

Kyowa Kirin R&D Day

December 10, 2020

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Kyowa Kirin Co., Ltd.



This document contains certain forward-looking statements relating to such items as the company's (including its domestic and overseas subsidiaries) forecasts, targets and plans. These forward-looking statements are based upon information available to the company at the present time and upon reasonable assumptions made by the company in making its forecasts, but the actual results in practice may differ substantially due to uncertain factors.

These uncertain factors include, but are not limited to, potential risks of the business activities in the pharmaceutical industry in Japan and overseas, intellectual property risks, risk of side effects, regulatory risks, product defect risks, risks of changes to the prices for raw materials, risks of changes to market prices, as well as risks of changes to foreign exchange rates and financial markets.

This document is used only for the purpose of providing the information to investors. Though it may contain the information concerning pharmaceutical products (including products under development), it is not for the purpose of promotion, advertising, or medical advice.

Agenda

■ Introduction

■ Topics

*** Projects aiming to launch products within 10-20 years**

Axcelead / InveniAI

*** Projects aiming to launch products within 10 years**

Drug discovery using bispecific antibody technology developed in-house /
Collaboration-leveraged drug discovery

*** Projects aiming to launch products within several years**

ME-401 / KHK7791 / RTA 402

■ Summary

■ Q&A Session

Introduction: Challenging the creation of new value in R&D

Initiatives for expanding the opportunities to create value unique to Kyowa Kirin

- **Initiatives and innovation through internal activities + collaborations**
 - Axcelead, InveniAI, SBI Biotech
 - Next generation antibody technology, Nucleic acid therapeutics, Small molecule drug discovery, Regenerative medicine
- **Foster next generation product candidates (global products, etc.)**
 - KHK4083, KW-6356, ME-401, RTA 402, KHK7791...

Technology strategy

Utilize next generation antibody technology and diverse modalities to build a platform that will support revolutionary new pharmaceuticals

Disease strategy

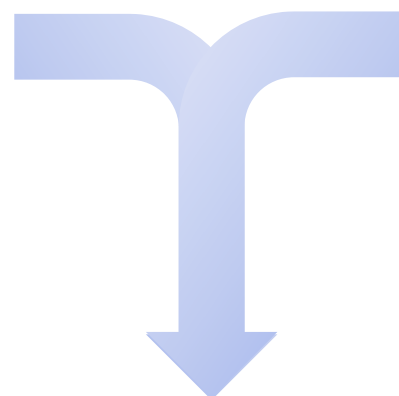
Utilize the accumulated knowledge and technology to change the lives of patients by providing unique value for UMN

Projects aiming to launch products within 10-20 years

Development of revolutionary small molecule drug discovery technology (collaboration with Axcelead)



- ✓ **Analysis of potential target drugs**
 - Screening technology that imitates the pathology, and molecule design technology
- ✓ **Diverse drug discovery modality research**
 - Fusion with biopharmaceutical research
- ✓ **R&D experience in the priority categories**
 - Appropriately grasp the treatment needs



- ✓ **Small molecule drug discovery infrastructure**
 - Leading capability in Japan
- ✓ **Vast experience in drug discovery**
 - Diverse expertise and know-how
- ✓ **Huge volume of drug discovery data**
 - Huge volume of data and analytical capabilities that enable efficient drug discovery

**Strengthen technology-driven drug discovery and
strive to create innovative new pharmaceuticals**

Promotion of data driven drug discovery (collaboration with InveniAI)

- InveniAI:
 - Possesses drug discovery technology that uses AI and machine learning and has experience working with multiple pharmaceutical companies
 - Started collaborating with InveniAI in 2018 aimed at maximizing the value of Kyowa Kirin's assets
- Expand the collaboration with InveniAI, and initiate efforts to identify new indications and potential target drugs suited to the next generation antibody technology independently developed by Kyowa Kirin



Utilize the strengths of each company, and accelerate “data driven drug discovery” based on data science

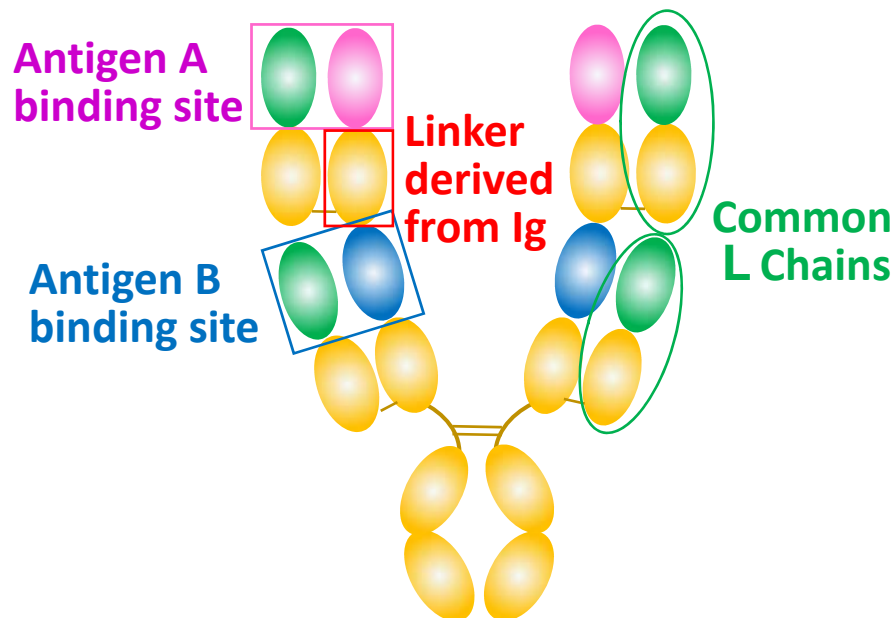
Projects aiming to launch products within 10 years

Drug discovery using in-house developed bispecific antibody technology

In-House Development of Bispecific-Antibody Technology

Key points

- Apply Kyowa Kirin's unique bispecific-antibody technology for new therapeutic antibodies
- Pursue the development of "first in class" drugs by blending technology with biology

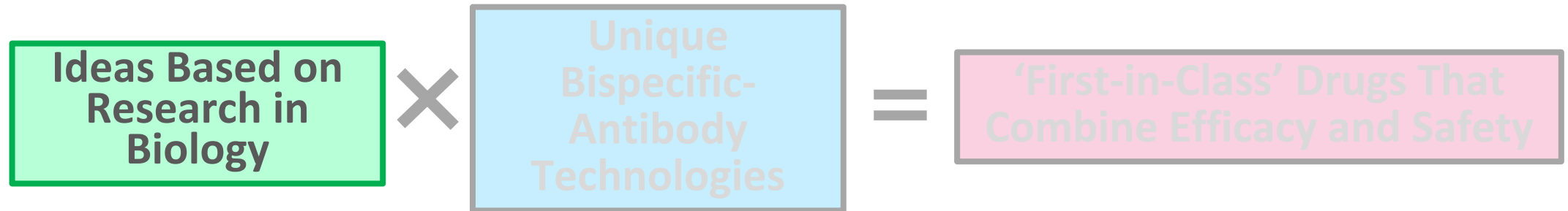


An Example of Kyowa Kirin's unique bispecific-antibody technology

- **Selection of linkers derived from Immunoglobulin (Ig) and the common sequence of L Chains**
 - Committed to the native sequences*
 - Application of human antibody producing animals*
- **Versatility equivalent to wild type IgG**
 - High productivity
 - High stability
 - Low antigenicity
- **Unique biology based on bivalent x bivalent binding**

* Kyowa Kirin's commitment to the native sequences derived from the research for POTELLIGENT®, COMPLEGENT®, and human antibody producing animals

Flagship Project



If targeted by conventional antibodies...

**Safety
Issues**

Issues related to the limitations of conventional modalities

- Ideal efficacy, if the issue of systemic side effects (safety) is resolved.
- Ideal efficacy, if there is tissue selectivity.
- Ideal pharmacological function, if there is cell selectivity.

