Arsanis and X4 Pharmaceuticals Merger

November 27, 2018

Forward Looking Statements

Certain statements in this communication regarding the proposed merger and other contemplated transactions (including statements relating to satisfaction of the conditions to and consummation of the proposed merger; the expected ownership of the combined company; the alternatives to the proposed merger; the expected benefits of the merger; the management and organization of the combined company; the initiation, cost, timing, progress and results of X4 Pharmaceuticals, Inc. ("X4")'s development activities, nonclinical studies and clinical trials; the potential benefits that may be derived from any product candidates; X4's strategy to advance strategic collaborations; and the strategies, goals, prospects, plans, expectations, forecasts or objectives of Arsanis, Inc. ("Arsanis"), X4 or the combined company) constitute "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and are usually identified by the use of words such as "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "seeks," "should," "will," "would," and variations of such words or similar expressions. We intend these forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act and Section 21E of the Exchange Act and are making this statement for purposes of complying with those safe harbor provisions. These forward-looking statements reflect our current views about our plans, intentions, expectations, strategies and prospects, which are based on the information currently available to us and on assumptions we have made. Although we believe that our plans, intentions, expectations, strategies and prospects as reflected in or suggested by those forward-looking statements are reasonable, we can give no assurance that the plans, intentions, expectations or strategies will be attained or achieved. Furthermore, actual results may differ materially from those described in the forward-looking statements and will be affected by a variety of important risks and factors that are beyond our control.

Risks and uncertainties for Arsanis and X4 and the combined company include, but are not limited to, the: inability to complete the proposed merger and other contemplated transactions; liquidity and trading market for shares prior to and following the consummation of the proposed merger; costs and potential litigation associated with the proposed merger; failure or delay in obtaining required approvals by the Securities and Exchange Commission ("SEC") or any other governmental or quasi-governmental entity necessary to consummate the proposed merger, including our ability to file an effective proxy statement/prospectus/information statement in connection with the proposed merger and other contemplated transactions, which may also result in unexpected additional transaction expenses and operating cash expenditures on the parties; failure to obtain the necessary stockholder approvals or to satisfy other conditions to the closing of the proposed merger and the other contemplated transactions; a superior proposal being submitted to either party; failure to issue Arsanis' or the combined company's common stock in other contemplated transactions exempt from registration or qualification requirements under applicable state securities laws; risks related to the costs, timing and regulatory review of the combined company's nonclinical studies and clinical trials; uncertainties in obtaining successful clinical results for product candidates such as X4P-001 and unexpected costs that may result therefrom; inability or the delay in obtaining required regulatory approvals for product candidates such as X4P-001, which may result in unexpected cost expenditures; failure to realize any value of certain product candidates developed and being developed, in light of inherent risks and difficulties involved in successfully bringing product candidates to market; inability to develop new product candidates; inability to commercialize and launch any product candidate that receives regulatory approval, including X4P-001; the combined company's anticipated capital expenditures, its estimates regarding its capital requirements and its need for future capital; uncertainties of cash flows and inability to meet working capital needs; cost reductions that may not result in anticipated level of cost savings or cost reductions prior to or after the consummation of the proposed merger; the approval by the U.S. Food and Drug Administration and European Medicines Agency and any other similar foreign regulatory authorities of other competing or superior products brought to market; risks resulting from unforeseen side effects; risk that the market for the combined company's products may not be as large as expected; inability to obtain, maintain and enforce patents and other intellectual property rights or the unexpected costs associated with such enforcement or litigation; inability to obtain and maintain commercial manufacturing arrangements with third party manufacturers or establish commercial scale manufacturing capabilities; inability to establish and maintain licensing, collaboration or similar arrangements on favorable terms and the inability to attract collaborators with development, regulatory and commercialization expertise; inability to successfully commercialize any approved product candidates, including their rate and degree of market acceptance; unexpected cost increases and pricing pressures; the possibility of economic recession and its negative impact on customers, vendors or suppliers; and risks associated with the possible failure to realize certain benefits of the proposed merger, including future financial, tax, accounting treatment, and operating results. Many of these factors that will determine actual results are beyond Arsanis's, X4's, or the combined company's ability to control or predict.

Other risks and uncertainties are more fully described in Arsanis's Annual Report on Form 10-K for the year ended December 31, 2017, filed with the SEC, and in other filings that Arsanis makes and will make with the SEC in connection with the proposed transactions, including the proxy statement/prospectus/information statement described herein under "Important Additional Information Will be Filed with the SEC." Existing and prospective investors are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. The statements made in this presentation speak only as of the date stated herein, and subsequent events and developments may cause our expectations and beliefs to change. While we may elect to update these forward-looking statements publicly at some point in the future, we specifically disclaim any obligation to do so, whether as a result of new information, future events or otherwise, except as required by law. These forward-looking statements should not be relied upon as representing our views as of any date after the date stated herein.

