

Reimagining therapeutic delivery

UNMET NEEDS IN ULCERATIVE COLITIS

BT-600 PHASE 1 TRIAL RESULTS

July 17, 2024

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UNMET NEEDS IN ULCERATIVE COLITIS

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Clinical presentation of ulcerative colitis





SYMPTOMS Rectal bleeding, tenesmus, urgency

30–60% of patients

SYMPTOMS E1 plus diarrhea, abdominal cramping

16–45% of patients

SYMPTOMS E2 plus constitutional symptoms (fatigue, fever) 15–35% of patients

E1: PANCOLITIS



UC histology findings



Normal colon



Inactive chronic colitis crypt branching and dilation (arrows)



Moderately active chronic colitis neutrophilic and lymphoplasmacytic infiltrate with cryptitis/crypt abscesses (arrows)



Mildly active chronic colitis

neutrophilic infiltrate in lamina propria and epithelium (arrows)



Severely active chronic colitis loss of crypts and thin epithelium (black arrow) and dense lymphoplasmacytic and neutrophilic infiltrate

UC has high impact on patient lives

 \approx 1.5 million patients with UC in the United States

PATIENTS WHO FELT THEIR CONDITION WAS CONTROLLING THEIR LIVES



PSYCHOLOGICAL IMPACT OF UC



Internet survey designed to address a variety of disease impact indices

Therapeutic gap in UC



INDUCTION OF CLINICAL REMISSION IN UC

UNMET NEED IN ULCERATIVE COLITIS

Anatomically targeted, topical delivery could improve efficacy and patient outcomes

THERAPEUTIC CHALLENGES



Difficulty of achieving sufficient drug activity at site of disease



Systemic toxicity issues may limit daily dosage of UC drugs



Combination therapy is limited by toxicity

POTENTIAL SOLUTION

Localized delivery could increase drug
 activity at the site of disease, which is correlated with improved outcomes¹

Reduced systemic uptake is
designed to reduce toxicity and adverse events

Reduced toxicity could enable combination therapy²

1. Verstockt B, Alsoud D, van Oostrom J, et al. Tofacitinib tissue exposure correlates with endoscopic outcome. Poster presented at: 17th Congress of the European Crohn's and Colitis Organisation (ECCO), February 18, 2022, virtual.

2. van Oostrom J, Verstockt B, Hanzel J, et al. Pharmacokinetic stratification of cytokine profiles during anti-TNF induction treatment in moderate-to-severe ulcerative colitis. Poster presented at: 17th Congress of the European Crohn's and Colitis Organisation (ECCO), February 18, 2022, virtual.



NAVICAP[™] TARGETED ORAL DELIVERY

Anatomically targeted, topical drug delivery to the colon





BT-600 PHASE 1 CLINICAL TRIAL IN HEALTHY PARTICIPANTS

Ariella Kelman, MD Chief Medical Officer Biora Therapeutics

NAVICAP[™] TARGETED ORAL DELIVERY PLATFORM

Needle-free, oral drug delivery to the colon

ORAL ADMINISTRATION

Convenient oral capsule the size of a fish-oil pill

AUTONOMOUS LOCATION

GITrac[™] autolocation technology enables targeted delivery to the colon, regardless of fasted or fed state¹

TARGETED DRUG DELIVERY

Method designed to coat the length of the colon with liquid formulation, minimizing systemic uptake



1. Lee SN, Razag G, Stork C, et al. Potential effects of food on a novel Drug Delivery System (DDS) to deliver therapeutic compound into the colon. Poster presented at: Crohn's & Colitis Congress, January 19-21, 2023, Denver, CO.

