



# Jasper Therapeutics

Corporate Presentation

*March 2024*

# Safe Harbor Statements

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# Briquilimab: Franchise Potential in Mast Cell Diseases

## c-Kit inhibition clinically validated MOA in mast cell diseases

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















## Briquilimab a potent c-Kit inhibitor

- Briquilimab is a potent c-Kit inhibitor proven to drive mast cell depletion
- Briquilimab could allow for less frequent dosing
- Optimal biologic dosing and PK profile could minimize unwanted adverse effects

## Robust pipeline multiple company- led clinical programs

- CSU: Enrolling patients in Phase 1b/2a BEACON study (initial data expected 3Q 2024)
- ClndU: Enrolling patients in Phase 1b/2a SPOTLIGHT study (initial data expected 2H 2024)
- Clinical study in an additional mast cell driven indication expected to commence 2H 2024
- LR-MDS: Phase 1 trial in the US ongoing (initial data expected mid-year 2024)

# Expanded portfolio presents exciting new opportunities in mast cell diseases

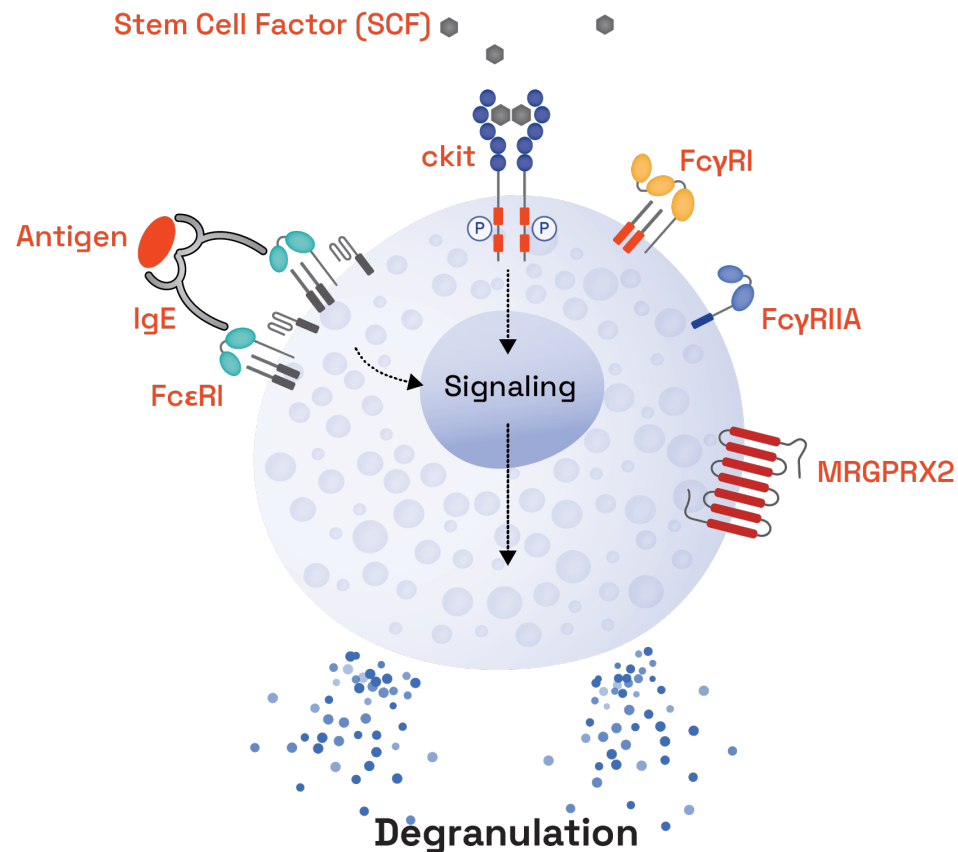
Indication	Sponsor	Phase 1	Phase 2	Phase 3	Program Milestones
Briquilimab					
Mast Cell Diseases (Subcutaneous)					
Chronic Spontaneous Urticaria					<ul style="list-style-type: none"><li>• Phase 1b/2a study being conducted in the US and EU</li><li>• Actively enrolling patients</li><li>• Initial clinical data expected in 3Q 2024</li></ul>
Chronic Inducible Urticaria					<ul style="list-style-type: none"><li>• Phase 1b/2a study being conducted in the EU</li><li>• Actively enrolling patients</li><li>• Initial clinical data expected in 2H 2024</li></ul>
Stem Cell Diseases (Intravenous)					
Low-to-Intermediate Risk MDS					<ul style="list-style-type: none"><li>• Enrolling patients</li><li>• Initial clinical data expected mid-year 2024</li></ul>
SCID					<ul style="list-style-type: none"><li>• Enrolling patients</li><li>• Discussing potential BLA filing with the FDA</li></ul>
Fanconi Anemia					<ul style="list-style-type: none"><li>• First 6 patients achieved full chimerism &amp; count recovery</li><li>• Expansion to Phase 2a (enrolling)</li></ul>
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Chronic Granulomatous Disease					<ul style="list-style-type: none"><li>• Enrolling patients</li></ul>
GATA2 MDS					<ul style="list-style-type: none"><li>• Study start up</li></ul>

 Investigator Sponsored Studies

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



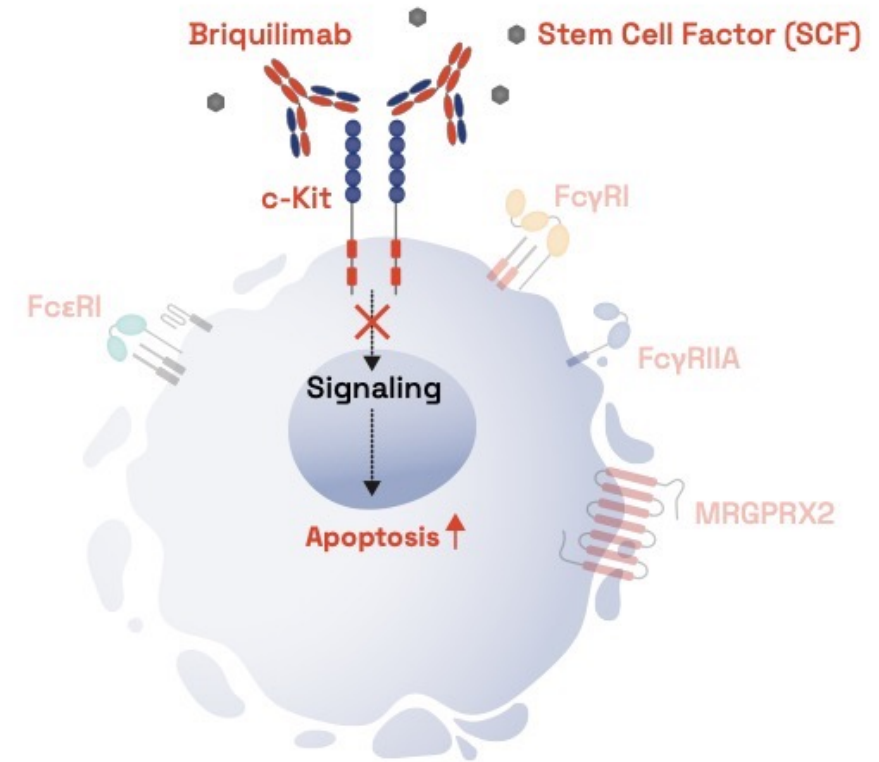
# Mast cells are key drivers of the inflammatory response in a number of allergic and dermatologic diseases



