



Jasper Therapeutics

Corporate Presentation

April 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)

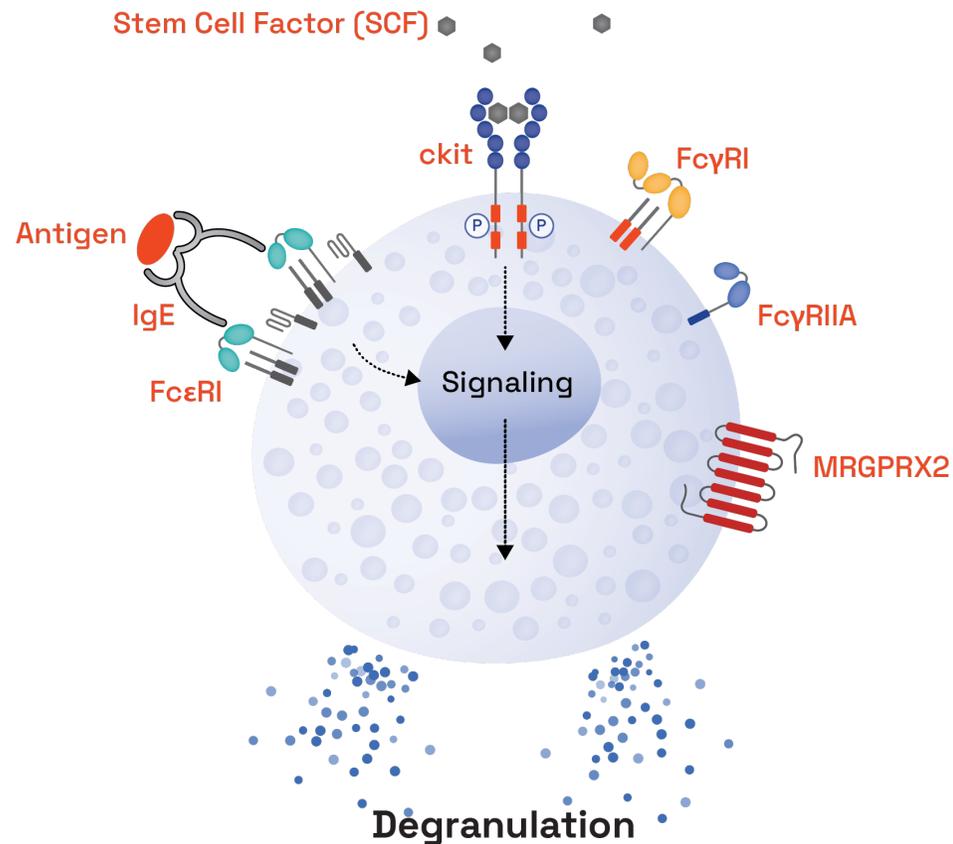
Expanded portfolio presents exciting new opportunities in mast cell diseases

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

 Investigator Sponsored Studies

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

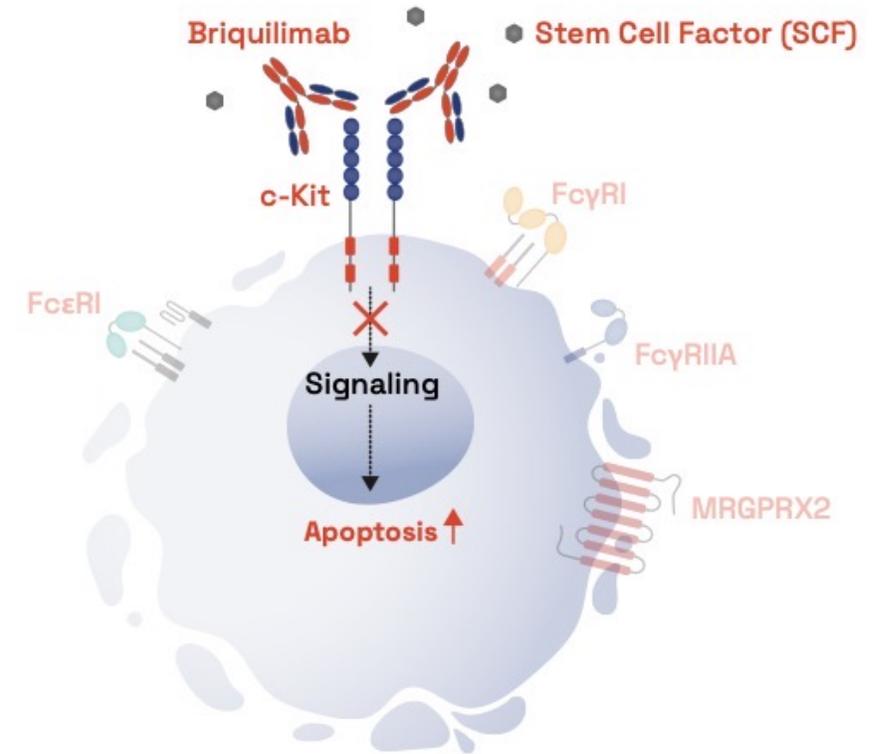
Mast cells are key drivers of the inflammatory response in a number of allergic and dermatologic diseases



