Jasper Therapeutics

Corporate Presentation

December 2024

JASPER THERAPEUTICS

Safe Harbor Statements

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Briquilimab: Franchise Potential in Mast Cell Diseases

c-Kit inhibition
a clinically validated MOA

- c-Kit inhibition is the only therapeutic mechanism shown to significantly deplete mast cells
- Mast cell depletion has unique potential to deliver safe and durable disease control
- c-Kit inhibition has demonstrated clinical proof of concept in multiple mast cell mediated diseases

Clinical Profile
supports optimal biologic dosing

- Briquilimab directly blocks ligand binding with high potency
- SPOTLIGHT results show rapid onset of effect and >80% complete response rate
- SPOTLIGHT data demonstrate favorable safety profile
- Multiple doses/regimens being evaluated to balance depth of response, safety and durability

Franchise Potential
in mast cell driven diseases

- CSU: BEACON study 12-week data for all cohorts through 240mg in early Jan 2025
- CIndU: Enrolling patients in SPOTLIGHT study 180mg cohort
- Asthma: Enrolling patients in Phase 1b/2a ETESIAN study, initial data expected in 2H 2025
- Additional mast cell mediated indications under evaluation

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Briquilimab is an investigative drug and is not approved for any indication

Expanded mast cell portfolio presents exciting new opportunities in mast cell diseases

Indication	Sponsor	Preclinical	Phase 1	Phase 2	Phase 3	Program Milestones
Briquilimab						
Mast Cell Diseases (Subcutaneous)						
Chronic Spontaneous Urticaria	JASPER THERAPEUTICS	BEACON				• Phase 1b/2a being conducted in the US and EU • 360mg cohort enrolling, other cohorts fully enrolled • 12-week clinical data expected in early Jan 2025
Chronic Inducible Urticaria	JASPER THERAPEUTICS	SPOTLIGHT				• 83% Complete Response with 120mg • Favorable safety profile • Commencing enrollment in 180mg cohort
Asthma	JASPER THERAPEUTICS	ETESIAN				• CTA Authorized • Enrolling in Phase 1b/2a study • Initial clinical data expected 2H 2025
New Mast Cell Indication	JASPER THERAPEUTICS					• Multiple indications under assessment
Stem Cell Diseases (Intravenous)						
SCID	JASPER THERAPEUTICS					• Enrolling patients • Discussing potential BLA filing with the FDA

Jasper maintains full worldwide rights to develop and commercialize briquilimab in all indications

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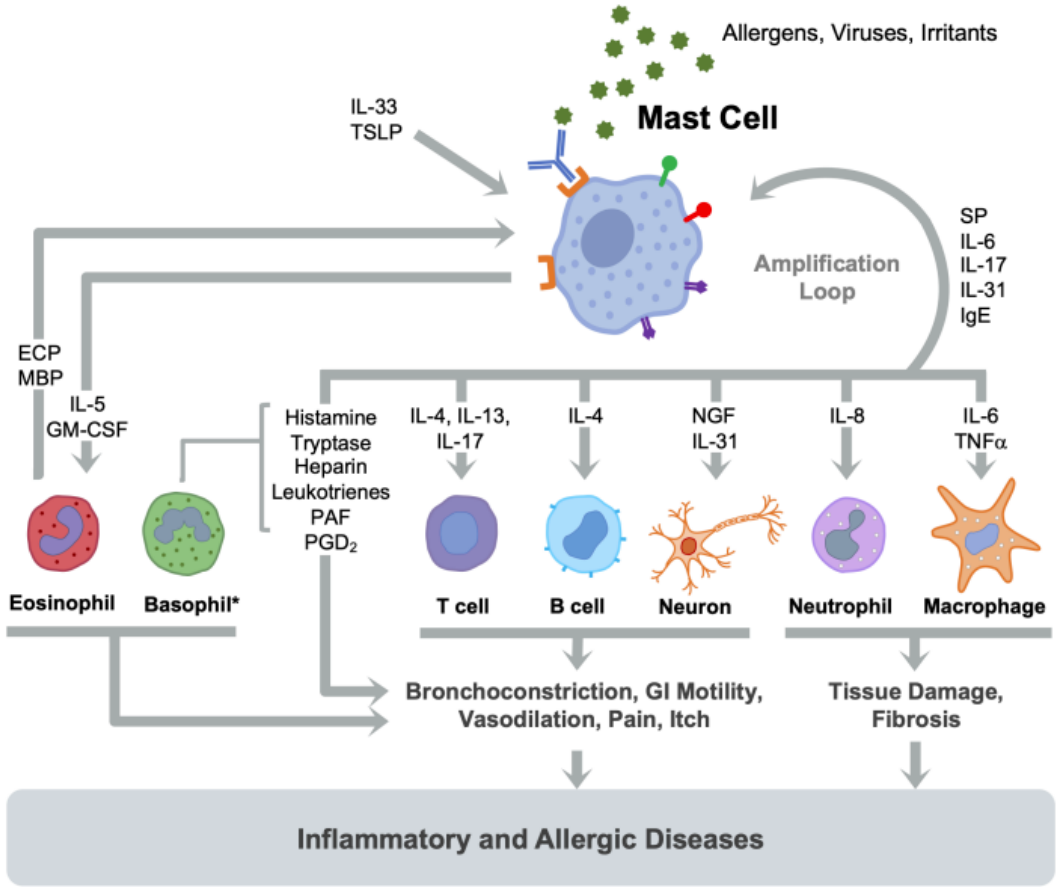
Briquilimab is an investigative drug and is not approved for any indication

Mast cells are the most potent drivers of inflammatory response in skin, lungs and gut



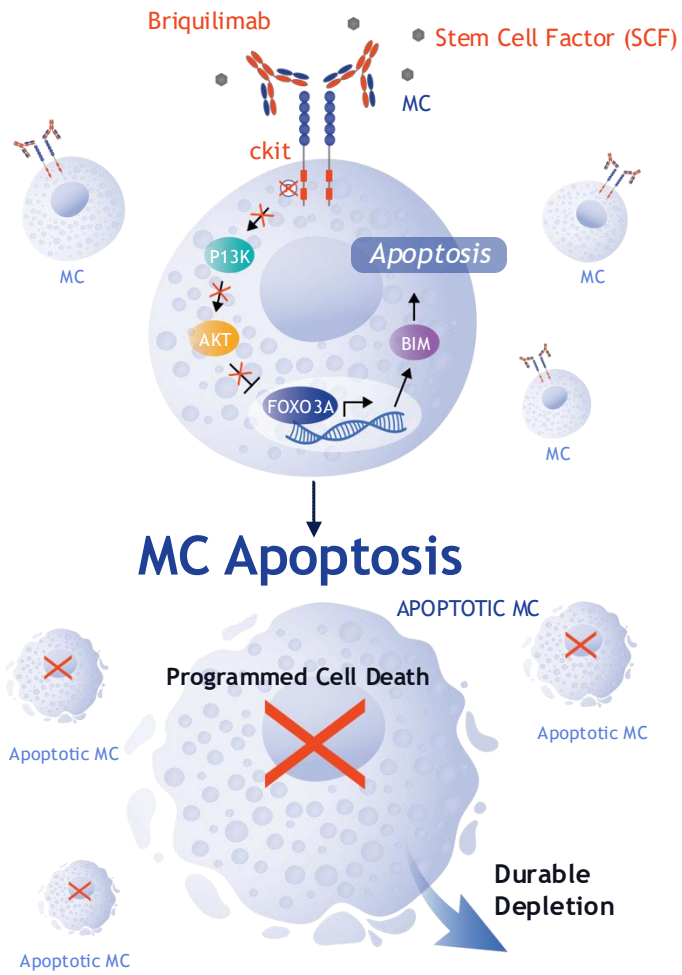
Metz et al. Allergy (2023)

- Mast cells are primitive immune cells involved in protection against venom and parasitic infection
- Mast cells triggered by allergens, viruses and other irritants degranulate and release pro-inflammatory compounds implicated in large number of immunologic diseases
  - Allergy
  - Asthma
  - Atopic Dermatitis
  - COPD
  - Eosinophilic Esophagitis
  - Prurigo Nodularis
  - Chronic Inducible Urticaria
  - Chronic Spontaneous Urticaria
- Currently approved therapies targeting mast cell driven diseases rely on mast cell inhibition and have limited efficacy and durability of response

Briquilimab is an investigative drug and is not approved for any indication

Depletion of mast cells by anti-c-Kit monoclonal antibody blockade is a novel approach with potential to deliver safe and durable disease control