- Mast cells are the most potent drivers of inflammatory response in skin, lungs and gut
- Activated mast cells release pro-inflammatory compounds that drive diseases such as Chronic Spontaneous Urticaria, Chronic Inducible Urticaria, Asthma and many others
- Current approved therapies targeting mast cell driven diseases have limited efficacy and limited durability of response

# Depletion of mast cells by anti-c-Kit monoclonal antibody blockade is a novel approach to treat urticarias and other mast cell mediated diseases

- SCF signaling through c-Kit prevents mast cells apoptosis via the Bim-mediated pathway<sup>1</sup>
- Blockade of c-Kit signaling on mast cells leads to organized cell death and phagocytic clearance<sup>2</sup>
  - Partial c-Kit inhibition blunts mast cell activation
- Aglycosylated c-Kit antibodies avoid indiscriminate ADCC driven killing of other c-Kit expressing cells<sup>3</sup>
- Unwanted effects on other c-Kit expressing cells can be minimized by the recovery of c-Kit signaling once the mast cells are depleted

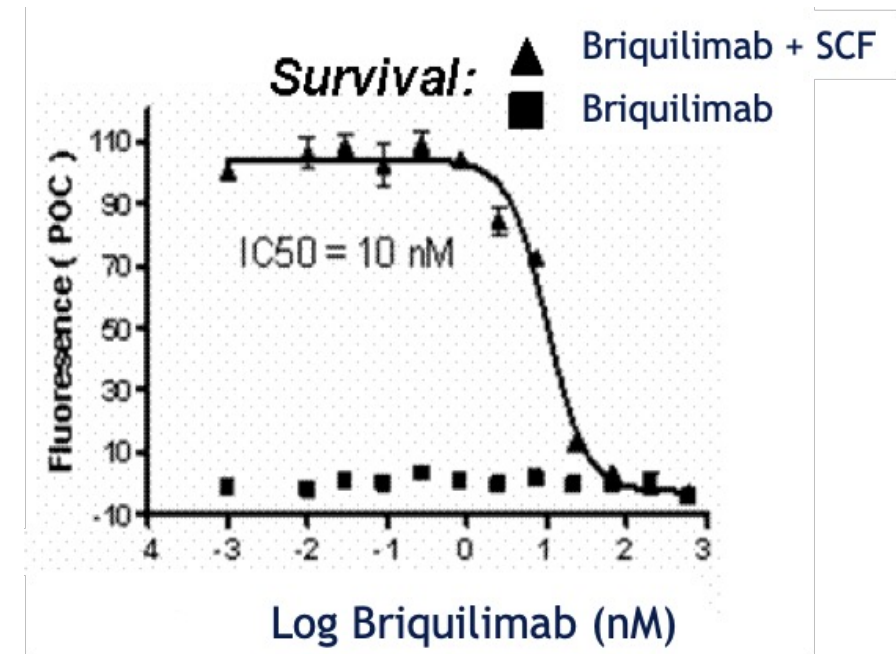


**Briquilimab-Mediated  
Mast Cell Apoptosis**

# Briquilimab blocks c-Kit signaling leading to durable mast cell depletion

- Briquilimab is an aglycosylated IgG1 anti c-Kit antibody with high affinity to c-Kit ( $K_d < 5\text{pm}$ )
- Briquilimab blocks c-Kit signaling by blocking the SCF ligand binding site on the receptor and triggering apoptosis
- Mast cell depletion occurs within hours to days