- 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 pathway¹
- Blockade of c-Kit signaling on mast cells leads to organized cell death and phagocytic clearance²
 - Partial c-Kit inhibition blunts mast cell activation
- Aglycosylated c-Kit antibodies avoid indiscriminate ADCC driven killing of other c-Kit expressing cells³
- Unwanted effects on other c-Kit expressing cells can be minimized by the recovery of c-Kit signaling once the mast cells are depleted

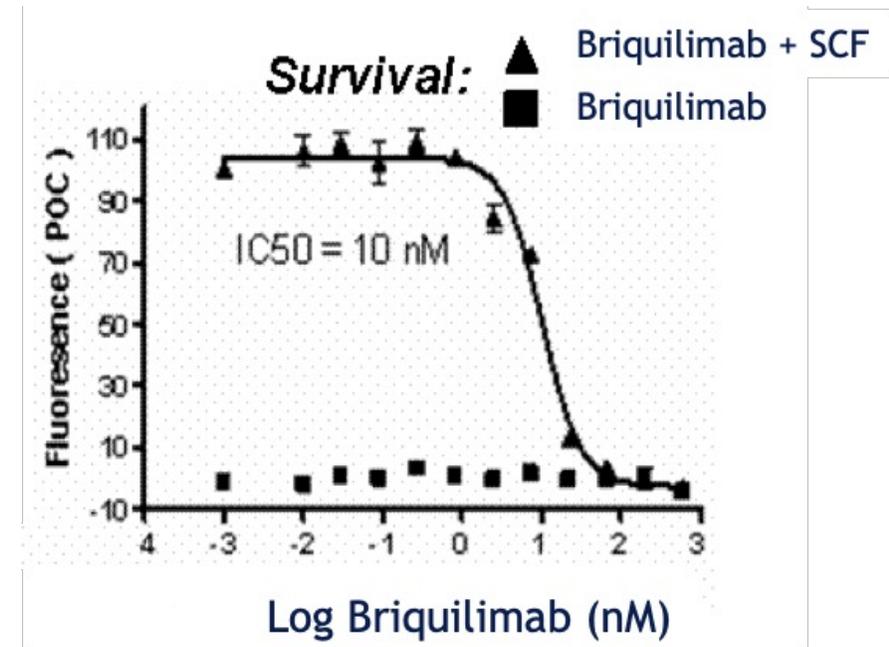


**Briquelimab-Mediated
Mast Cell Apoptosis**

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

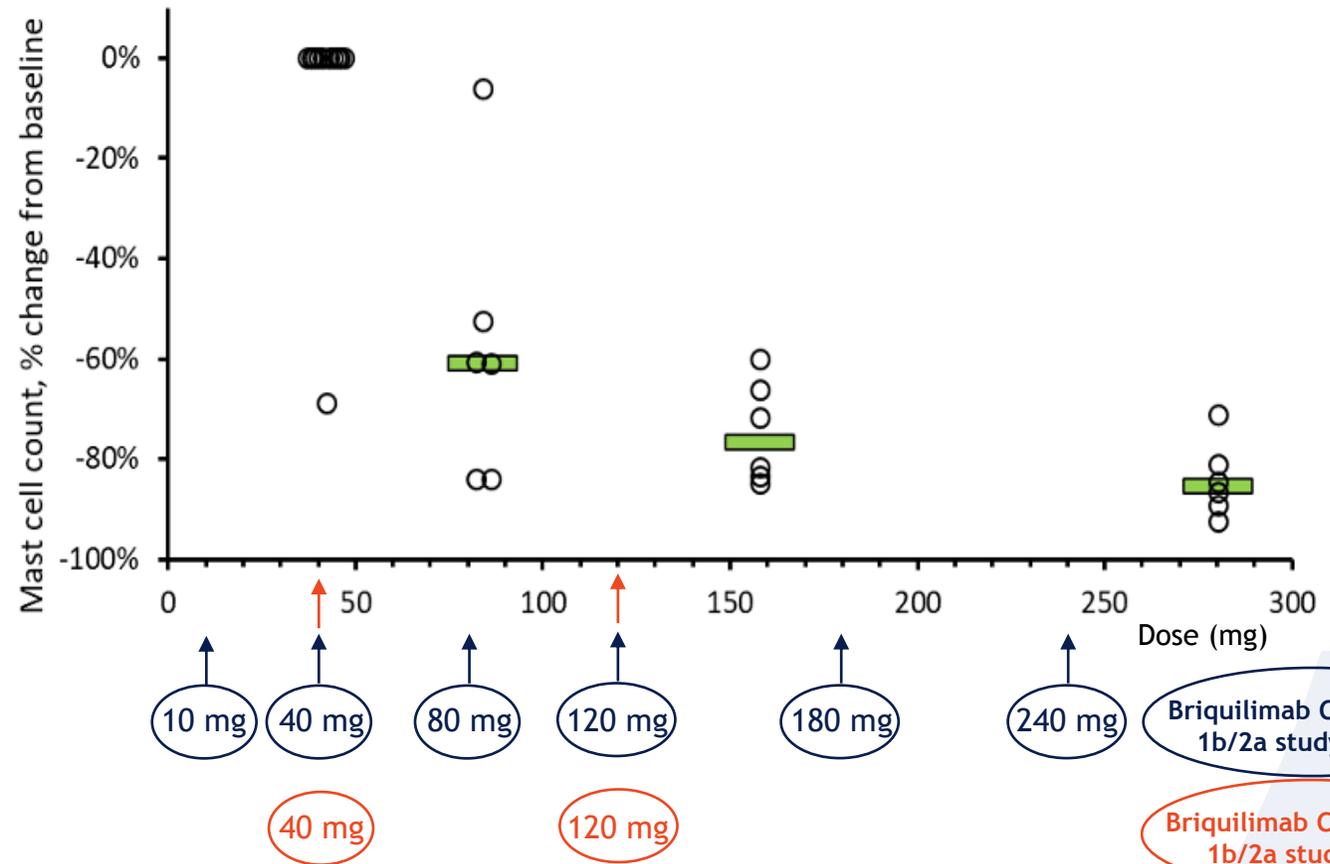
Mast cell survival assay¹



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

- A single subcutaneous dose at / above ~80mg potently 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 control²

