Perseus Proteomics Inc.
(Security code:4882)

FY2021 First Half Business Results
November 15, 2021

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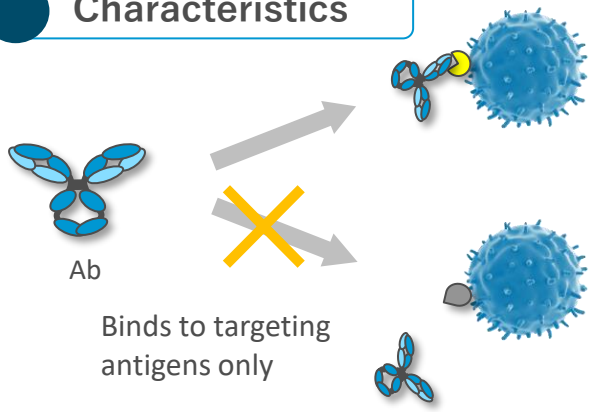
What are Ab drugs?

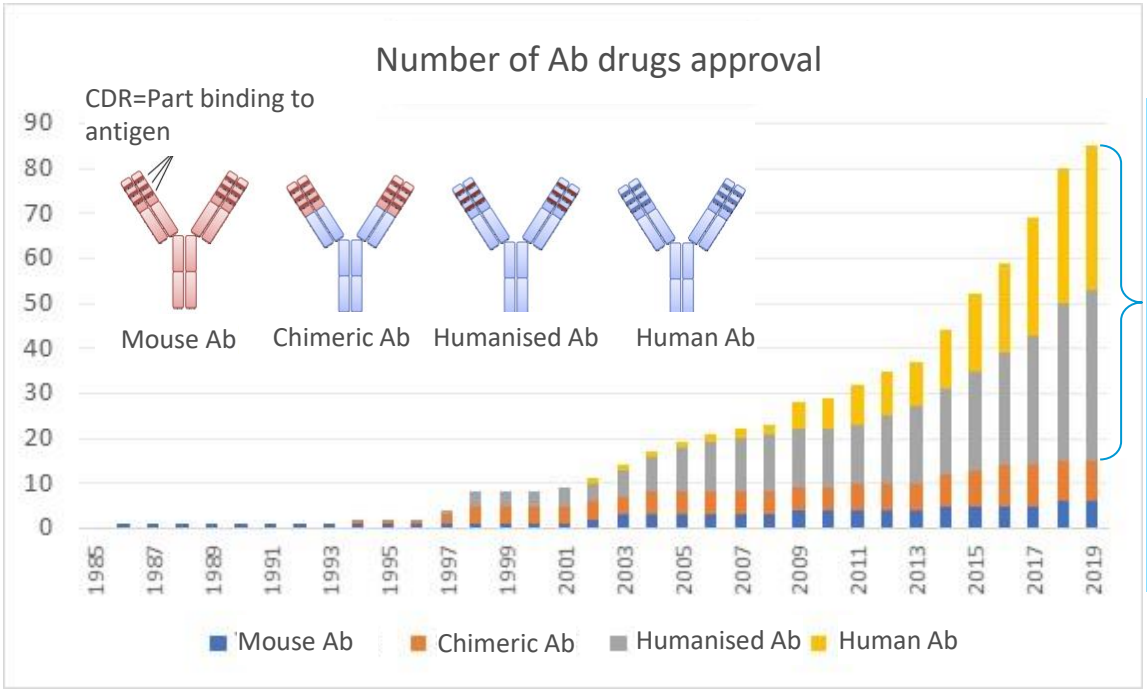
Abs are substances that remove foreign objects in human body
Ab drugs are Abs obtained against targets expressed on cancers or pathogens

Characteristics



Expected effects

- Blocks signal transmission and inhibits multiplication functions, etc.
- Activates immune cells including T cells to induce cytotoxicity
- Activates physiological functions
- Transmits drugs to cells where targets are expressed



Indication of Ab drugs

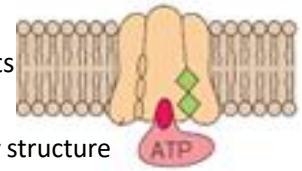
- Cancer
- Rheumatism
- Inflammatory bowel disorder
- Psoriasis
- Infectious diseases
- Bronchial asthma
- Atopic dermatitis
- Seasonal allergic rhinitis
- Complement deficiencies
- Hypercholesteremia
- Macular degeneration
- Rare diseases
- Urticaria