Flagship Project

Ideas Based on
Research in
Biology

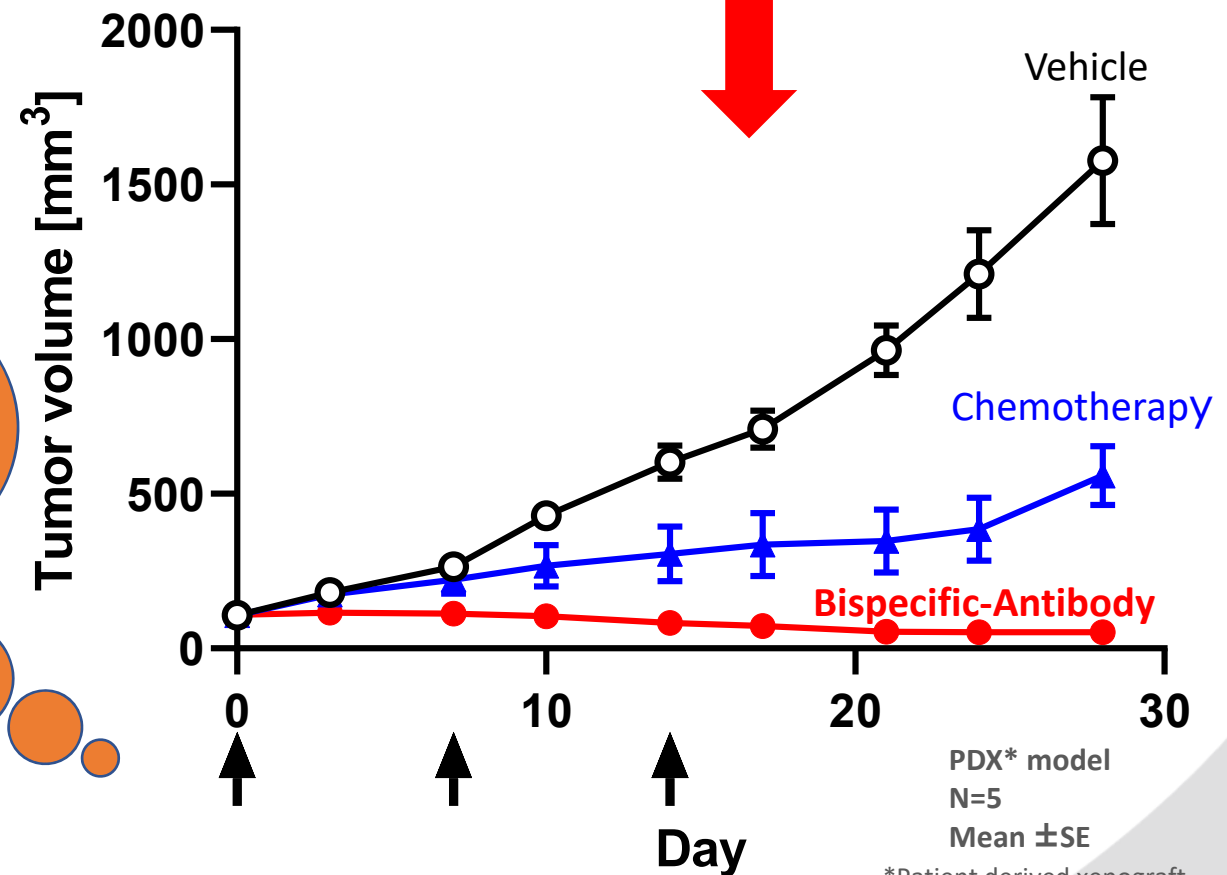


Unique
Bispecific-
Antibody
Technology



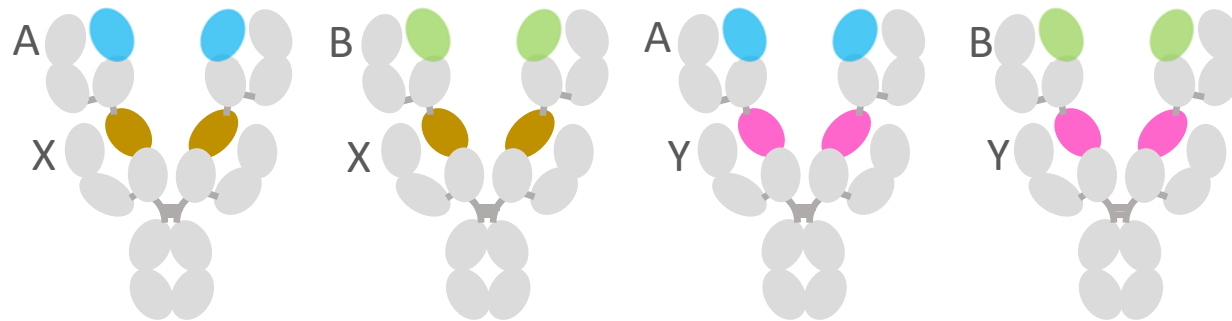
'First-in-Class' Drugs That
Combine Efficacy and Safety

Realizing Ideal
Efficacy with Safety
Through Bispecific-
Antibody
Technologies

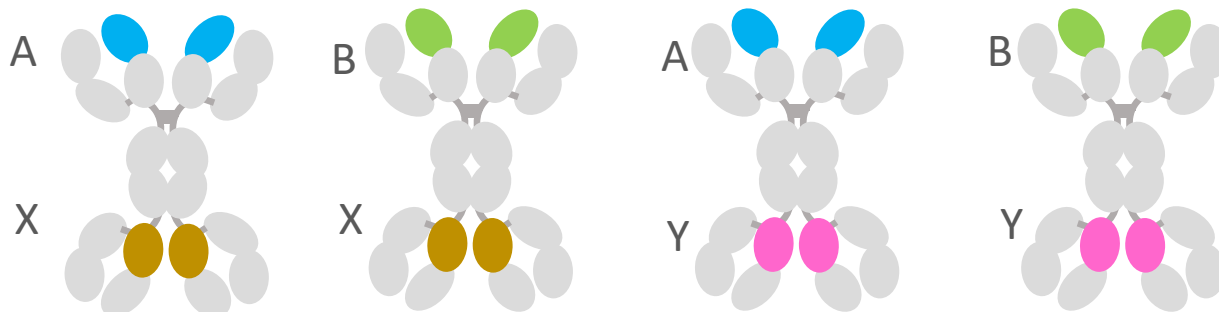


Expansion of the Bispecific-Antibody Project

Type I



Type II



Combinations of the targets
(A,B...) x (X, Y...)



Selection of the types
(Type I, II)



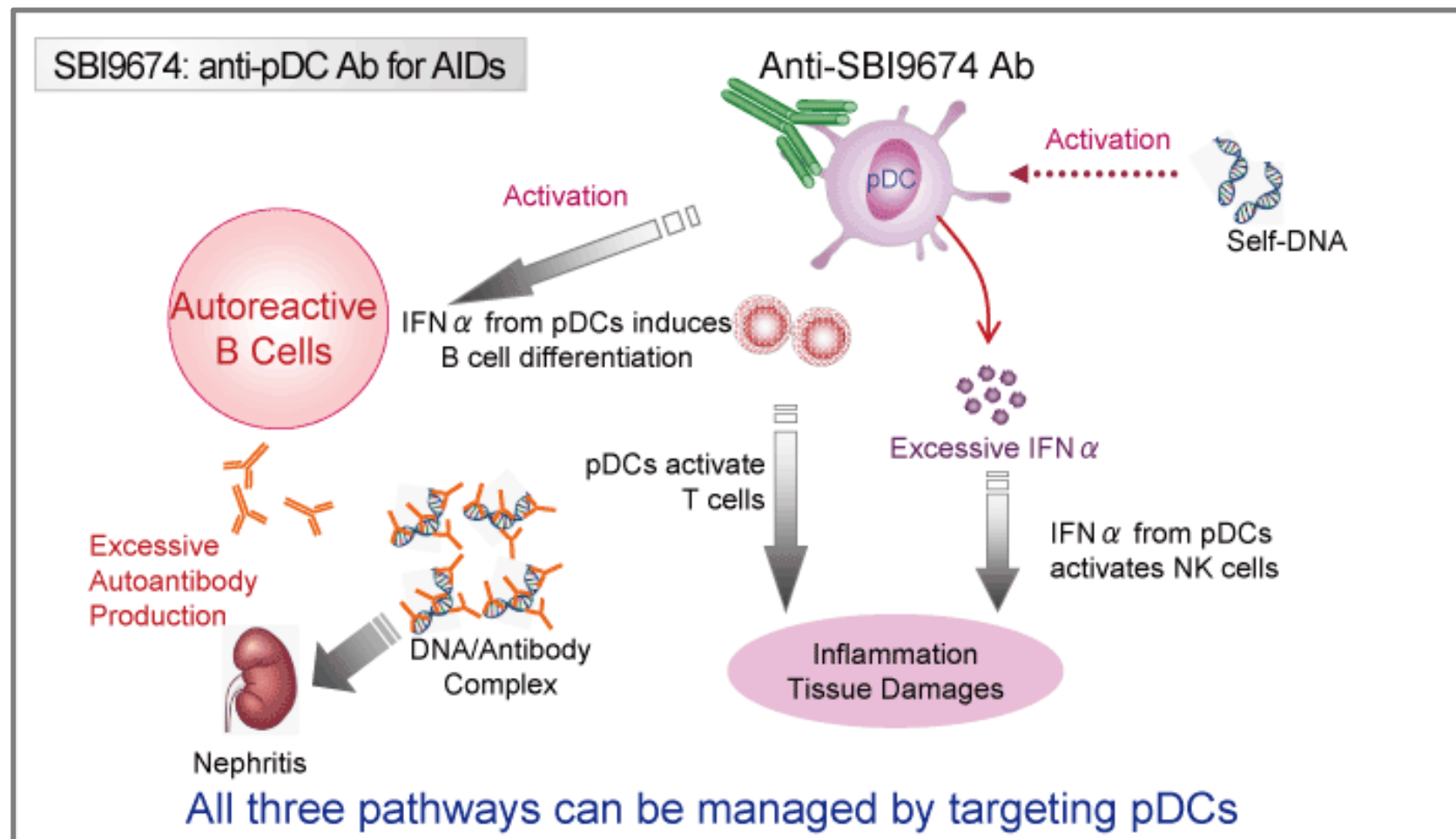
Challenges exceeding
the limitations of
conventional modalities

