-target selectivity profile (<50% inhibition at 10 μM for 86 target panel, >450-fold selectivity for LDHA)

Low Drug-Drug Interaction (DDI) Potential

- Low risk of CYP-mediated DDI
 - No CYP3A4 inhibition or time-dependent inhibition (IC₅₀ > 30 μ M)
 - No CYP3A4 induction in hepatocytes (IC₅₀ > 10 μ M)

Promising Non-GLP in vivo Safety Profile

- Non-GLP in vivo safety studies suggest wide therapeutic margins over anticipated efficacious exposures
- Doses up to 1000 mg/kg/day explored in 14-day rat study



Conclusions

- Targeting LDHA, the terminal step in hepatic oxalate synthesis, represents a potential therapeutic strategy for all forms of PH, as well as other disorders arising from excess oxalate
- By potently blocking LDHA and engineering a liver-targeted tissue distribution profile, CHK-336 represents a potentially safe and effective oral small molecule for the treatment of primary hyperoxaluria
- CHK-336 shows robust efficacy in a PH1 mouse model at low, once-daily oral doses including the ability to reduce elevated urinary oxalate levels to the normal range
- The non-clinical safety assessment of CHK-336 conducted to date supports continued advancement into IND-enabling studies

CHK-336 is a first-in-class oral LDHA inhibitor with the potential to treat all subtypes of primary hyperoxaluria as well as other disorders arising from excess oxalate





Single-Cell Transcriptomic Analysis to Define Cellular Heterogeneity in Human ADPKD

Yoshiharu Muto,¹ Eryn E. Dixon,³ Chidambaram Ramachandran,² Andrew J. King,² Stephen L. Seliger,³ Owen M.Woodward,³ Paul A. Welling,⁴ Terry J. Watnick,³ Benjamin D. Humphreys.¹

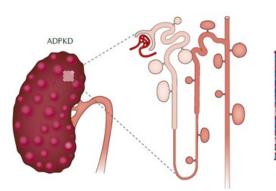
1. Washington University School of Medicine, St. Louis, MO, United States

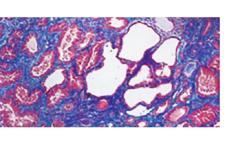
- 2. Chinook Therapeutics Canada, Inc., Vancouver, BC, Canada
- 3. University of Maryland School of Medicine, Baltimore, MD, United States
- 4. Johns Hopkins School of Medicine, Baltimore, MD, United States

Single-Cell Transcriptomic Analysis to Define Cellular Heterogeneity in Human ADPKD

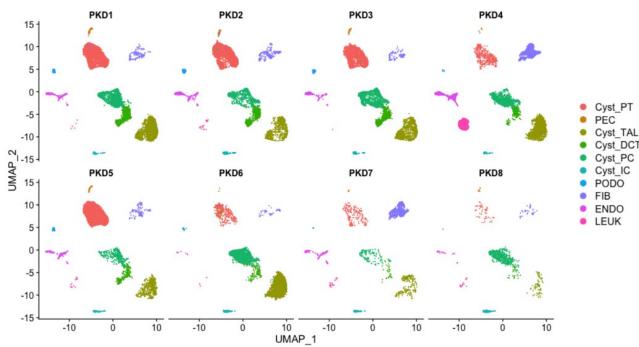
SA-OR21: Oral Presentation, Saturday, October 24, 2020 at 5:00 – 7:00 pm ET

 ADPKD is the most common potentially lethal monogenic disorder globally and the most common inherited kidney disease with ~50% of patients progressing to ESKD by age 60





- The kidney has nearly 30 distinct cell types
- In ADPKD, cysts arise out of <1% of nephrons and only from discrete cell populations
- Single cell transcriptional resolution is required to define the central molecular drivers of cystogenesis



- To our knowledge, this is the first single cell transcriptomic atlas described for human ADPKD
- Potential for unprecedented mechanistic insight into ADPKD



Ben Humphreys, MD, PhD

Multiple cell types detected in each ADPKD Patient Sample



Closing

Chinook Well-Positioned to Achieve Value-Generating Milestones

- Building a differentiated and proprietary pipeline of precision medicines targeting IgA nephropathy, glomerular diseases and other rare, severe chronic kidney diseases
- Well-capitalized to support multiple clinical and preclinical programs with >\$275 million in capital upon closing of the Aduro merger and concurrent financing
- Two clinical programs with potentially complementary mechanisms in IgA nephropathy with atrasentan and BION-1301
 - IgA nephropathy is a large patient population with great unmet medical need
 - Atrasentan program de-risked through well-characterized safety profile and extensive data collected in >5,300 DKD patients
 - Phase 3 AFFINITY and phase 2 ALIGN trials initiating in H1 2021
 - BION-1301 has the potential to be a disease-modifying therapy with possibility to combine with other therapies, including atrasentan
 - Enrollment of IgAN patients ongoing in part 3 of phase 1 study, with interim data expected in H1 2021
- CHK-336, a **first-in-class, liver-targeted, oral LDHA inhibitor**, has the potential to treat all subtypes of PH and other disorders arising from excess oxalate
- Several research and discovery programs ongoing in other rare, severe chronic kidney diseases including ADPKD









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