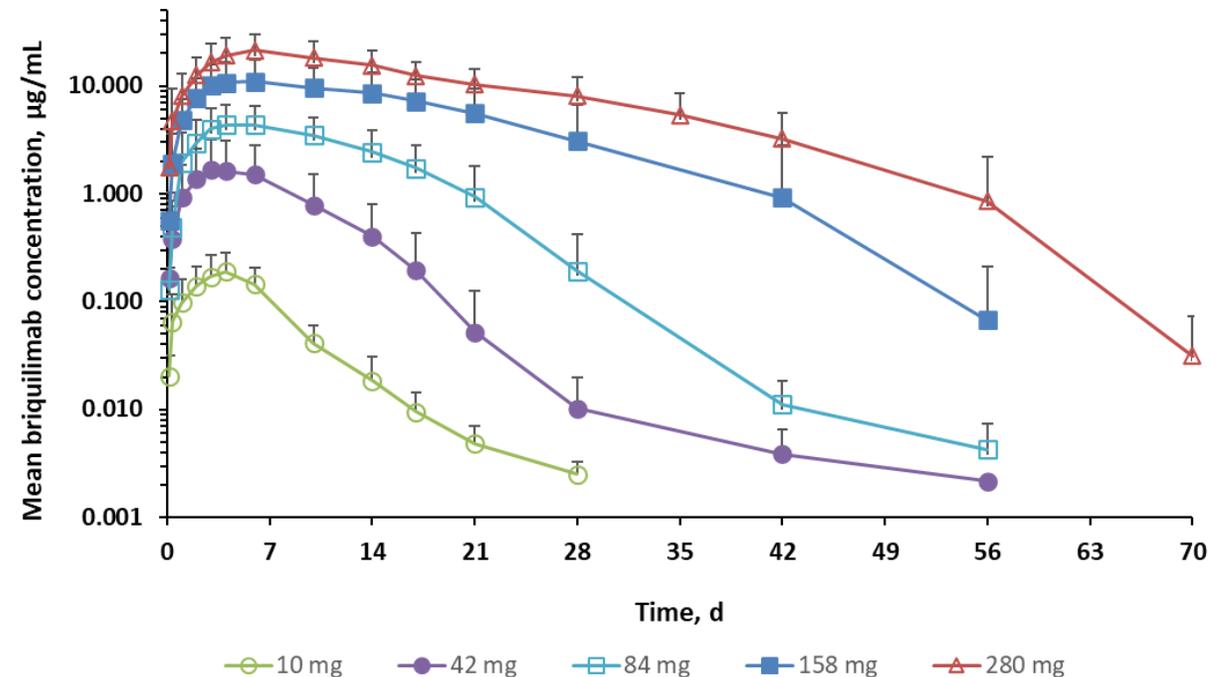
Skin mast cell depletion 4 weeks after single dose (≥ 42 mg)¹
Briquilimab Healthy Volunteer Phase 1 Subcutaneous Study



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 (≥ 10 mg)¹
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

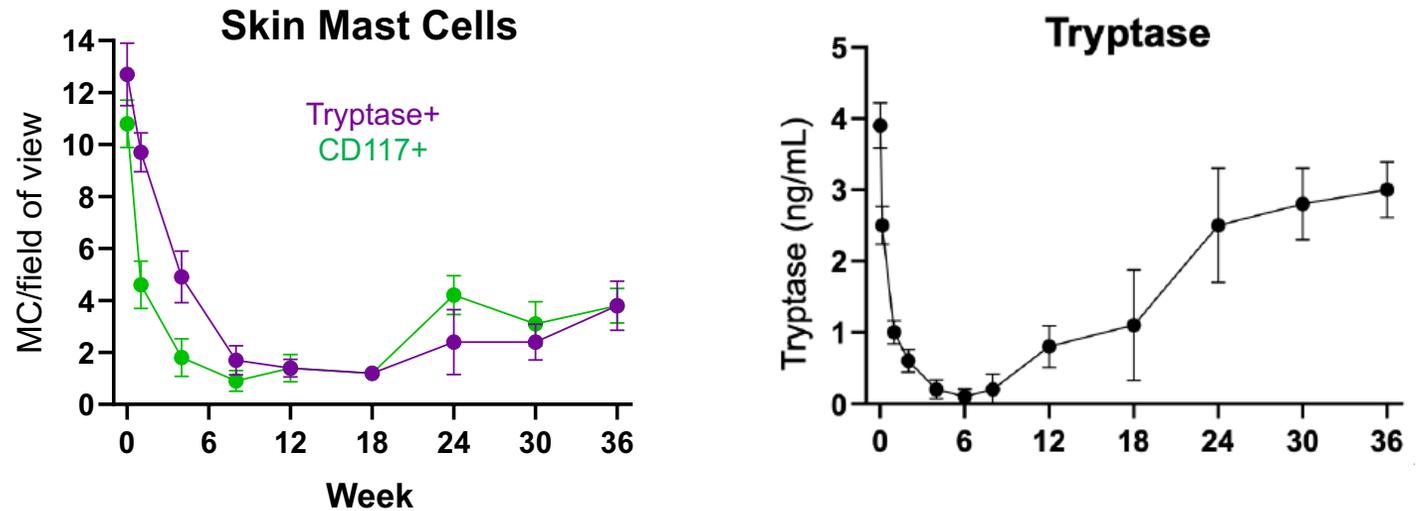


Briquilimab in Chronic Urticaria

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 months¹
- 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 patients¹