Collaboration-leveraged drug discovery

New antibody that targets pDCs (in-licensed from SBI Biotech)

In 2016 Kyowa Kirin concluded an exclusive licensing agreement with SBI Biotech Co., Ltd. covering development, manufacturing and sales worldwide for SBI-9674, an antibody drug for autoimmune diseases

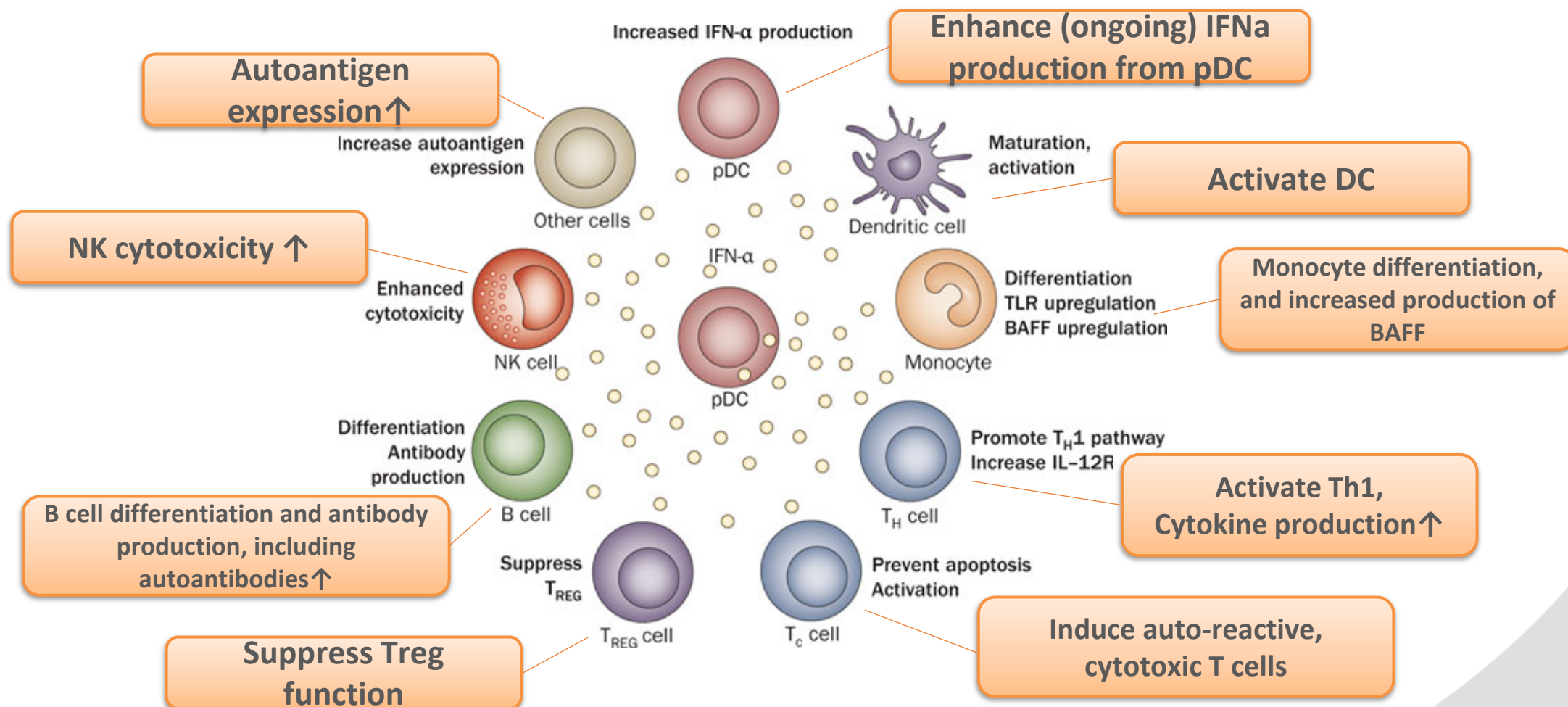
* pDC : Plasmacytoid dendritic cell



Source: SBI Biotech homepage (<https://www.sbibiotech.jp/english/pipeline/sbi9674.html>)

New antibody that targets pDCs (in-licensed from SBI Biotech)

- pDCs are known to be the main source of type 1 interferons (Type 1 IFN), which are the cause of various autoimmune diseases
- Type 1 IFN produced from pDCs coordinate immune functions through a variety of mechanisms (see the illustration below)



New antibody that targets pDCs (in-licensed from SBI Biotech)

- At this year's ACR (American College of Rheumatology) convergence, the results of the Phase 2 study of the developed compound that targets pDCs (Anti-BDCA2 mAb) in patients with SLE/CLE were reported

ABSTRACT NUMBER: 0935 • ACR Convergence 2020

Efficacy and Safety Results from a Phase 2, Randomized, Double-Blind Trial of BIIB059, an Anti-Blood Dendritic Cell Antigen 2 Antibody, in SLE

Richard Furie¹, Ronald van Vollenhoven², Kenneth Kalunian³, Sandra Navarra⁴, Juanita Romero-Díaz⁵, Victoria Werth⁶, Xiaobi Huang⁷, Hua Carroll⁸, Adam Meyers⁹, Cristina Musselli⁷, Catherine Barbey⁹ and Nathalie Franchimont⁷, ¹Zucker School of Medicine at Hofstra/Northwell, Great Neck, NY, ²Department of Rheumatology, Amsterdam Rheumatology and Immunology Center, Amsterdam, Netherlands, ³University of California San Diego, La Jolla, CA, ⁴University of Santo Tomas, Manila, Philippines, ⁵Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico City, Mexico, ⁶University of Pennsylvania and the Michael J. Crescenz VA Medical Center, Philadelphia, PA, ⁷Biogen, Cambridge, MA, ⁸Biogen, Cambridge, ⁹Biogen, Baar, Switzerland

Background/Purpose: Type I interferons (IFN-I), inflammatory mediators principally produced by plasmacytoid dendritic cells (pDCs), components of the innate immune system, have been implicated in the...


ABSTRACT NUMBER: 0986 • ACR Convergence 2020

BIIB059, a Humanized Monoclonal Antibody Targeting Blood Dendritic Cell Antigen 2 on Plasmacytoid Dendritic Cells, Shows Dose-Related Efficacy in a Phase 2 Study in Participants with Active Cutaneous Lupus Erythematosus

Victoria Werth¹, Richard Furie², Juanita Romero-Díaz³, Sandra Navarra⁴, Kenneth Kalunian⁵, Ronald van Vollenhoven⁶, Filippa Nyberg⁷, Benjamin Kaffenberger⁸, Saira Sheikh⁹, Goran Radunovic¹⁰, Xiaobi Huang¹¹, Hua Carroll¹², Francois Gaudreault¹², Adam Meyers¹¹, Catherine Barbey¹³, Cristina Musselli¹¹ and Nathalie Franchimont¹¹, ¹University of Pennsylvania and the Michael J. Crescenz VA Medical Center, Philadelphia, PA, ²Zucker School of Medicine at Hofstra/Northwell, Great Neck, NY, ³Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico City, Mexico, ⁴University of Santo Tomas, Manila, Philippines, ⁵University of California San Diego, La Jolla, CA, ⁶Department of Rheumatology, Amsterdam Rheumatology and Immunology Center, Amsterdam, Netherlands, ⁷Karolinska University Hospital, Stockholm, Sweden, ⁸Ohio State University, Columbus, OH, ⁹Division of Rheumatology, Allergy and Immunology, University of North Carolina, Chapel Hill, NC, ¹⁰Institute of Rheumatology, University of Belgrade, Belgrade, Serbia, ¹¹Biogen, Cambridge, MA, ¹²Biogen, Cambridge, ¹³Biogen, Baar, Switzerland

Background/Purpose: No approved targeted therapies have been developed for cutaneous lupus erythematosus (CLE), a disfiguring autoimmune disease that severely impairs quality of life.1 BIIB059 is...