Source: data from National Institute of Health Sciences
Calculated based on Approval date in Japan, USA and Europe

Ab creation technology now required

Difficulty=High antigen

The most important targets
Still untouched



Quaternary structure

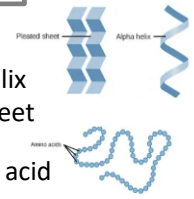
Difficulty=Medium antigen

Receptor-type targets
Needs functional Ab

Tertiary structure

Difficulty=Easy antigen

Antigen as targets already developed



α helix
B sheet
Amino acid

Important targets are not easily reachable.

Any technology to help us to get the fruit on the treetop easily?

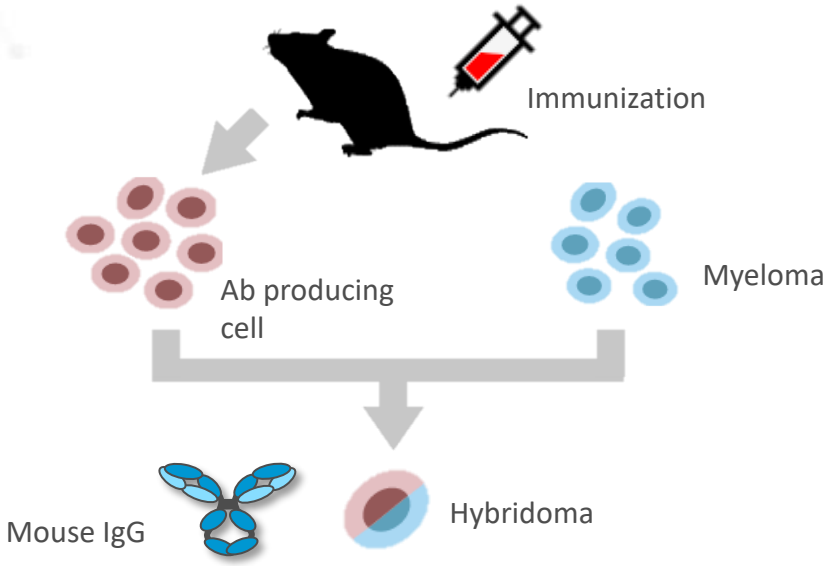
Small molecules might cause side effects. They may not have enough efficacy.

Antigen preparation is the core task!

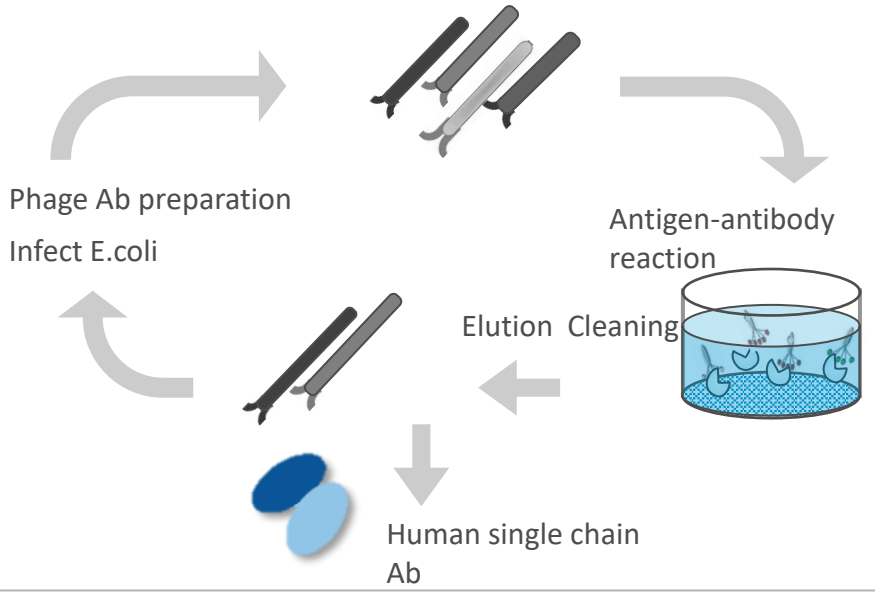
Technology required for obtaining Abs efficiently against medium to high level antigens