Participants and Additional Information

No Offer or Solicitation:
This communication shall not constitute an offer to sell or the solicitation of an offer to sell or the solicitation of an offer to buy any securities, nor shall there be any sale of securities in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction. No public offer of securities shall be made except by means of a prospectus meeting the requirements of Section 10 of the Securities Act of 1933, as amended.

Participants in the Solicitation:
Arsanis, Inc. (Arsanis), X4 Pharmaceuticals, Inc. (X4 Pharma) and their respective directors and executive officers may be deemed to be participants in the solicitation of proxies from the holders of Arsanis common stock in connection with the proposed transaction. Information about Arsanis's directors and executive officers is set forth in Arsanis's Annual Report on Form 10-K for the year ended December 31, 2017, which was filed with the Securities and Exchange Commission (SEC) on March 9, 2018, and the proxy statement for Arsanis's 2018 annual meeting of stockholders, which was filed with the SEC on April 23, 2018. Other information regarding the interests of such individuals, as well as information regarding X4 Pharma's directors and executive officers and other persons who may be deemed participants in the proposed transaction, will be set forth in the proxy statement/prospectus/information statement relating to the proposed transaction, which will be included in Arsanis's registration statement when it is filed with the SEC. You may obtain free copies of these documents as described in the paragraph below.

Important Additional Information Will be Filed with the SEC:
This presentation may be deemed to be solicitation material in respect of the proposed transaction between Arsanis and X4 Pharma. In connection with the proposed transaction between Arsanis and X4 Pharma, Arsanis intends to file relevant materials with the SEC, including a registration statement that will contain a proxy statement and prospectus of Arsanis and an information statement of X4 Pharma and certain of its affiliates. ARSANIS URGES INVESTORS AND STOCKHOLDERS TO READ THESE MATERIALS CAREFULLY AND IN THEIR ENTIRETY WHEN THEY BECOME AVAILABLE BECAUSE THEY WILL CONTAIN IMPORTANT INFORMATION ABOUT ARSANIS, X4 PHARMA, THE PROPOSED TRANSACTION, AND RELATED MATTERS. This presentation is not a substitute for the registration statement, proxy statement, prospectus, information statement or any other document that Arsanis may file with the SEC or send to Arsanis stockholders in connection with the proposed transaction. Investors and stockholders will be able to obtain free copies of the proxy statement/prospectus/information statement and other documents filed by Arsanis with the SEC (when they become available) through the website maintained by the SEC at www.sec.gov. In addition, investors and stockholders will be able to obtain free copies of the proxy statement/prospectus/information statement and other documents filed by Arsanis with the SEC by contacting Investor Relations by mail at Arsanis, Inc., Attention: Investor Relations, 890 Winter Street, Suite 230, Waltham, MA 02451-1472. Investors and stockholders are urged to read the proxy statement/prospectus/information statement and the other relevant materials when they become available before making any voting or investment decision with respect to the proposed transaction.

Transaction Overview

- X4 Pharmaceuticals to merge with Arsanis in stock for stock transaction

- Combined company will operate as X4 Pharmaceuticals, Inc.
  - Paula Ragan, X4's president and chief executive officer, will maintain this role and the remainder of the management team at X4 are expected to continue in such roles at the combined company
  - Board of directors will include 5 members from X4 (including chairperson of the board) and 2 members from Arsanis
  - X4 strengthening infrastructure with Arsanis' clinical development/regulatory employees and Vienna R&D facility
  - Will be a Nasdaq listed, late-stage biopharmaceutical company focused on rare diseases and cancer

- Transaction expected to close 1Q 2019, subject to the approval of the stockholders of each company and the satisfaction or waiver of other customary conditions
  - Approved by boards of directors of both companies
  - Expected ownership split subject to adjustment based on each Company's equity ownership and Arsanis' net cash at closing[1]:
    - X4 Pharma Shareholders: 69.7%
    - Arsanis Shareholders: 30.3%

(1) Based on each Company's equity ownership as of November 26, 2018 and expected Arsanis net cash as of closing.

X4 Pharmaceuticals: Company Overview

Developing treatments designed to have a clear and profound impact for patients suffering with rare diseases, including WHIM syndrome, and patients with rare cancers.