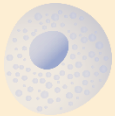
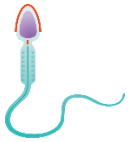
- Briquilimab is an aglycosylated IgG1 anti c-Kit antibody with high affinity to c-Kit
  - Aglycosylated c-Kit antibodies avoid indiscriminate ADCC driven killing of other c-Kit expressing cells[1]
  - Kd < 5pM affinity to human c-Kit with IC50 ~ 70pM
  - Human mast cell survival bioassay IC50 ~12.5nM
  - Half life of 9 days
- Briquilimab blocks c-Kit signaling at the SCF ligand binding site on the receptor triggering apoptosis
  - Mast cell depletion occurs within hours to days
- Mast cell recovery in the skin takes 3 months or longer[2], potentially leading to durable disease control



1. Arnold JN et al. Annu Rev Immunol (2007)
2. Maurer et al, GA²LEN Global Urticaria Forum – Berlin, December 6, 2022

Briquilimab is an investigative drug and is not approved for any indication

Transient blockade of c-Kit leads to temporary and reversible effects on other cells expressing c-Kit

Cell type	Role of c-Kit	Impact of c-Kit Blockade	Benefit of Optimal Biologic Dosing
 **Mast cell**	Survival signal	Mast cell apoptosis via the Bim-mediated pathway[1]	**Mast cells are depleted and take months to repopulate**
 **Stem Cell (HSC)**	Cellular maintenance	Differentiation and exit out of the bone marrow niche[2]	**Mild, transient drop in a subset of cycling neutrophils and reticulocytes** with rapid recovery expected after c-Kit signaling restored
 **Melanocyte**	Proliferation and melanin production	Blocks melanocyte proliferation and melanogenesis[3]	Hair and skin hypopigmentation mitigated by exposure-free intervals, enabling melanogenesis
 **Spermatogonial Progenitor**	Downstream survival signal	Downstream (non-stem cell) progenitor cell apoptosis[4]	**Transient drop in sperm count**, and effects on fully reversible given lack of effect on spermatogonial stem cells (SSCs)
 **Taste Cell**	Cellular maintenance	Disruption of specific mature taste cell subpopulations[5]	**Potential impairment of salt and umami taste** with rapid recovery expected after c-Kit signaling restored

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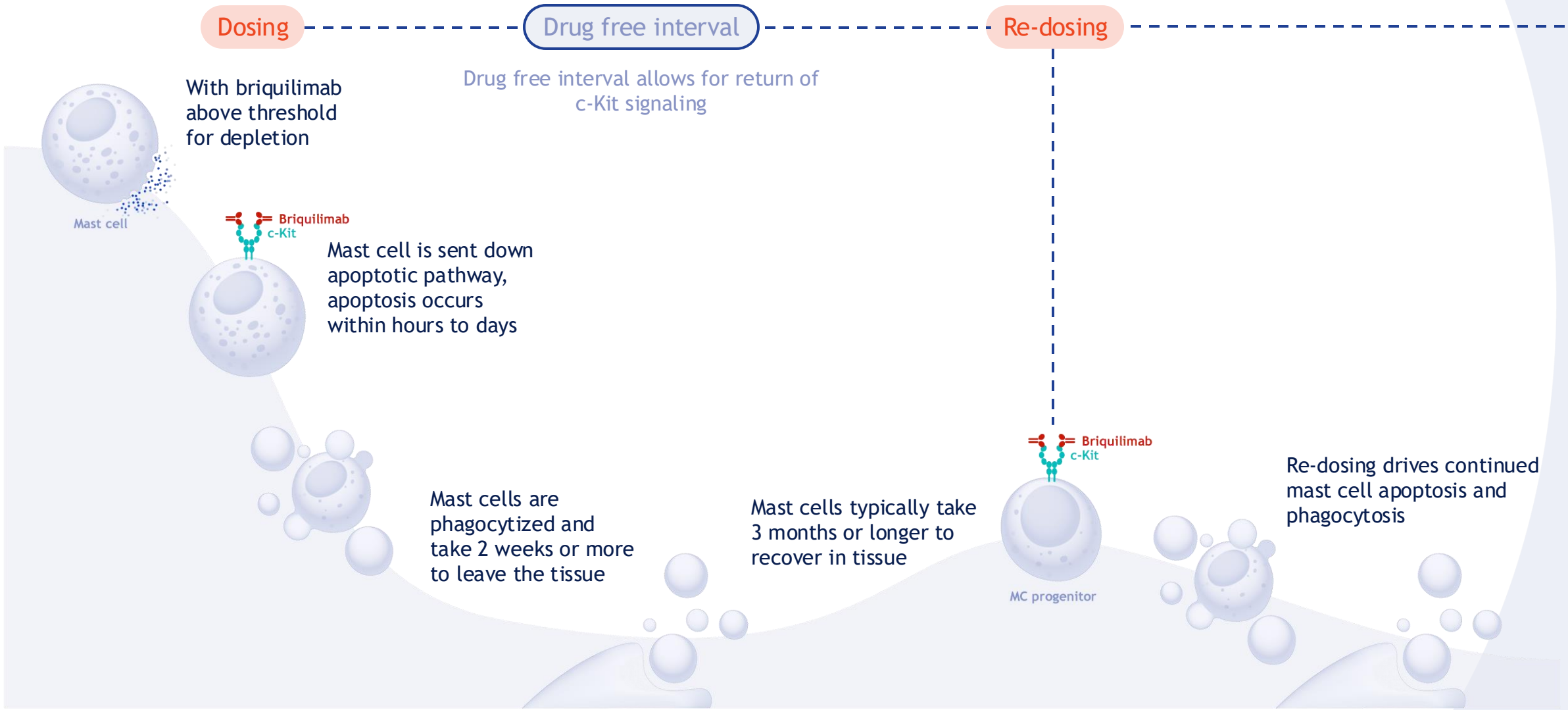
1 Alfredsson J, et al. Cell Death and Differentiation (2005)
2 Shin JY, et al. Journal of Experimental Medicine (2014)
3 Alexeev V, Yoon K, Journal of Investigative Dermatology (2006)
4 Morimoto H, et al. PLoS ONE (2009); 5 Choo E, Dando R. Chemosensory Perception (2019).

Briquilimab is an investigative drug and is not approved for any indication

Briquilimab design and characteristics enable optimal biologic dosing and could minimize unwanted effects of c-Kit inhibition



Briquilimab is an investigative drug and is not approved for any indication

Briquilimab in CIndU

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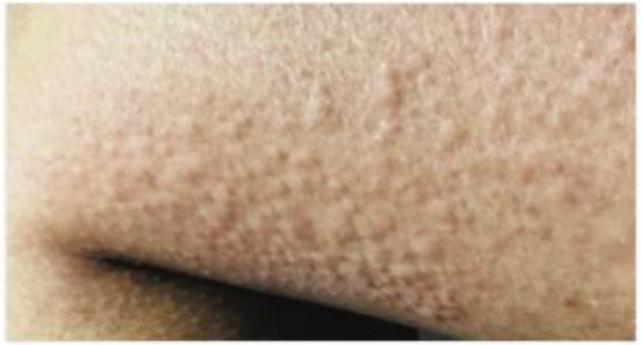
CIndU can be a severe & debilitating disease resulting in a major negative impact on quality of life

- Chronic inducible urticaria (CIndU) is a debilitating inflammatory condition of the skin with a specific trigger such as heat, cold, sunlight, rubbing or scratching the skin or tight clothing
- Mast cell degranulation, leading to the release of histamine and other inflammatory mediators, is the key driver of severe itching, hives and angioedema in CIndU patients
- CIndU patients **suffer both physically and psychologically**. Severe disease has a similar **negative impact on QoL** as other dermatologic diseases like plaque psoriasis
- Targeting the c-Kit receptor with briquilimab disrupts a critical survival on mast cells leading to mast cell apoptosis and disease resolution



1 Munoz M, et al. Current Allergy and Asthma Reports June 2024
2 Ozdemir SO, et al. JEADV Mar 2024
3 Maurer M, et al. J Allergy Clin Immunol 2017
4 Nikolaev I, et al. EAACI Hybrid Congress, July 1-3, 2022
5 Mauer M, et al. EAACI Hybrid Congress, May 31- June 3 2024

Briquilimab is an investigative drug and is not approved for any indication

Phase 1b/2a SPOTLIGHT study of subcutaneous briquilimab in CIndU

SPOTLIGHT TRIAL

Open-label, cold urticaria & symptomatic dermographism, single ascending dose study

Screening/Eligibility

- Diagnosis of Cold Urticaria (ColdU) or Symptomatic Dermographism (SD) for ≥ 3 mos.
- H1-antihistamine-failed
- 18+ years

Study Operations

- **EU Lead: Martin Metz, MD**
- 6 sites in the EU
- N = ~27
- 180mg enrollment upcoming