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

* Interim analyses built into the design for a 12-week efficacy endpoint readout

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

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

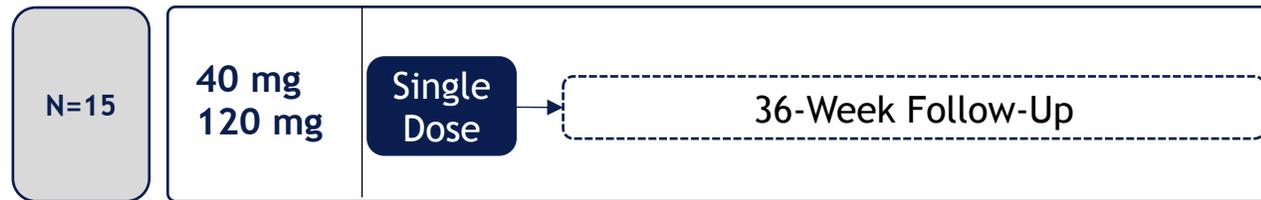
- Diagnosis of Cold Urticaria (ColdU) or Symptomatic Dermographism (SD) for ≥ 3 mos.
- H1-antihistamine-failed
- 18+ years

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

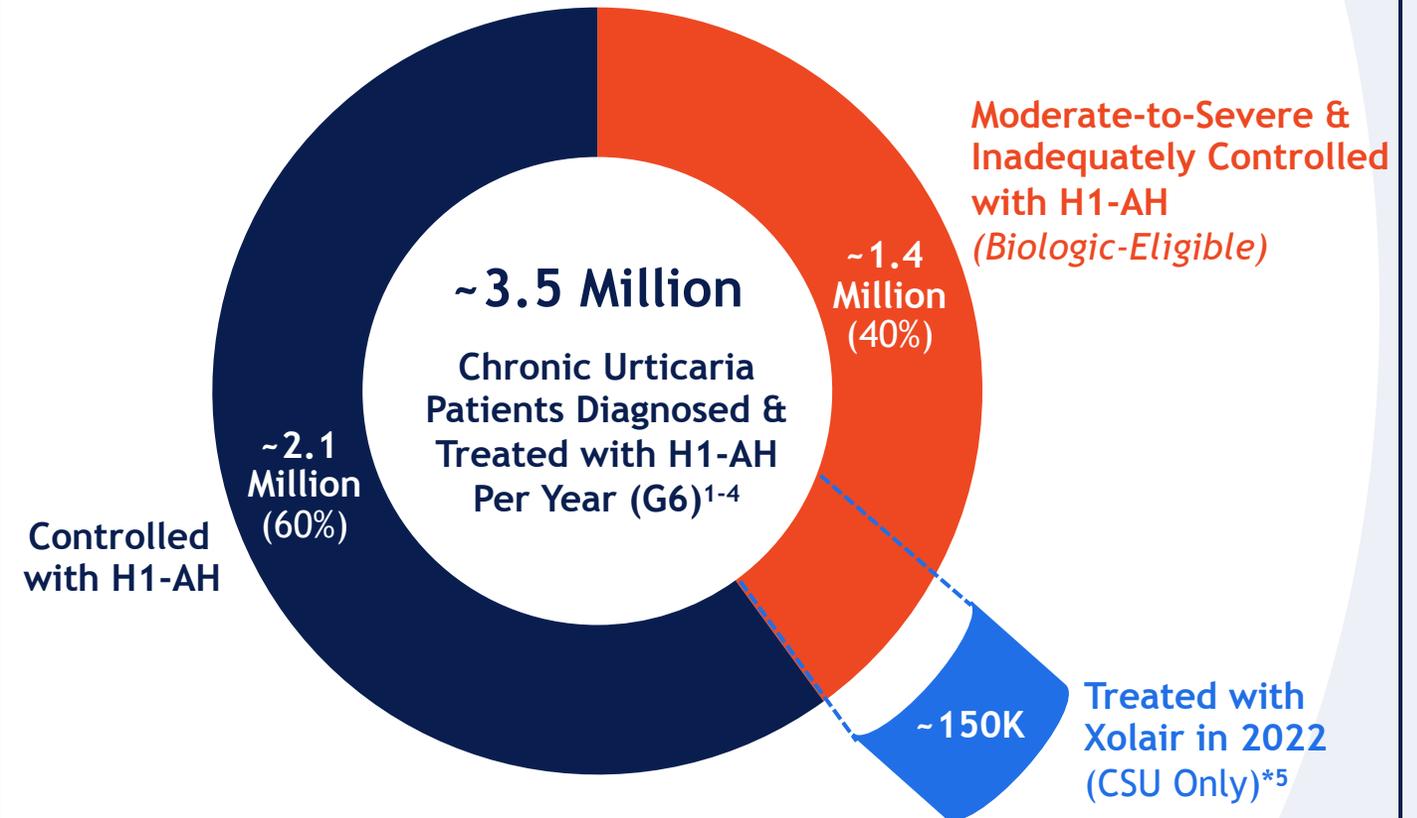
Chronic urticaria is one of the most prevalent dermatologic conditions with ~1.4 million biologic eligible patients in the G6