- **Novel therapeutics designed to improve immune cell trafficking**
- **Founded in 2014, $75 million in capital raised to-date (Cormorant Asset Management largest investor)**
- **Headquarters in Cambridge, MA**
- **Phase 3 clinical trial for lead product candidate, X4P-001 in WHIM syndrome, anticipated to start in the first half of 2019**

X4 Pharmaceuticals: Building a Global Rare Disease Franchise

- **Rare disease focus provides opportunity for rapid path to global commercialization with disease-modifying lead**
- **Multiple clinical trials planned while building towards Phase 3 top-line results**
- **Potential expansion opportunities across the rare disease landscape**
- **$1B+ market potential across multiple rare diseases**
- **Experienced leadership team in rare disease – includes several former members of Genzyme leadership team**

Proven Leadership Team with Rare Disease Expertise

Key management and advisors involved with R&D and launch of only approved CXCR4 antagonist - Mozobil

Paula Ragan, PhD
CEO

genzyme, SANOFI

Ken Gorelick, MD
CMO

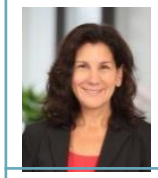
Pfizer, DU PONT MERCK

Adam Mostafa
CFO

abpro, CANTOR Fitzgerald

Mary DiBiase, PhD
VP of Technical Operations and Quality

