

April 2024

The logo for Progress 4 Patients, featuring a stylized '4' in white with a red dot on the top right of the '4'.

PROGRESS 4 PATIENTS

Developing the first oral treatments for chronic
neutropenic disorders

Forward-Looking Statements

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X4 Overview: A Compelling Investment Opportunity

Sharp focus on rare immunodeficiencies

Advancing innovative medicines to address significant unmet needs in people with rare immunodeficiencies and few to no treatment options

A pipeline in a product: mavorixafor

An orally available CXCR4 antagonist being developed as a once-daily therapy for a range of chronic neutropenia (CN) indications and WHIM¹ syndrome



Significant regulatory & clinical milestones expected in 2024:

- ✓ U.S. NDA accepted for priority review of mavorixafor in WHIM syndrome
- PDUFA date of April 30, 2024: PRV² eligible if approved for WHIM
- Pivotal, global Phase 3 CN trial to begin in 1H 2024
- Phase 2 CN data (n>15) in 1H 2024
- Global regulatory milestones
- Exploring further indications for mavorixafor

Unparalleled expertise in CXCR4³ biology

Antagonizing the CXCR4/CXCL12 axis has been proven to increase the mobilization of white blood cells, including neutrophils and lymphocytes (B cells and T cells)

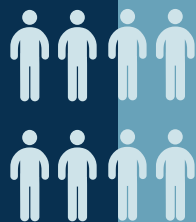
Cash runway⁴ expected to fund operations into 2025

Strong balance sheet with possible upside from non-diluting financing opportunities, including potential monetization of Priority Review Voucher

Chronic Neutropenia: No Innovation in More Than 30 Years

~50,000¹

U.S. Prevalence: total diagnosed with Chronic Neutropenia (CN)



~15,000¹

Estimated subset with highest unmet need: minimal addressable market for mavorixafor in CN

Only One

Therapy Approved for Severe Chronic Neutropenia



Injectable Granulocyte Colony-Stimulating Factor (G-CSF)

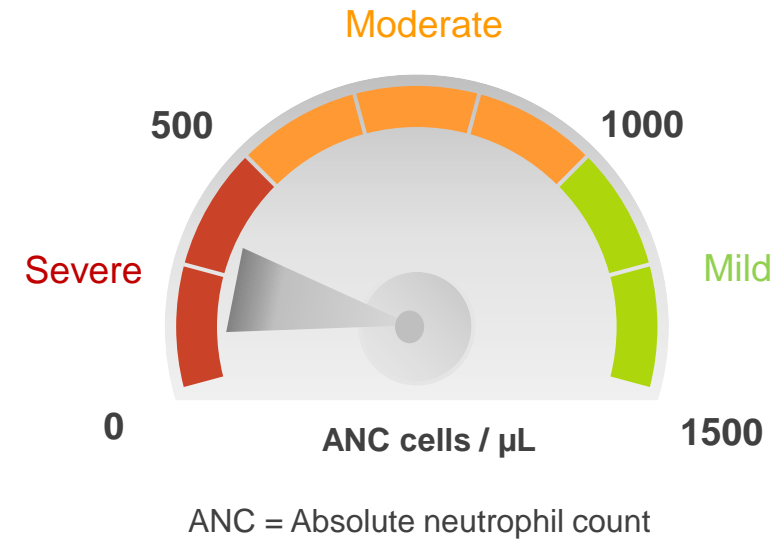
- Inconvenient daily injections
- Frequent treatment-related/treatment-limiting bone pain and other adverse events

**Clear Need for Increased Options for Patients:
Efficacious, Oral, Well Tolerated Treatments**

Living With Chronic Neutropenia (CN): Risk of Serious, Life-Threatening Infections¹

NIH Classification ²	ANC Levels (cells/ μ L)	Infection Risk with Immunodeficiency ¹
Severe (Grade 4)	<500	Moderate to severe
Moderate (Grade 3)	500-1,000	Moderate to severe
Mild (Grade 2)	1,000-1,500	Minimal to severe
Non-clinical (Grade 1)	1,500 - LLN	No clinical impact

Infection Risk and Low ANC (“Neutropenia”)



- Frequent and/or severe infections are the primary clinical consequence of chronic neutropenic disorders³
- Infection frequency, severity, and duration are correlated with magnitude and duration of decreased ANC levels⁴
- Infections may lead to frequent hospitalizations or result in life-threatening complications, including death^{5,6}

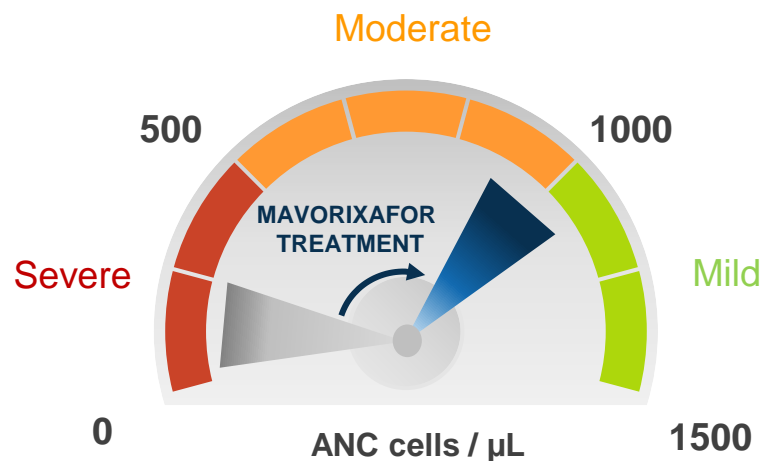
New Treatment Needed: A Well Tolerated Oral Option that Reduces Infection Risk