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+ years⁶

Chronic Urticaria Market Opportunity



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

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

Target ¹	Mechanisms	Dosing Frequency	CSU Efficacy ²	CIndU Efficacy ²
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

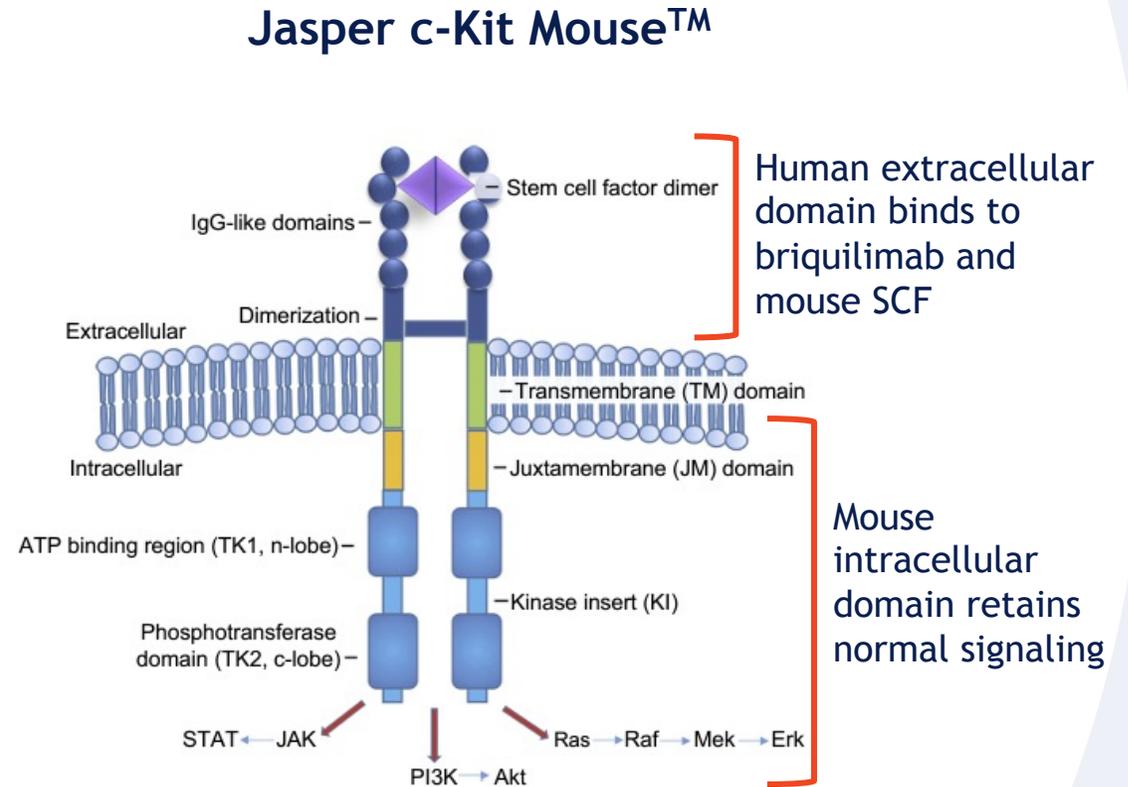
- Sufficient to deplete mast cells while minimizing unwanted effects on other c-Kit expressing cells