Biogen, EPIRUS BIOPHARMACEUTICALS



Celeste DiJohnson
VP of Clinical Operations

SAREPTA THERAPEUTICS, SANOFI

Tarek Ebrahim, MD
VP of Medical Affairs

genzyme, ALEXION

Michael Wyzga
Board Chair

genzyme, Radius

Gary Bridger, PhD
Director

AnorMED, genzyme

Key Founders and Investors

Michael Bonney
Investor & Advisor

Bihua Chen
CEO and Portfolio Manager, Cormorant

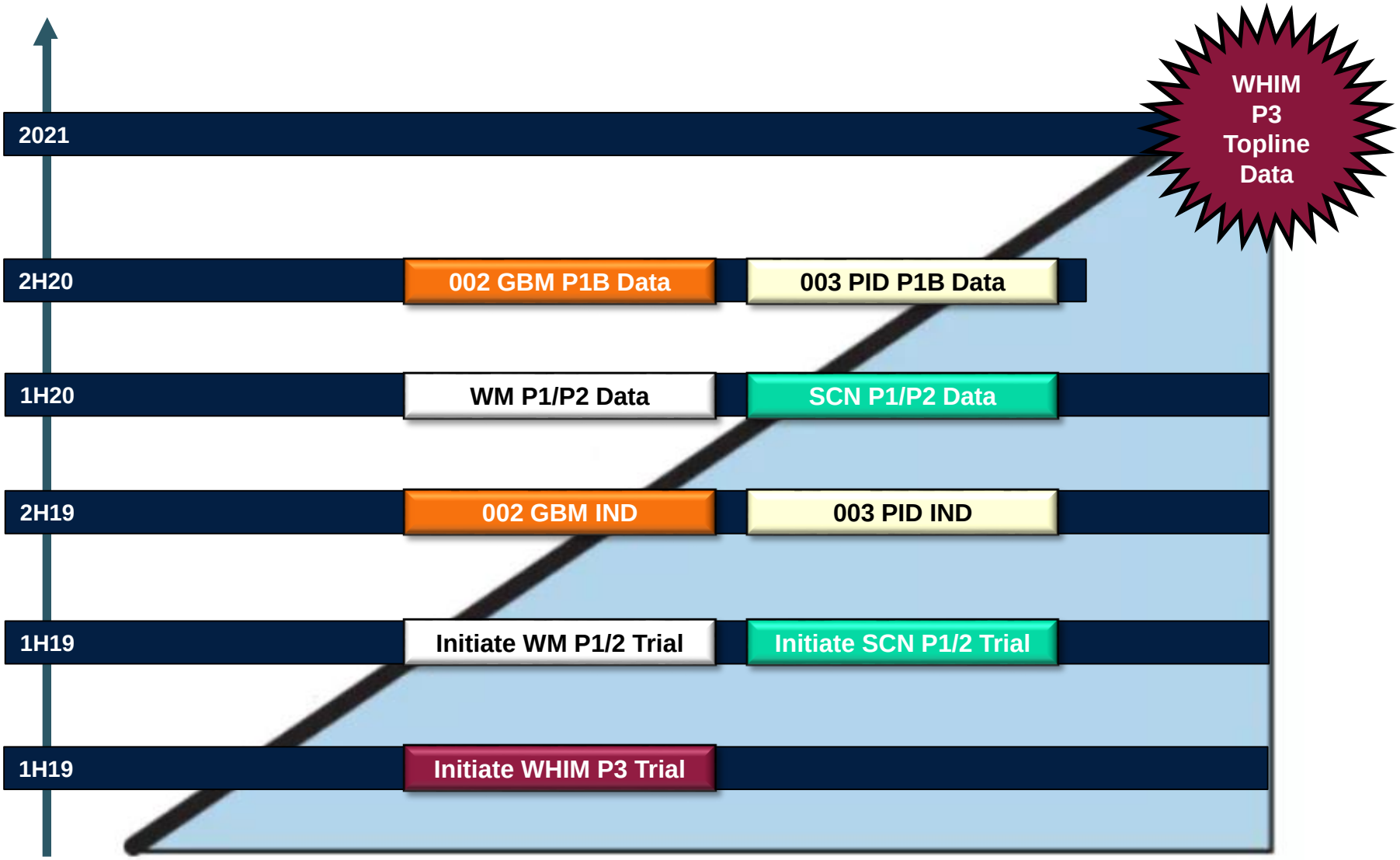
Henri Termeer
Founder

Pipeline

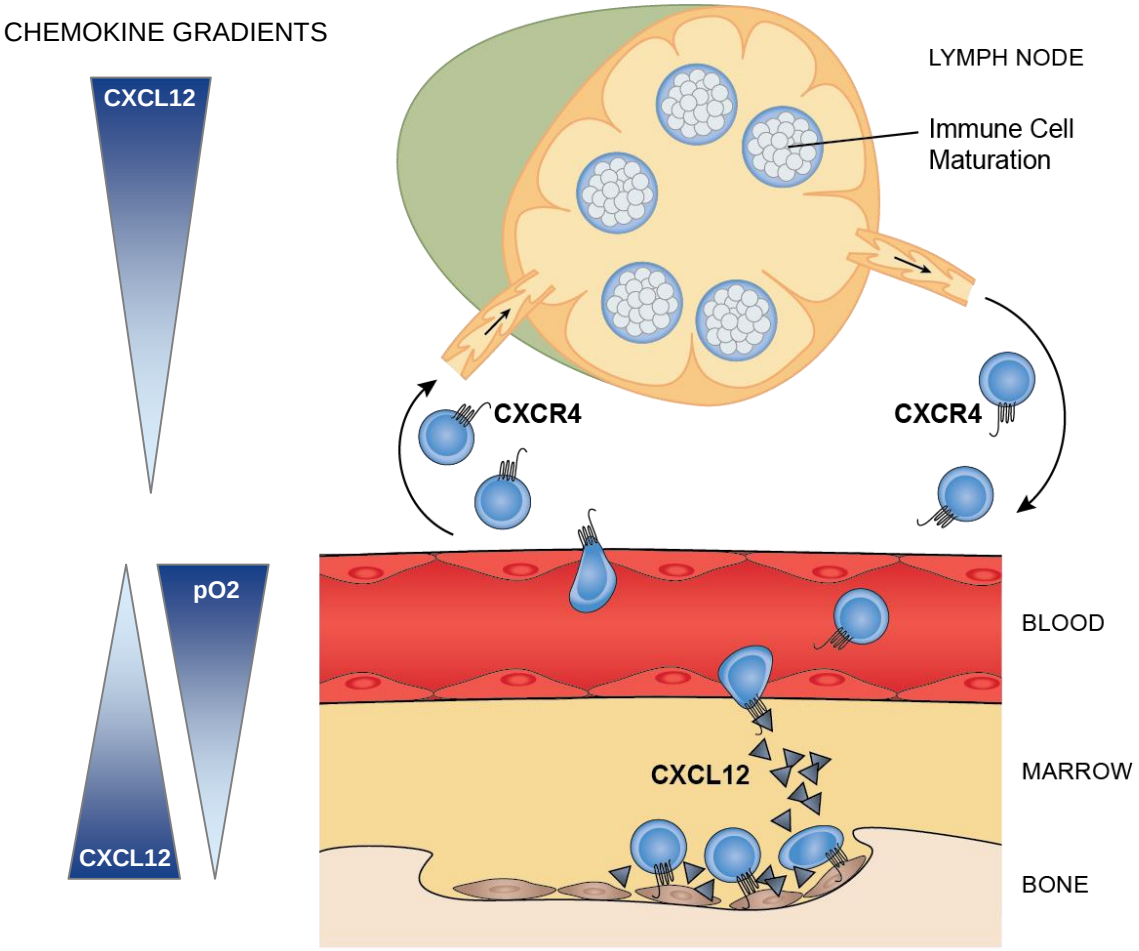
Product Candidate	Indication	Stage of Development				Next Anticipated Milestone(s)
		Preclinical	Phase 1	Phase 2	Phase 3	
X4P-001	WHIM syndrome		Phase 2/3			▪ 1H:2019 – Initiate Phase 3 trial ▪ 2021 – Top-line Phase 3 data
	Severe Congenital Neutropenia (SCN)		Phase 1/2			▪ 1H:2019 – Initiate Phase 1/2 ▪ 1H:2020 – Data from Phase 1/2
	Waldenstrom's Macroglobulinemia (WM)		Phase 1/2			▪ 1H:2019 – Initiate Phase 1/2 ▪ 1H:2020 – Data from Phase 1/2
	Renal cell carcinoma* *(Combination with Inlyta®)*			Phase 2a		▪ Mid 2019 – Announce full Phase 1/2 efficacy data ▪ 2019 – Advance Strategic Partnership discussions
X4P-003	Primary immuno-deficiencies (PID)					▪ IND – 2H:2019 ▪ Phase 1b data 2H 2020
X4P-002	Brain Cancers					▪ IND – 2H:2019 ▪ Phase 1b data 2H 2020