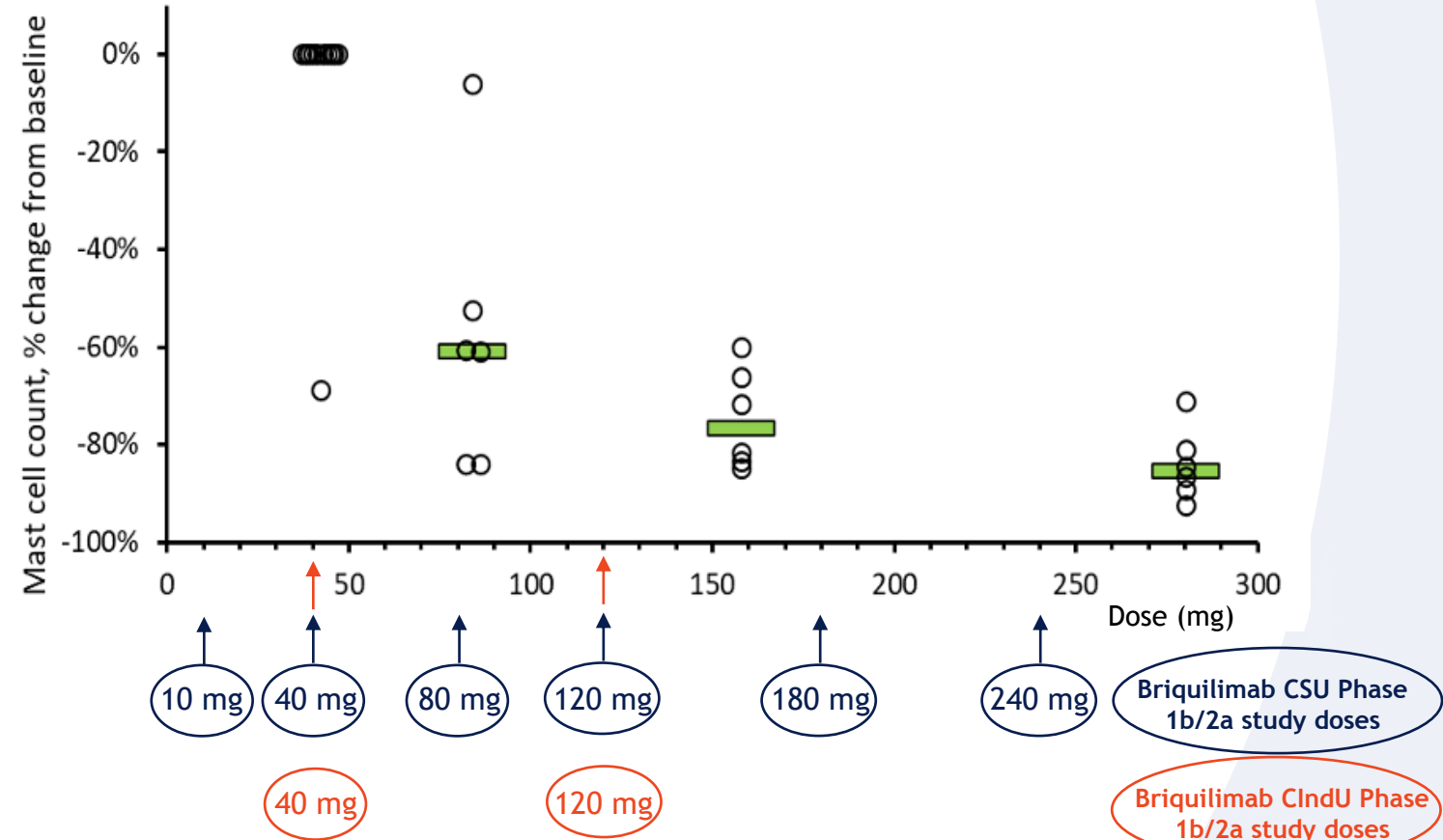
Mast cell survival assay<sup>1</sup>



# Briquilimab delivered with a single subcutaneous injection significantly depletes skin mast cells in humans

- A single subcutaneous dose at / above ~80mg potentially depletes mast cells in the skin of healthy volunteers
- Skin mast cell depletion highly correlated to serum briquilimab exposure after subcutaneous administration
- Significant depletion by day 7, with durable response lasting at least 29 days
- Once depleted with an anti-c-Kit antibody, skin mast cells take at least 3 months to recover, potentially leading to durable disease control<sup>2</sup>

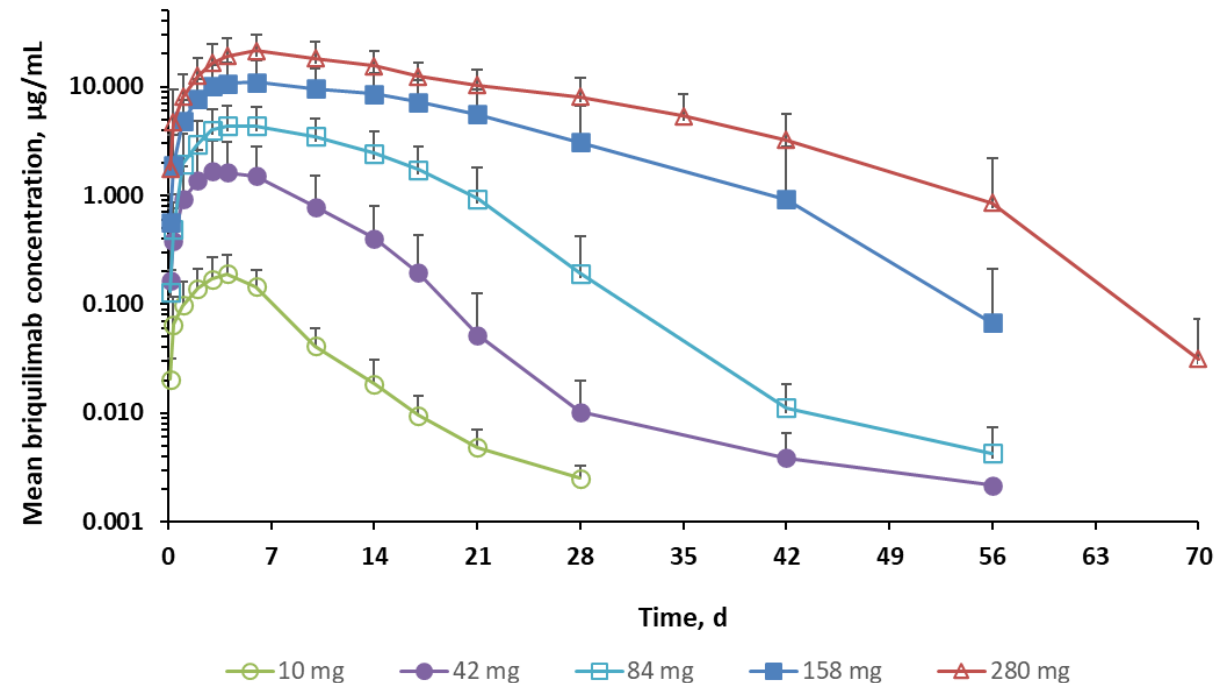
Skin mast cell depletion 4 weeks after single dose ( $\geq 42$  mg)<sup>1</sup>  
Briquilimab Healthy Volunteer Phase 1 Subcutaneous Study



# Briquilimab's favorable pharmacokinetic properties may enable optimal biologic dosing

- Briquilimab is designed to minimize unwanted c-Kit-related effects
- Subcutaneous dosing leads to predictable PK profile
- Low frequency of ADAs and do not appear to affect PK
- Drug elimination profile is favorable for minimizing off target effects
  - Clearance to allow for return of c-Kit signaling once the mast cells are depleted
  - No modifications to extend FcRn recycling

Pharmacokinetics ( $\geq 10$  mg)<sup>1</sup>  
Briquilimab Healthy Volunteer Phase 1 Subcutaneous Study





# Briquilimab safety profile to-date supports development in a wide variety of mast cell diseases

- c-Kit is expressed on mast cells, hemopoietic stem cells, melanocytes, taste buds, spermatogonia and Cajal (GI) cells, which all may be impacted by anti-c-Kit agents
- Briquilimab's favorable elimination kinetics may allow for an improved safety profile on these other cell types

## Relevant Preclinical & Clinical Experience

- NHP Chronic Toxicology Study
  - Paleness in skin & fur, depletion of colonic mast cells, decrease in reticulocytes and RBC mass, impact on spermatogenesis
  - All effects, except for paleness in skin/fur, reversible at highest dose of 300mg/kg weekly for 26 weeks
- Healthy Volunteer Subcutaneous Studies (n=77 briquilimab-treated)
  - TEAEs in the HV studies, in the highest frequency of reporting, were Headache, Nausea, Upper Respiratory Tract Infection, Back Pain and Dizziness
    - All were mild or moderate in severity and all resolved with no medical intervention
  - One Grade 3 allergic reaction reported