PHASE 1 CLINICAL TRIAL DESIGN

Evaluate safety and pharmacokinetics of BT-600 (NaviCap + tofacitinib proprietary liquid formulation) in healthy participants



PHASE 1 SAD/MAD: TOPLINE RESULTS

All trial objectives met; Precise drug delivery to the colon with limited systemic exposure

PLASMA PHARMACOKINETICS (PK)	Achieved PK profile consistent with drug delivery in the colon	 Tofacitinib first detected in blood at ≈6 hours, consistent with colonic delivery Maximal blood levels were 3–4x lower than seen with Xeljanz¹ Demonstrated ability to deliver tofacitinib to the colon with lower systemic levels than seen with conventional oral delivery in both SAD/MAD cohorts¹
COLON TISSUE EXPOSURE	Pan-colonic drug deliverv	 After delivery to the proximal colon, tofacitinib was detected across multiple biopsy sites in the distal colon
		 Delivery and distribution of tissue exposure consistent with delivery to the entire colon
		 Modeling projects tissue levels at or above the estimated IC90 across all three biopsy sites through at least 16 hours
DEVICE FUNCTION	Accurately delivered to the colon	 >95% of devices successfully detected colon entry
SAFETY & TOLERABILITY	Showed safety of daily administration	 BT-600 was well tolerated by participants in SAD and MAD cohorts

Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

1. These data are derived from different clinical trials at different points in time, with differences in trial design and patient populations. As a result, cross-trial comparisons cannot be made, and no head-to-head clinical trials have been conducted.

PHASE 1 NAVICAP DEVICE PERFORMANCE

Consistent drug release in the colon, bypassing the upper GI tract

- >95% of devices successfully detected colon entry
- No early drug release before colon entry
- Tight correlation between software device function and PK results
- Data consistent with those previously observed in human device function studies¹

SOFTWARE ANALYSIS OF POST-DOSE RETRIEVED NAVICAP DEVICES

	SAD	MAD
Devices identified colon entry S4 call	24/24 (100%)	156/162 (96%)
Mean time of colon entry, hours post dose (SD)	5.6 (2.1)	6.6 (3.2)
Mean T _{first} , hours post dose (SD)	6.9 (2.6)	6.9 (2.0)





Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

1. Lee SN, Razag G, Kelly C, et al. Results of human device function studies for the NaviCap[™] Targeted Oral Delivery Platform in healthy volunteers and patients with UC. Poster presented at: Digestive Disease Week, May 18 – 21, 2024, Washington DC.

PHASE 1 SAD: PK RESULTS

PK profile confirms lower systemic levels with 3–4x lower Cmax than Xeljanz

BT-600: MEAN PLASMA DRUG CONCENTRATION FOLLOWING ADMINISTRATION OF SINGLE ORAL DOSES¹

1000 1000 -0.3 mg (n = 8)1 mg (n = 8)3 mg (n = 8)10 mg (n = 8)Plasma tofacitinib conc. (ng/mL) 5 mg BT-600 30 mg (n = 9)100 100 60 mg (n = 8)10 mg BT-600 100 mg (n = 7)-▲-'n 10 10 ****** Ô 0.1 0.1 12 16 20 24 28 36 0 12 42 48 6 18 24 30 Time after dose (hr) Time after dose (hr)

XELJANZ: MEAN PLASMA DRUG CONCENTRATION FOLLOWING ADMINISTRATION OF SINGLE ORAL DOSES²

1. Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

2. Krishnaswami S, Boy M, Chow V, Chan G. Safety, tolerability, and pharmacokinetics of single oral doses of tofacitinib, a Janus kinase inhibitor, in healthy volunteers. *Clin Pharmacol Drug Dev.* 2015;4(2):83-88. doi:10.1002/cpdd.171 NOTE: These data are derived from different clinical trials at different points in time, with differences in trial design and patient populations. As a result, cross-trial comparisons cannot be made, and no head-to-head clinical trials have been conducted



Plasma tofacitinib conc. (ng/mL)