* Two oncology trials have concluded: P1b biomarker in melanoma and P1b in RCC. Final publications expected in 4Q19

Strategy Focused on Strong and Steady Value Build Towards a Diversified Commercial Rare Disease Business



CXCR4/CXCL12 and Immune System Responses



Homeostasis
- Neutrophil homing
- Lymphocyte homing
- Dendritic cell trafficking

Infection Response
- Bacterial
- Viruses
- Fungal/Other

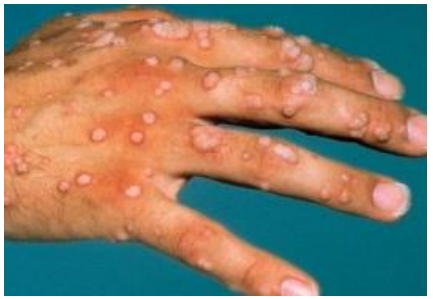
Cancer
- Chemo-resistance/mets
- CTL trafficking
- Suppressor cell trafficking

Adapted from *Blood* 2013 121:1501-1509

Overview: X4P-001 for WHIM

Warts **H**ypogammaglobulinemia **I**nfections **M**yelokathexis

- WHIM Disease results from “gain-of-function” mutations in the CXC chemokine receptor 4 gene
- X4P-001 Phase 2 studies complete; expected to enter Phase 3 in 1H19
- Proof of concept in WHIM previously demonstrated with Mozobil (twice-daily injectable CXCR4 antagonist)[1]
- We believe WHIM represents a $500M market opportunity



X4 is Partnering with World Class Organizations to Increase WHIM Awareness and Build Patient Registries

Jeffrey Modell Foundation

Immune Deficiency Foundation

Hôpitaux Universitaires Est Parisien
TROUSSEAU LA ROCHE-GUYON

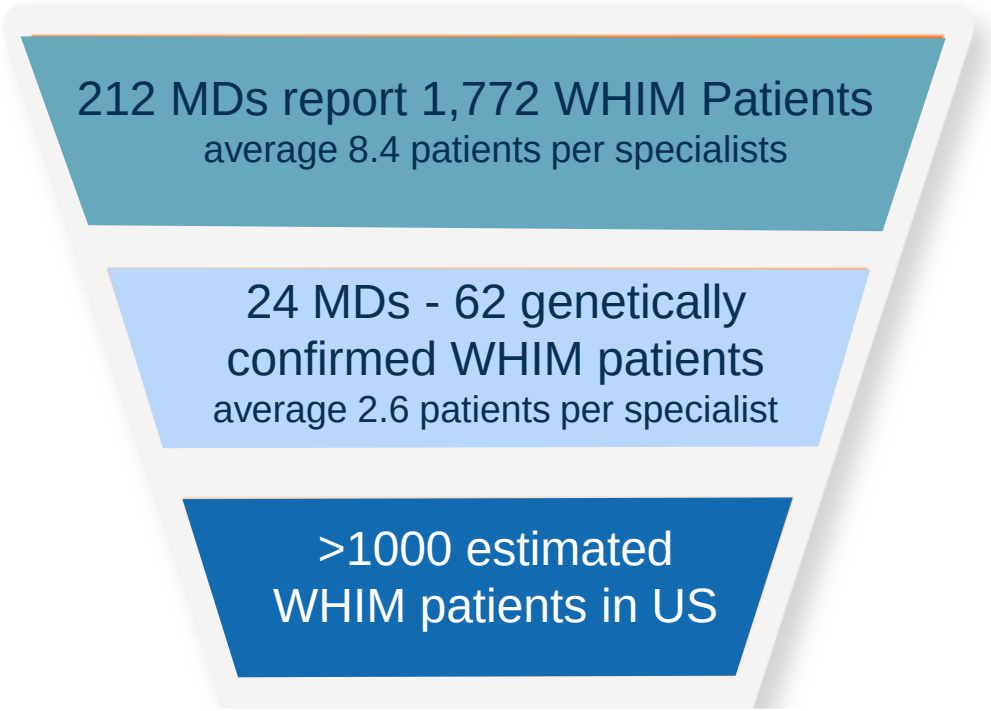
1. McDermott et al; Blood, 2014

>1,000 WHIM Patients Estimated in US: X4 Primary Research (2017)