Mavorixafor: Potential to Deliver First Innovation in 30+ Years

Successful WHIM Phase 3 with NDA Accepted
PDUFA Date: April 30, 2024

Positive Phase 1 & 2 CN Data to Date Support
Advancement to Phase 3

Significant Increase in ANC Over 52 Weeks
~60% Reduction in Infection Rates



ANC = Absolute neutrophil count

CN Phase 1b Results

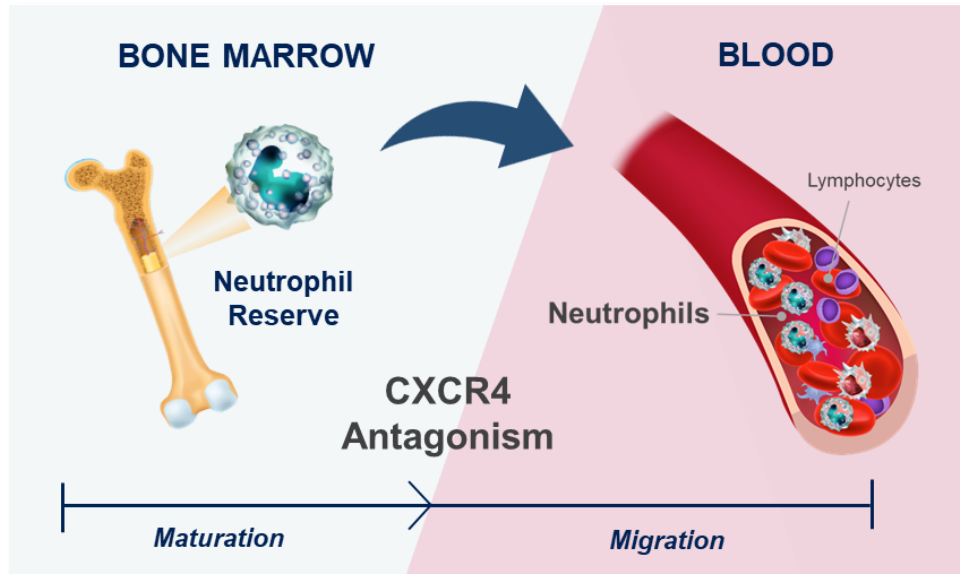
- ANC increased by >500 cells/ μ L in 100% (n=25) after single-dose

Preliminary CN Phase 2 Results

- Durable increases in ANC¹ in all subjects reported to date (n=3)
 - Clinically meaningful (Δ ANC >500 cells/ μ L)
- Infection rates
 - No infections in all patients after month 2
 - No increase in infections despite reduction/withdrawal of G-CSF (n=2)

Mavorixafor: a Pipeline in a Product via CXCR4 Antagonism

Validated mechanism shown to alleviate neutropenia and lymphopenia



Modified figure from reference 1

Targeted Mechanism

- Neutrophils retained in the bone marrow by the CXCR4/CXCL12 axis, creating a “reserve”²
- **CXCR4 antagonism** results in migration of cells from the bone marrow, increasing circulating levels of neutrophils and lymphocytes^{3,4}

Potential Breakthrough With Oral, Once-Daily Treatment

- A once-daily, oral CXCR4 antagonist shown to raise blood levels of neutrophils and lymphocytes⁵
- Broad clinical potential across multiple rare immunodeficiencies
- For WHIM syndrome: mavorixafor granted Breakthrough Therapy Designation, Fast Track Designation, and Rare Pediatric Disease Designation in U.S. (PRV eligible); Orphan Drug Status in U.S. and Europe
- U.S. patent protection through 2038



Advancing Mavorixafor in Chronic Neutropenic Disorders and WHIM Syndrome

Only oral candidate in clinical development across these indications

Candidate		Indication	Preclinical	Phase 1	Phase 2	Phase 3	FDA Approval	EXPECTED MILESTONES
CHRONIC NEUTROPENIC DISORDERS	Mavorixafor	WHIM Syndrome (Warts, Hypogammaglobulinemia, Infections and Myelokathexis)	U.S. NDA accepted					PDUFA DATE: APRIL 30, 2024
		Chronic Neutropenia (Idiopathic, Congenital)	Phase 2					Phase 2 data (n>15) in 1H24
	X4P-003	TBD						Pivotal Phase 3 FPD ¹ in 1H 2024

WHIM Syndrome: Poorly Functioning Immune System with Chronic Neutropenia

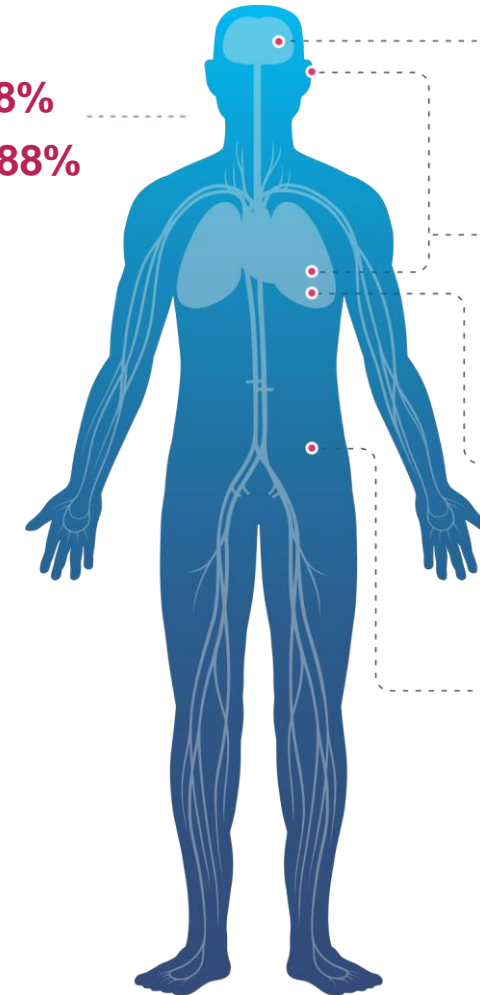
Clinical symptoms driven by over-signaling in the CXCL12/CXCR4 pathway

Fewer than 1 in 4 WHIM patients present with all 4 manifestations making diagnosis a challenge

- W** Warts (**40% prevalence¹**)
 - can lead to HPV-related cancers
- H** Hypogammaglobulinemia (**65%**)
 - low antibody levels
- I** Infections (**92%**)
 - frequent bacterial and viral infections
- M** Myelokathexis (**100%**)
 - retention of WBCs in bone marrow

A rare disease with no approved treatment options affecting at least 1,000 people² in the U.S.