Key Assessments

- **Provocation Test:** TempTest (ColdU), FricTest (SD)
- **Disease Scores:** UCT
- **Mast Cell Depletion & Recovery:** Serum Tryptase, Skin Biopsies
- **Safety:** TEAEs, SAEs

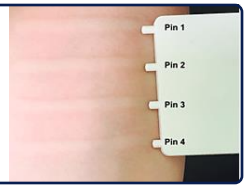
40 mg **120 mg** **180 mg**	**n=3** **n=12** **n=12**	Single Subcutaneous Dose →	12 Week Efficacy Observation Period (6 Week Preliminary Analysis) + 24 Week Additional Safety Observation

Provocation Tests Used for Clinical Evaluation

FricTest™ - Symptomatic Dermographism

CR - No response at Fric Level 4

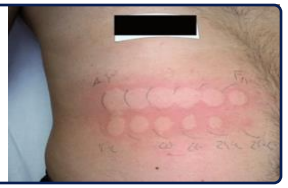
PR - ≥ 2 pin improvement



TempTest™ - Cold Induced Urticaria

CR - Negative test at ≤ 4°C

PR - Improvement by ≥ 4°C



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SPOTLIGHT Baseline Demographics

	Briquilimab 40mg (n=3)	Briquilimab 120mg (n=12)
Age (years), mean ± SD	35.3 ± 8.0	46.4 ± 13.8
Female, n (%)	1 (33%)	8 (67%)
Weight (kg), median (range)	86.0 (69-94)	99.0 (57-115)
Cold Urticaria, n	1	4
Symptomatic Dermographism, n	2	8
Baseline Provocation Threshold		
TempTest™ (°C), mean (range)	16.0 (16-16)	20.8 (15-27)
FricTest™ (Pin Count), mean (range)	3.5 (3-4)	3.9 (3-4)
Urticaria Control Test (UCT) score, mean ± SD	3.7 ± 2.5	6.3 ± 3.3
Tryptase (ng/ml), mean (range)	4.7 (4.1-5.3)	7.6 (3.6-25.7)

SPOTLIGHT 6 Week Efficacy Evaluation

Briquilimab 120mg single dose achieved 83% (10 of 12) complete response

	Briquilimab 40mg (n=3)	Briquilimab 120mg (n=12)	Briquilimab All doses (n=15)
Complete Response, n (%)	1 (33%)	10 (83%)	11 (73%)
ColdU, n	0	3	3
Symptomatic Dermographism, n	1	7	8
Partial Response, n (%)	2 (66%)	1 (8%)	3 (20%)
ColdU, n	1	0	1
Symptomatic Dermographism, n	1	1	2
Complete or Partial Response at any time, n (%)	3 (100%)	11 (92%)	14 (93%)

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SPOTLIGHT 6 Week Efficacy Evaluation

Rapid Onset of Effect

- >70% of 120mg patients with a CR or PR at 1 week assessment

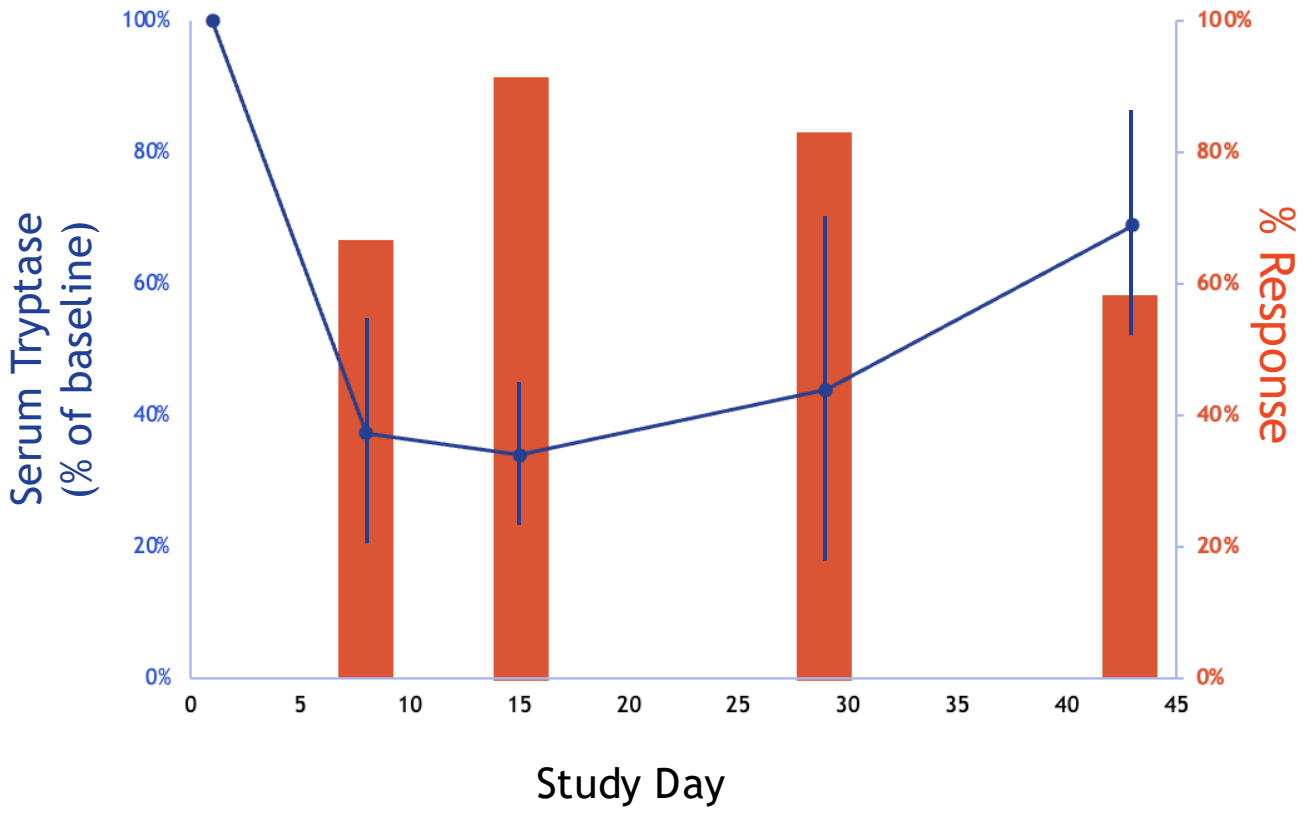
Depth of Response

- 93% (14 of 15) of patients reporting a clinical response
- 92% (11 of 12) patients at the 120mg dose achieving a CR or PR by week 2
- 83% (10 of 12) patients at the 120 mg dose reported as well controlled or complete disease control by UCT score at week 4

Durability of Effect

- 6 CRs and 1 PR continue at six weeks, durability assessment ongoing

SPOTLIGHT: Complete or partial response and serum tryptase through 6 weeks with briquilimab 120mg (n=12)



- Significant clinical response occurs within one week following dosing
- Serum tryptase reductions occur within the first week following dosing
  - Magnitude of tryptase reductions do not appear to be predictive of clinical response
  - i.e. Tryptase reductions as low as 50% associated with Complete Response in preliminary SPOTLIGHT data
- Serum tryptase recovery does not predict the timing of return of symptoms
  - Patients maintained CR even with tryptase recovering to 70%+ of baseline in preliminary SPOTLIGHT data

AD_T0003, AD_T0004, AD_L0001, AD_L0002, AD_L0003

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SPOTLIGHT safety and tolerability