MDs from 5 specialties self-identified having genetically confirmed or highly suspected WHIM patients

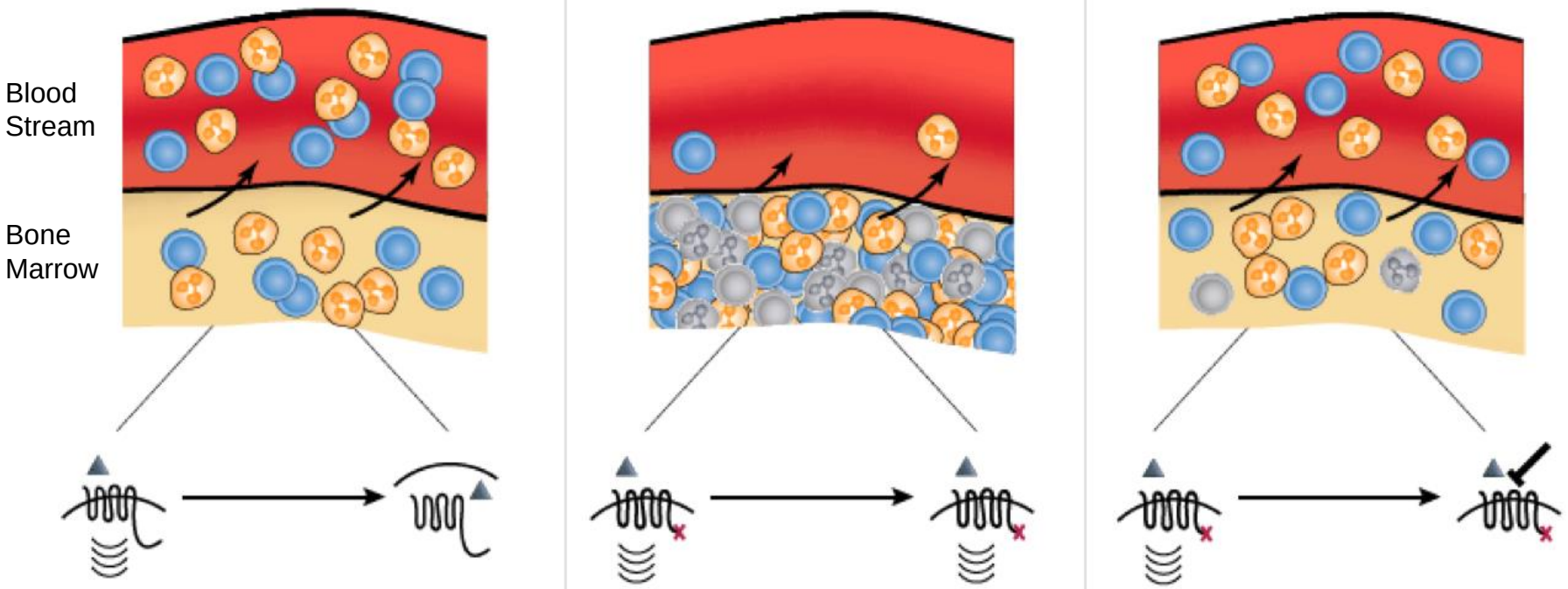
Subset analysis - 24 MDs care for 62 genetically confirmed WHIM patients; established prevalence per specialty

Extrapolated Prevalence from WHIM Genetically Confirmed Patients Per MD



WHIM: Genetic Mutations in CXCR4 Create Abnormal Trafficking of White Blood Cells (WBCs)