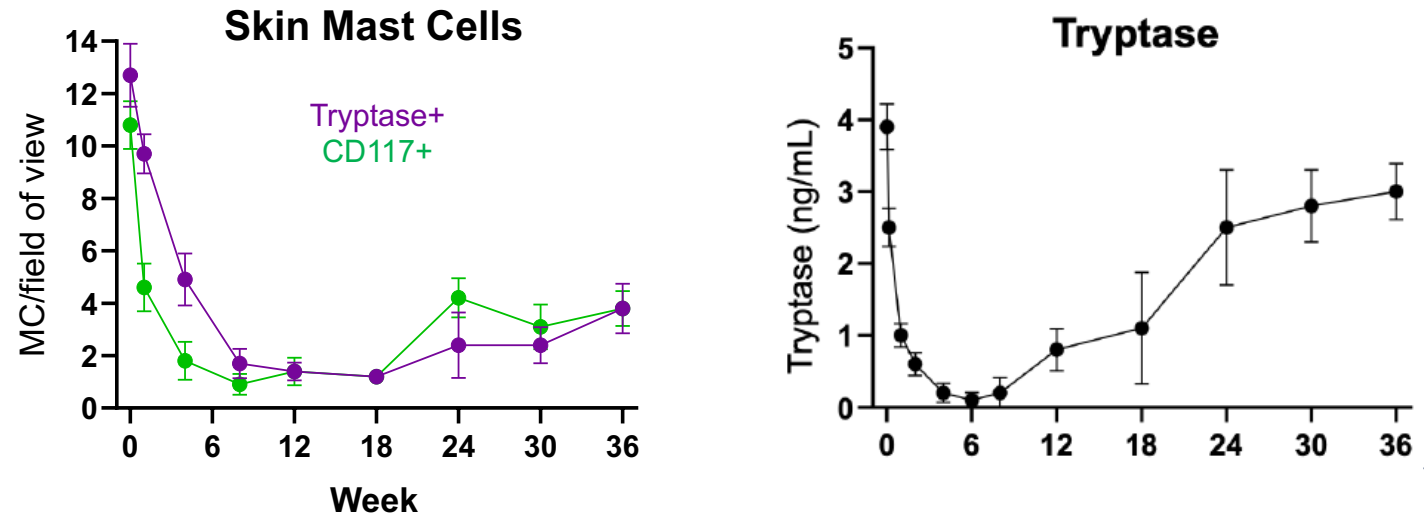


# Briquilimab in Chronic Urticaria

# Phase 1b/2a dose frequencies selected to align with mast cell recovery in the skin, which typically takes 3 months or longer

- Single administration of anti-c-Kit leads to deep depletion of skin mast cells
- Following depletion, mast cell recovery in the skin takes at least three months<sup>1</sup>
- Serum tryptase recovery precedes return of urticarial symptoms and skin mast cells
  - Likely due to earlier recovery of lung and gut mast cells

## Single Dose of Barzolvolimab in CIndU (3 mg/kg IV)



Minimal recovery of skin mast cells by week 36 following single administration of barzolvolimab IV in CIndU patients<sup>1</sup>

# Briquilimab Phase 1b/2a BEACON study in patients with Chronic Spontaneous Urticaria (CSU)



**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 ranging from 4 to 12+ weeks to study the effects of:
  - Mast cell depletion and disease symptom/disease modifications
  - Briquilimab drug clearance
  - Time to return of disease symptoms
  - Briquilimab on other c-Kit expressing cell lineages
- Part 1 intended to identify the minimally effective dose
- Treat the highest unmet need population for clearest efficacy signal

**Status: Patient enrollment ongoing at sites in US and EU**

# Phase 1b/2a BEACON Study in Chronic Spontaneous Urticaria

Randomized, Double-Blind, Placebo-Controlled, Multiple Ascending Dose Study



## Screening/Eligibility

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

## Study Operations

- US Lead: Tom Casale, MD
- EU Lead: Marcus Maurer, MD
- ~30 sites in the US & EU
- N = ~38

## 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 3+3	10 mg 40 mg	Dose W0, 4, 12, 20 Dose W0, 4, 12, 20	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment 24 week - Follow Up
Part 2 Double-Blind Placebo-Controlled (n=28)	n=8 (3:1) n=6 (2:1) n=6 (2:1) n=8 (3:1)	80 mg (Q8W) 120 mg (Q8W) 120 mg (Q12W) 180 mg (Q12W)	Dose W0, 8, 16, 24 Dose W0, 8, 16, 24 Dose W0, 12, 24 Dose W0, 12, 24	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment* 24 week - Follow Up
Part 3 Double-Blind Placebo-Controlled (n=4)	n=4 (3:1)	240 mg	Single Dose	Day 8 - Safety Assessment Week 12 - UAS7 Efficacy Assessment* 36 week - Follow Up



# Briquilimab Phase 1b/2a SPOTLIGHT study in patients with Chronic Inducible Urticaria (CIndU)



**Study Goal:** identify therapeutic doses of subcutaneous briquilimab to inform future registrational trials

## Key Objectives:

- Demonstration of efficacy and safety in a second dermatological indication
- Study design intended to identify minimally effective dose
- Provocation study enables a clear demonstration of potential drug effect
- Assess the effects of single dose briquilimab on mast cell depletion and disease symptoms/disease modification

**Status: Patient enrollment ongoing at sites in EU**

# Briquilimab Phase 1b/2a SPOTLIGHT Study in CIndU

Open-Label, Cold Urticaria & Symptomatic Dermographism, Single Ascending Dose Study



## Screening/Eligibility

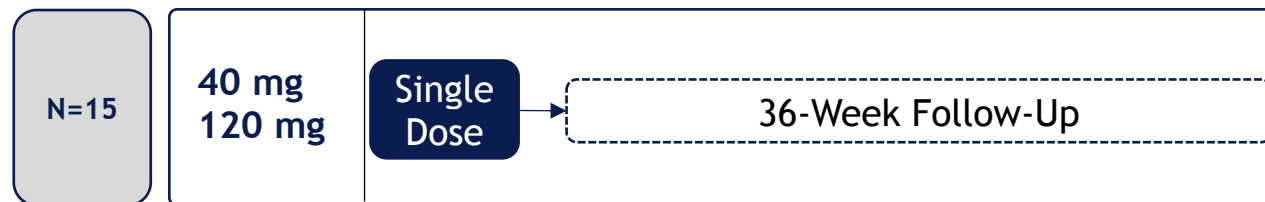
- Diagnosis of Cold Urticaria (ColdU) or Symptomatic Dermographism (SD) for  $\geq 3$  mos.
- H1-antihistamine-failed
- 18+ years