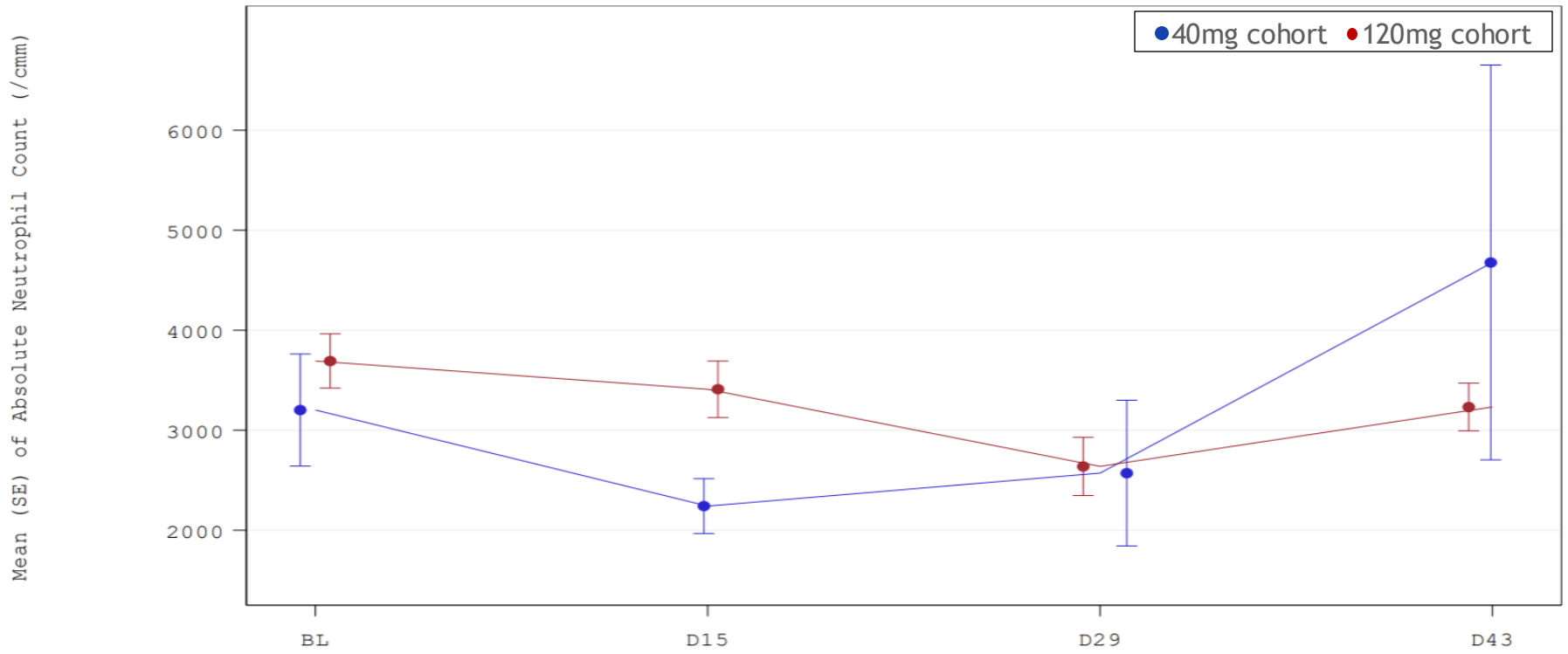
	Briquilimab 40mg (n=3)	Briquilimab 120mg (n=12)
Any adverse event*	2**	10***
Any serious adverse event	0	0
Hypersensitivity reaction	0	0
Any adverse event leading to discontinuation	0	0
Adverse event leading to death	0	0
Adverse event ≥ grade 3	0	0

*AEs occurring in ≥2 participants: fatigue, dizziness, headache, nasopharyngitis, blood CK increased, diarrhea, muscle tightness, nausea
**AE report of Grade 1 neutropenia at Day 94, ANC 1825, resolved by Day 164
***AE report of Grade 1 neutrophil decreased at Day 29, ANC 1570, resolved by next measurement, Day 39

SPOTLIGHT Absolute Neutrophil Count

No ANC values observed below 1500 and no association with infection

Figure AD_F0007. Mean (SE) of Absolute Neutrophil Count (/cmm) over Visit by Cohort (up to Week 6 (Day 43))
Safety Analysis Set



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Briquilimab in Chronic Spontaneous Urticaria

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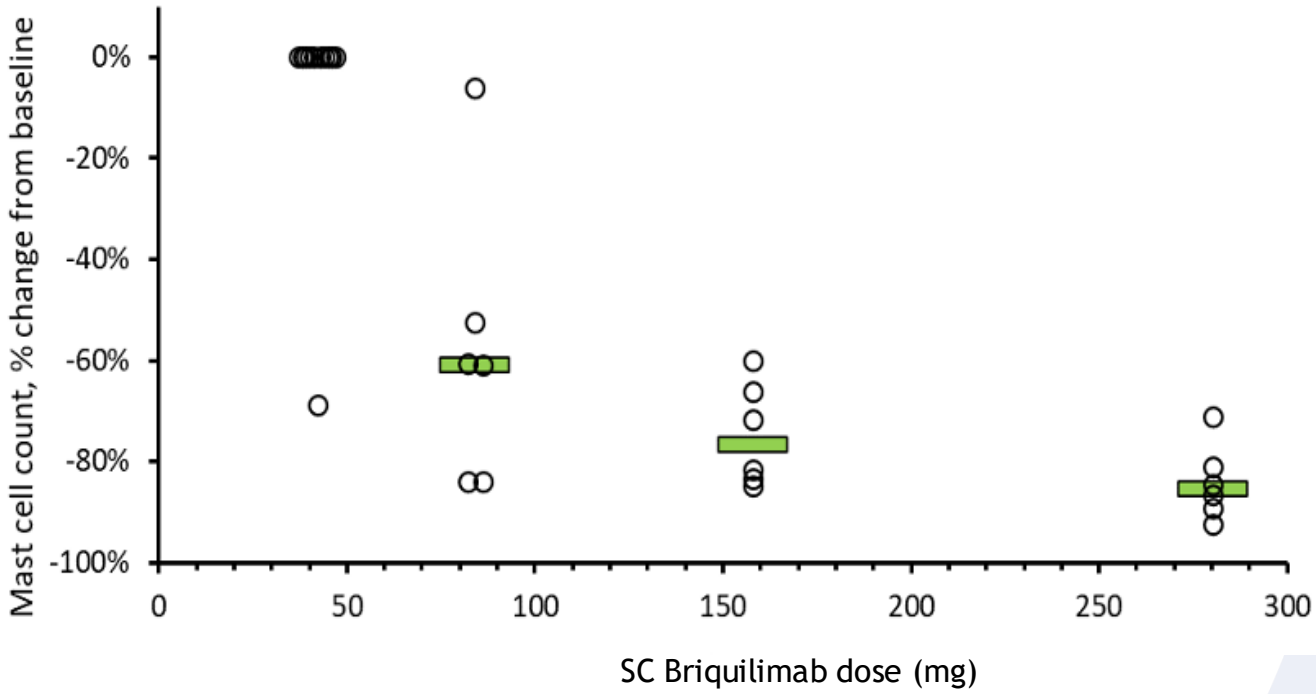
Briquilimab significantly depletes skin mast cells in humans at subcutaneous (SC) doses above ~80 mg

- Single SC dose at or above ~80 mg potently depletes mast cells in the skin of healthy volunteers
- Cmax reached at ~day 5
- Depletion begins occurring as early 7 days following SC dosing
- Robust depletion at day 29
- Briquilimab's favorable pharmacokinetic properties may enable optimal biologic dosing

Briquilimab Healthy Volunteer Phase 1 Subcutaneous Study

Skin mast cell depletion 4 weeks after single dose (42 mg, 84mg, 158mg, 280mg)[1]



1 Jasper internal data (Phase 1a, healthy volunteer study); Dose is adjusted to body weight (mg/kg) on graph. Skin biopsies were used to count mast cells.

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Briquilimab Phase 1b/2a BEACON study in patients with chronic spontaneous urticaria (CSU) ongoing

BEACON TRIAL

Study Goal: identify the optimal therapeutic doses & dosing frequency of subcutaneous briquilimab to inform future registrational trials

Key Objectives:

- Study multiple briquilimab dose levels, and intervals up to every 12 weeks to determine optimal biologic dosing via assessment of:
  - Mast cell depletion and disease symptom/disease modifications
  - Briquilimab drug clearance
  - Time to return of disease symptoms
  - Briquilimab effect on other c-Kit expressing cell lineages
- Identify dose and dosing schedule for registrational trial

Status: Patient enrollment ongoing at sites in US and EU

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Phase 1b/2a BEACON study in chronic spontaneous urticaria

Randomized, double-Blind, placebo-controlled, multiple ascending dose study

BEACON TRIAL

Screening/Eligibility

- CSU diagnosis ≥ 6 mos.
- UAS7 ≥ 16
- 18+ years
- H1-antihistamine-failed
- Inadequate response to omalizumab

Study Operations

- **US Lead: Tom Casale, MD**
- **EU Lead: Martin Metz, MD**
- ~30 sites in the US & EU
- N = ~50

Key Assessments

- ✓ **Disease Scores:** UAS7, UCT
- ✓ **Mast Cell Depletion & Recovery:** Serum Tryptase, Skin Biopsies
- ✓ **Safety:** TEAEs, SAEs