Source: ACR convergence 2020 Abstract

- 
- ✓ pDCs are involved in the pathology of autoimmune diseases incl. SLE/CLE
 - ✓ Expectations are increasing for a therapeutic agent that targets pDCs

Projects aiming to launch products within several years

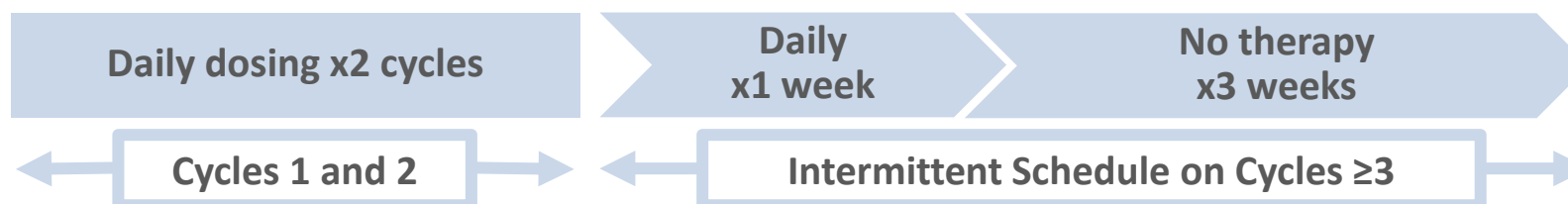
ME-401

ME-401: Results of a Phase 1b Study in B-cell Malignancies

ASCO 2020

ClinicalTrials.gov Identifier: NCT02914938

■ Treatment: ME-401 monotherapy or in combination with rituximab administered in IS



■ Overall Response Rate (ORR) and Adverse Events of Special Interest (AESI)

Diagnosis	Evaluable Patients	ORR n (%)	Adverse Event of Special Interest (AESI)	Grade ≥ 3
FL	36	30 (83%)	Diarrhea or colitis	
By treatment group			Diarrhea	2 (3.5%)
ME-401 monotherapy	17	13 (76%)	Colitis	2 (3.5%)
ME-401 + rituximab	19	17 (89%)	Rash, all types	1 (1.8%)
CLL/SLL	9	8 (89%)	ALT/AST elevation	1 (1.8%)
By treatment group			Stomatitis	0
ME-401 monotherapy	3	3 (100%)	Pneumonia/Infectious pneumonitis	0*
ME-401 + rituximab	6	5 (83%)	Non-Infectious pneumonitis	1 (1.8%)

ME-401 administered on an intermittent schedule showed a high response rate and was generally well tolerated in r/r FL and CLL/SLL

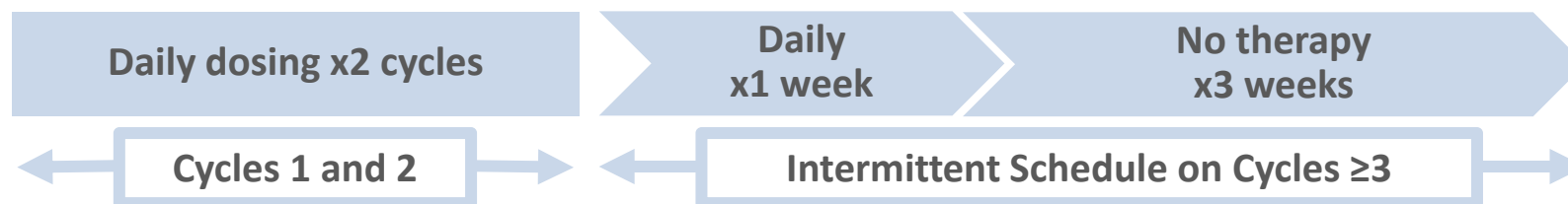
* A patient with grade 5 COVID-19 pneumonia in Cycle 15
IS: Intermittent schedule, 1 cycle: 28 days, ORR: Overall response rate, FL: Follicular Lymphoma, CLL/SLL: Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma, r/r: Relapsed/Refractory

ME-401: Global Phase 2 TIDAL* Study in r/r Follicular Lymphoma or Marginal Zone Lymphoma

ClinicalTrials.gov Identifier: NCT03768505



- Subjects: Patients with r/r FL after failure of at least two systemic therapies
- Treatment: ME-401 monotherapy administered on an intermittent schedule



- Target number of patients: 180
- Study location: US, Europe, Oceania, South Korea, Taiwan
- Primary endpoint: Overall response rate
- The results of TIDAL are intended to be submitted to the U.S. Food and Drug Administration (FDA) to support accelerated approval of the marketing application

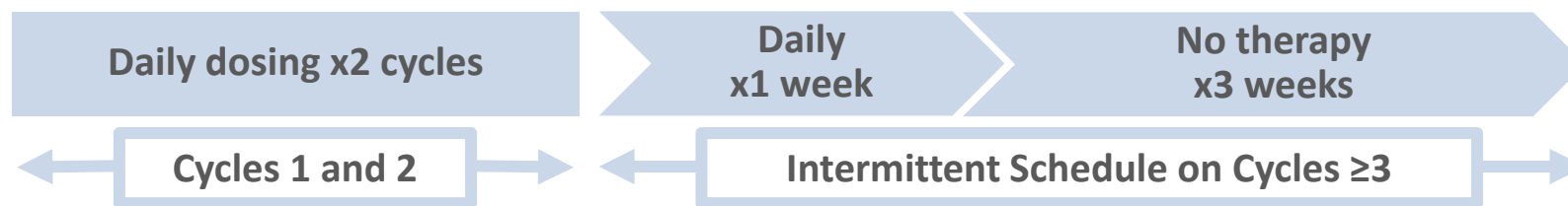
* TIDAL: Trials of PI3K DeltA in Non-Hodgkin's Lymphoma

ME-401: Japanese Phase 2 K02 Study in r/r Indolent B-cell NHL

ClinicalTrials.gov Identifier: NCT04533581



- **Subjects:** Patients with r/r indolent B-cell NHL* after failure of at least two systemic therapies
- **Treatment:** ME-401 monotherapy administered on an intermittent schedule

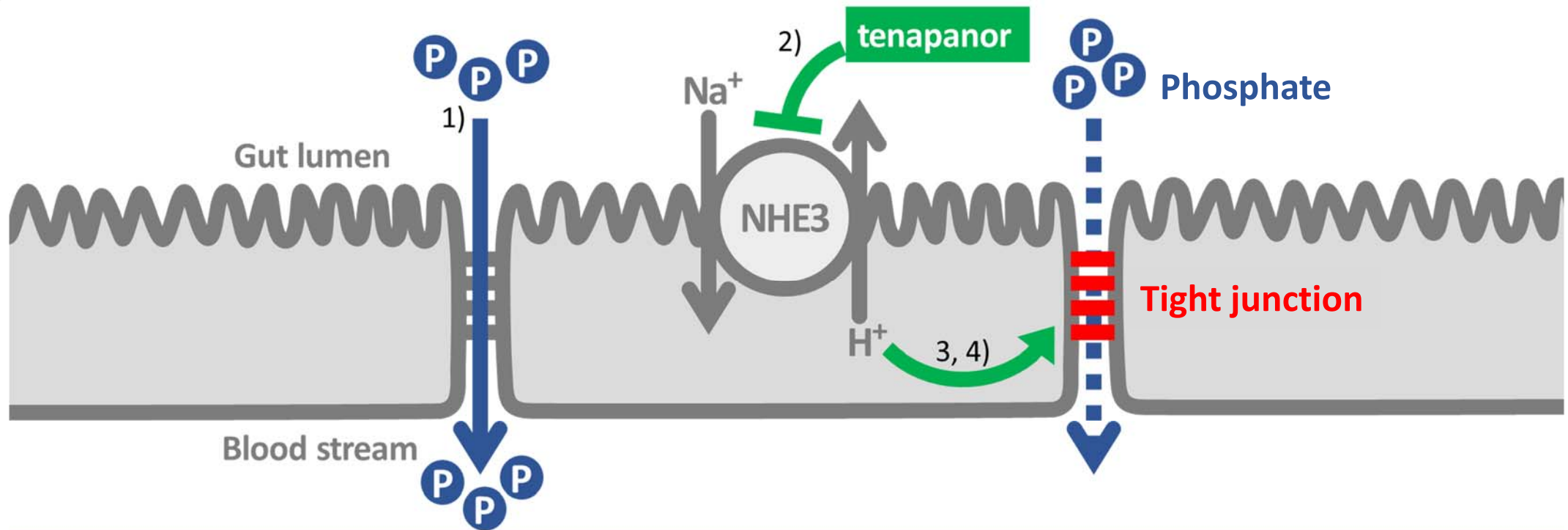


- **Target number of patients:** 60
- **Study location:** Japan
- **Primary endpoint:** Overall response rate
- **Plan to consider submission of the marketing application to the Japanese authorities after completion of the K02 study**

* Excluding Small lymphocytic lymphoma (SLL), lymphoplasmacytic lymphoma (LPL), and Waldenström's macroglobulinemia (WM)

KHK7791

KHK7791 / tenapanor



Mechanism of action

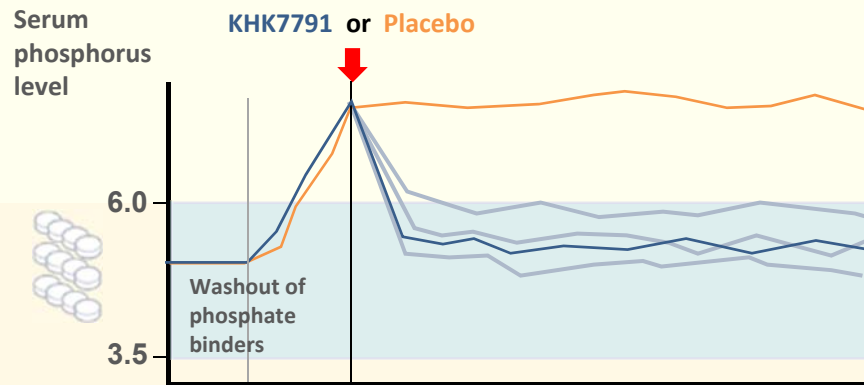
- ✓ The primary uptake route of phosphorous is passive transport between cell membranes
- ✓ Tenapanor inhibits NHE3 and thereby inhibits the uptake of sodium (Na^+)
- ✓ At the same time, the concentration of protons (H^+) in the cells increases
- ✓ The increased intracellular proton concentration tightens the epithelial cell junctions, which regulates the uptake of phosphorous in the digestive tract, and thereby inhibits the uptake of phosphorous