## Study Operations

- **EU Lead:** Marcus Maurer, MD
- ~5 sites in the EU
- N = ~15

## Key Assessments

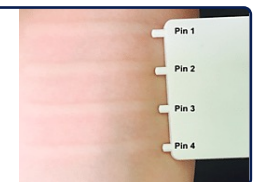
- **Provocation Test:** TempTest (ColdU), FricTest (SD)
- **Disease Scores:** UCT
- **Mast Cell Depletion & Recovery:** Serum Tryptase, Skin Biopsies, Codeine Skin Tests
- **Safety:** TEAEs, SAEs



Provocation test measured at 12 weeks (Primary Endpoint)

## Provocation Tests Used for Clinical Evaluation

Symptomatic Dermographism  
*FricTest*



Cold Urticaria  
*TempTest*





# Market Opportunity in Mast Cell Diseases

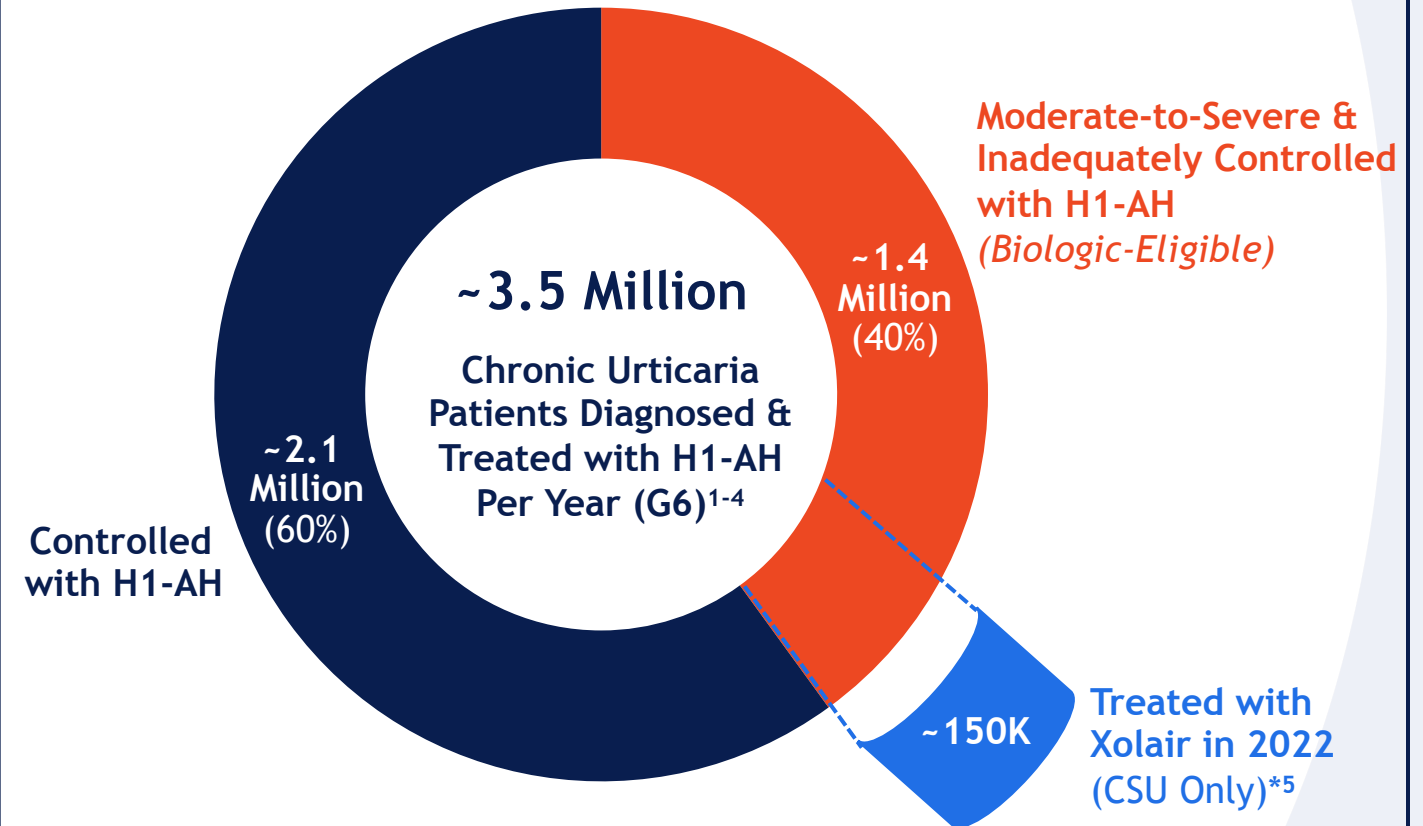
# Chronic urticaria is one of the most prevalent dermatologic conditions with ~1.4 million biologic eligible patients in the G6

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<sup>6</sup>

## Chronic Urticaria Market Opportunity



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

# c-Kit blockade has achieved deeper and more consistent responses in chronic urticaria than other approaches

Target <sup>1</sup>	Mechanisms	Dosing Frequency	CSU Efficacy <sup>2</sup>	CIndU Efficacy <sup>2</sup>
c-Kit	Mast cell depletion	4 to 12+ weeks (SQ)	++	++
IgE*	Signal inhibition	4 weeks (SQ)	+	×
IL-4/IL-13	Cytokine inhibition	2 weeks (SQ)	+	×
BTK	Signal inhibition	Twice daily (Oral)	+	?
MRGPRX2	Signal inhibition	Daily (Oral)	?	?
JAK	Signal inhibition	Unknown (Oral)	?	?
Siglec-6	Signal inhibition	Unknown (SQ)	?	?

\*Xolair (omalizumab) FDA Approved for use in chronic spontaneous urticaria



# Briquilimab is a Differentiated c-Kit Inhibiting mAb

## c-Kit Abs in Development

### **c-Kit (CD117) monoclonal antibody**

- c-Kit antibodies in development are humanized, aglycosylated IgG1 inhibitors of c-Kit signaling

### **On-target depletion of mast cells**

- Early clinical data suggests dose-dependent inhibition of c-Kit on mast cells in the skin

### **Predictable SQ PK/PD profile**

- Established in multiple early stage trials

## Key Differentiators for Briquilimab

### **Briquilimab directly blocks SCF binding**

- Direct and potent blockage of natural ligand binding to the c-Kit receptor, limiting signal leakage

### **Shorter half-life / safety**

- Sufficient to deplete mast cells while minimizing unwanted effects on other c-Kit expressing cells