	Patients (Randomization)	Dose (Frequency)	Cohorts	Key Assessments & Follow Up
Part 1 Open Label (n=6)	3+3	10 mg	Dose W0, 4, 12, 20	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment 24 week - Follow Up
	3+3	40 mg	Dose W0, 4, 12, 20	
Part 2 Double-Blind Placebo-Controlled (n=36)	n=8 (3:1)	80 mg (Q8W)	Dose W0, 8, 16, 24	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment 24 week - Follow Up
	n=6 (2:1)	120 mg (Q8W)	Dose W0, 8, 16, 24	
	n=6 (2:1)	120 mg (Q12W)	Dose W0, 12, 24	
	n=8 (3:1)	180 mg (Q12W)	Dose W0, 12, 24	
	n=8 (3:1)	180 mg (Q8W)	Dose W0, 8, 16, 24	
Part 3 Double-Blind Placebo-Controlled (n=8)	n=4 (3:1)	240 mg	Single Dose	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment 36 week - Follow Up
	n=4 (3:1)	360 mg	Single Dose	

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Briquilimab in Asthma

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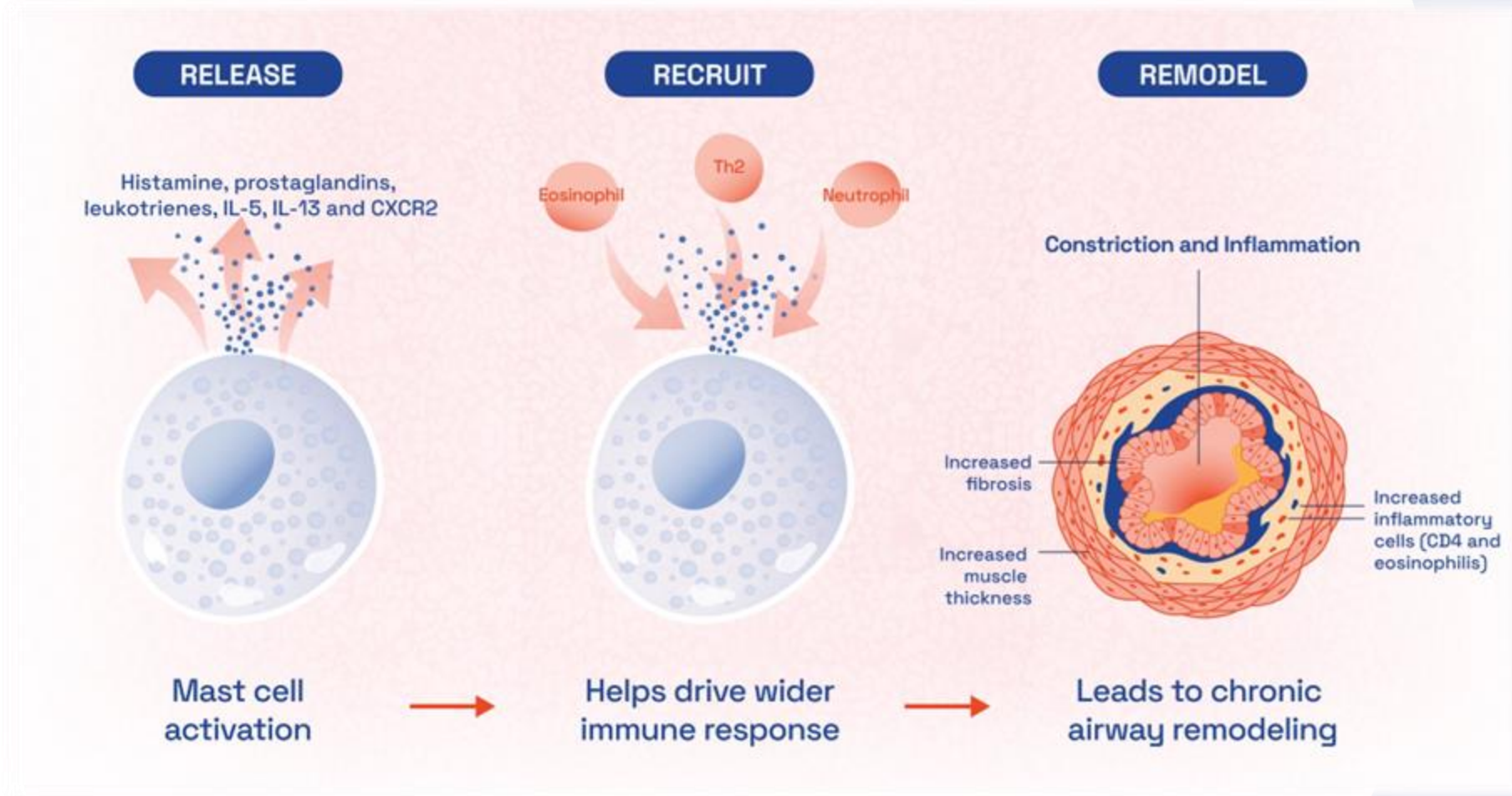
Mast cells play a critical role in allergic inflammation and tissue remodeling in asthma

- Mast cells are distributed throughout multiple compartments in the lung[1]
- Mast cells release mediators and recruit other cell types into the airway that drive inflammation throughout all phases of the asthmatic response[2]

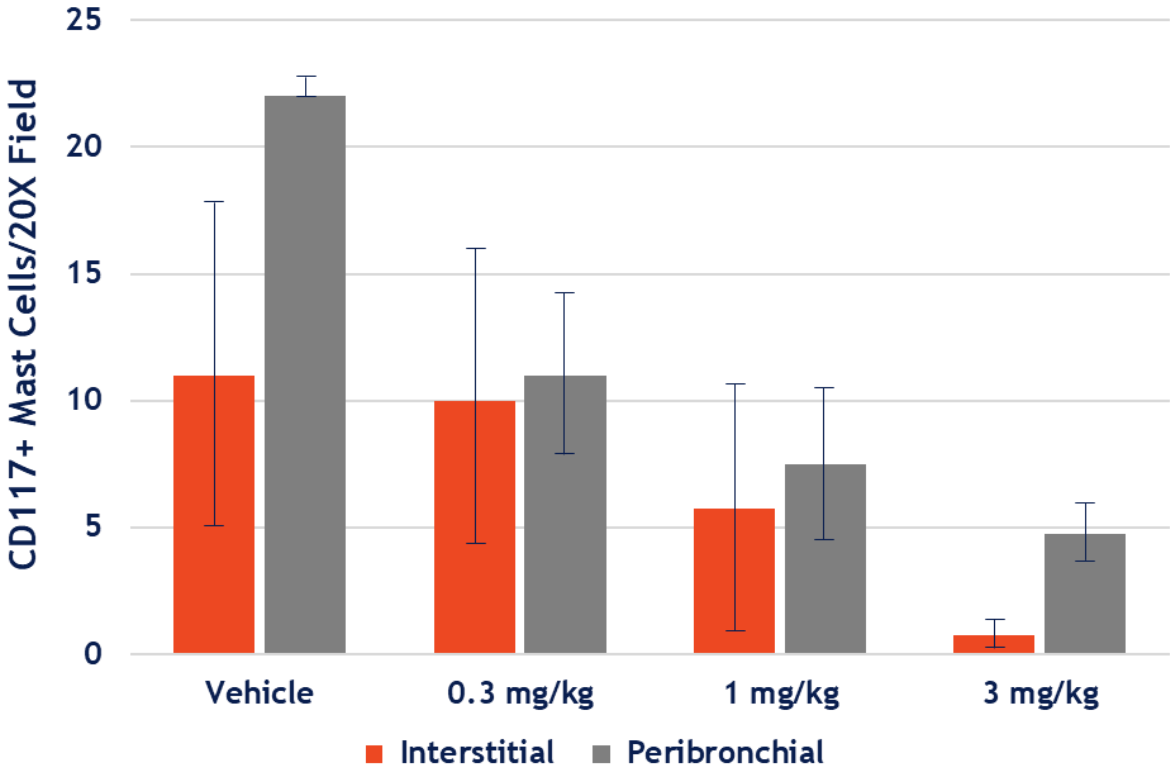


1 Méndez-Enríquez E, Hallgren J. Mast cells and their progenitors in allergic asthma. Front Immunol. 2019;10:442022.
2 Galli SJ, Tsai M, Piliponsky AM. The development of allergic inflammation. Nature. 2008;454(7203):445-454.