Neutropenia 98%
Lymphopenia 88%



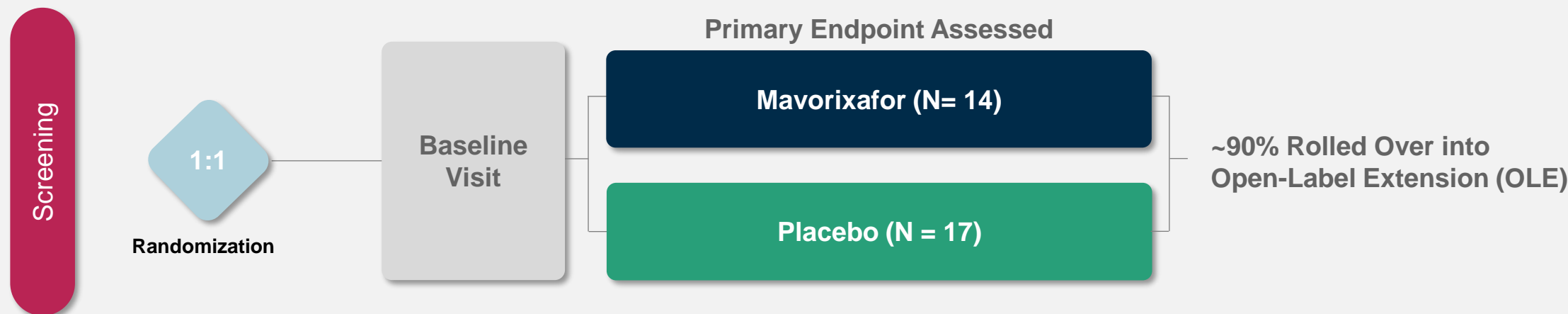
Sepsis 13%
Resulting from bacterial meningitis and bacteremia

End-organ damage 20%
Bronchiectasis and hearing loss

Pneumonia 63%

Cancer 30%
Estimated overall risk by age 40, including HPV and EBV-associated malignancies

Successful Pivotal, Global Phase 3 Clinical Trial in WHIM Syndrome



Baselines: 100% of patients had **severe chronic neutropenia (median ANC ~200 cells/μL)** and chronic lymphopenia (median ALC ~500 cells/μL)

Primary & First Secondary Endpoint: Time above Threshold (TAT) for ANC and ALC calculated as mean of 13, 26, 39, and 52-week assessments

Infection-Related Assessments: Data reviewed by independent, blinded, centralized adjudication committee for rate, severity, duration

Safety Assessments: Throughout the 52-weeks by an independent Data Safety Monitoring Board

POTENTIAL LABELED INDICATION: For the treatment of people aged 12 and above **diagnosed with WHIM syndrome**



Mavorixafor Pivotal, Phase 3 Trial

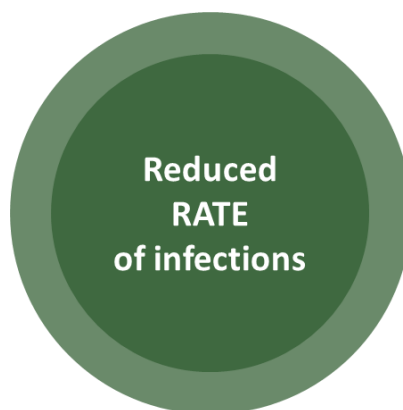
Met primary and key secondary endpoints, demonstrating good tolerability¹

4WHIM trial met primary endpoint of time above threshold (500 cells/ μ L) for absolute neutrophil counts (TAT_{ANC}) and certain key clinical benefit assessments

Mavorixafor achieved statistically significant increases in all white blood cells (WBCs) – including **neutrophils** & lymphocytes – versus placebo

Mavorixafor well tolerated with no treatment-related serious adverse events, no discontinuations due to safety events, no treatment-limiting toxicities

Significant reductions in the rate, severity and duration of infections associated with increases in TAT_{ANC} over the 52-week trial

