THARIMMUNE

Unlocking Immunology for a Better Tomorrow

Corporate Presentation

March 2025

Nasdaq: THAR | www.tharimmune.com

Forward-Looking Statements

Certain statements in this presentation are forward-looking within the meaning of the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical facts, contained in this press release, including statements regarding the timing and design of Tharimmune's future Phase 2 trial, Tharimmune's strategy, future operations, future financial position, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words "anticipate," "believe," "continue," "could," "depends," "estimate," "expect," "intend," "may," "ongoing," "plan," "potential," "predict," "project," "target," "should," "will," "would," and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. The Company may not actually achieve the plans, intentions, or expectations disclosed in these forward-looking statements, and you should not place undue reliance on these forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in these forward-looking statements. Factors that may cause such differences, include, but are not limited to, those discussed under Risk Factors set forth in our Annual Report on Form 10-K for the year ended December 31, 2024 and other periodic reports filed by the Company from time to time with the Securities and Exchange Commission. In addition, the forward-looking statements included in this press release represent the Company's views as of the date of this release. Subsequent events and developments may cause the Company's views to change; however, the Company does not undertake and specifically disclaims any obligation to update or revise any forward-looking statements to reflect new information, future events or circumstances or to reflect the occurrences of unanticipated events, except as may be required by applicable law. These forward-looking statements should not be relied upon as representing the Company's views as of any date subsequent to the date of this release.

Investment Highlights

Developing **novel treatments for immune-mediated diseases**, with lead programs in primary biliary cholangitis (PBC) and autoimmune conditions

Clinical-stage Immunology & Inflammation Pipeline

- TH104: First-in-class buccal film delivery of nalmefene for chronic pruritus in PBC (Phase 2-ready)
- TH023: Oral anti-TNFα monoclonal antibody targeting autoimmune diseases (Phase 1-ready)

Large, Underserved Market Opportunities

- Chronic pruritus in PBC: No FDA-approved therapies, with an estimated >150K US patients
- Oral anti-TNFα opportunity: Potential to disrupt the $50B+ global autoimmune biologics market

Proprietary Drug Delivery Innovation

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- TH023's oral formulation offers a patient-friendly alternative to injectable TNF-α inhibitors

Strong Leadership & Clinical Expertise

- Management has a proven track record launching biopharma companies
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Near-Term Clinical & Regulatory Milestones

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Product Pipeline

Multiple, De-Risked Shots on Goal

Stage	Candidate	Modality & Indication	Preclinical	Phase 1	Phase 2	Next Milestones
Clinical	***TH104*** *MOR/KOR*	**Buccal Transmucosal Film** Avoids first-pass liver effect **Moderate-to-Severe Chronic Pruritus in PBC**	***Phase 2 Ready****			**2025:** HI Study Initiation* Ph2 Planning
	TH023 *Anti-TNFα*	**Oral Infliximab** Only approved as IV/SC **Multiple high-value autoimmune indications**	***Phase 1 Ready†***			**2H25:** CMC Optimization Ph1 Initiation
Development	***HS1940*** *PD-1/VEGF*	**EpiClick™ Technology** **Multiple high-value oncology indications**				**2025:** Preclinical studies

MOR = mu opioid receptor; KOR = kappa opioid receptor; TNFα = tumor necrosis factor-alpha;

*CMC completed; HI – hepatic impairment; TH104 ready to go into Phase 2 in the EU and US with FDA and EMA feedback received

† trial initiation ex-US; Celltrion has right-of-first refusal post clinical study

Major Unmet Need for Chronic Pruritis (Severe Itching) in PBC

Primary Biliary Cholangitis (PBC) is a rare, chronic autoimmune liver disease that leads to bile duct damage and progressive liver failure

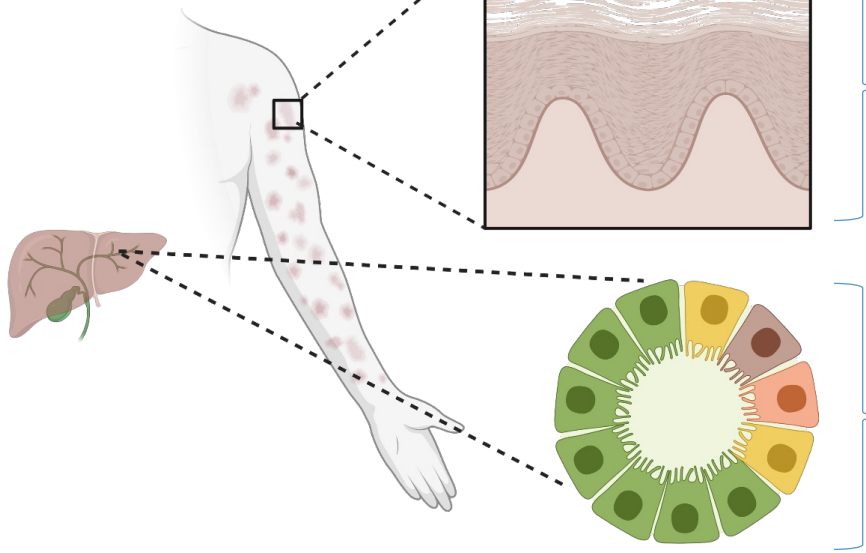
>150,000
US cases

Orphan Disease in US and EU

>200,000
Global cases

~90%
PBC cases are women

~65%
Have worse nocturnal pruritis



More than 70% of PBC patients affected by pruritus[1]

PBC is a chronic disease where bile ducts in the liver are eventually dysfunctional; the bile builds up and causes liver damage[4]

Current Treatment Gaps

- Limited options: No convenient FDA-approved therapies for PBC-related pruritus
- Existing treatments have suboptimal efficacy or cause significant side effects
- Significant QoL impact: leads to sleep disturbance, anxiety and depression

In patient testimonials, PBC itch is described as **"the worst, most unimaginable itch, like bugs crawling under the skin"**

Lead Asset – TH104 for PBC Pruritis

TH104 is a proprietary transmucosal buccal film embedded with FDA-approved nalmefene, designed to suppress chronic pruritus in PBC patients