Features

- ✓ Unlike existing phosphorous binders, the novel mechanism of action makes it a first-in-class phosphorous absorption inhibitor

Summary of the Phase 2 studies (Dose-finding, Add-on, Switching)

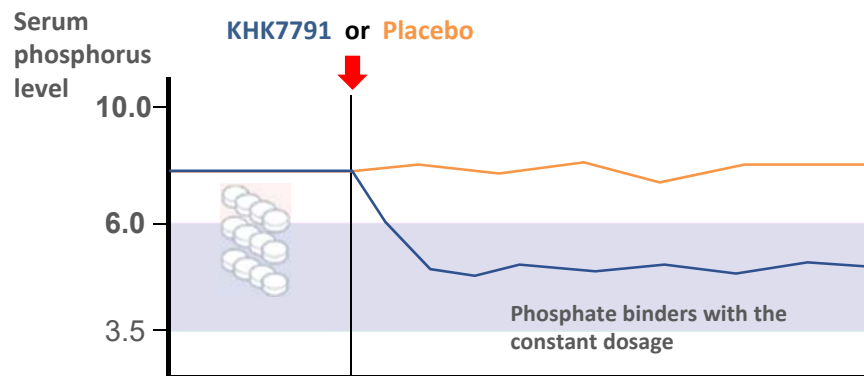
Dose-finding



Objectives

- ✓ Explain that hyperphosphatemia can be treated with a single agent, KHK7791
- ✓ Explain the validity of using KHK7791 for patients who are starting treatment for hyperphosphatemia

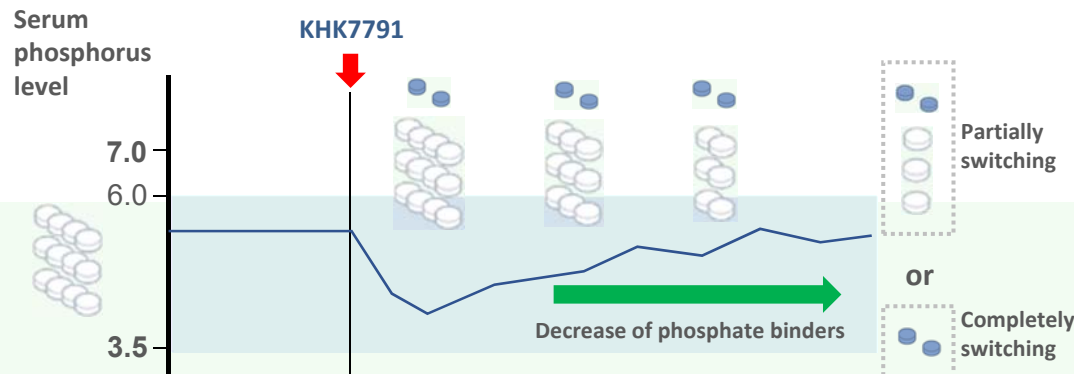
Add-on



Objectives

- ✓ Satisfy the unmet needs that cannot be controlled with existing phosphate binders
- ✓ Confirm the efficacy by coadministration of KHK7791 with phosphate binders

Switching



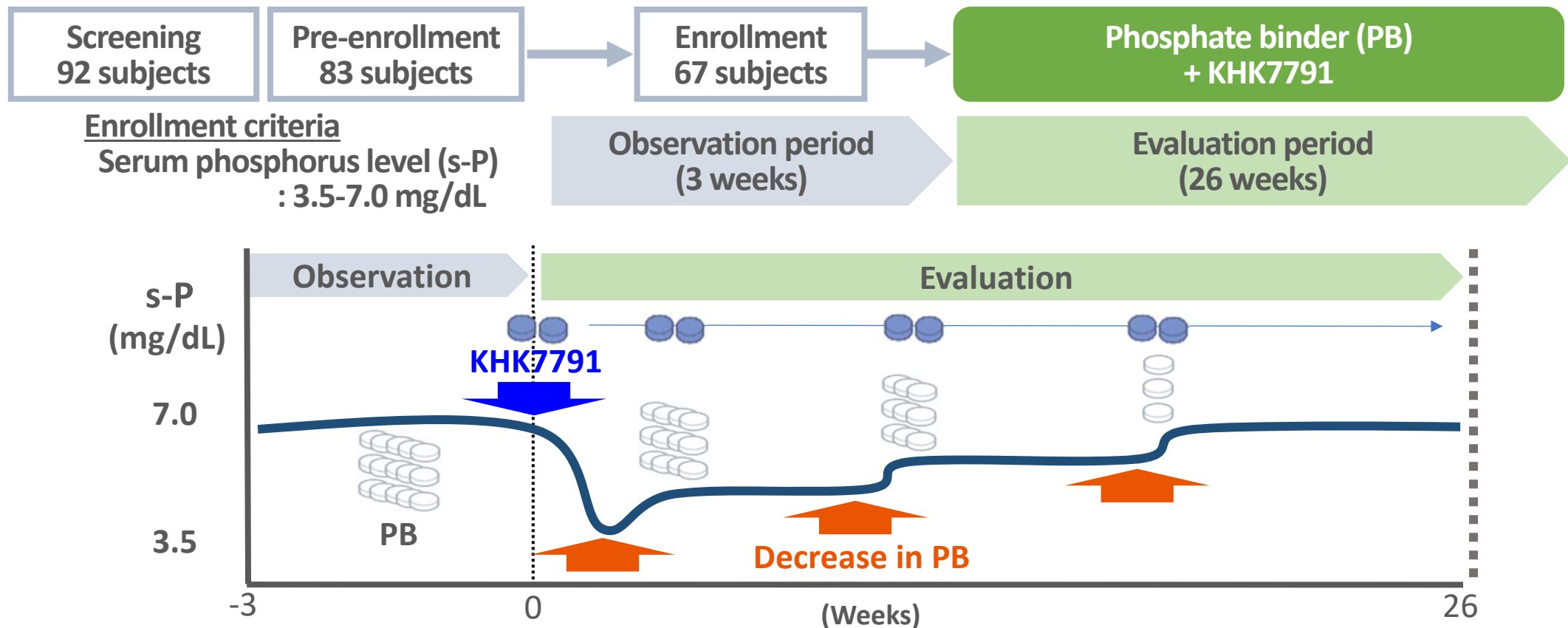
Objectives

- ✓ Explain the benefit of switching from existing phosphate binders, taking advantage of the small pill size and quantity
- ✓ Quantitatively confirm the reduction in phosphate binder pill burden

KHK7791: PB switching study design

ClinicalTrials.gov Identifier: NCT03831607

- Open-label, single-arm, phosphate binder (PB) switch study for hyperphosphatemia patients on hemodialysis



- Primary endpoint : Achievement of 30% decrease in the mean total tablet number (PB+KHK7791) compared to baseline PB