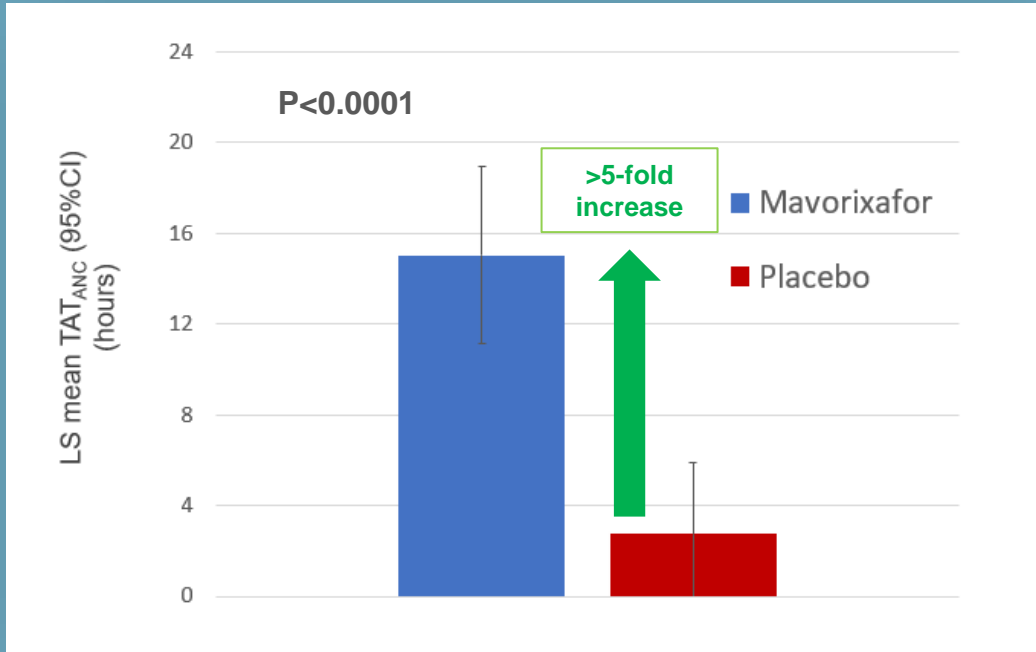


4WHIM Primary Endpoint Met; ANC Increases Maintained Over 52 Weeks

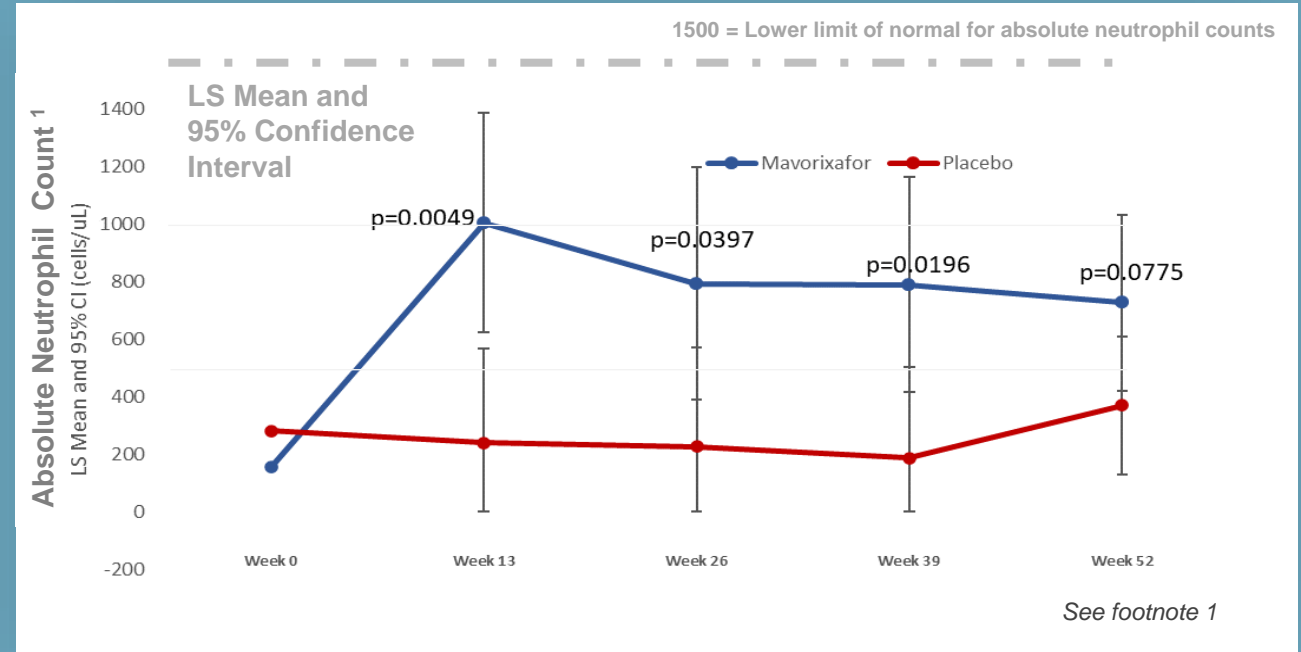


Intent-to-Treat (ITT) population analysis

Primary Endpoint



52-Week Absolute Neutrophil Counts (ANC)



Mavorixafor significantly improved the time above threshold of ANC (>500 cells/ μ L) over 52 weeks vs. placebo

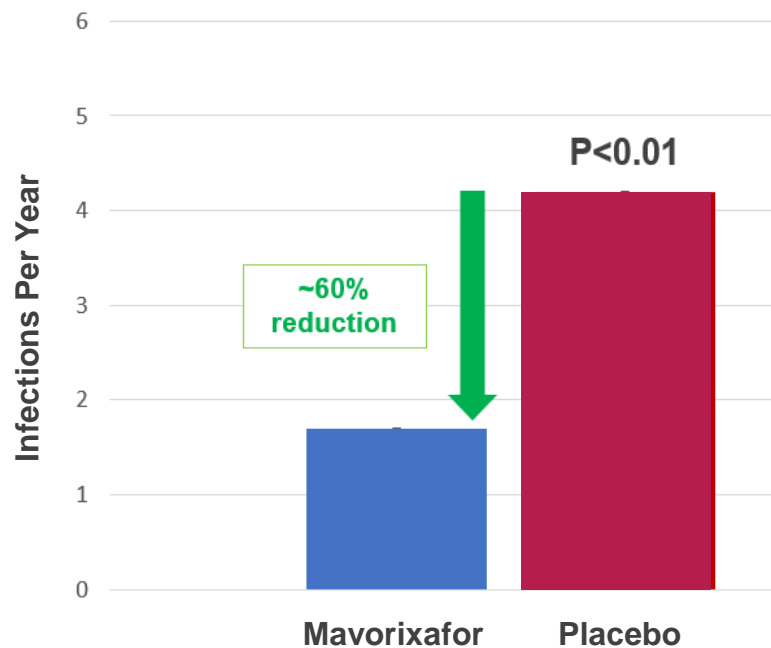
Mean TAT_{ANC} was 15.04 hours for mavorixafor vs. 2.75 hours for placebo

Statistically significant, durable increases in neutrophils and lymphocytes (including B cells and T cells)²