Asset De-Risked by Improved Formulation

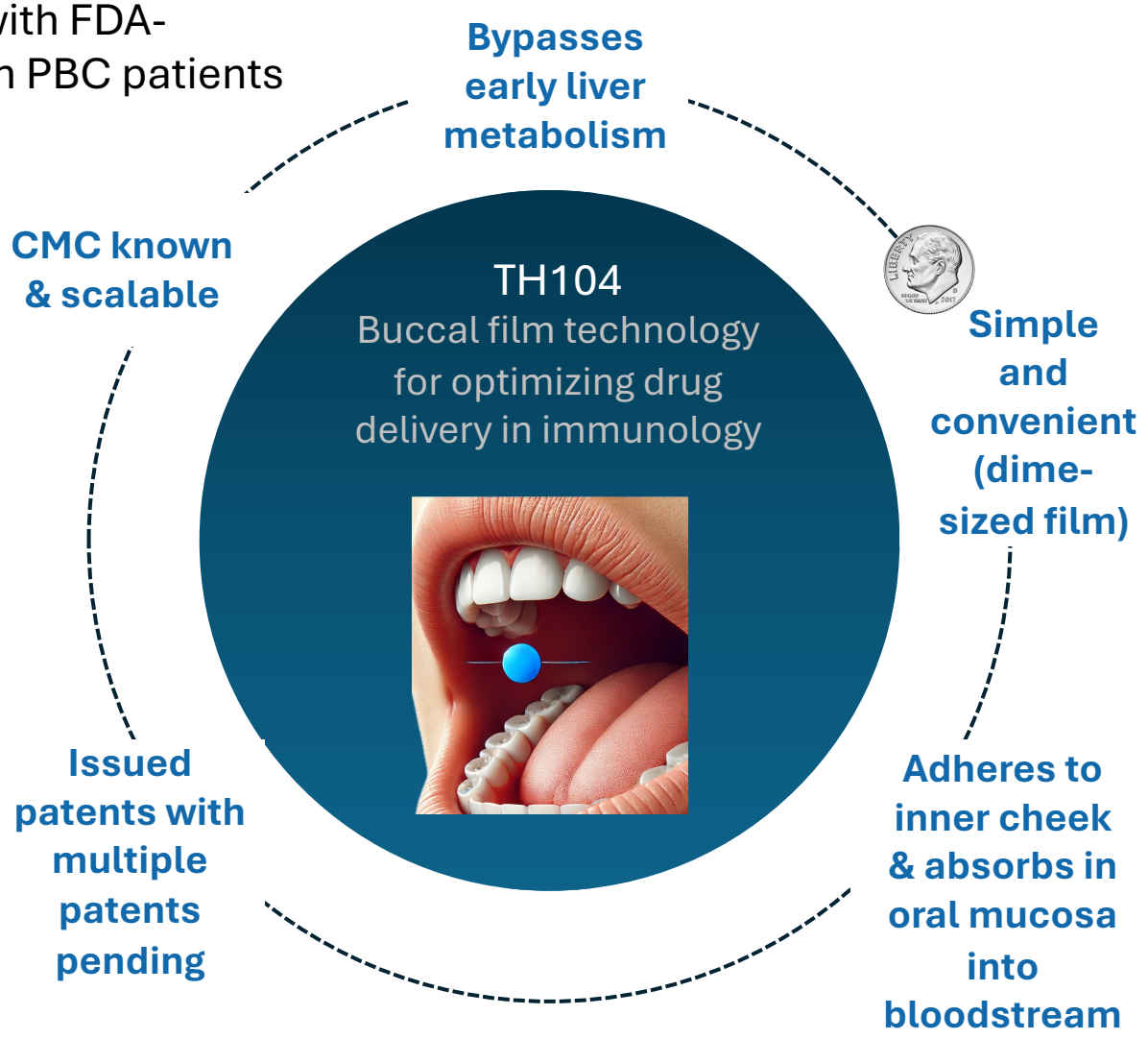
- Active ingredient, FDA-approved (nalmefene), suppresses PBC-induced pruritis
- Buccal delivery potentially avoids early liver metabolism, benefitting liver impaired patients
- Once-daily dosing, rapid onset, high absorption
- Buccal delivery offers comparable bioavailability as IV and oral delivery of nalmefene

Positive Phase 1 Results

- ✓ All subjects had a mean **33.3% decline** in itch scores after a single dose at 24 hours in an open-label proof-of-concept
- ✓ Significant correlation between blood levels and symptom relief

Clinical Progress

- Positive Phase 1 completed
- Phase 2 initiation planned

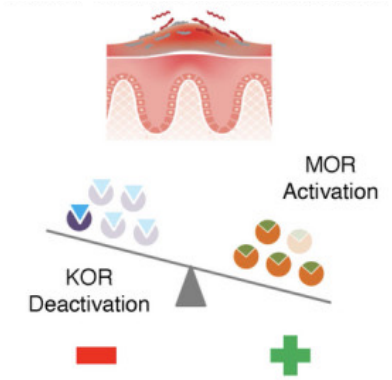


TH104 Mechanism of Action: Dual Modulation of Receptors

Growing Market Opportunity Unlocked by Addressing Root Causes

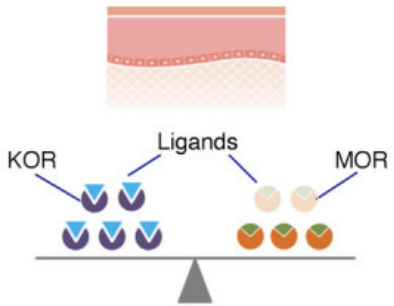
1 TH104 functions by **restoring the opioid receptor activation imbalance** implicated in promoting itch across many liver diseases