Normal	WHIM Disease	Goal: Treatment with X4P-001



Normal CXCR4 Signaling

Hyperactive CXCR4 Signaling

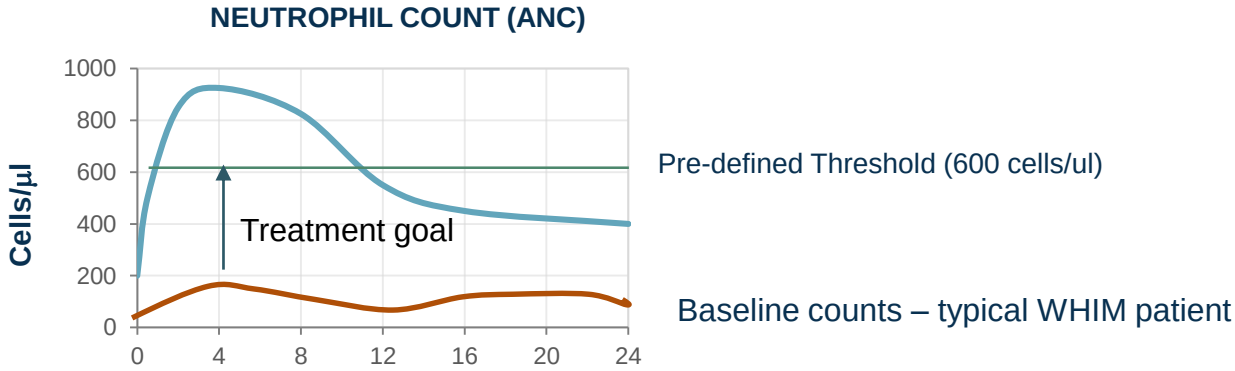
Corrected CXCR4 Signaling

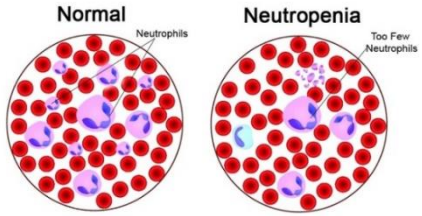
Proof of Concept in WHIM Previously Demonstrated with Mozobil (Twice-Daily Injectable CXCR4 antagonist)[1]

1. McDermott et al; Blood, 2014

Phase 2 Study Design: Neutrophil Counts Biomarker

Phase 2 Goal: Daily Neutrophil and Lymphocyte Counts Exceed Target Thresholds

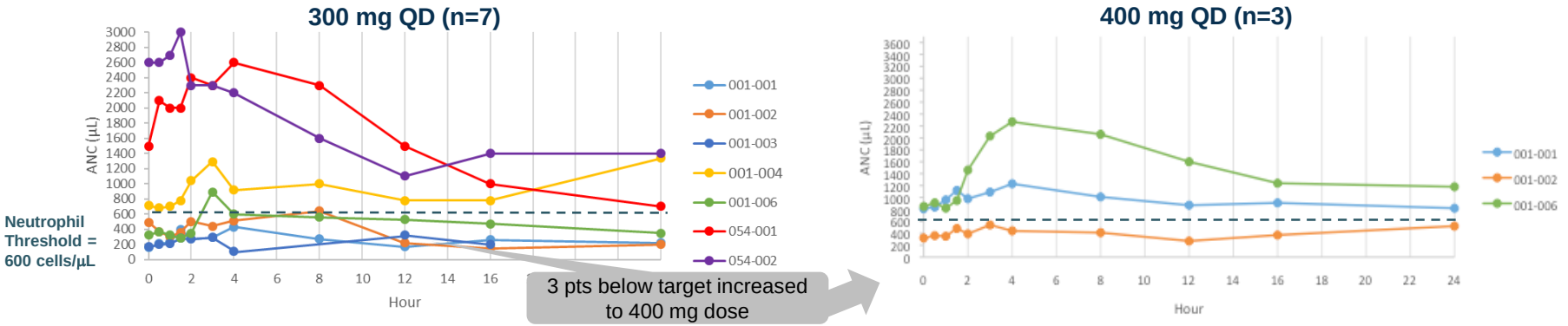


Intra-Patient Dose Escalation	Inclusion Criteria	Endpoints
• Open label • 50 mg to 400 mg QD • n=4-10 patients	• Neutrophil count: ANC ≤400/µL *or* • Lymphocyte count: ALC ≤650/µL *or* both 	• Safety, pharmacokinetics (PK) and pharmacodynamics (PD) • **Biomarker:** 24-hr Blood Counts of Neutrophils (ANC) & Lymphocytes (ALC)

Phase 2: Achieved Threshold Targets In Most Patients

Neutrophil and Lymphocytes Mobilized; Pan-Leukopenia Addressed

Patients Started with an ANC of 50 – 100 cells/ul Prior to Treatment



Assessments	Result	
Neutrophil Counts > Threshold	✓	5 of 7 patients (71%) exceeded target
Lymphocyte Counts > Threshold	✓	6 of 7 patients (85%) exceeded target
Safety	✓	Acceptable; no Grade 3/4
Infection rates	✓	Improvements reported by patients and KOLs
Wart Burden	✓	Two patients with reductions

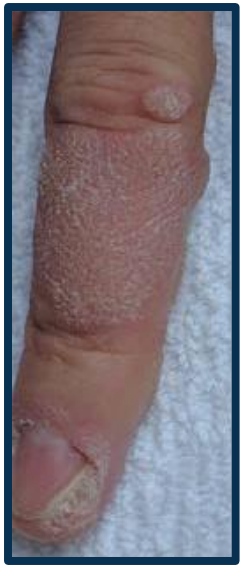
DRC Recommended 400 mg QD for Phase 3 Trial