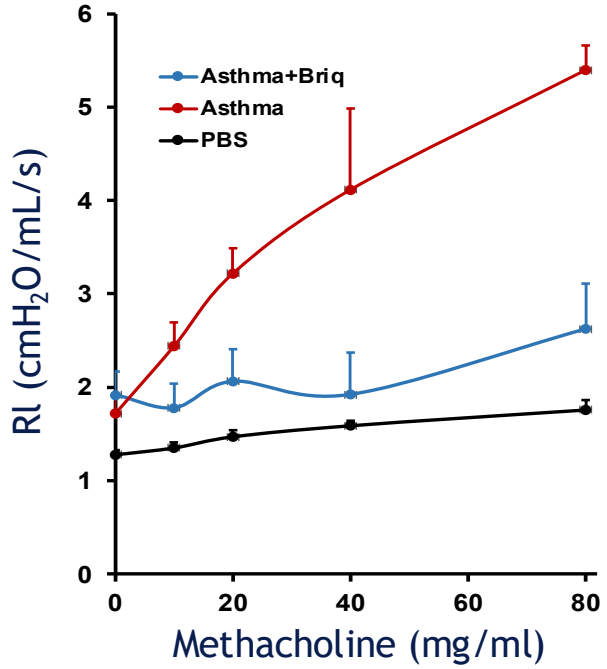
Briquilimab is an investigative drug and is not approved for any indication

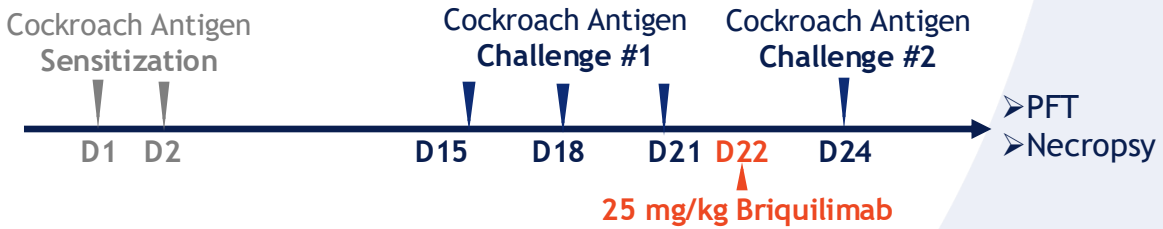
Single dose of briquilimab depleted lung mast cells in NHP and reduced asthmatic response to allergen in Jasper c-Kit Mouse™

Lung Mast Cell Counts in African Green Monkeys



Jasper c-Kit Mouse™ - Pulmonary Resistance





Briquilimab is an investigative drug and is not approved for any indication

1 Jasper Internal Data
2 AAAAI February 23-26, 2024.

c-Kit inhibition in severe asthma is demonstrated across preclinical and clinical Phase 2 and Phase 3 data sets

- ✓ Mast cells are central to asthma pathophysiology[1]
- ✓ Preclinical evidence shows that briquilimab depletes lung mast cells and reduces asthmatic response to allergen[2]
- ✓ Clinical evidence that c-Kit inhibition improves airway response and reduces exacerbations across severe asthma endotypes[3,4]
  - ✓ Imatinib Phase 2 data - challenge model
  - ✓ Masitinib Phase 3 data – reduction in exacerbations

Airway Hyperresponsiveness

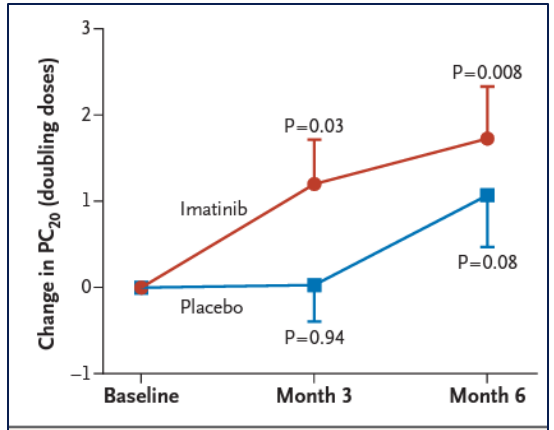


Figure 2. Change in Airway Methacholine Reactivity.

Serum Tryptase

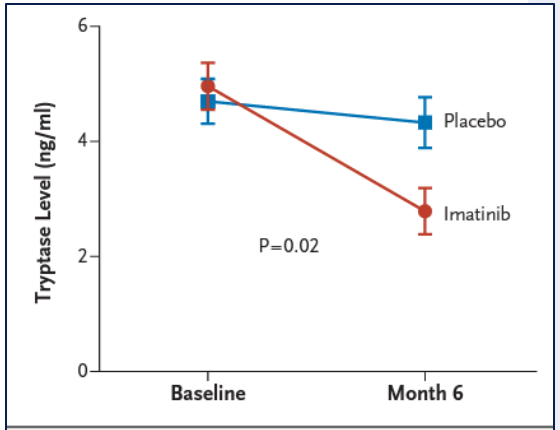


Figure 3. Total Tryptase Levels in Serum.

In patients with severe asthma, imatinib decreased airway hyperresponsiveness, MC counts, and tryptase release[3]

1 Galli SJ, Tsai M, Piliponsky AM. The development of allergic inflammation. Nature. 2008;454(7203):445-454.
2 Yu, M, et al. "Briquilimab, an Anti-CD117 (c-Kit) Antibody, Prevents Cockroach Allergen-Induced Allergic Asthma in Mice Expressing Chimeric Human and Mouse CD117.", AAAAI February 23-26, 2024.
3 Cahill KN, Katz HR, Cui J, et al. Kit inhibition by imatinib in patients with severe refractory asthma. N Engl J Med. 2017;376(20):1911-1920.
4 Davidescu L, Ursol G, Korzh O, et al. Efficacy and safety of masitinib in corticosteroid-dependent severe asthma: a randomized placebo-controlled trial. J Asthma Allergy. 2022;15:737-747.

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Briquilimab is an investigative drug and is not approved for any indication

Briquilimab Phase 1b/2a ETESIAN challenge study in allergic asthma

Double-blind, placebo-controlled, single dose study

ETESIAN TRIAL

Screening/Eligibility

- Diagnosis of stable allergic asthma
- Baseline FEV_1 70% of predicted value
- Positive methacholine challenge at baseline
- 18-65 years of age

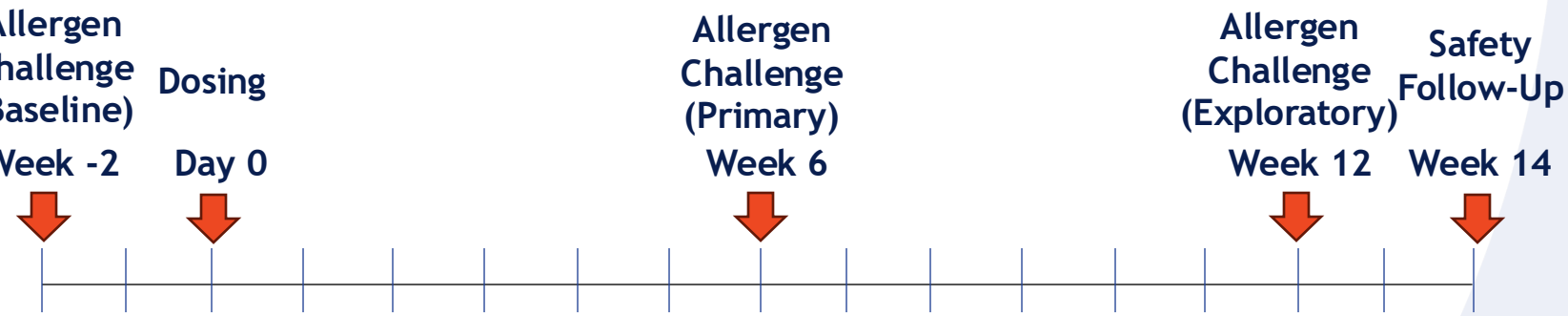
Study Operations

- **Lead Investigator: Paul O'Byrne, MD**
- Up to 7 centers in Canada
- N = 30 patients

Key Assessments

- **Early & Late Asthmatic Response:** % decrease in FEV_1 from baseline
- **Changes in Airway Hyperresponsiveness:** Methacholine PD20 24 hours after allergen challenge
- **Mast Cell Depletion & Recovery:** Serum Tryptase
- **Safety:** TEAEs, SAEs

Patients (Randomization)	Dose	Timeline
N=30 (1:1)	180 mg Single-Dose	Allergen Challenge (Baseline) Week -2; Dosing Day 0; Allergen Challenge (Primary) Week 6; Allergen Challenge (Exploratory) Week 12; Safety Follow-Up Week 14



Endpoints: Allergen Challenge & Methacholine PD20 measured at 6 weeks (Primary) and 12 weeks (Exploratory)

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Briquilimab is an investigative drug and is not approved for any indication

Mast cell depletion offers a novel therapeutic approach for asthma

Mast cell depletion: briquilimab has demonstrated the ability to deplete mast cells throughout multiple tissue types

Early and late phase response: early phase in asthma is driven by mast cell degranulation, which may also drive the late phase recruitment of other cell types to the lung

Airway remodeling: reduction of inflammation by mast cell depletion may reduce excess inflammation and epithelial remodeling

Durability and convenience: mast cell depletion may lead to durable effect based on long periods of mast cell recovery lasting weeks to months

Broad response: c-Kit targeting may have an impact across multiple asthma endotypes