Pruritic Skin



Induction of itch from overactivation of MOR and/or KOR deactivation

Normal Skin



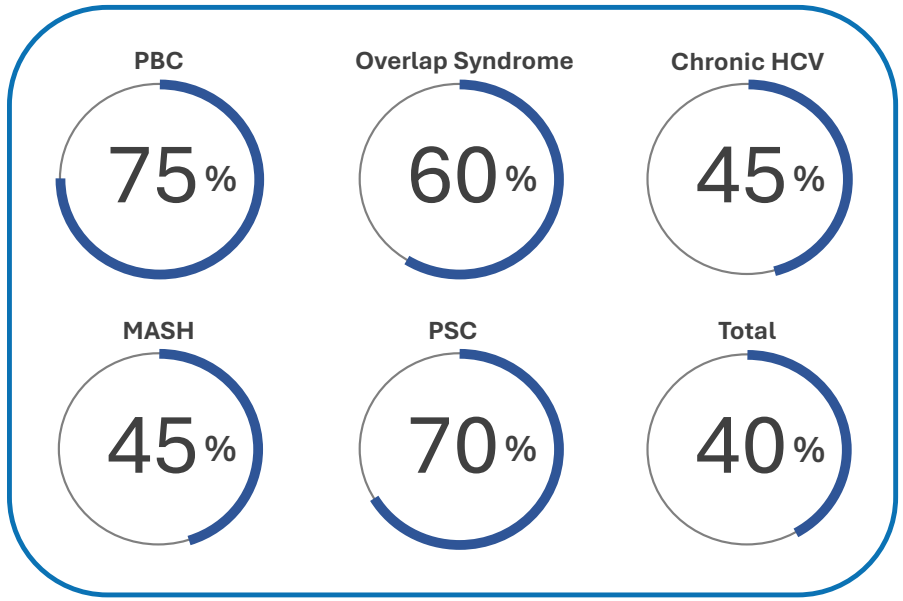
THAR104 looks to balance MOR and KOR activation to relieve pruritus

Kappa-opioid receptors (KORs) and mu-opioid receptors (MORs) are implicated in both the suppression and promotion of itch, respectively, and pronounced in conditions such as liver and atopic diseases

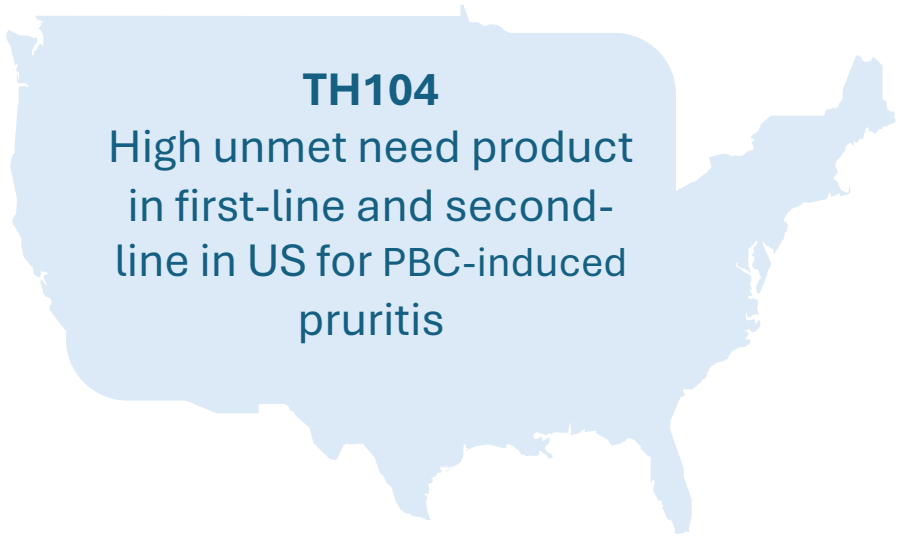
2 This unlocks **clinical potential across multiple indications** with PBC being the first

~1.7 million patients

Prevalence of pruritus in liver diseases[2,3,4]



TH104 – Market Opportunity and Differentiation



Treatment	Mechanism	Limitations	TH104's Advantage
Bile acid binders (e.g., cholestyramine)	Reduce bile salts	Poor tolerability, GI side effects	Buccal film avoids GI issues
Rifampin	antibacterial, PXR agonist	Hepatoxicity concerns	Improved safety profile
Opioid antagonists (e.g., naltrexone)	Central opioid modulation	Liver metabolism	Lower systemic exposure
TH104	**Dual opioid receptor modulation**	**Targeted delivery, generally safe, non-invasive**	**Potential best-in-class therapy**

Global PBC treatment market valued at ~$2.5B and expected to grow

Global chronic pruritus treatment market projected to exceed $7B by 2030 (across multiple conditions, including liver disease)

Regulatory & Commercial Potential for TH104

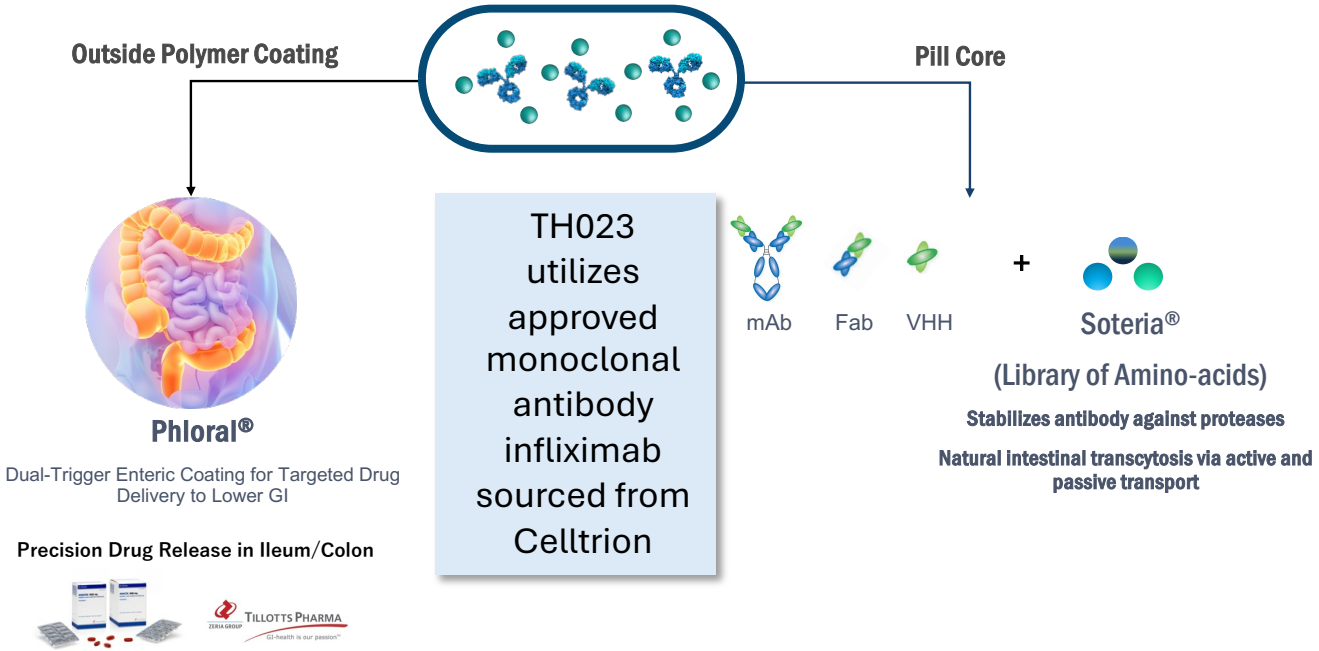
- Regulatory pathway: FDA approval pathway under 505b2 path with de-risked active
- Physician & patient adoption: non-invasive, easy-to-administer therapy more compelling
- Improved formulation: first buccal delivery treatment targeting PBC pruritis specifically

TH023 - Oral Anti-TNFα for Autoimmune Diseases

Oral infliximab, a gold standard for multiple autoimmune diseases

What is it?