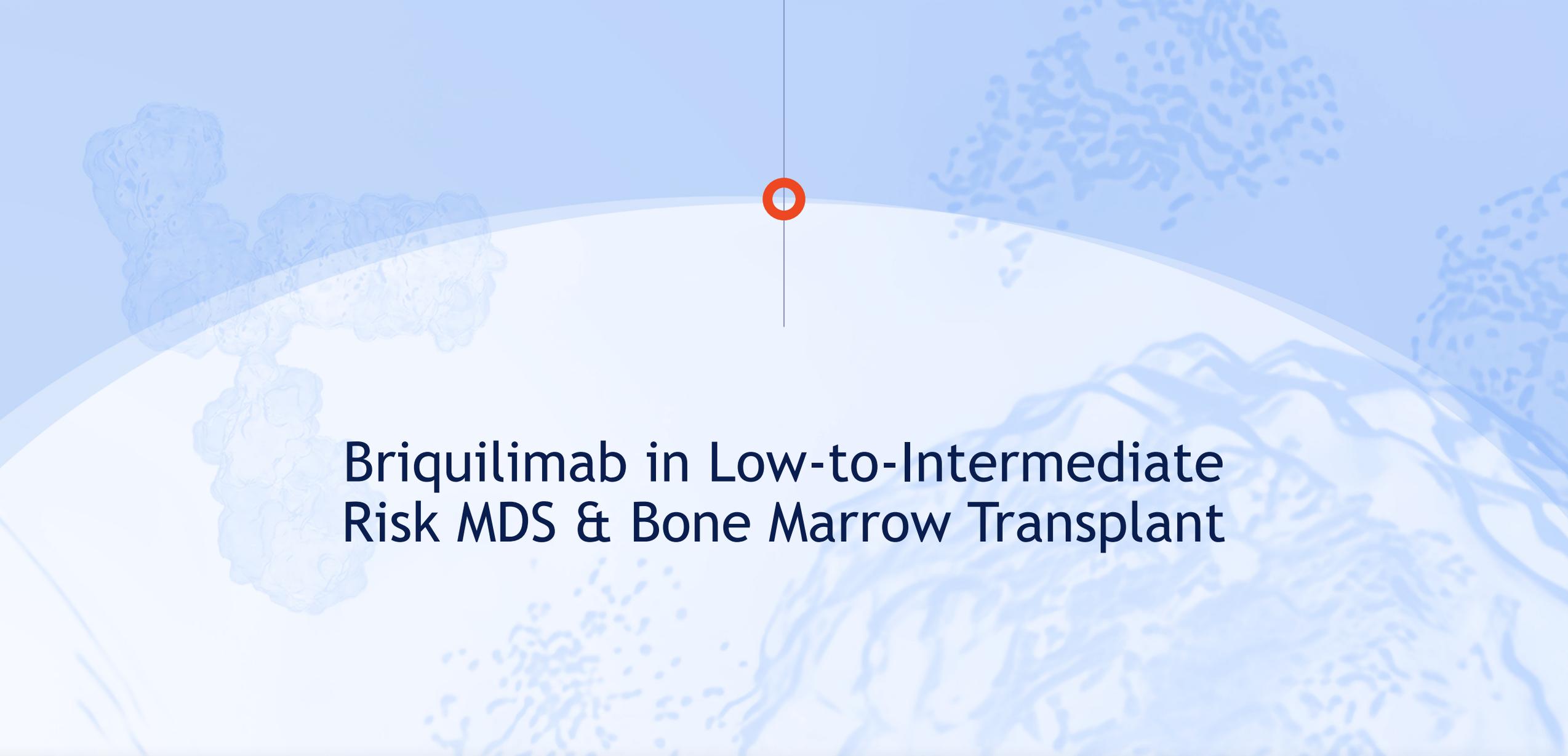
Optimized dosing

- 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

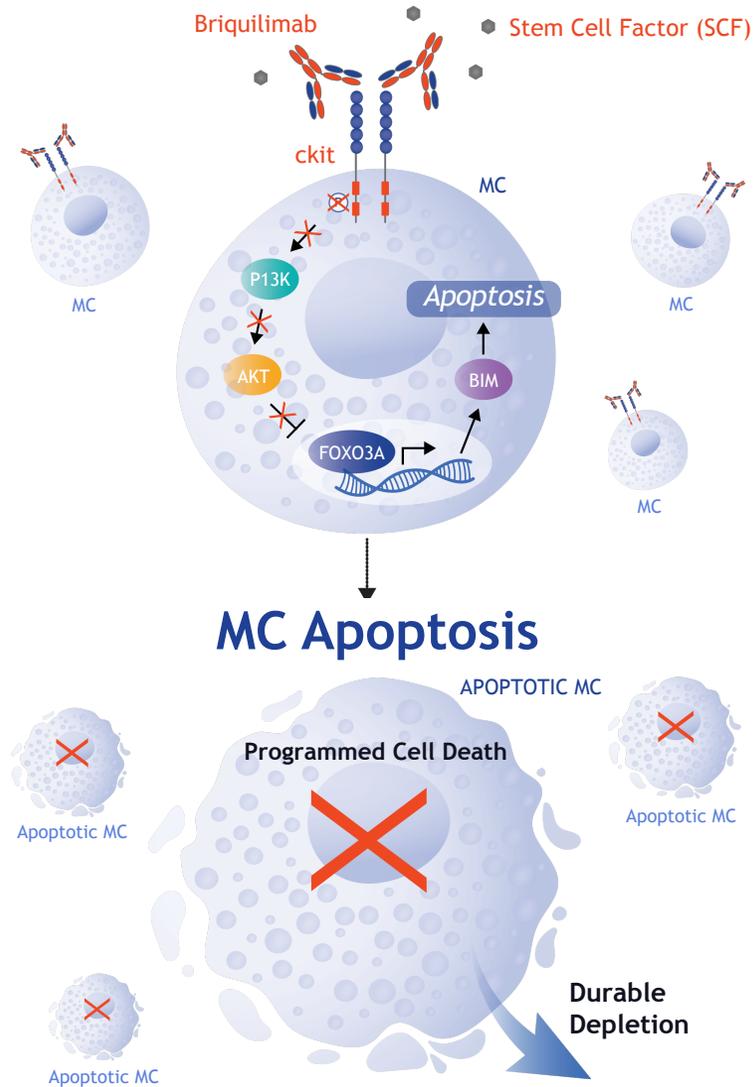




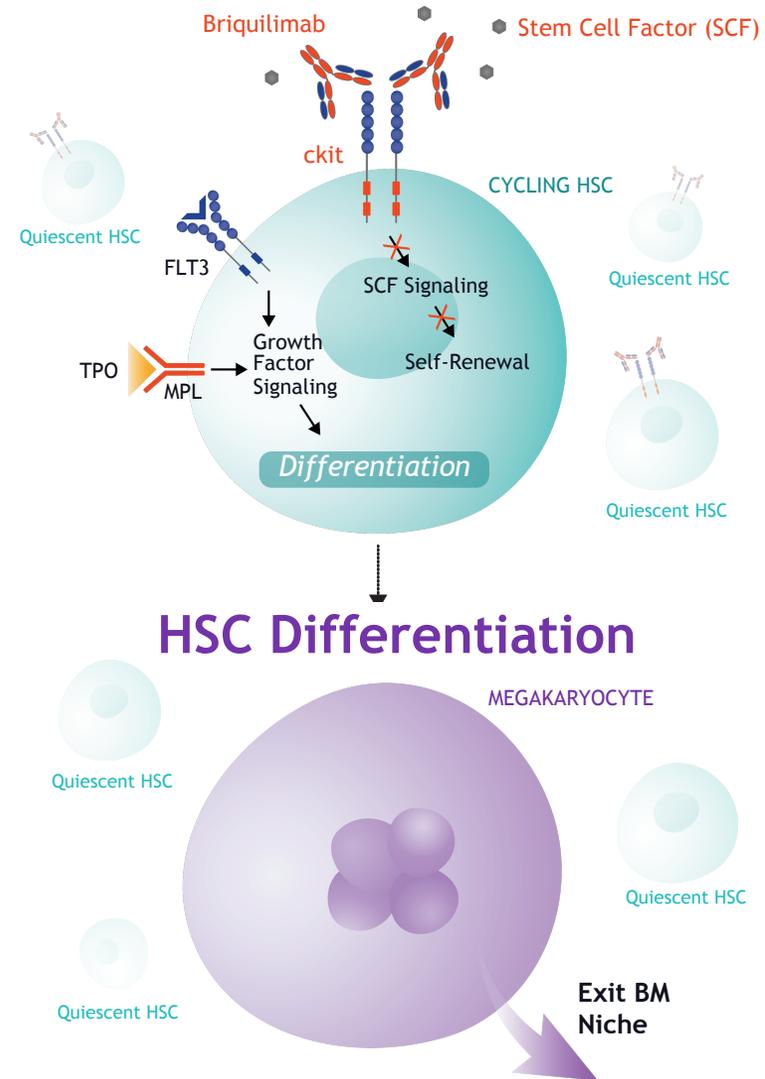