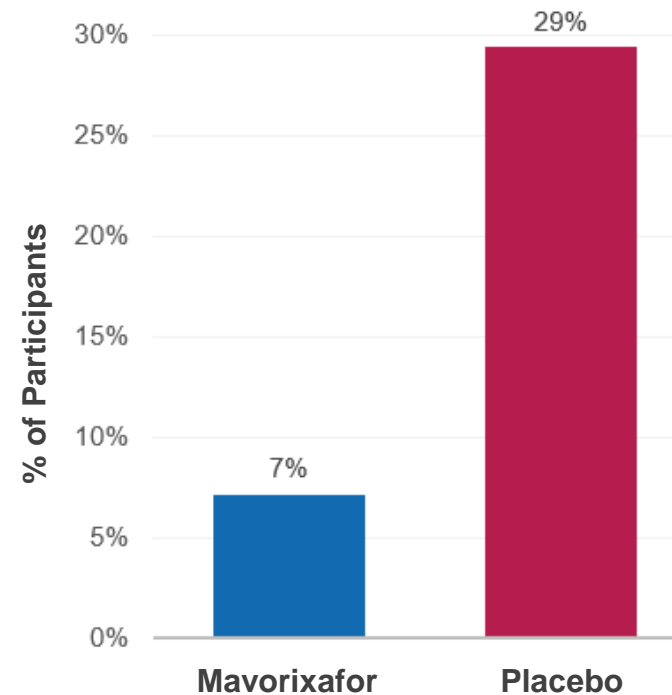
Mavorixafor Reduced Annualized Infection Rate, Severity, & Duration



Annualized Infection Rate



Percentage of Patients Experiencing Grade 3 or Higher Infection Severity



Total Time with Infection (in days)

	Mavorixafor (n=14)	Placebo (n=17)
Mean (SD)	14.1 (2 weeks)	49.1 (7 weeks)
Median	8.5	32.0
Min, Max	0, 43	8, 134

**FDA PDUFA Date of
April 30, 2024**

**Preparations Underway
for Potential 2Q 2024
U.S. Launch of
Mavorixafor in WHIM
Syndrome**

Helping Build the WHIM Syndrome Community

- Establishing X4 as a trusted partner with key stakeholders
- Educating on WHIM syndrome, highlighting unmet need and enabling better patient identification
- Supporting earlier diagnoses to improve patient outcomes

Ensuring Broad Patient Access

- Communicating the mavorixafor value proposition
- Implementing distribution and supply chain
- Engaging with payers to ensure rapid reimbursement

Evolving X4 to a Fully Integrated Biopharmaceutical Company

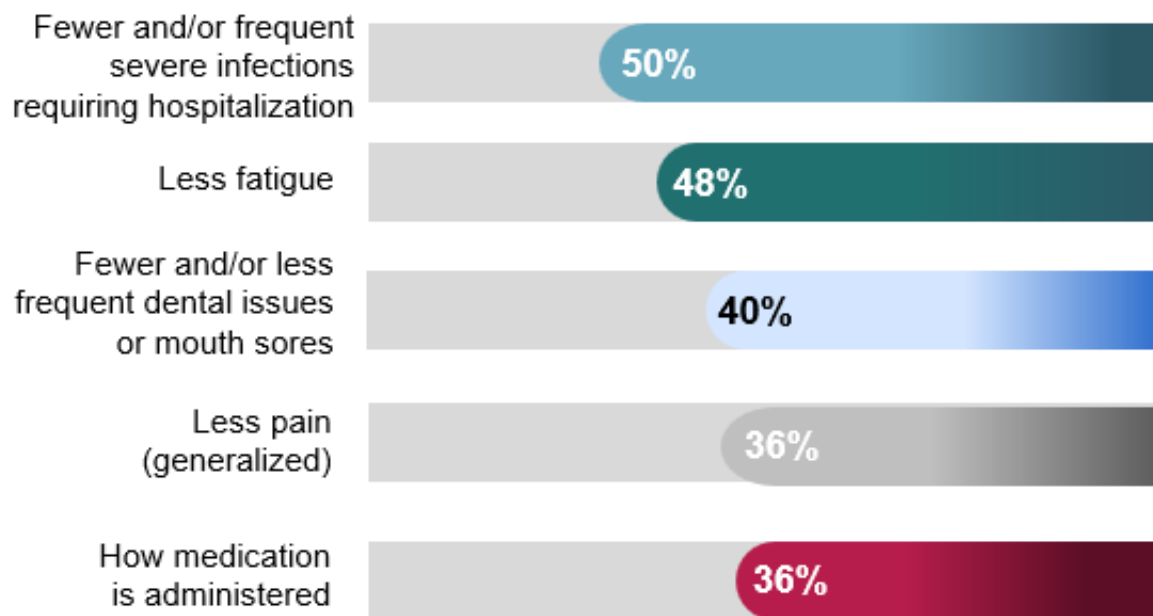
- Building a “fit for purpose” rare disease commercial organization
- Establishing infrastructure and capabilities
- Coordinating cross-functional launch readiness

What Makes a Difference to Chronic Neutropenia Patients and Their Physicians?

Expanded treatment options, ideally:

- Reduced infection rates
- Oral formulation
- Good safety profile
- Alternate therapy to injectable G-CSF and/or
- Reduced G-CSF-dose & related toxicities

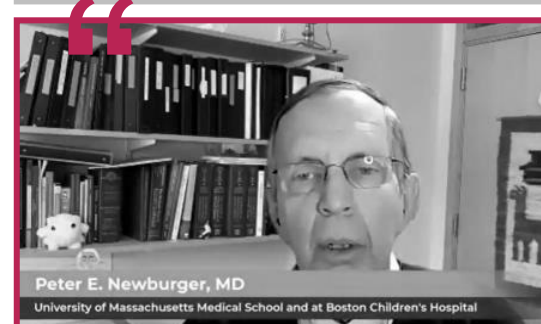
Patients/Caregivers (n=100)^{1,2}



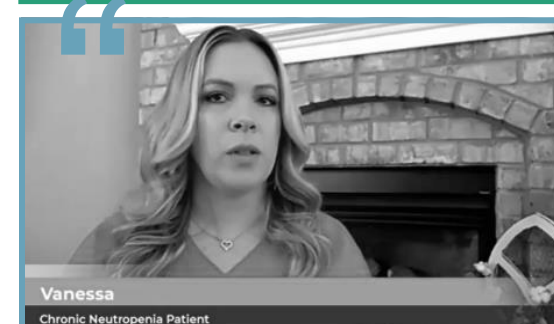
“There is a major diagnostic gap currently..., and also treatment options are extremely narrow”



“What I'd like to see with neutropenia would be a different way to administer the medicine... nobody likes needles.”