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Market Opportunity in Mast Cell Diseases

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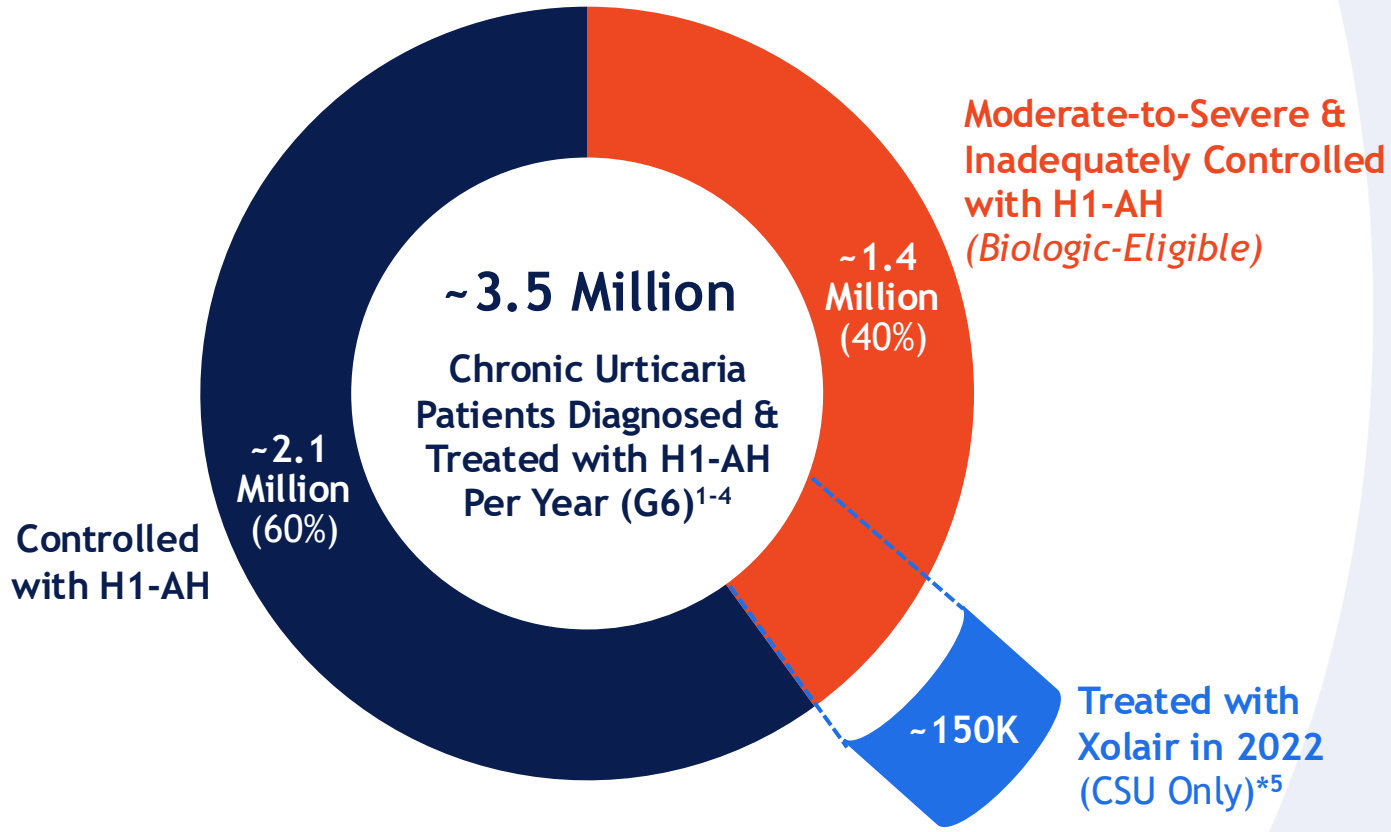
Chronic urticaria is one of the most prevalent immunological conditions with ~1.4 million biologic eligible patients in the G6

Chronic urticaria is a devastating disease characterized by severe itching, hives/wheals, inflammation, and/or angioedema **occurring for >6 weeks**

Chronic urticaria symptoms can **arise spontaneously (CSU) or after known triggers (CIndU)**

~1.4 million patients have moderate-to-severe disease, in which the disease commonly persists for 5+ years[6]

Chronic Urticaria Market Opportunity



~2/3 chronic urticaria cases are CSU; ~1/3 are CIndU (~15% of patients have both)[1]

*Approximately 50% of patients receiving Xolair have an inadequate response (Xolair prescribing information); H1-AH = H1-antihistamines

1 Kolkhir P, et al. Nature Reviews. 2022; 2 Balp MM, et al., EADV 2023; 3 Novartis R&D Day, Dec. 2021; 4 Decision Resources Group, Chronic Urticaria, Dec. 2023; 5 IQVIA sales data; 6 Saini S, Kaplan A. JACI Practice. 2018.

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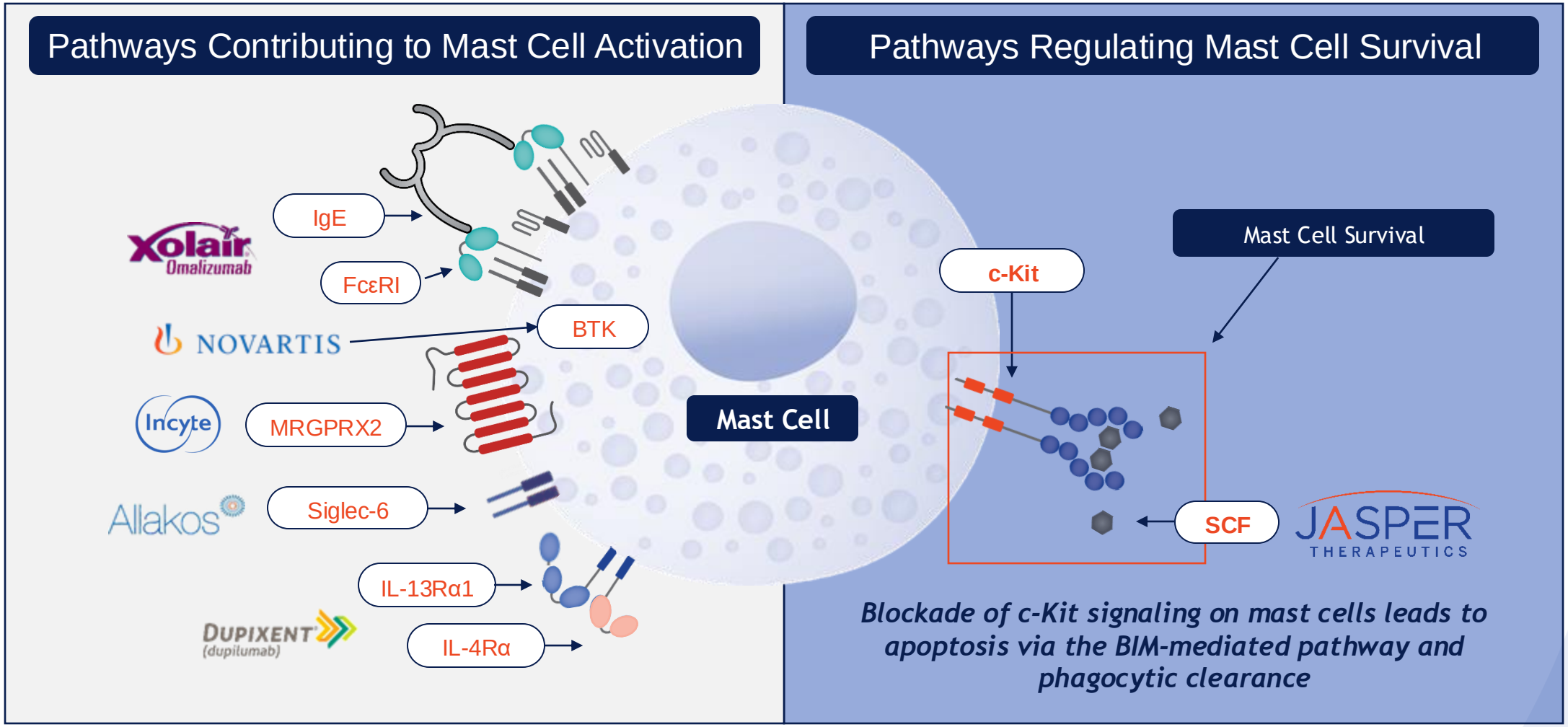
Mast cell depletion may lead to deeper and more durable efficacy compared to inhibition and silencing approaches