PHASE 1 MAD: PK RESULTS

MAD PK confirms colonic delivery and low systemic exposure

PK Parameters†	BT-600 Multiple Oral Dosing ¹ (n=9)			XELJANZ		
	DAY 1		DAY 7			
Dosing Regimen	5 mg Once Daily	10 mg Once Daily	5 mg Once Daily	10 mg Once Daily	5 mg Twice Daily²	10 mg Single Dose ³
T _{first} hours	6 (4–16)	8 (4–10)	N/A	N/A	NR	NR
T _{max} hours	10 (4–10)	8 (4–12)	10 (6–12)	8 (6–10)‡	1.0 (0.5–14.0)	0.5 (0.25–1.0)
C_{max} ng/mL	11.3 (97)	24.2 (27)	11.3 (39)	16.3 (77)	42.7 (26)	88 (10.2)
AUC ₀₋₂₄ ng.hr/ml	92.8 (61)	194.0 (21)	115.8 (33)	140.5 (91)	263.4 (15)	283 (80)

† Values for T_{first} and T_{max} represent median (range). Values for C_{max} and AUC₀₋₂₄ represent geometric mean (CV), except Xeljanz single-dose results which represent arithmetic mean (SD). ‡ T_{max} range excludes one device that did not release payload.

1. Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

2. Pfizer, Inc. Xeljanz (tofacitinib) USPI. https://labeling.pfizer.com/showlabeling.aspx?id=959 Revised May 2024. Accessed June 18, 2024.

3. Krishnaswami S, Boy M, Chow V, Chan G. Safety, tolerability, and pharmacokinetics of single oral doses of tofacitinib, a Janus kinase inhibitor, in healthy volunteers. *Clin Pharmacol Drug Dev.* 2015;4(2):83-88. NOTE: These data are derived from different clinical trials at different points in time, with differences in trial design and patient populations. As a result, cross-trial comparisons cannot be made, and no head-to-head clinical trials have been conducted.



PHASE 1 MAD: PK RESULTS

Consistent PK profile with repeat dosing

Characteristic, single-subject concentration time curve

- Dose dependent, low systemic exposure
- Consistent with colonic delivery





1. Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

PHASE 1 MAD: BT-600

Evidence of drug delivery across all distal biopsy sites



- Drug measured in tissue across distal colon sites (following proximal payload delivery) consistent with pan-colonic delivery
- Colon tissue absorption demonstrated despite:
 - Long dose-to-biopsy latency at \approx 24 hours (and five half-lives) since final dose
 - Pre-procedural bowel prep with oral and rectal laxatives
 - Healthy participants (vs. UC patients who may have enhanced colonic absorption during active disease)



Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

PHASE 1 MAD: COLON TISSUE EXPOSURE

Good correlation between tissue and plasma levels



- Plasma levels determined at 20 hours after final dose, while tissue biopsies were obtained at 24 ±2 hours after final dose
- Mean tissue concentrations above IC50 across all 3 biopsy sites at ≈24 hours (5 half lives) post dose
- Correlation between plasma and tissue levels was used to model tissue levels at earlier time points



Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

PHASE 1 MAD: COLON TISSUE EXPOSURE

Projected tofacitinib levels above IC90 through at least 16 hours

protein) 2000000 6/6d) Median for both ration 1500000. groups = 520 ng/g Median tissue exposure CON 1000000.0 tissue $IC_{90} = 823 \text{ ng/g}$ ofacitinib 500000 (Non-responders Responders

CONVENTIONAL ORAL TOFACITINIB

CONCENTRATIONS (DOSE 10MG BID)¹

NAVICAP-DELIVERED TOFACITINIB CONCENTRATIONS (BT-600 5MG QD AND 10 MG QD)²

	Plasma Concentration ng/mL	Colon Tissue Concentration [†]			
Hours Post Last Dose		Splenic Flexure ng/g	Descending Colon ng/g	Sigmoid Colon ng/g	
22–26 hours tissue 20 hours plasma (measured, n=15)	3.0	338 (28, 649)	159 (96, 223)	161 (72, 251)	
16 hours projected‡	10	Range 3,000 – 10,000 ng/g			

Endoscopic improvement by week 16, P=0.04 for group comparison

† Values represent mean (95% confidence interval)