“..an augmentation [of ANC] by 500 or 1000 would be adequate for clinical purposes of preventing infection.”



“.. I'm using Neupogen... I use it daily on a low dose... If I get the extreme bone pain..., I am unable to sleep...Yeah. It's unreal.”

Segmentation of Unmet Needs in Chronic Neutropenia Patients

Chronic Neutropenia Patients Have A Range of Needs¹

Alternative Monotherapy

Low neutrophil counts

High risk of infections

G-CSF intolerant / no alternative therapies

Highest need: well tolerated treatment that improves ANC and reduces infection risk

Improved Efficacy While On G-CSF

Remain neutropenic while on G-CSF

Infection risk remains

Experience bone pain, other AEs on G-CSF

Highest need: achieving normalized ANC and reduced infection risk, no additional adverse effects

Lower G-CSF Dose/Toxicity

Normalized ANC levels

Normalized infection risk

Experience bone pain, other AEs on G-CSF

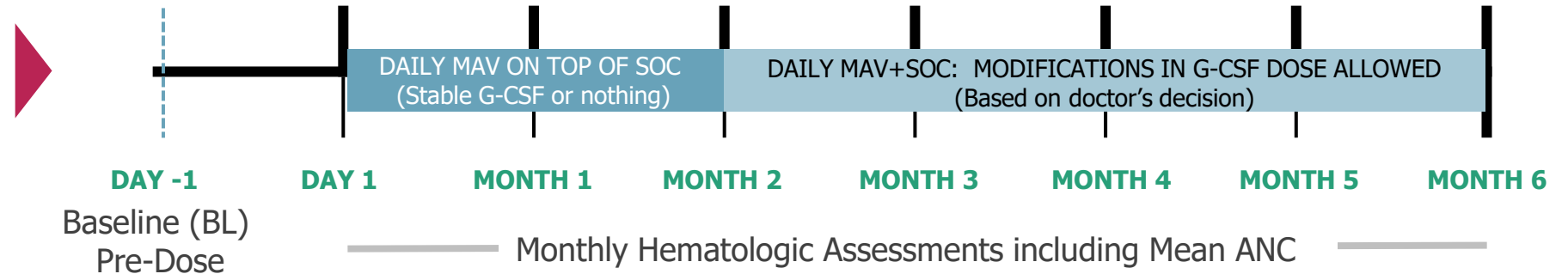
Highest need: reduced G-CSF while maintaining normalized ANCs and no increased infection risk

CN Phase 2 Study: Assessing Chronic Daily Dosing of Mavorixafor +/- G-CSF

Mavorixafor: Same Oral Dosing as WHIM Phase 3



Phase 2 Trial: Safety, Durability of ANC Levels, Exploring G-CSF Reduction



Primary Study Objectives:

Mavorixafor Monotherapy: Assess if mavorixafor raises ANC levels in neutropenic patients as a monotherapy

Mavorixafor + G-CSF in Neutropenic Patients: Assess if mavorixafor raises ANC levels in combination with G-CSF

Mavorixafor + G-CSF in Non-Neutropenic Patients: Assess if mavorixafor raises ANC levels in combination with G-CSF to enable/explore reducing or discontinuing G-CSF treatment

➤ **Inform the design of a global, pivotal Phase 3 clinical trial of mavorixafor in neutropenic patients**

Preliminary CN Phase 2 Results¹: Addressing Individual Needs

All (n=3) had clinically meaningful increases in ANC² with addition of mavorixafor

Data to Date: Three Cases Studies With All Participants on G-CSF



Alternative Monotherapy

- ✓ ~25% enrolled participants are not treated with G-CSF
- ✓ Data presentation planned for 1H 2024



CIN, age 24, female
Baseline ANC ~1,170 cells/ μ L



CyN, age 39, male
Baseline ANC ~690 cells/ μ L

Improved Efficacy While On G-CSF

- ✓ Clinically meaningful² increases in ANC due to mavorixafor observed in all subjects
- ✓ Neutropenic participants achieved normalized ANC on combination
- ✓ Mavorixafor well tolerated in combination with G-CSF



CIN, age 20, female
Baseline ANC ~5,560 cells/ μ L

Lower G-CSF Dose/Toxicity

- ✓ G-CSF dosing reduced/removed in the 2 CIN participants
- ✓ Reductions in G-CSF dosing of 75% and 50% maintained normalized ANC

No infections seen after month 2 in all participants

CN Clinical Data to Date Support Advancing Mavorixafor into Phase 3 Trial

Overall learnings

First supporting evidence that mavorixafor treatment durably increases ANC

Levels of observed ANC increase ($\Delta \text{ANC} \geq 500$) correlate with infection risk reduction

Safety profile to date supports chronic treatment with mavorixafor

Preliminary data support responder criteria used as primary endpoint in planned CN Phase 3

Mavorixafor delivered on patient needs

Neutropenic participants achieved normalized ANC

G-CSF could be reduced meaningfully (50% or more)