Data as of April 26, 2018

Dramatic Reduction in Wart Burden

Consistent with Disease Modifying MOA

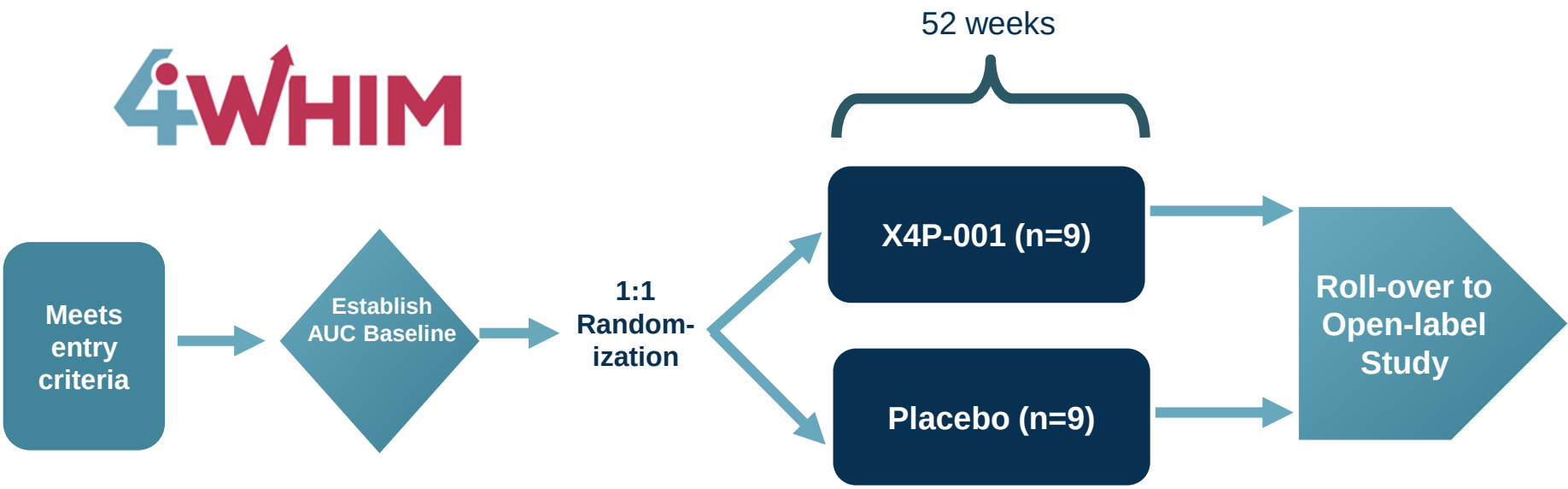
Right Middle Finger Pre-Rx



Right Middle Finger at 26-wks Rx

Patient Remains on Treatment

Phase 3 Trial of X4P-001 in WHIM – Expected Initiation in 1H 2019



X4P-001: Additional Opportunities

Severe Congenital Neutropenias (SCN)

- Rare blood disorder
- Prevalence of 2,000-3,000 patients in US and EU
- Characterized by abnormally low levels of certain white blood cells (neutrophils <500 cell/ul)
- Genetic drivers:
  - May be inherited as either an autosomal dominant or an autosomal recessive genetic trait.
  - Many cases of SCN are the result of spontaneous, random mutations.

Waldenstrom's Macroglobulinemia (WM)

- Rare Form of Non-Hodgkin's Lymphoma
- Estimated prevalence of >13,000 in US and EU
- Genetic drivers:
  - >90% have mutations in MYD88 gene
  - 30-40% have WHIM-like mutations in CXCR4 gene
- Current Treatment
  - Imbruvica ($136,000 per year) – used in all lines (NCCN guidelines)
  - Chemo and Rituxan in certain lines/settings

IO Strategy: Leveraging Biological Expertise Via Partnering

- Three On-Going Trials: Demonstrating PoC
  - Phase 1b – melanoma biomarker with pembrolizumab
  - Phase 1b – clear cell renal cell carcinoma with nivolumab
  - Phase 1b/2a – clear cell renal cell carcinoma with axitinib
    - Clinical collaboration with Pfizer
- Additional clinical collaboration expected near term for CPI
- 2019: Strategy to advance strategic collaborations by:
  - Leveraging partners oncology development infrastructure
  - Optimizing non-dilutive funding to advance programs & retain optionality

Key Benefits of the Merger

- Leverages X4's deep experience in rare disease products and its advanced pipeline with Arsanis' European infrastructure and related scientific research expertise
- Provides near-term capital to support the Phase 3 trial of X4P-001, a potentially disease modifying treatment for WHIM syndrome, and enable future financing opportunities
- Strengthens the combined team, capabilities and infrastructure
- Enables growth to pursue our strategy of becoming a global commercial business grounded in a rare disease franchise