- TH023 is a first-in-class oral formulation of infliximab, an anti-TNFα monoclonal antibody targeting autoimmune diseases
- Designed to provide the **benefits of biologics without injections**
- Developed using proprietary oral antibody delivery platform licensed from Intract Pharma



How it works

- TNFα is a key driver of inflammation in autoimmune diseases
- TH023 blocks TNFα activity, reducing inflammation in conditions like RA and Crohn's
- Oral formulation offers a non-invasive alternative to IV or subcutaneous TNF inhibitors

Development Status

- ❑ CMC planning and finalization underway
- ❑ Phase 1 pharmacokinetic study to demonstrate oral bioavailability of infliximab, planning underway

TH023 – Market Opportunity

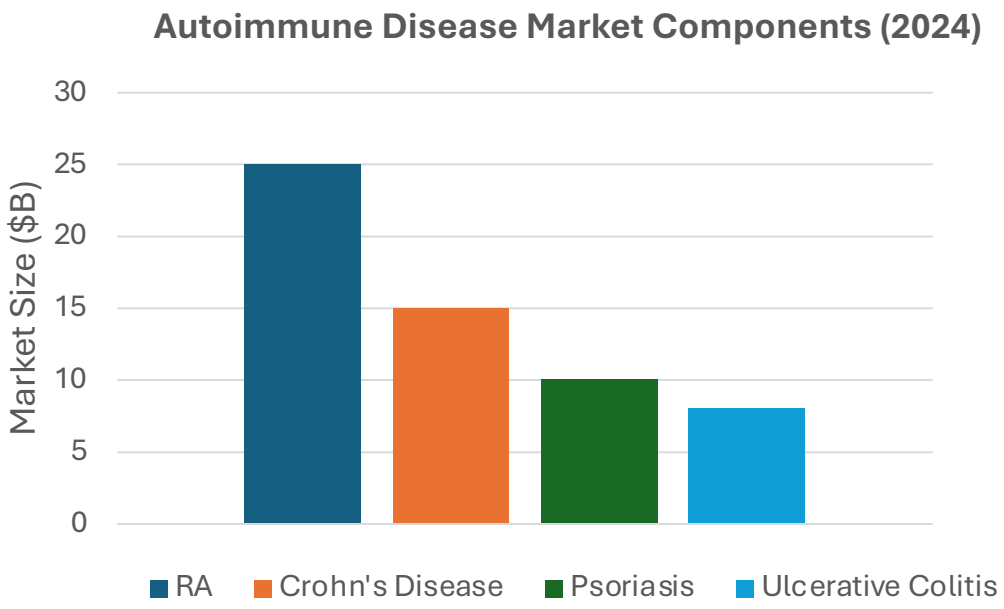
A $50B+ Market Ready for Innovation

Existing Market Size

~$47B

Generated annually by TNFα inhibitors (e.g., Humira, Remicade)

- Rheumatoid arthritis (RA), Crohn's disease, psoriasis, ulcerative colitis (UC) are primary indications



Unmet Need

- **High patient burden with injectables** (pain, needle phobia, side effects)
- **Biologic adoption barriers**: Cost, physician administration requirements
- **Oral therapy could increase patient compliance & accessibility**

Potential to Disrupt a Multibillion-Dollar Market

Market Shift to Oral Biologics: if TH023 proves efficacy and bioavailability, it could capture market share from injectables

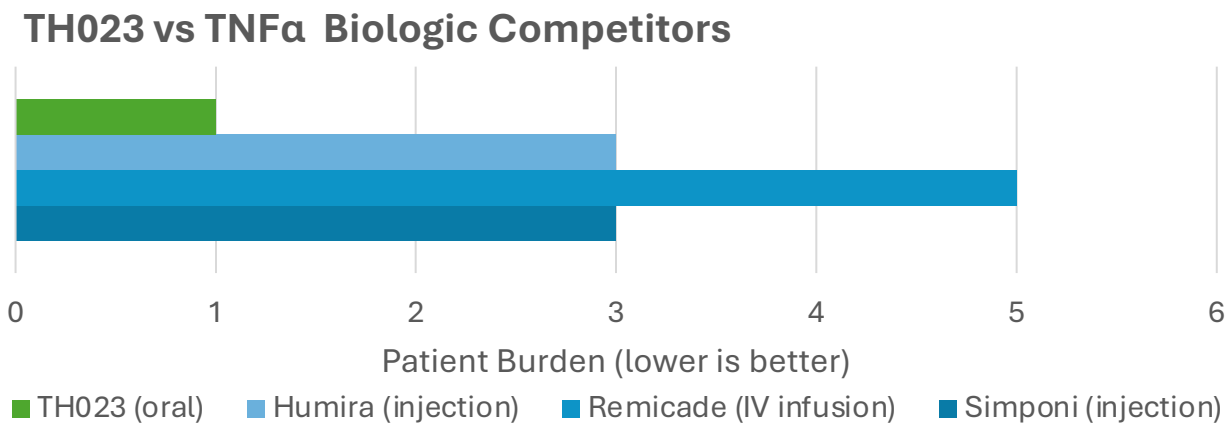
Potential Competitive Differentiation: A **daily oral anti-TNFα could**

- ✓ Enhance adherence
- ✓ Improve patient quality of life
- ✓ Lower costs for healthcare systems