No additional adverse effects seen to date in combination with G-CSF

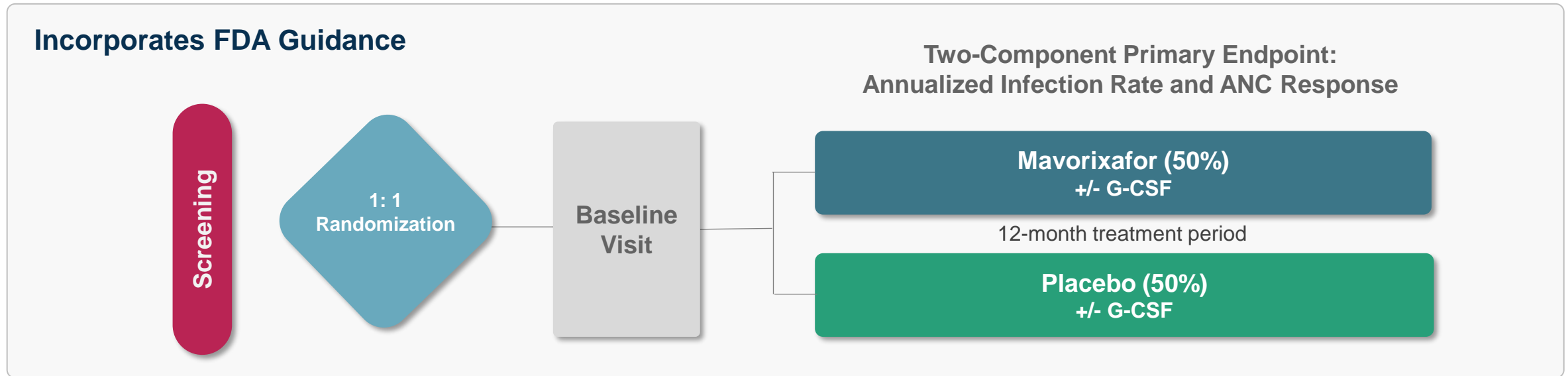


Phase 2 CN Trial Status

- >15 participants enrolled in trial
- Comprehensive Phase 2 data expected in 1H 2024

**Data Across Multiple Studies to Date +
Input from FDA Informed Pivotal, Global
Phase 3 Trial Design**

CN Pivotal, Global Phase 3 Trial Expected to Initiate in 1H 2024



Key Inclusion Criteria:

- **Diagnosis:** congenital, autoimmune, or idiopathic neutropenia
- **Absolute Neutrophil Count (ANC):** <1500 cells/ μ L
- **Infection history:** 2 infections requiring intervention within last 12 months

Design: double-blinded, randomized, placebo-controlled on top of standard of care (+/- G-CSF¹); same mavorixafor dosing as 4WHIM trial

Secondary Endpoints Include: severity and duration of infection, antibiotic use, fatigue, QoL, and safety

Endpoint and Power: 150 subjects, $\geq 90\%$ on primary endpoints of annualized infection rate and ANC response

Primary Endpoints: Infection Rate & Responder Criteria Align with Unmet Needs

Primary Infection Endpoint

Powered to $\geq 90\%$ for annualized infection rate and ANC response

Primary ANC/Biomarker Endpoint

Unmet Need for Participants	ANC Inclusion Criteria at Baseline (Baseline _{ANC})	Responder Criteria for Phase 3 ANC Endpoint
Alternative Monotherapy ¹	Baseline _{ANC} \leq 500 cells/ μ L	2 out of 3 ANC measurements in first 3 months of study exceed 2x the value of the Baseline _{ANC}
Improved Efficacy with G-CSF	500 cells/ μ L < Baseline _{ANC} \leq 1500 cells/ μ L	2 out of 3 ANC measurements in first 3 months of study exceed 1500 cells/ μ L

Maximizing Mavorixa for Potential to Address Infection Risk in CN and Beyond

WHIM Syndrome

>1,000 est. US Patients

Significant Infection Benefit Shown

PDUFA date of April 30, 2024

Potential U.S. launch in 2Q 2024

Chronic Neutropenic Disorders

~15,000 minimal addressable US market; ~50,000 est. total US Patients

Initiation of Pivotal Phase 3

Expected in 1H 2024

idiopathic

cyclic

Primary Immunodeficiencies (PIs)

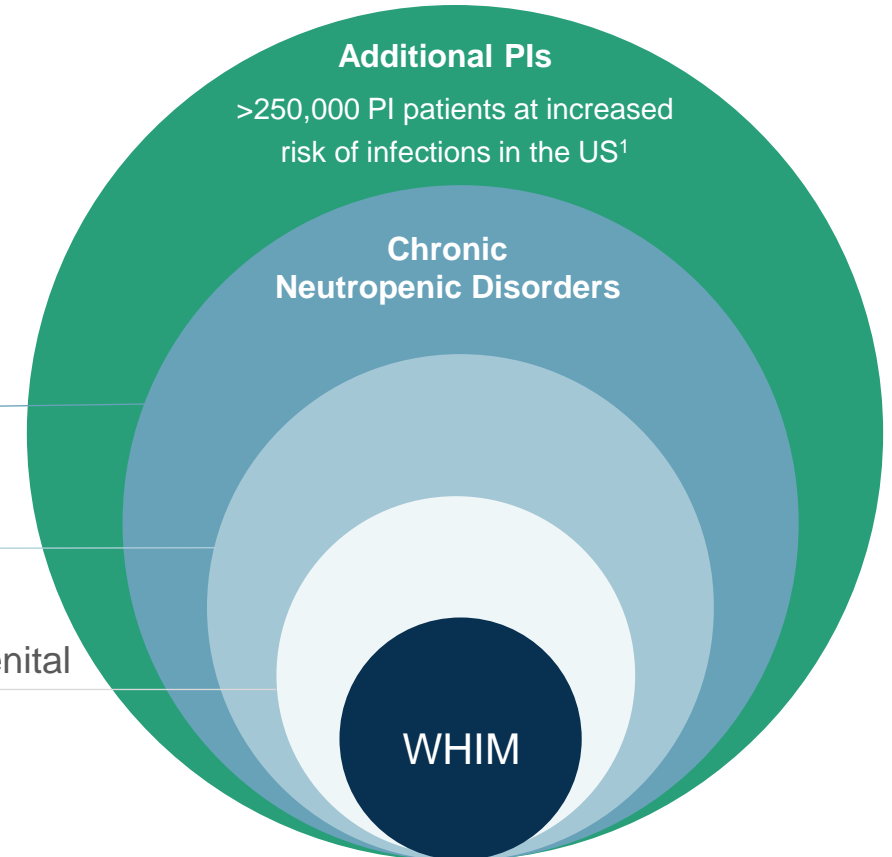
>250,000¹ est. US Patients
(potential subset for further study)