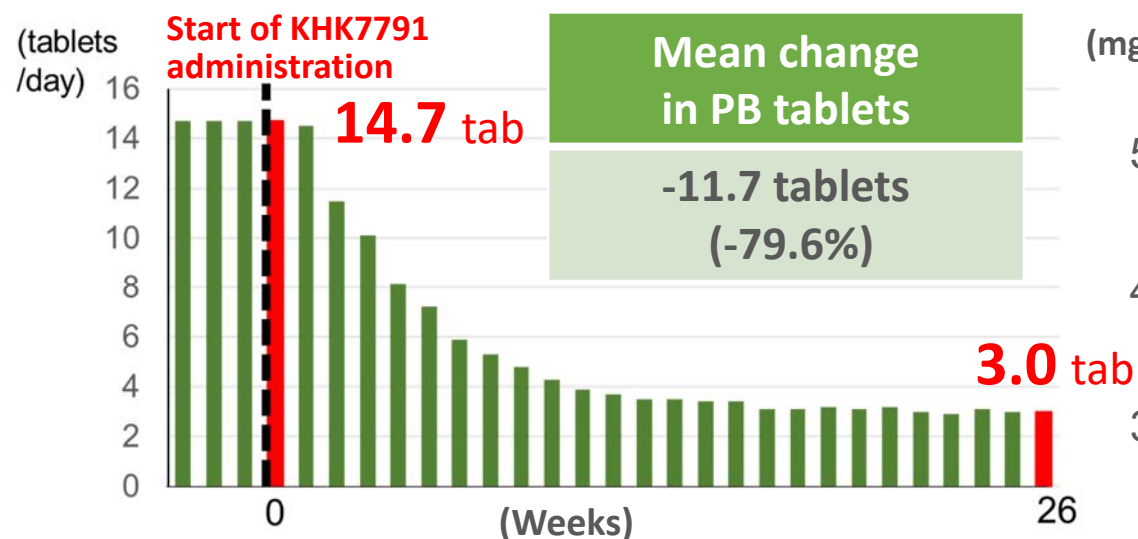
KHK7791: PB switching study results

■ Primary endpoint

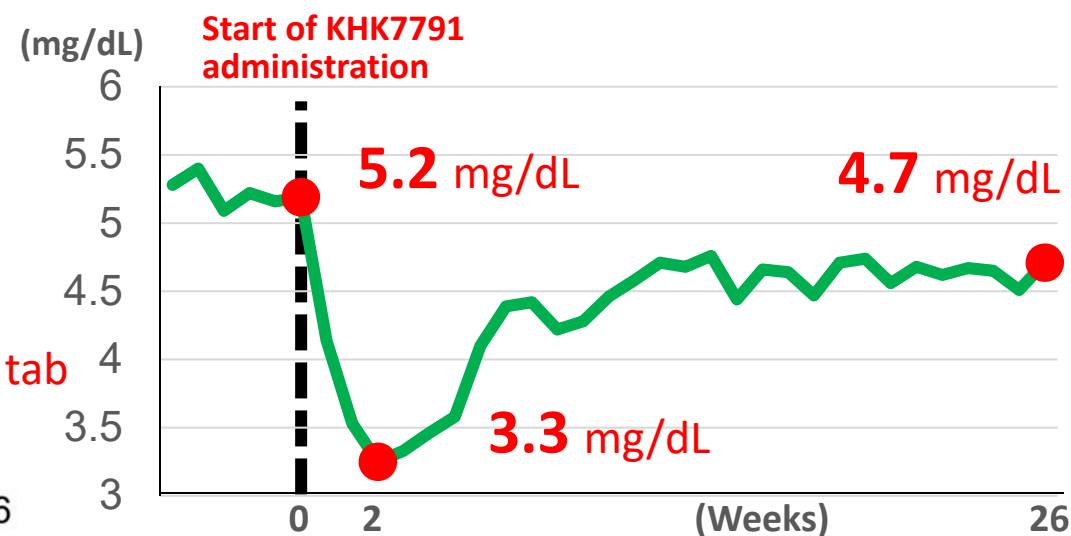
	Achievement ratio	P value [95%CI]
30% decrease	71.6% (48/67)	<0.001 [59.3, 82.0]

CI confidence interval.

■ Mean change in total PB tablets over time



■ Mean change in s-P over time

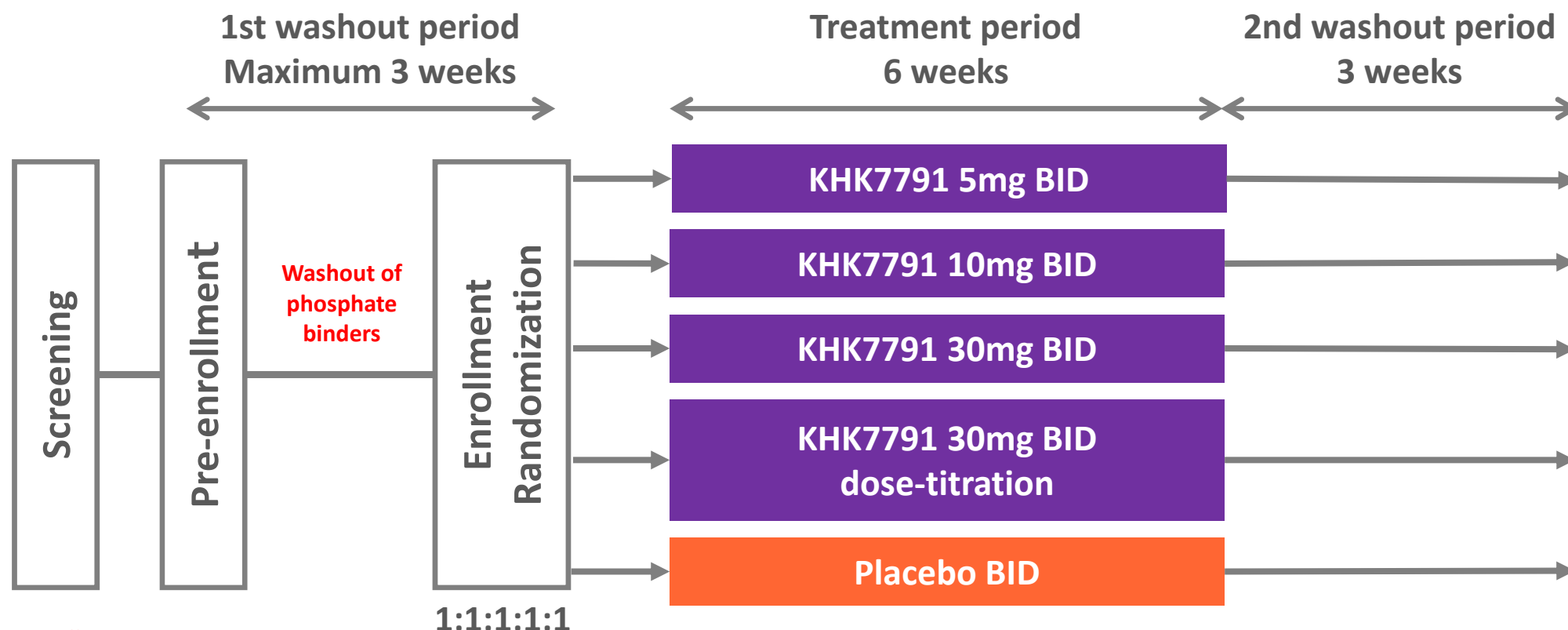


More than 70% patients achieved a 30% decrease in the total number of PB tablets compared to the baseline.

KHK7791: Dose-finding study design

ClinicalTrials.gov Identifier: NCT03864458

- A phase 2, randomized, double-blind, placebo-controlled, dose-finding study of KHK7791 in hyperphosphatemia patients on hemodialysis



Enrollment criteria

(Pre-enrollment) Serum phosphorus level : 3.5-6.0 mg/dL

(Enrollment) Serum phosphorus level : Increased by ≥ 1.0 mg/dL from screening to 6.1-9.9 mg/dL

◆ Sites : 31

◆ Target patients : 200

- Primary endpoint: Changes in serum phosphorus levels from baseline values at Week 6

KHK7791: Dose-finding study results

■ Primary endpoint

		Placebo	KHK7791 5 mg	KHK7791 10 mg	KHK7791 30 mg	KHK7791 30 mg dose- titration
		N=41	N=42	N=41	N=42	N=41
Week 6 Serum phosphorus level (mg/dL)	Mean±SD	0.6±1.6	-0.9±1.7	-1.4±1.5	-1.9±1.2	-2.0±1.1
	Median	0.4	-1.0	-1.5	-2.1	-2.0
	Difference	-	-1.6	-2.0	-2.6	-2.6
	95% CI	-	[-2.3,-0.9]	[-2.7,-1.3]	[-3.2,-2.0]	[-3.2,-2.0]
	p-value	-	<0.001	<0.001	<0.001	<0.001

■ Drug-related TEAEs, discontinued

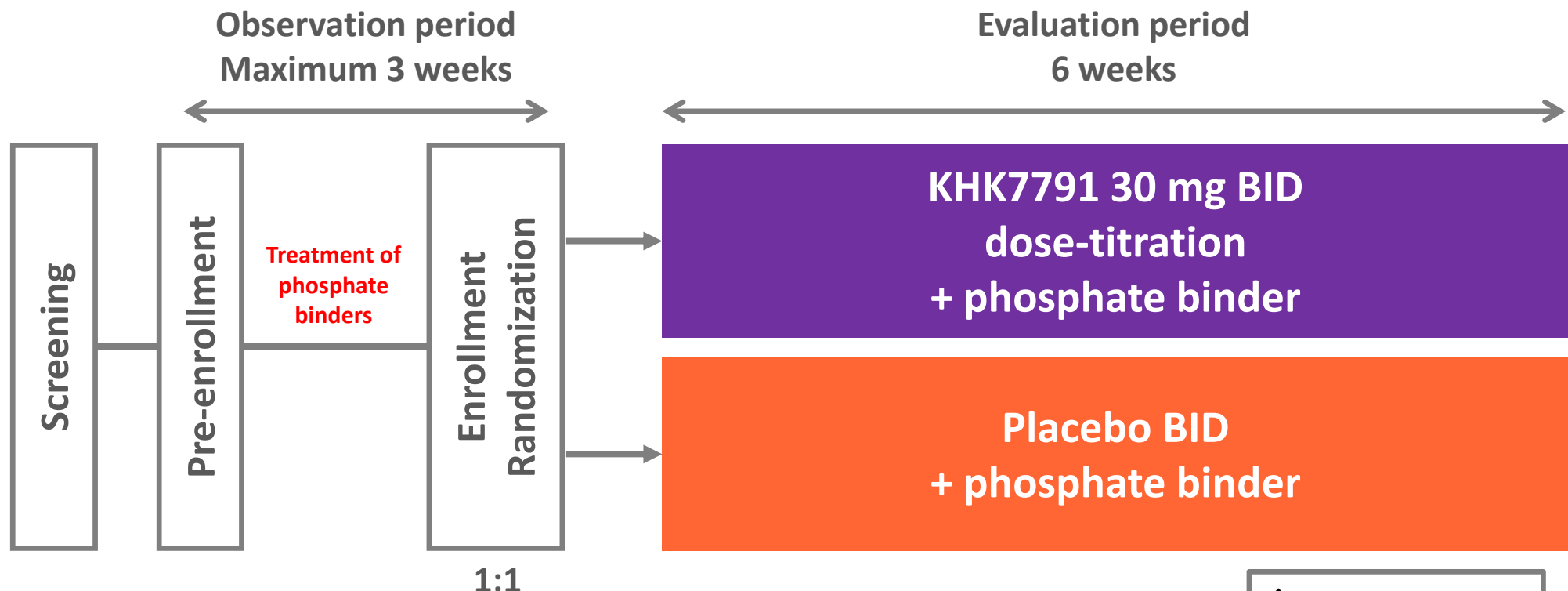
		Placebo		KHK7791 5 mg		KHK7791 10 mg		KHK7791 30 mg		KHK7791 30 mg dose-titration	
		N=41		N=42		N=41		N=42		N=41	
		N	%	N	%	N	%	N	%	N	%
Drug-related TEAEs		7	(17.1)	22	(52.4)	28	(68.3)	32	(76.2)	28	(68.3)
[Gastrointestinal disorders]		5	(12.2)	22	(52.4)	28	(68.3)	32	(76.2)	28	(68.3)
Diarrhea		4	(9.8)	21	(50.0)	27	(65.9)	32	(76.2)	27	(65.9)
Severity of diarrhea	Mild	4		21		25		28		24	
	Moderate	0		0		2		4		3	
	Severe	0		0		0		0		0	