Our technology to obtain Abs

1) Hybridoma method



2) Phage display method



Merit

- Easy method, established technique
- Increased biological affinity
- Low cost

- Possible to obtain human Ab
- No animals used
- No need to consider biological toxicity
- Rich in screening conditions

Problem

- Abs with species crossing are hard to obtain
- Needs humanisation due to immunnogenicity
- Abs against complex antigens are hard to obtain
- Easy-to-obtain Abs already developed

  ⇒ Focusing on new targets and modified Abs including ADC*1 and RIT*2

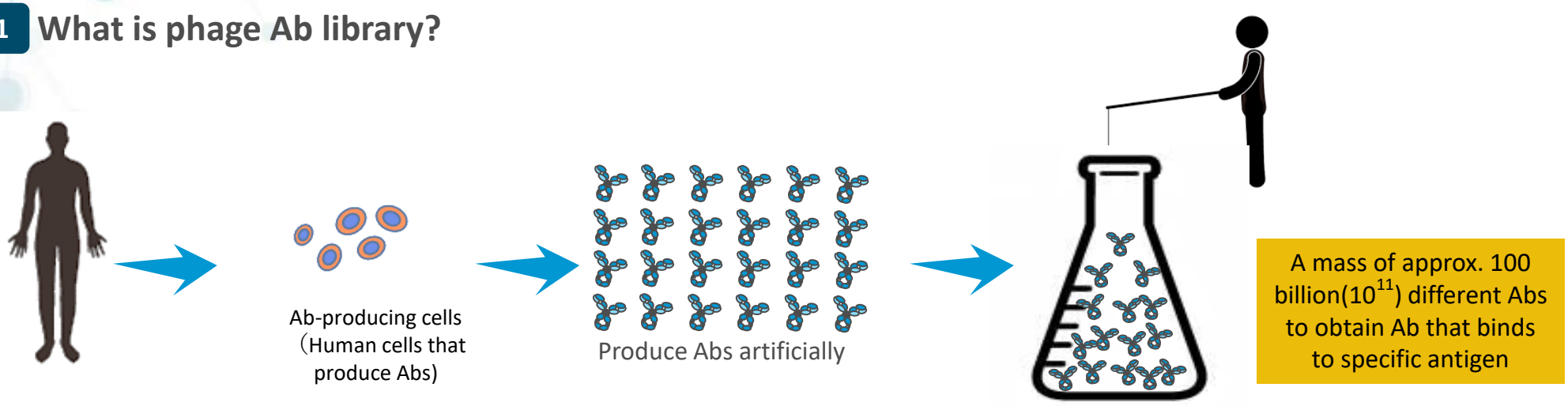
- Needs skills in creation of libraries
- More expensive than animal immunization
- Low affinity of antigen-antibody

  ⇒ Conquered this problem by maximising library diversity

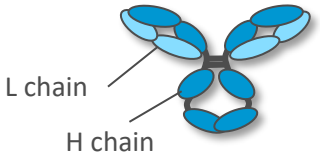
*1 ADC: Antibody drug conjugate. It delivers drug combined with Ab by utilizing Ab function.
*2 RIT: Radioimmunotherapy. Radioisotope combined with Ab irradiates cancer cells by utilizing Ab function.

Our strength: Phage Ab library

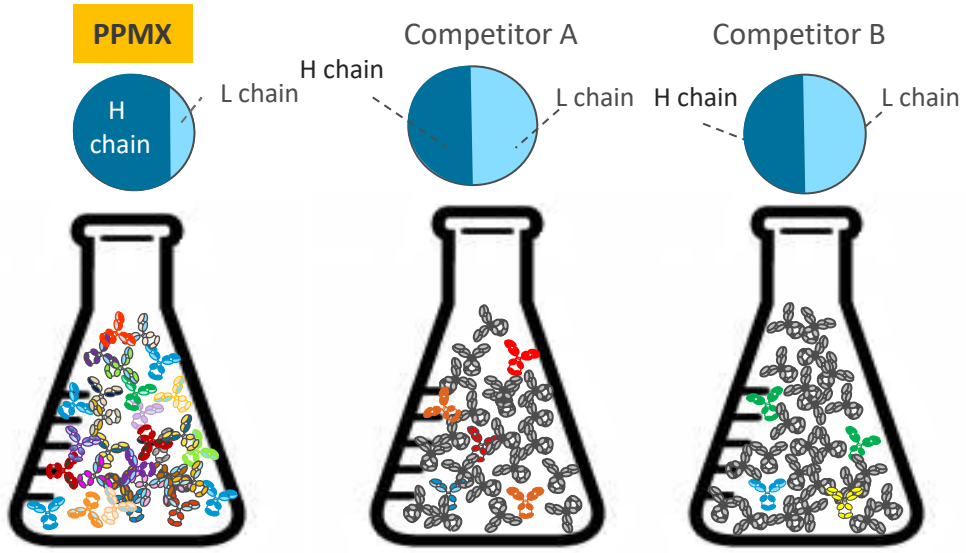
1 What is phage Ab library?