Additional WHIM Phase 3 Data:

Innate & adaptive immunity

Data anticipated 1H 2024

congenital



An Exciting 2024 Expected: Delivering Innovation to Patients in Need

FDA PDUFA date set for April 30, 2024

U.S. NDA for mavorixafor in WHIM accepted 4Q 2023

X4 eligible for Priority Review Voucher

U.S. launch of mavorixafor for WHIM expected in 2Q 2024

Preparing for potential launch of first-ever treatment for WHIM syndrome

4WHIM trial open-label extension update expected in 1H 2024

Additional Phase 2 CN trial data expected in 1H 2024

>15 participants enrolled

Comprehensive Phase 2 data set expected in 1H 2024

Initiation of Phase 3 CN trial anticipated in 1H 2024

Key learnings and FDA input have enabled finalization of pivotal, global Phase 3 chronic neutropenia trial design

Expansion Opportunities for Mavorixafor

Global regulatory filings anticipated for WHIM in 2024/2025

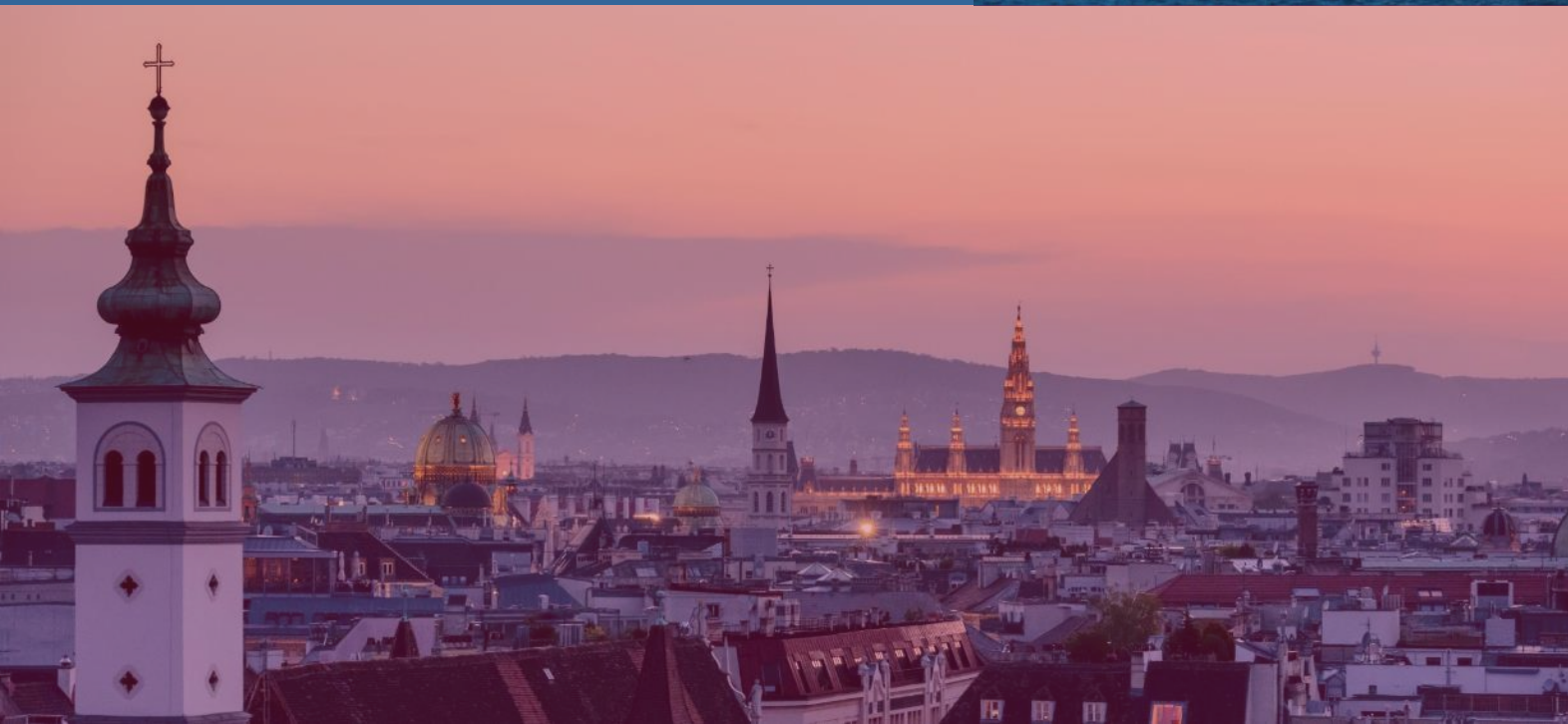
Exploring additional immunodeficiency indications

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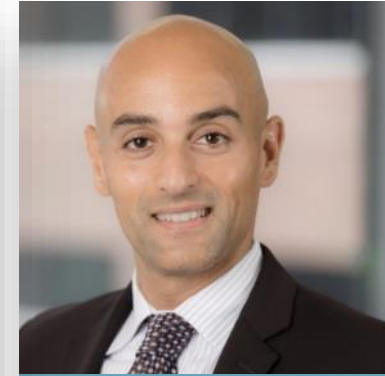
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Strong Balance Sheet Supports Expected Upcoming Milestones

~\$115.2 million¹

Funds expected to support operations into 2025²

Top-tier Life Science-Focused Institutional Shareholder Base

Analyst Coverage

B RILEY FBR

BROOKLINE
CAPITAL MARKETS

CANTOR
Pitigerald

PIPER | SANDLER

STIFEL

 **HCW**
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