TH023 – Market Opportunity

TNFα Competitive Comparison

Therapy	Delivery	Dosing Frequency	Patient Burden	Peak Sales
TH023 (Tharimmune)	**Oral**	**Daily / as needed**	**Low - no injections**	**High potential**
Humira® (AbbVie)	Injection	Every 2 weeks	Moderate – painful injections	$21B
Remicade® (Janssen)	IV infusion	Every 6-8 weeks	High – hospital visits required	$4B
Simponi® (Janssen)	Injection	Monthly	Moderate	$2.5B



Dosing & Administration Burden

- **Humira (Injection):** Biweekly or monthly self-administered injection
- **Remicade (IV):** Requires infusions administration every 6-8 weeks (high burden)
- **Simponi (Injection):** Monthly subcutaneous injection

✓ **TH023 (Oral): Daily pill,** offering a non-invasive alternative

Patient Burden Ranking

✓ **Lower burden = More convenience & better adherence**

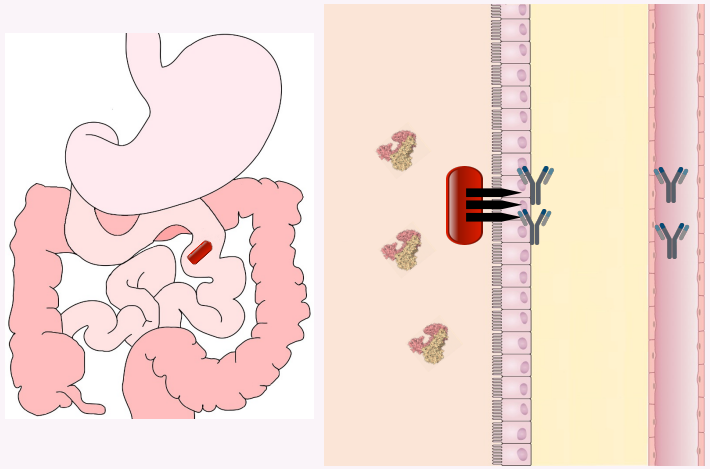
✓ Oral treatment (TH023) **minimizes administration barriers** vs. injections/IV infusions

TH023 – Market Opportunity

Oral Biologics Delivery Platform Compared to Other Technologies in Development

Orally Ingestible Devices

Rani THERAPEUTICS · BIORA Therapeutics · BIO-GRAIL

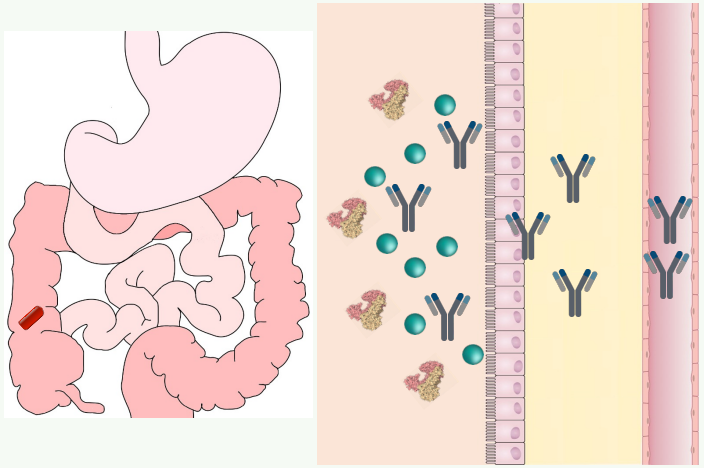


Drug Loaded Needles

- X No enzyme protection if deployment fails
- X CMC/COGS/safety challenges
- Injection into tissue for systemic delivery hampered by deployment failures