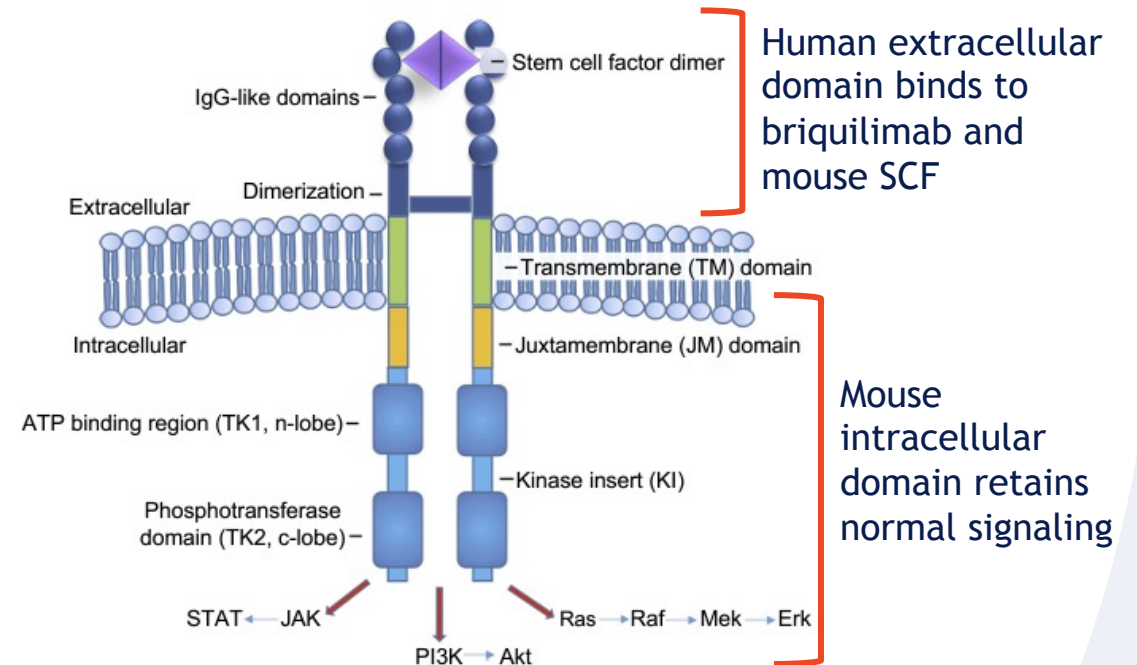
### **Optimized dosing**

- Less frequent dosing potentially leading to fewer side effects and greater compliance

# Jasper's c-Kit Mouse™ enables direct in-vivo disease model testing to support briquilimab's significant mast cell franchise opportunity

- c-Kit antibodies designed against human receptor do not bind to wild type mouse c-Kit, thereby limiting disease model testing
- Jasper's proprietary transgenic mouse allows for direct in-vivo testing of briquilimab
  - Transgenic mouse with human c-Kit ectodomain and mouse c-Kit intracellular domain allows for briquilimab binding leading to mast cell apoptosis
- Multiple diseases models that can now be directly tested to develop broad franchise strategy
  - Allergy
  - Anaphylaxis
  - Asthma
  - Atopic Dermatitis
  - COPD
  - Conjunctivitis
  - Eosinophilic Esophagitis (EoE)
  - Inflammatory Bowel Disease
  - Prurigo Nodularis
  - Rhinitis