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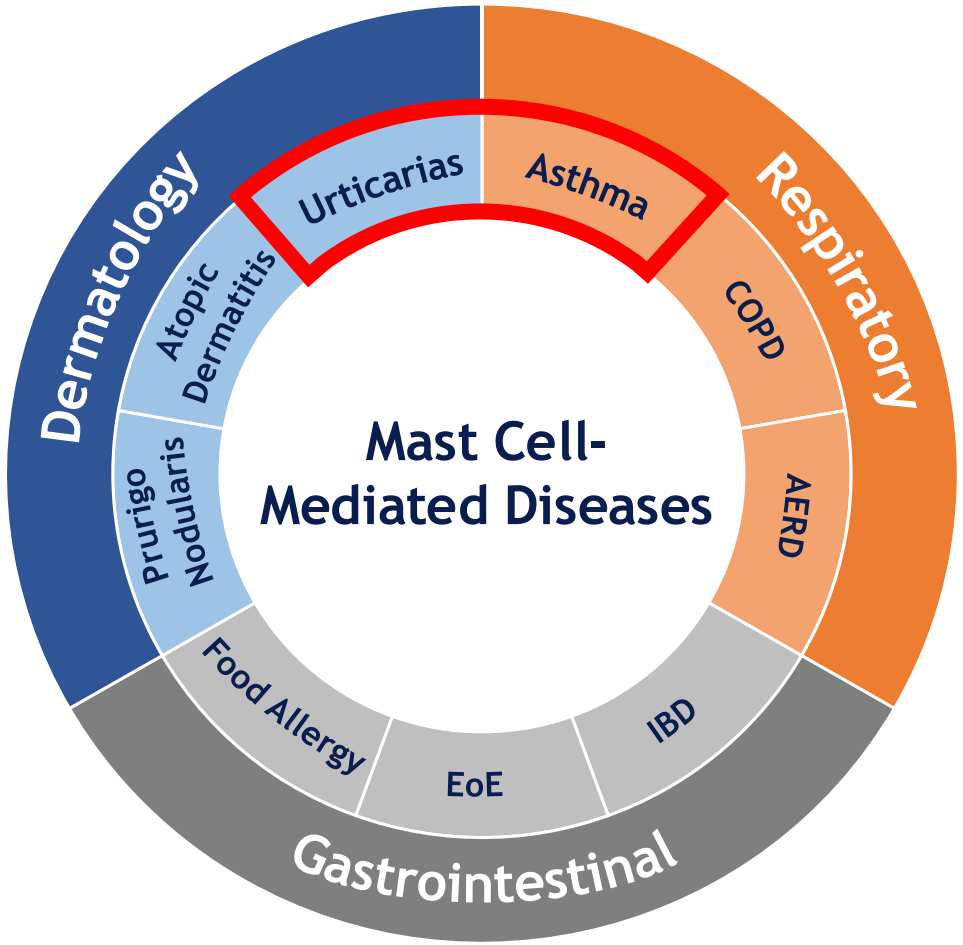
Mast cells play a central role in many diseases, presenting numerous potential opportunities for briquilimab in immunology and inflammation



Currently targeted indications

Dermatology	Other
Chronic Spontaneous Urticaria	Allergic Conjunctivitis
Chronic Inducible Urticaria	Age-Related Macular Degeneration (AMD)
Allergic Contact Dermatitis	Alpha-1 Antitrypsin Deficiency
Alopecia Areata	Alzheimer's Disease
Atopic Dermatitis	Angioedema
Bullous Pemphigoid	Celiac Disease, Dermatitis Herpetiformis
Prurigo Nodularis	Chronic GvHD
Psoriasis	Cystitis
Rosacea	Endometriosis
Respiratory	Fibromyalgia
Asthma	Hereditary Alpha Tryptasemia (HaT)
Allergic Rhinitis	Idiopathic Anaphylaxis
Aspirin Exacerbated Respiratory Disease (AERD)	Insulin-Dependent Diabetes Mellitus
Chronic Obstructive Pulmonary Disease (COPD)	Mast Cell Activation Syndrome (MCAS)
Chronic Rhinosinusitis with Nasal Polyps (CRSwNP)	Mast Cell Leukemia
Idiopathic Pulmonary Fibrosis	Mastocytosis (KIT negative)
Gastrointestinal	Migraine
Eosinophilic Esophagitis (EoE)	Multiple Sclerosis
Food Allergy & Oral Immunotherapy	Pancreatitis (acute/chronic)
IBD (Crohn's, Ulcerative Colitis)	Rheumatoid Arthritis
Irritable Bowel Syndrome (IBS)	Sickle Cell Disease (Sickle Crisis)

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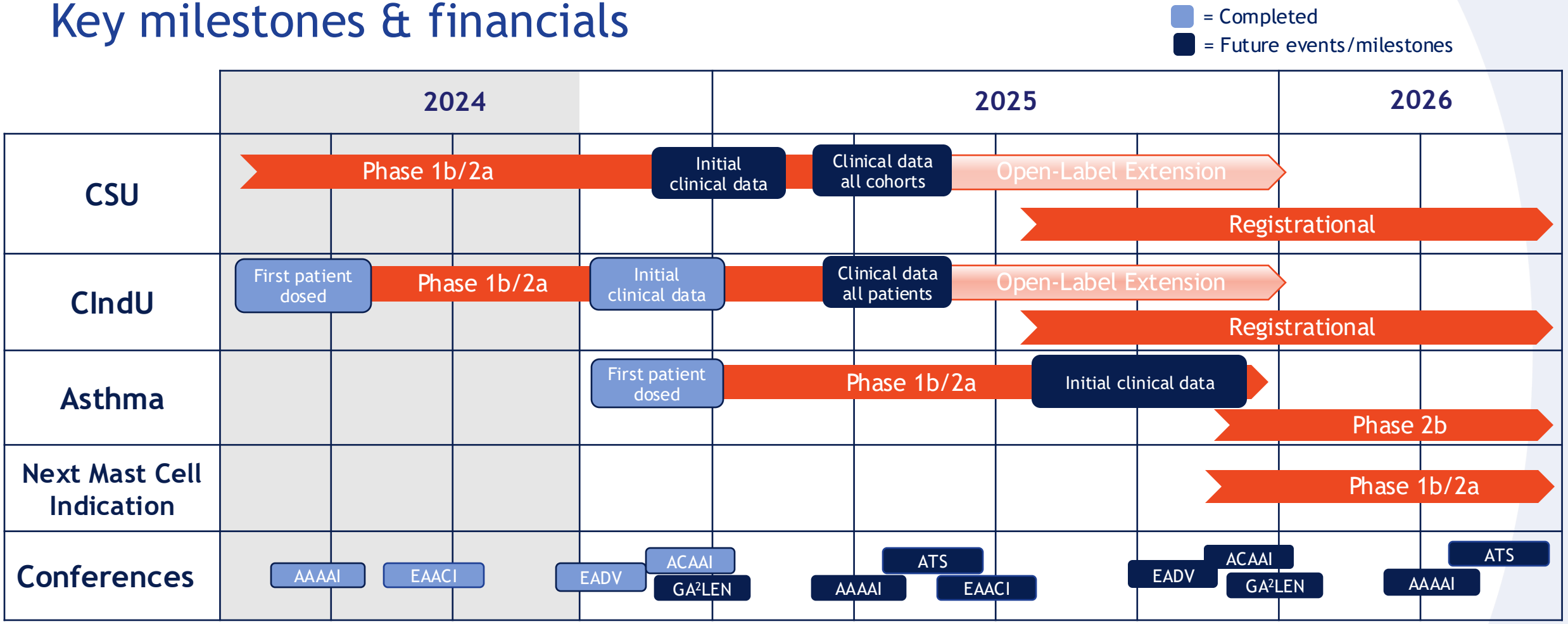
Key milestones & financials



Financial Overview

$92.5M cash & investments at 9/30/24 *	Cash runway through 3Q25

*Completed $50m equity financing in February 2024

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Jasper: Advancing briquilimab in multiple large indications

Significant data readout expected in January 2025

c-Kit inhibition – a novel mechanism driving depletion of mast cells

- Has potential to address diseases impacting millions of patients

Briquilimab – a clinically validated, potent and differentiated c-Kit inhibitor

- Drives rapid and robust clinical responses while minimizing unwanted adverse effects
- Evaluating additional doses/dose regimens to identify optimal biologic dosing

Briquilimab – franchise potential in mast cell diseases

- CSU: Phase 1b/2a BEACON study data, including 180 mg and 240 mg cohorts, in January 2025
- CIndU: Phase 1b/2a SPOTLIGHT study commencing 180 mg cohort
- Asthma: Enrolling in Phase 1b/2a ETESIAN study, initial data expected in 2H 2025
- Additional mast cell indication expected to start clinical development in 2025

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December 2024

Jasper Therapeutics

NASDAQ: JSPR

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