Briquilimab in Low-to-Intermediate Risk MDS & Bone Marrow Transplant

SCF blockade drives differential impact on mast cells and stem cells

MAST CELLS (MC)

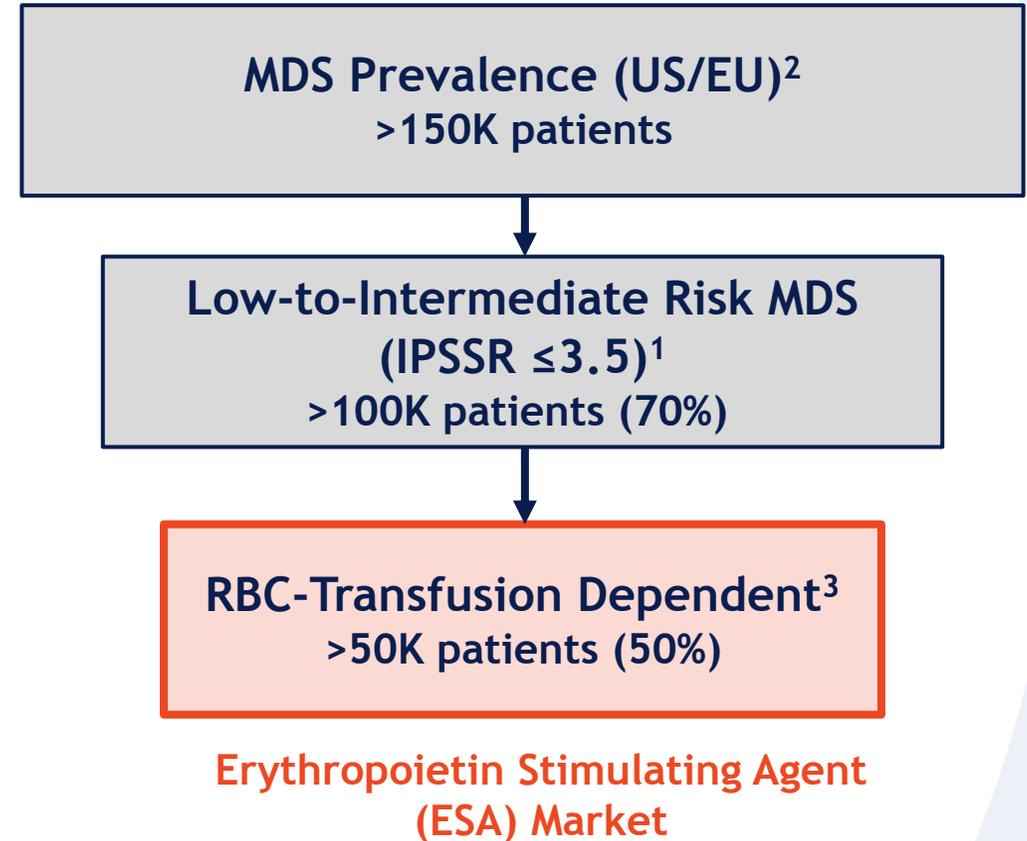


STEM CELLS (HSC)