## Jasper c-Kit Mouse™

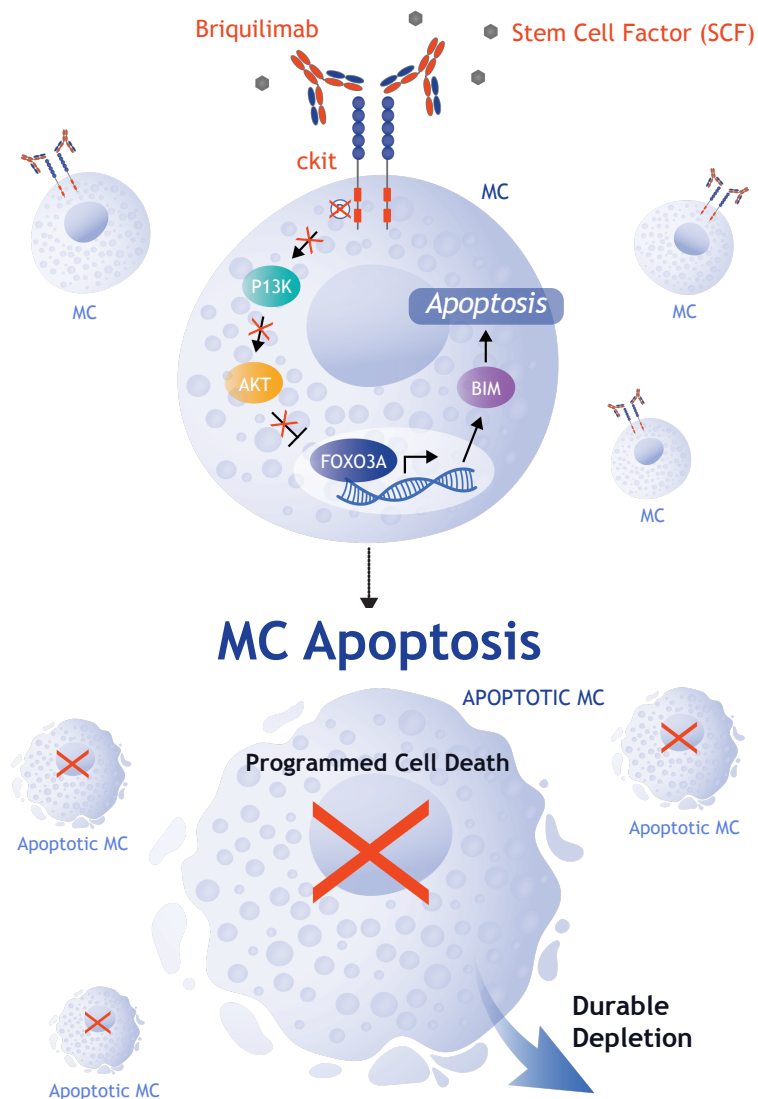




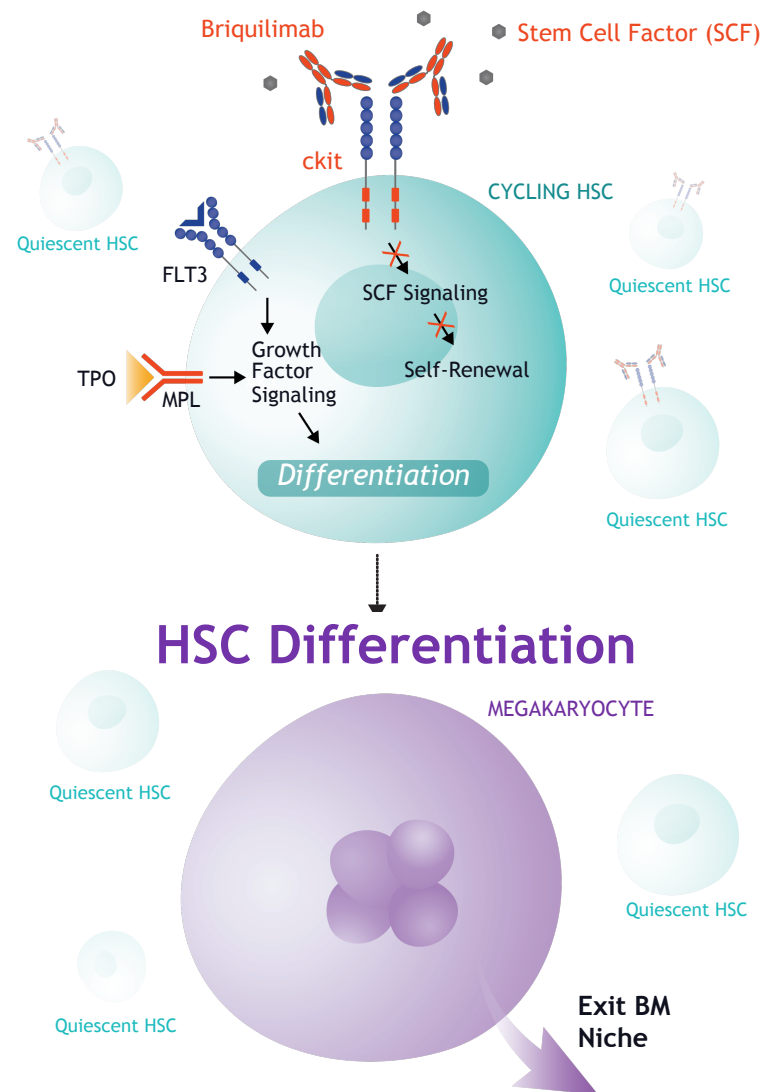
# Briquilimab in Low-to-Intermediate Risk MDS & Bone Marrow Transplant

# SCF blockade drives differential impact on mast cells and stem cells

## MAST CELLS (MC)

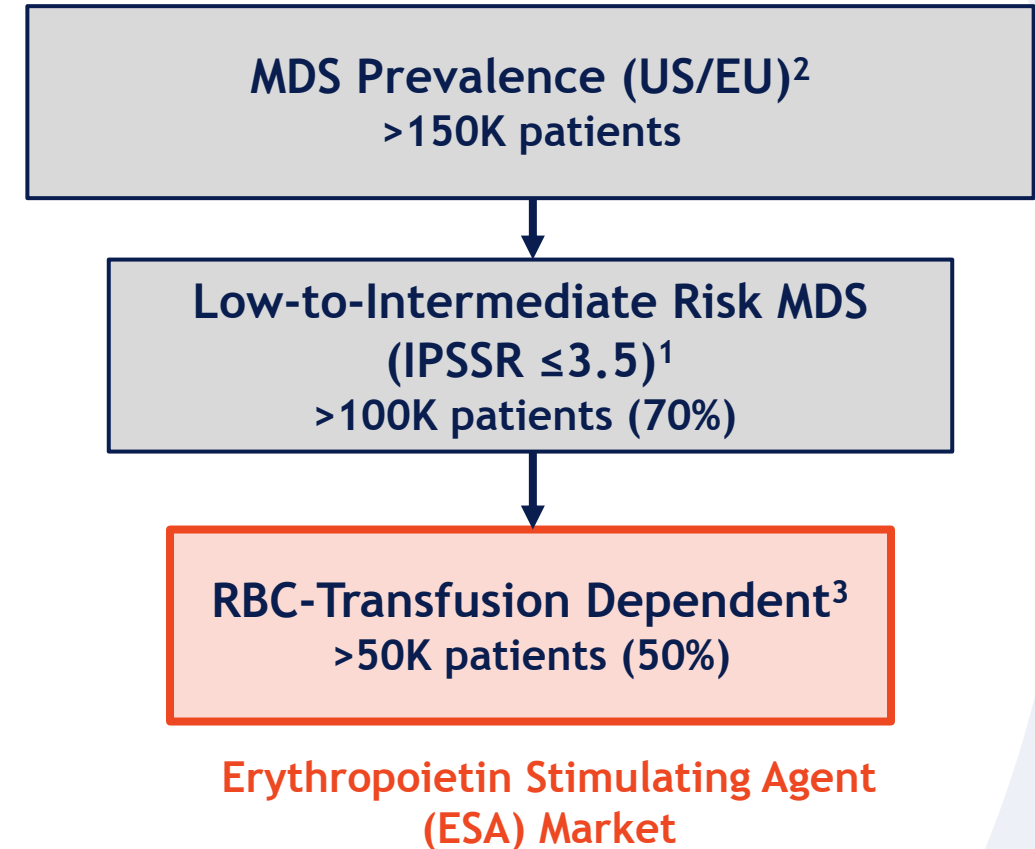


## STEM CELLS (HSC)



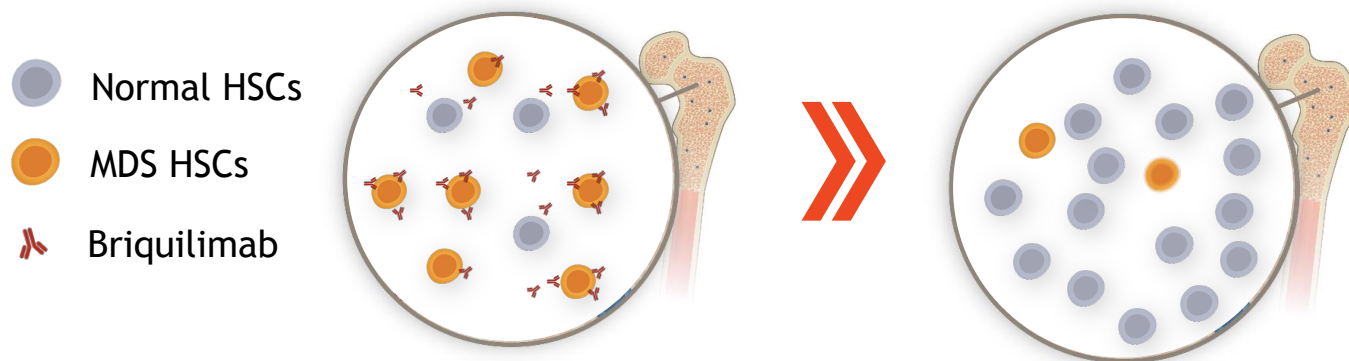
# Briquilimab's ability to directly deplete cancerous stem cells may be leveraged as a disease-modifying therapeutic in low-to-intermediate risk MDS patients