Oral Antibody Platform Technology

Intract Pharma + THARIMMUNE

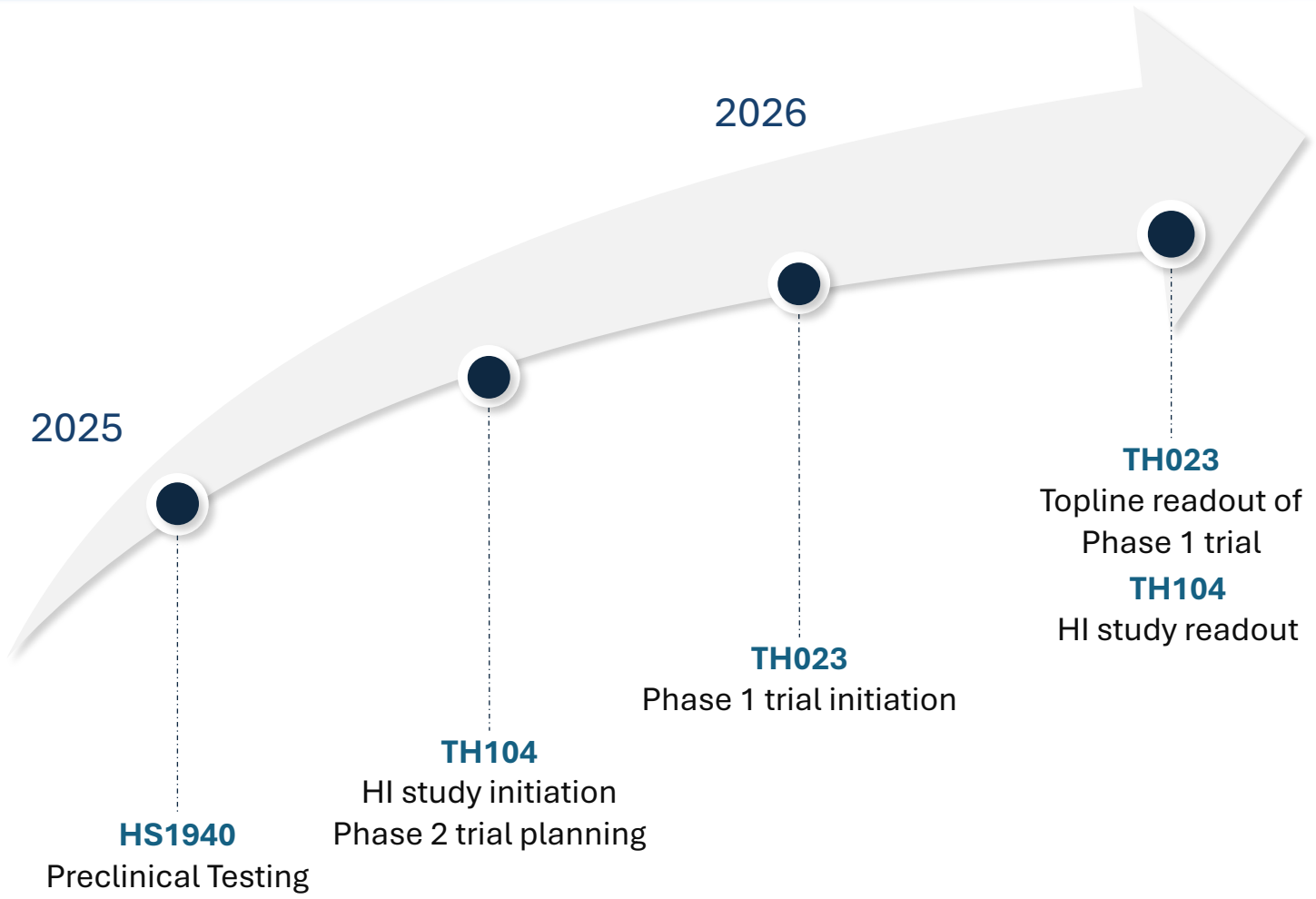


Enzyme Stabilizer + Amino Acids

- ✓ Enzyme protection for high local tissue exposure
- ✓ CMC/COGS
- Modest permeation enhancement

Anticipated Key Upcoming Milestones

Two potential clinical readouts in the **next 18 months**



Leadership

Executive Team

Randy Milby
Chief Executive Officer

Sireesh Appajosyula
Chief Operating Officer

Don Kim
Chief Financial Officer

Nir Barak, MD
Chief Medical Advisor

Board of Directors

Randy Milby
Chairman of the Board

Leonard Mazur
Director

Lynne A Bui
Director

Sireesh Appajosyula
Director

Kelly Anderson
Director

Sanam Parikh
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Appendix: TH104

Phase 1 Chronic Liver Disease (CLD) Study Results

All Patients Responded to TH104

Single-dose, single-center, open-label, randomized, study conducted in India in two different cohorts

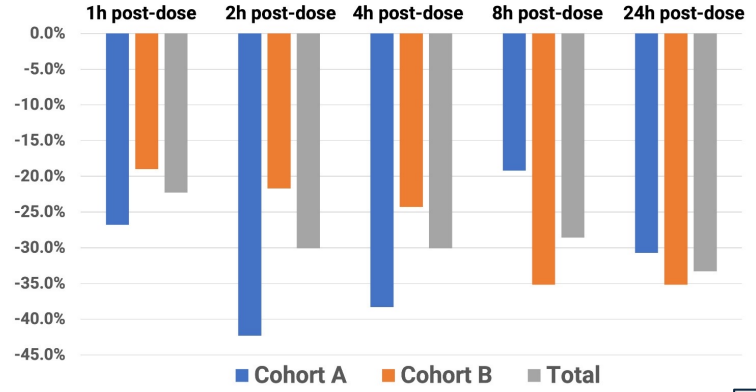
Primary outcome measure: safety and tolerability of a buccal dose in CLD patients

At 24-hours, Groups A & B had mean declines of 30.7% & 35.2%, respectively in pruritus scores. ***All 12 subjects had a mean decline of 33.3% in itch scores after a single dose at 24-hours*** post dosing

The correlation coefficient between TH104 AUC and change in itch, r, was 0.7060, with a p-value of 0.0103 and a 95% confidence interval for r of 0.2220 to 0.9108.

n=12; Cohort A (6); Cohort B (6)

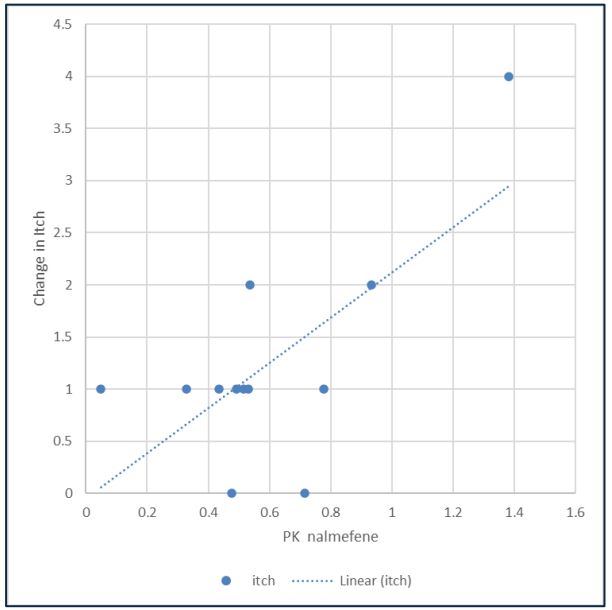
% change from baseline in Worst Itch – Numerical Rating Scale (WI-NRS)



Cohort A: Child-Pugh A Liver Cohort; Baseline WI-NRS = 4.33
Cohort B: Child-Pugh B Liver Cohort; Baseline WI-NRS = 6.17
Total: Baseline WI-NRS = 5.25

The Worst Itch Numerical Rating Sale (WI-NRS) is a validated scale with 11 numbers - 0 representing "no itch" to 10 representing "worst imaginable itch"; patients are asked to pick the number corresponding to the intensity of their pruritus.

Significant correlation shown between blood levels and symptom relief; *TH104 was well tolerated with no unexpected treatment-emergent adverse events*