‡ Predicted tissue levels geometric means based on plasma drug level at 16 hours after device ingestion

- Tofacitinib tissue concentrations shown to correlate with endoscopic response, with responders having a median tissue concentration above the estimated IC90
- Projected tofacitinib levels above IC90 through at least 16 hours, with measured levels above IC50 at 24 hours post dose
- NaviCap delivery predicted to enable tissue concentrations associated with improved efficacy with lower systemic exposure

1. Verstockt B, Alsoud D, van Oostrom J, et al. Tofacitinib tissue exposure correlates with endoscopic outcome. Poster presented at: 17th Congress of the European Crohn's and Colitis Organisation (ECCO), February 18, 2022, virtual.

2. Phase 1 clinical trial data on file, Biora Therapeutics, Inc.



PHASE 1: SAFETY PARAMETERS

BT-600 was well tolerated

- All AEs were mild and consistent with those expected in healthy population (headache, constipation)
- No evidence of device or drug colon toxicity; colon tissue histology within normal limits
- No notable changes or differences in safety laboratory parameters between groups



LDL CHOLESTEROL

MEAN CHANGES FROM BASELINE (MAD)







Phase 1 clinical trial data on file, Biora Therapeutics, Inc.

BT-600 IN ULCERATIVE COLITIS

Phase 1 trial results support clinical development plan

PHASE 1	PHASE 1b	PHASE 2
Purpose	Purpose	Purpose
Provide evidence of NaviCap colonic	Confirm PK profile in UC patients;	Proof of concept: efficacy of tofacitinib
delivery of a therapeutic	inform Ph2 dose selection	delivered via NaviCap
Population	Population	Population
48 healthy participants	≈15 UC patients	≈150 UC patients
Design	Design	Design
Single-center SAD/MAD trial	Single-center trial	Global multicenter induction efficacy trial
 Endpoints Safety & tolerability PK/PD Device function 	 Endpoints Safety & tolerability PK/PD Device function 	 Endpoints Clinical and endoscopic response Mucosal healing PROs

PLANNED START: Q4 2024

DURATION: 6 MO

• Biomarkers

PLANNED START: Q4 2025 DURATION: TBD



COMPLETE

CONSIDERATIONS FOR COLONIC DELIVERY IN UC

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Topical treatments can be effective in UC, but challenging to deliver

Previous approaches to topical treatment include enemas, rectal foams, suppositories, and oral delayed-release preparations

- 5-Aminosalicylates, corticosteroid preparations in mild to moderate disease
- Calcineurin inhibitor enemas and suppositories in severe refractory disease

Inability to sufficiently reach colon tissue may limit efficacy of systemic treatments

- Doses needed to achieve sufficient colon tissue exposure are limited by toxicity risks
- Precise topical delivery could result in improved tissue exposure with lower systemic absorption



RECTAL PREPARATIONS

- Associated with poor retention
- Cannot reach proximal colon
- Can be embarrassing for patients

EXISTING COLONIC DELIVERY ORAL CAPSULES

- pH-sensitive polymers, enzyme sensitive systems
- Highly variable delivery in colon, often disintegrate in upper GI tract or are retrieved intact¹
- Limited drug exposure in the distal colon, especially in UC²
 - Often require solid-dose formulations which need solubilization in the colon, limiting uptake
 - Reliant on variable GI conditions including pH, motility, water content, and bacterial enzymes

COLONIC DELIVERY ORAL FORMULATIONS SHOW POOR COLONIC DISTRIBUTION IN UC PATIENTS²



UC: 91% (proximal) vs. 9% (distal) Healthy: 69% (proximal) vs. 31% (distal)

1. Ibekwe, V.C., Fadda, H.M., McConnell, E.L. et al. Interplay Between Intestinal pH, Transit Time and Feed Status on the In Vivo Performance of pH Responsive lleo-Colonic Release Systems. Pharm Res 25, 1828–1835 (2008).