- 70% of myelodysplastic syndrome (MDS) patients have low to intermediate risk (LR-MDS) disease and are typically treated with ESA, other growth factors and/or transfusions<sup>1</sup>
- Current treatments only treat symptoms and do not delay disease progression to AML or High Risk MDS
- By directly targeting c-Kit-reliant MDS stem cells, briquilimab may be the first disease modifying therapeutic for LR-MDS patients
- Jasper's ongoing study is designed to examine the impact of briquilimab to shift towards healthier bone marrow and restoration of normal hemopoiesis





# Briquilimab Phase 1 trial in patients with LR-MDS



Restoration of healthy bone marrow following  
briquilimab treatment

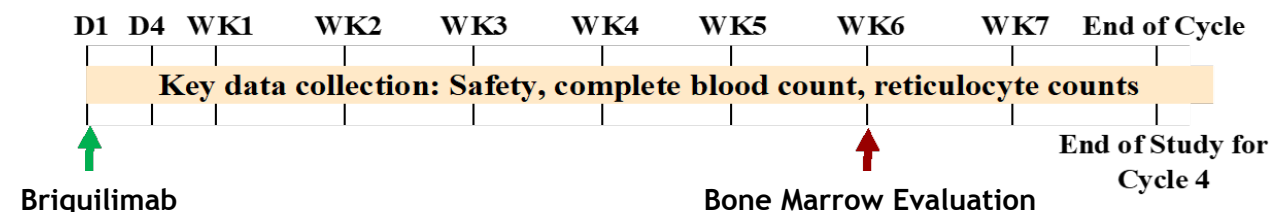
## Screening/Eligibility

- IPSS-R very low, low or intermediate risk MDS patients
- RBC transfusion dependence, thrombocytopenia or neutropenia

## Single Arm, MAD, Open Label Design (Enrolling)

- **Dosing:** Up to 4 cohorts - 0.3, 0.6, 0.9 and 1.2 mg/kg; Every 8 weeks
- **Size:** 3-6 per cohort

### CYCLES 1 to 4

















## Screening/Eligibility

- Primary: Safety, tolerability
- Secondary: PK, Efficacy by HI-E/HI-P/HI-N, duration of response, reduction in RBC transfusions, ORR, progression free survival
- Exploratory: Depletion of leukemic MDS and normal stem & progenitor cells, molecular characteristics of LSCs/HSCs/HPCs, cytokine profile, immunogenicity

# Briquilimab is also being tested as a novel conditioning agent for bone marrow transplant

- Briquilimab c-Kit inhibition temporarily creates space in specialized bone marrow niches
  - May drive non-quiescent HSCs to differentiate
  - Combination with radiation required for full depletion
- Briquilimab based bone marrow transplant conditioning regimens has been tested in SCID, Sickle Cell Disease, Fanconi Anemia, CGD, AML and MDS
  - Large unmet need for reduced toxicity bone marrow conditioning regimens
  - No briquilimab-related SAEs. Patients range in age from 3 months to 79 years
  - NIH sponsorship of studies in Sickle Cell, Beta Thalassemia, CGD, GATA-2 MDS; Stanford sponsorship in Fanconi
- Potential approval in SCID provides strategic opportunity for early product launch and Priority Review Voucher

# Expanded portfolio presents exciting new opportunities in mast cell diseases

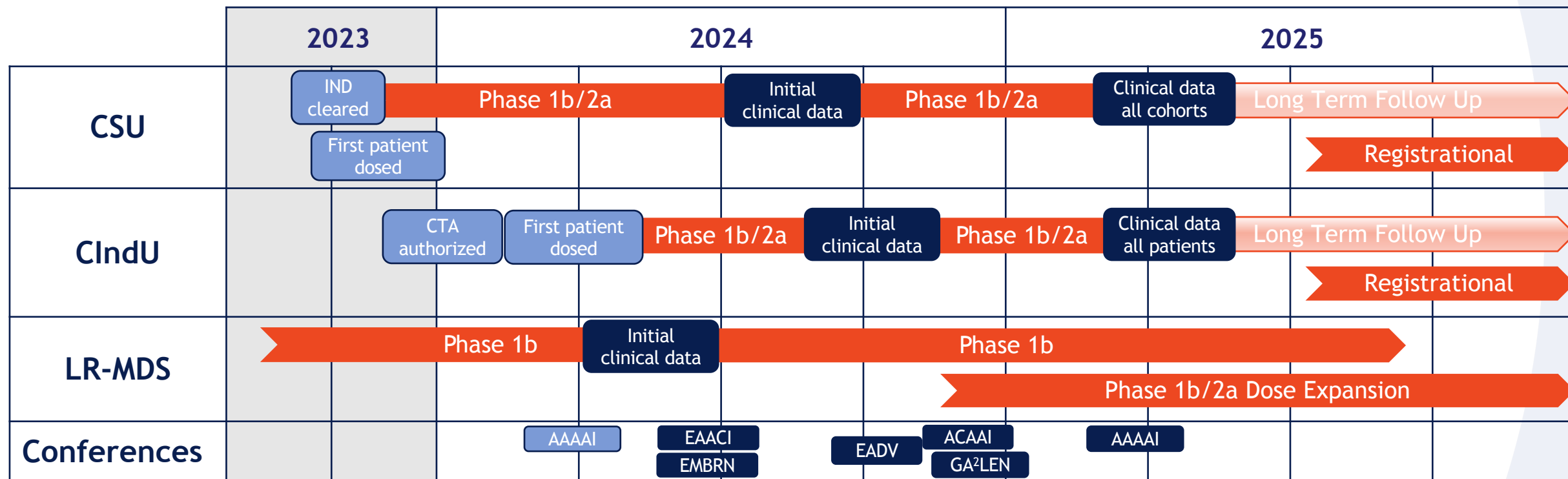
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# Key milestones & financials

■ = Completed  
■ = Future events/milestones



## Financial Overview

\$86.9M cash & investments at 12/31/23\*

Cash runway through 3Q25\*\*

# Jasper: Advancing briquilimab in multiple large indications

*Several significant data readouts expected in 2024*

## c-Kit inhibition - a clinically validated mechanism driving depletion of mast cells

- Has potential to address diseases impacting millions of patients

## Briquilimab - a potent and differentiated c-Kit inhibitor

- Drives mast cell depletion while potentially minimizing unwanted adverse effects
- Evaluating less-frequent dosing aligned with duration of mast cell depletion in skin

## Briquilimab - franchise potential in mast cell diseases

- CSU: Phase 1b/2a BEACON study enrolling (initial data expected 3Q 2024)
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March 2024



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NASDAQ: JSPR