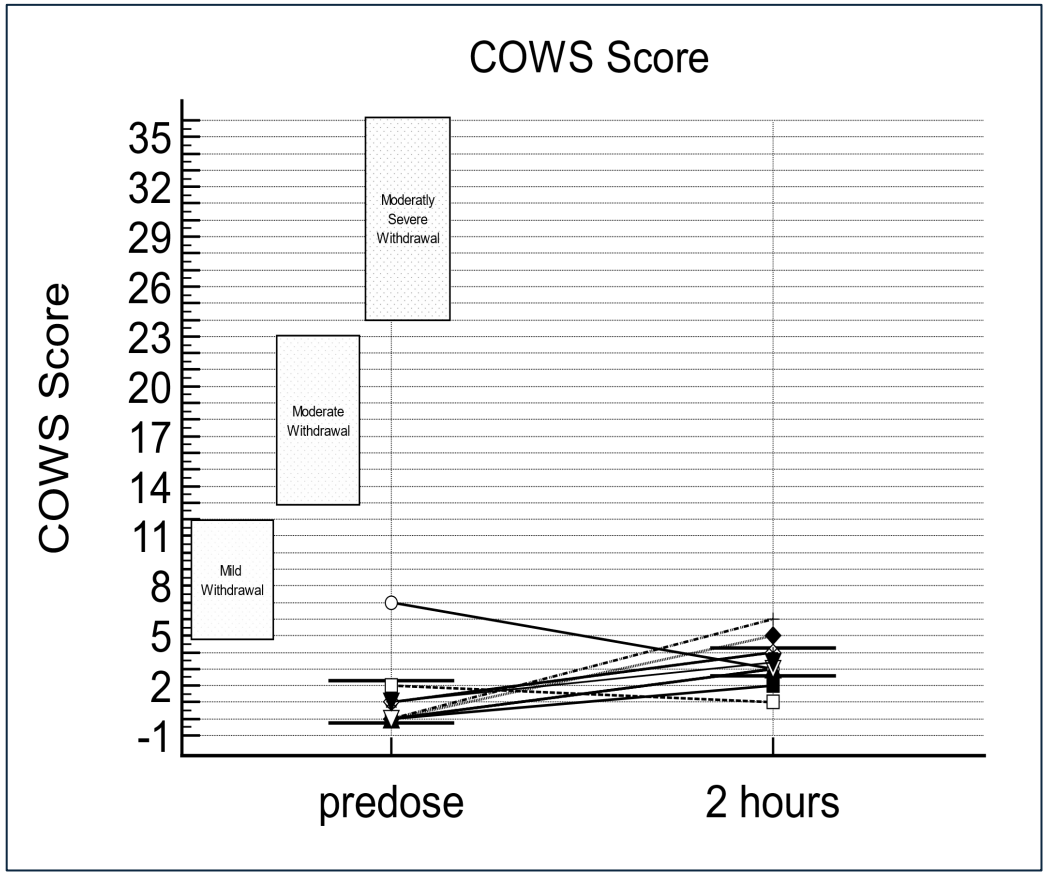
Poster titled "4348: Correlation Between the Pharmacokinetics of TH104 and Pruritus Relief in Patients with Cholestatic Pruritus," presented at the 75th American Association for the Study of Liver Diseases (AASLD) Annual Conference at The Liver Meeting® 2024, November 15-18 in San Diego

Appendix: TH104

Withdrawal Symptoms were not seen in CLD patients given TH104

TH104 did not induce withdrawal symptoms in CLD patients after a single low dose

- Assessment of patients for withdrawal symptoms used the Clinical Opiate Withdrawal Scale (COWS)
- The COWS is an 11-item clinician-administered scale for inpatient and outpatient settings to rate common signs and symptoms of opiate withdrawal and monitoring
- **Study results indicate the use of TH104 2 mg in patients with mild and moderate cholestatic liver disease is safe and tolerable and not associated with opioid withdrawal syndrome**



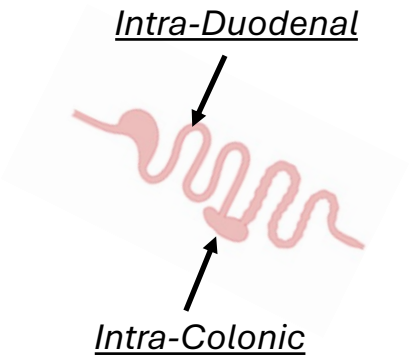
Poster titled "P1780: Safety and Tolerability of TH104, Buccal Nalmefene, in Patients with Cholestatic Liver Disease and Pruritus," presented at the American College of Gastroenterology (ACG) Annual Scientific Meeting October 25-30 in Philadelphia