25 2. Hebden JM, Blackshaw PE, Perkins AC, Wilson CG, Spiller RC. Limited exposure of the healthy distal colon to orally-dosed formulation is further exaggerated in active left-sided ulcerative colitis. *Aliment Pharmacol Ther.* 2000 Feb;14(2):155-61.

Colon tissue drug exposure and activity correlates with endoscopic outcomes



TOFACITINIB TISSUE EXPOSURE HIGHER IN RESPONDERS¹

30 UC patients with active endoscopic disease Tx with XELJANZ (tofacitinib) and prospectively monitored

 Higher tofacitinib tissue exposure was associated with endoscopic improvement by week 16 (p=0.04)



ANTI-TNF TISSUE EXPOSURE HIGHER IN ENDOSCOPIC RESPONDERS²

30 UC patients on active maintenance therapy with REMICADE (infliximab) or HUMIRA (adalimumab) with tissue < blood and endoscopic assessment

- While there was a correlation between serum and tissue drug levels, areas of tissue with active inflammation acted as a sink for the anti-TNF antibody
- The ratio of anti-TNF to TNF cytokine levels was higher in patients in endoscopic remission



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VEDOLIZUMAB TISSUE EXPOSURE HIGHER IN ENDOSCOPIC RESPONDERS³

37 IBD patients with active endoscopic disease Tx with ENTYVIO (vedolizumab) and prospectively monitored

- Patients with endoscopic remission or response had significantly higher tissue drug levels (p=0.04)
- Authors suggest targeting vedolizumab tissue levels to optimize Tx in patients with no or loss of response
- 1. Verstockt B, Alsoud D, van Oostrom J, et al. Tofacitinib tissue exposure correlates with endoscopic outcome. Poster presented at: 17th Congress of the European Crohn's and Colitis Organisation (ECCO), February 18, 2022, virtual
- 2. Yarur AJ, Jain A, Sussman DA, et al. The association of tissue anti-TNF drug levels with serological and endoscopic disease activity in inflammatory bowel disease: the ATLAS study. Gut. 2016;65(2):249-255. doi:10.1136/gutjnl-2014-308099
- 3. Pauwels RWM, Proietti E, van der Woude CJ, et al. Vedolizumab Tissue Concentration Correlates to Mucosal Inflammation and Objective Treatment Response in Inflammatory Bowel Disease. Inflamm Bowel Dis. 2021;27(11):1813-1820. doi:10.1093/ibd/izab053

PHASE 1 MAD: COLON TISSUE EXPOSURE

NaviCap colonic delivery achieves higher tissue to plasma concentration ratio at lower dose



- Correlation between plasma and tissue levels was used to model tissue levels at earlier time points
- NaviCap colonic delivery achieves higher tissue to plasma concentration ratio at lower dose
 - Potential for improved efficacy with tissue exposure above IC90, with lower systemic absorption

1. Verstockt B., et al., . Tofacitinib tissue exposure correlates with endoscopic outcome. Poster presented at: Digestive Disease Week, May 21, 2022, virtual.

Key goals for successful topical colonic delivery

1. CONSISTENT PHARMACOKINETICS	Colonic delivery regardless of GI motility, which can vary between patients and across disease activity	 ✓ Demonstrated in BT-600 Phase 1 trial and in NaviCap scintigraphy device function studies
2. PRECISION RELEASE	Reliable delivery in the colon, rather than the upper GI tract	✓ No early releases in BT-600 Phase 1 trial
3. TISSUE EXPOSURE	Tissue exposure along the length of the colon	 ✓ Demonstrated in BT-600 Phase 1 trial and in NaviCap scintigraphy device function studies

NAVICOP™ TARGETED ORAL DELIVERY

The NaviCap platform accurately delivers drug to colon

- Could achieve desired tissue exposure while decreasing undesired systemic exposure
- Could deliver better than current 20–30% efficacy rates while also enabling combination therapies
- NaviCap platform could be used for multiple drugs and drug classes