KHK7791 significantly decreased serum phosphorus levels from baseline compared with the placebo and decreased serum phosphorus levels in a dose-dependent manner.

KHK7791: Add-on study design

ClinicalTrials.gov Identifier: NCT03864445

- A phase 2, randomized, double-blind, placebo-controlled, phosphate binder-combination study of KHK7791 in hyperphosphatemia patients on hemodialysis



Enrollment criteria

(Pre-enrollment, Enrollment) Serum phosphorus level : 6.1-9.9 mg/dL

◆ Sites : 9

◆ Target patients: 40

- **Primary endpoint: Changes in serum phosphorus levels from baseline values at Week 6**

KHK7791: Add-on study results

■ Primary endpoint and target achievement ratio of serum phosphorus level (3.5~6.0 mg/dL)

		Placebo N=24	KHK7791 N=23
Week 6 Serum phosphorus level (mg/dL)	Mean±SD	0.1±1.5	-2.0±1.2
	Median	-0.2	-2.1
	Difference	-	-2.1
	95% CI	-	[-2.9,-1.3]
	p-value	-	<0.001
Week 6 Target achievement proportion	% (n/N)	37.5 (9/24)	87.0 (20/23)

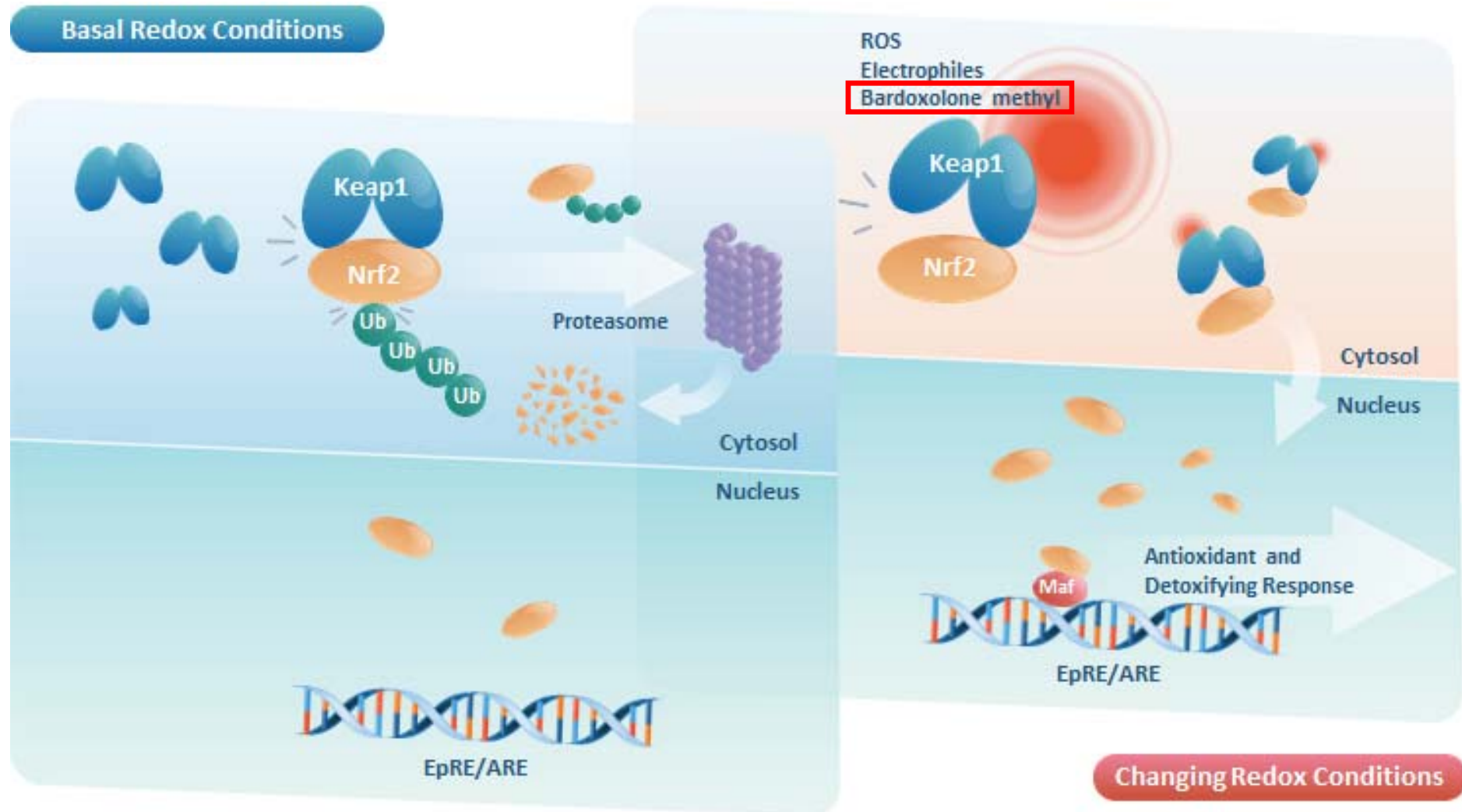
■ Drug-related TEAEs, discontinued

		Placebo N=24		KHK7791 N=23	
		N	%	N	%
Drug-related TEAEs		2	(8.3)	16	(69.6)
[Gastrointestinal disorders]		2	(8.3)	16	(69.6)
Diarrhea		2	(8.3)	15	(65.2)
Severity of diarrhea	Mild	2		8	
	Moderate	0		7	
	Severe	0		0	

Adding on KHK7791 resulted in a significant decrease in serum phosphorus levels compared with the placebo.

RTA 402

RTA 402 / Bardoxolone methyl



Kanda H and Yamawaki K, Clinical and Experimental Nephrology 24:857–864, 2020

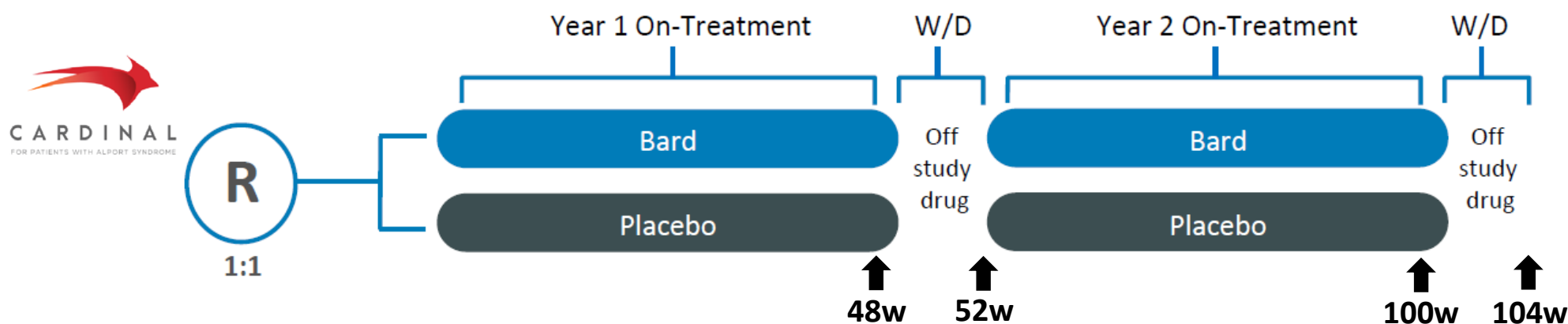
RTA 402 (Bardoxolone methyl) activates the Keap1-Nrf2 pathway, which is an oxidative stress response system.