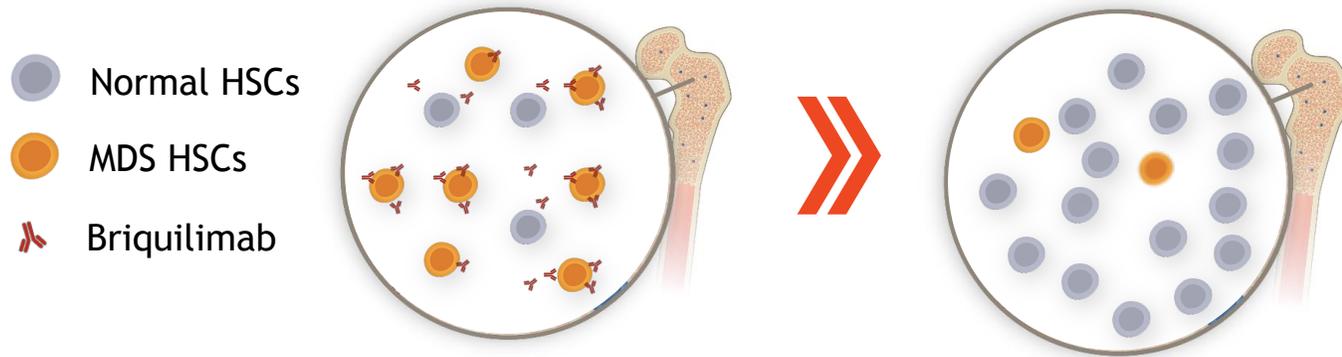


Briquilimab's ability to directly deplete cancerous stem cells may be leveraged as a disease-modifying therapeutic in low-to-intermediate risk MDS patients

- 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 transfusions¹
- 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

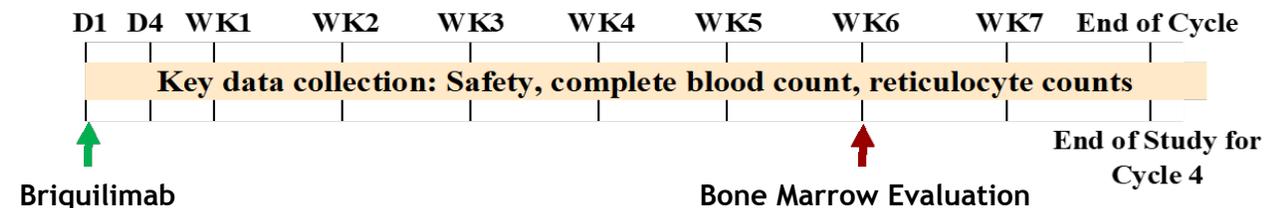
Screening/Eligibility

- 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

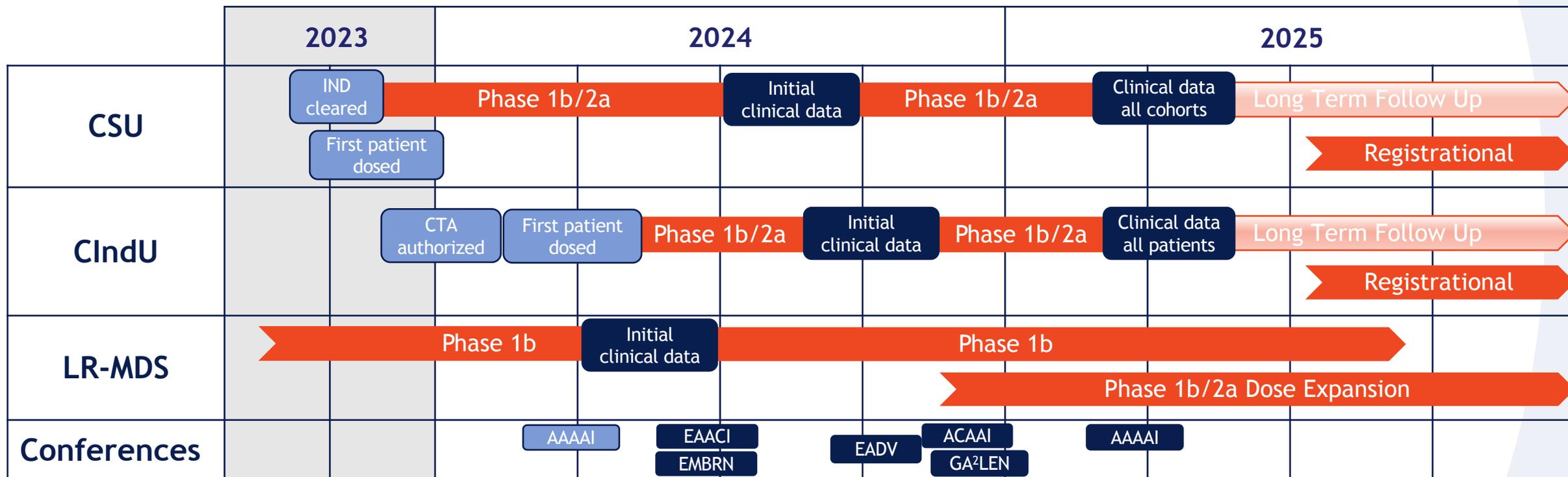
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Key milestones & financials

■ = 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

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March 2024

Jasper Therapeutics

NASDAQ: JSPR