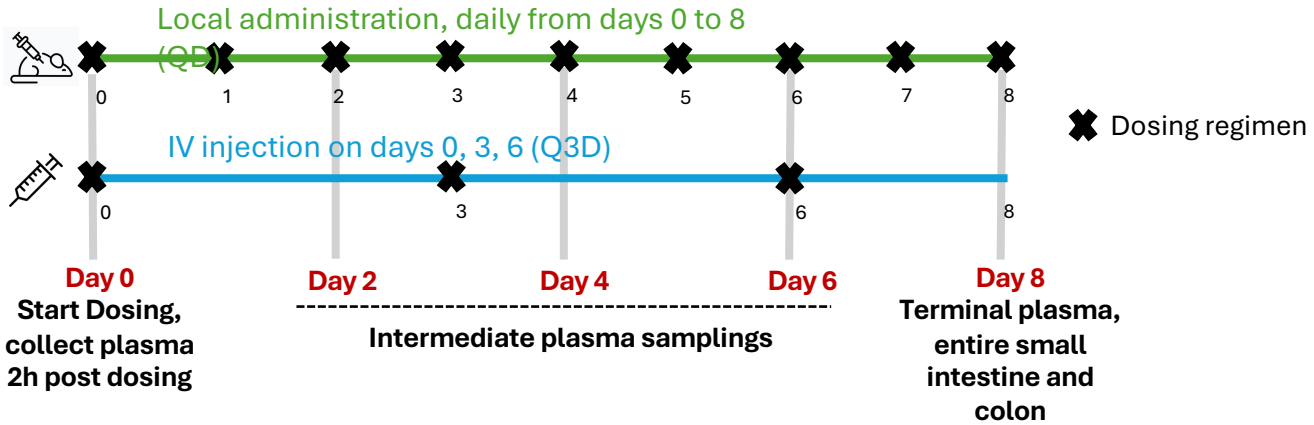
Appendix: TH023

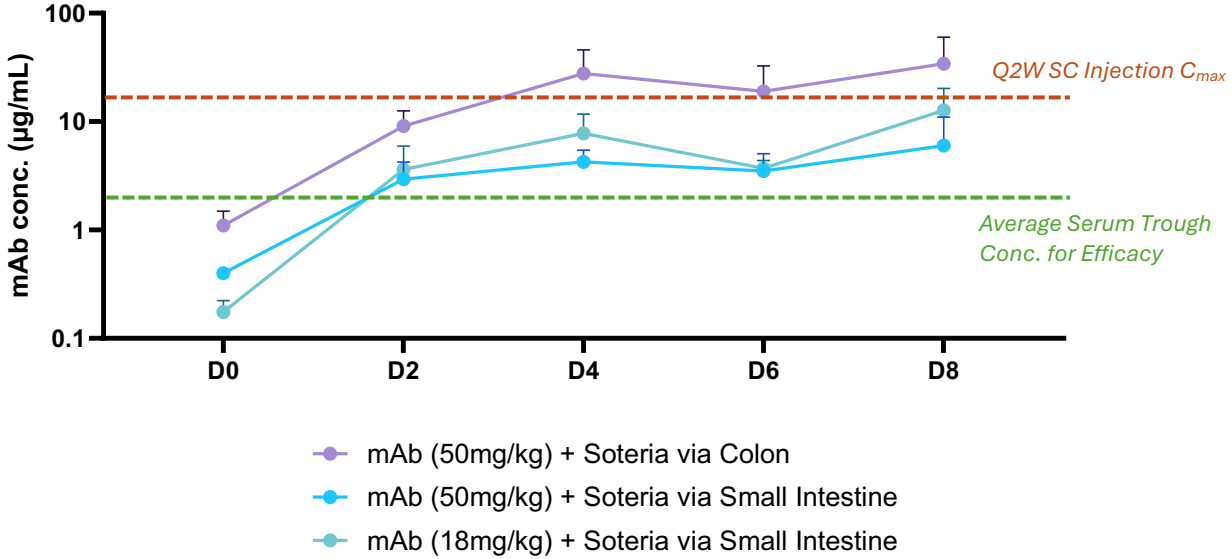
TH023 Exceeds Trough Concentration and Matches Subcutaneous Injection C_{max}

In-vivo PK in Healthy Mice Following QD Dosing for 1wk

Healthy C57BL/6 mice







Colon targeting of mAb showed higher systemic conc. vs **small intestine delivery**, potentially due to better enzymatic stability and active transport receptor engagement

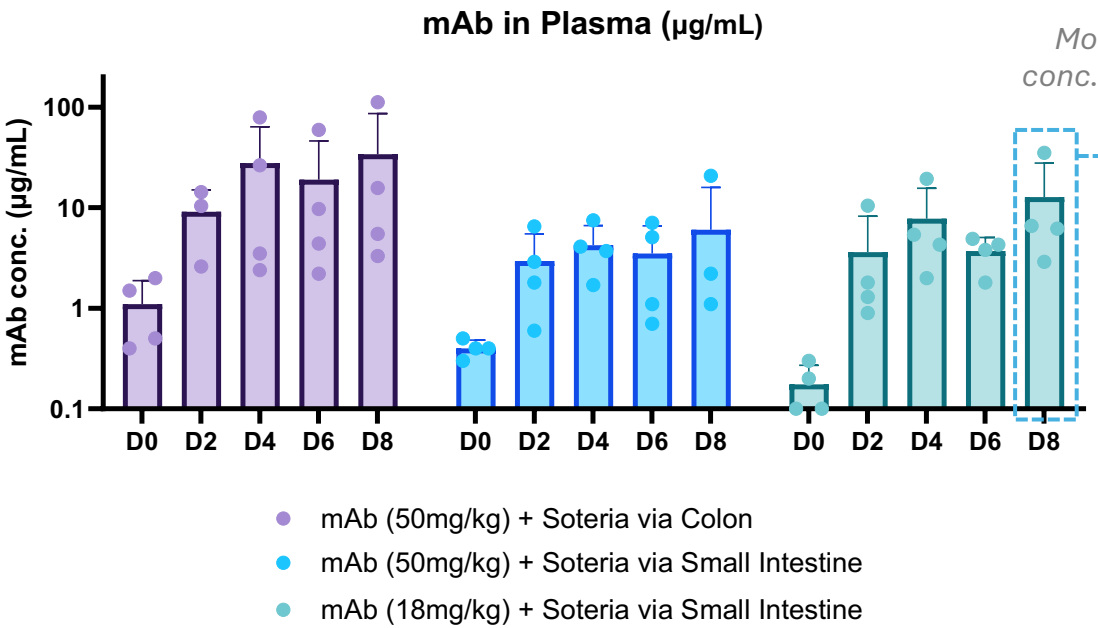
No dose effect observed between 50 and 18mg/kg, potentially due to intestinal epithelial transport saturation.

QD dosing of antibody enables build-up in plasma levels due to $t_{1/2}$ of ~3-4 days in mouse.

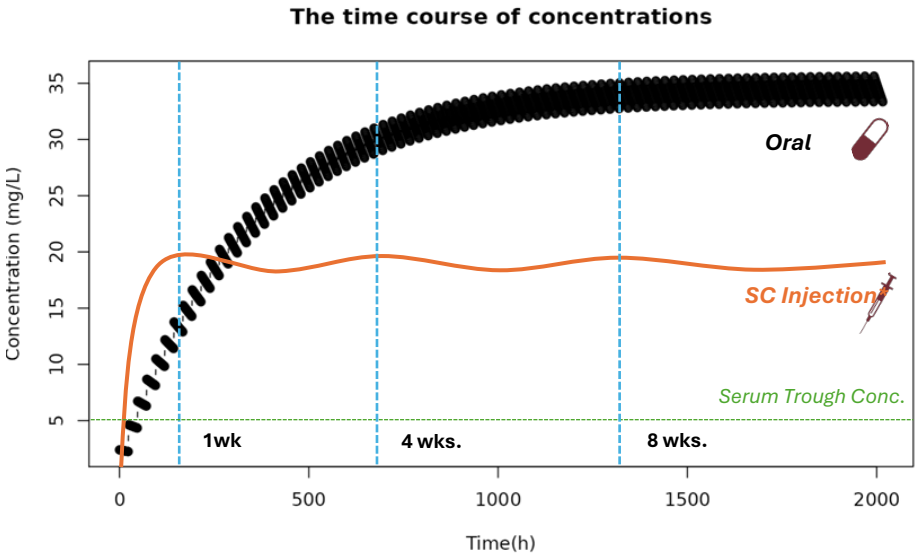
Appendix: TH023

TH023 Systemic Concentration May Exceed Injection Trough and C_{max}

PK Plot with Individual Mouse Data Points



Modelling 1wk mAb plasma conc. to 12 wks. in humans with $t_{1/2}$~10 days



- ✓ All arms reached > therapeutic serum trough concentration for injectable mAbs in humans
- ✓ When 1wk plasma conc. is modelled in humans with a $t_{1/2}$ of 10days, the mAb concentration surpasses Q2W 240mg SC injection PK profile

*Schreiber et al., Gastroenterology, 2021; 160:2340-2353