RTA 402: CARDINAL Phase 3 for Alport Syndrome patients

What is Alport Syndrome?

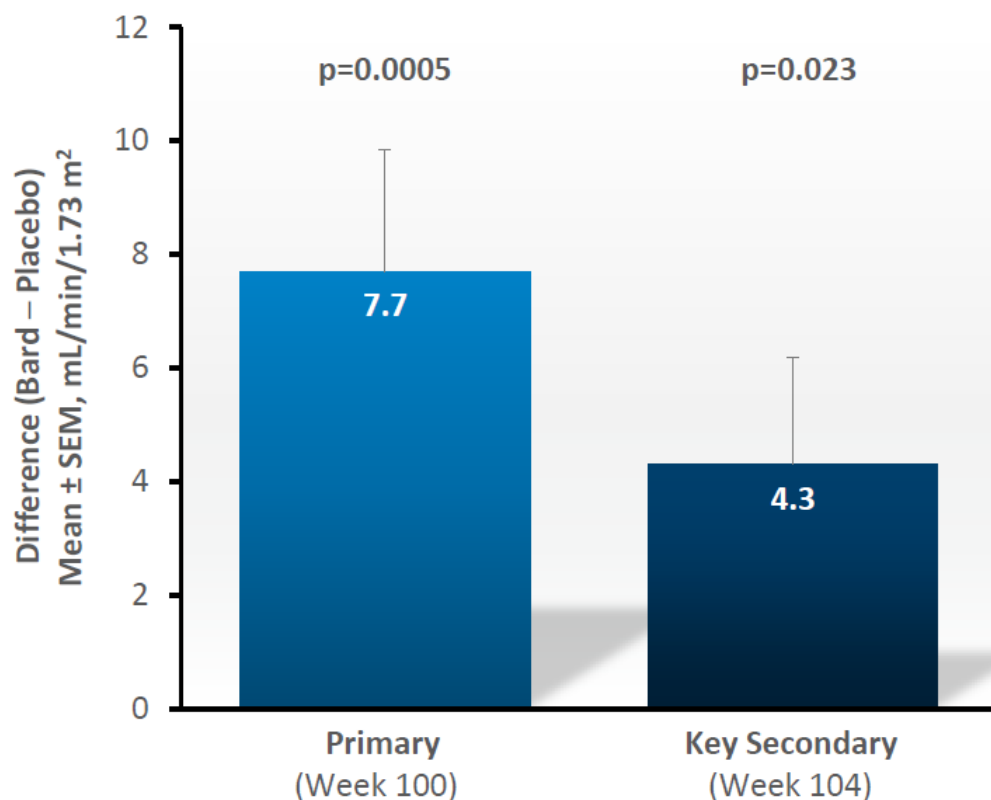
Alport Syndrome is a kidney disease caused by genetic mutations in either the type IV collagen $\alpha 3$, $\alpha 4$ or $\alpha 5$ chain. In Japan, Alport Syndrome is certified as designated intractable diseases and specific pediatric chronic diseases. Severe cases have been reported to progress to end-stage kidney disease in the late teens and early 20s. Currently there is no approved treatment for Alport Syndrome as an indication.

- Number of subjects : 157 (Placebo: 80, RTA 402: 77)
- Subjects : 12-70 years, eGFR: 30-90 mL/min/1.73m²
- Primary efficacy endpoint : Change in eGFR from baseline at Week 48 and Week 100
- Key secondary endpoint : Change in eGFR from baseline at Week 52 and Week 104 (4 weeks after withdrawal of drug)
- Region : US, JP, EU, AU



The 2-year study period was completed, and Reata announced the year 2 results on Nov 9th.

RTA 402: CARDINAL Phase 3 for Alport Syndrome patients



Mean \pm SEM eGFR Change (mL/min/1.73 m²)

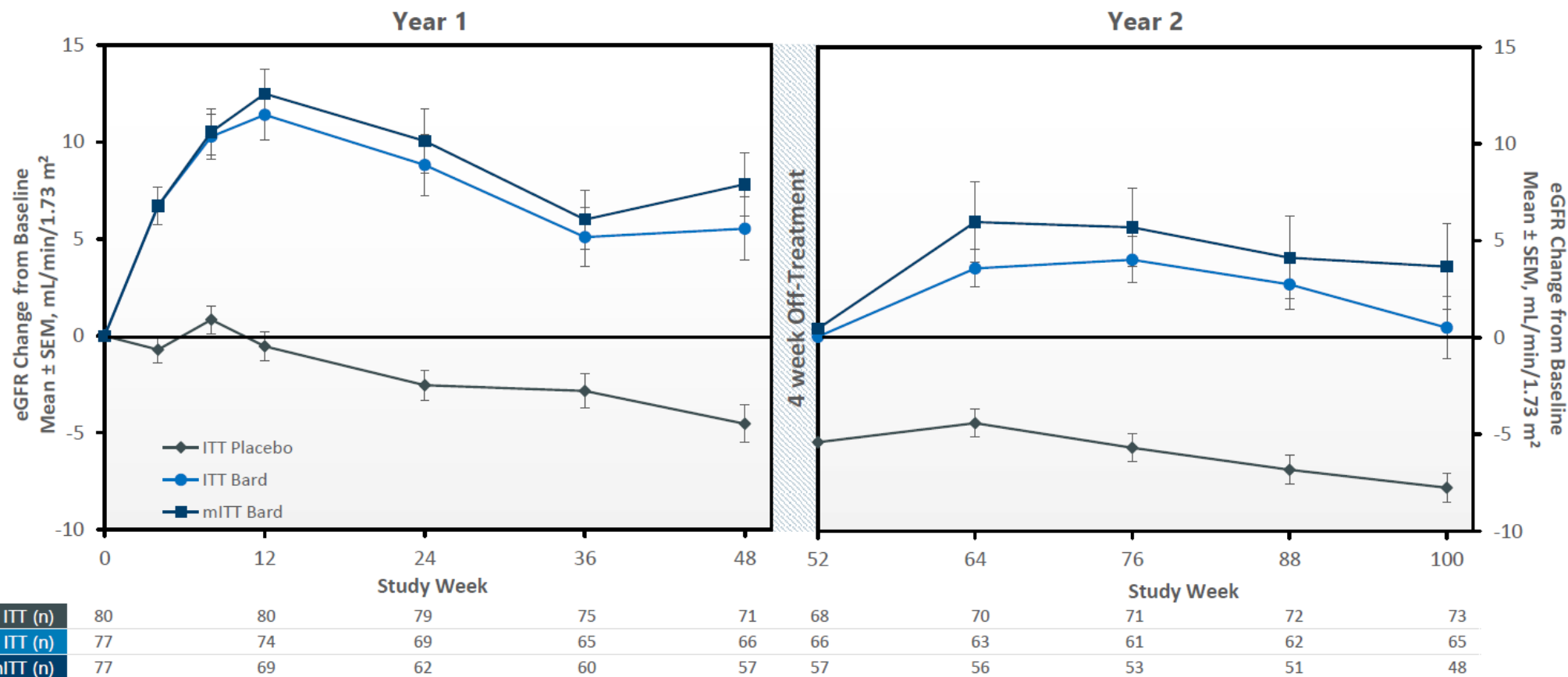
Endpoint	Placebo	Bard	Difference (Bard — Placebo)
Primary (ITT)	-8.5 \pm 1.5	-0.8 \pm 1.6	7.7 \pm 2.1 (p=0.0005)
Primary (mITT)	-9.6 \pm 1.5	1.7 \pm 1.6	11.3 \pm 2.2 (p<0.0001)
Key Secondary (ITT)	-8.8 \pm 1.4	-4.5 \pm 1.4	4.3 \pm 1.9 (p=0.023)

ITT: Intent to treat

mITT: modified-ITT, analysis assesses the effect of receiving treatment by excluding values after patients discontinued treatment

**Both primary/key secondary endpoints were met.
The results also show a favorable safety profile.**

RTA 402: CARDINAL Phase 3 for Alport Syndrome patients



Effect for eGFR was observed over the study period in the RTA 402 group.

Based on the current results, KKC also plans to submit a marketing approval application for the indication of Alport Syndrome in Japan.

Summary

Summary (1): Challenging the creation of new value in R&D

Initiatives for expanding the opportunities to create value unique to Kyowa Kirin

- **Initiatives and innovation through internal activities + collaborations**
 - Axcelead, InveniAI, SBI Biotech
 - **Next generation antibody technology**, Nucleic acid therapeutics, Small molecule drug discovery, Regenerative medicine
- **Foster next generation product candidates (global products, etc.)**
 - KHK4083, KW-6356, ME-401, RTA 402, KHK7791...

Technology strategy

Utilize next generation antibody technology and diverse modalities to build a platform that will support revolutionary new pharmaceuticals

Disease strategy

Utilize the accumulated knowledge and technology to change the lives of patients by providing unique value for UMN

Summary (2): Challenging the creation of new value in R&D

R&D spirits



Q&A Session

Thank you.

Kyowa Kirin Co., Ltd.

KYOWA KIRIN

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