2 Our design of phage Ab library



We maximise diversity of H chain by focusing on H chain (our unique library)



While numbers of Abs are the same 10 billion, diversities are different

Phage display method utilizing maximised diversity of Ab library

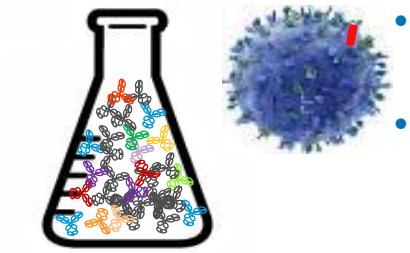
Our strength: Ab screening using cell (PPMX exclusive method)

Problem 1

During preparation of antigen, steric structure is lost.

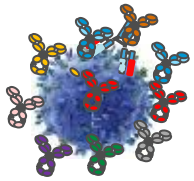
Solution

Ab screening using living cells



- Reflects complex steric structure through using living cells
- Directly obtains Abs against antigens on cell membrane

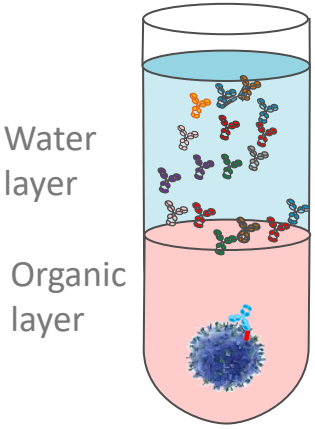
Problem 2



Numerous unrelated Abs also bind to cells.

Solution

ICOS* method: Ab screening utilizing organic solvent



- Obtains Abs that bind to antigen only
- Patent registered

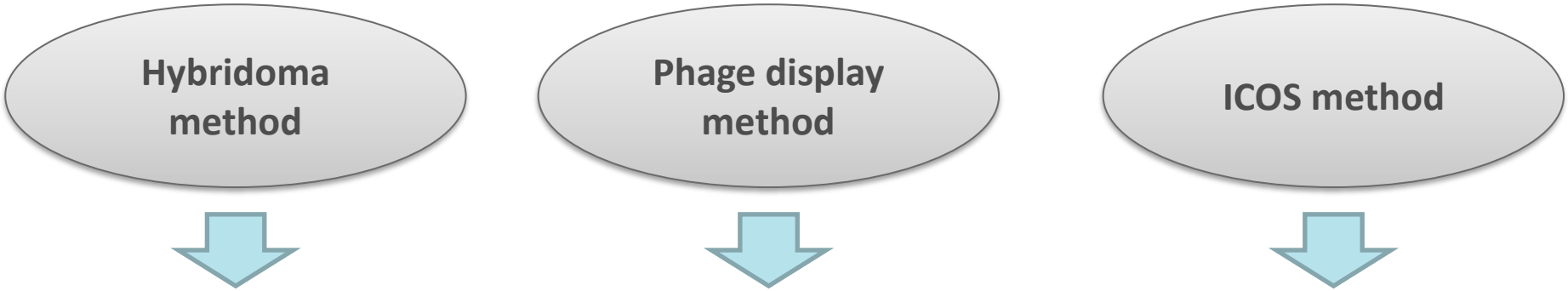
Efficiently separates Abs difficult to obtain by targeting cells

*Isolation of antigen/antibody Complexes through Organic Solvent

Summary of technology to obtain Abs

Our technology on Ab drug development

Our unique technology platform sophisticated
to aim at drug discovery for highly difficult targets



Mature and reliable technology

Maximizing human Ab diversity

Reflecting complex steric structure on cell membrane

Showing our maximum value
in developing anti-cancer drugs

PPMX's sophisticated Ab obtaining platform

Contents

01 Topics

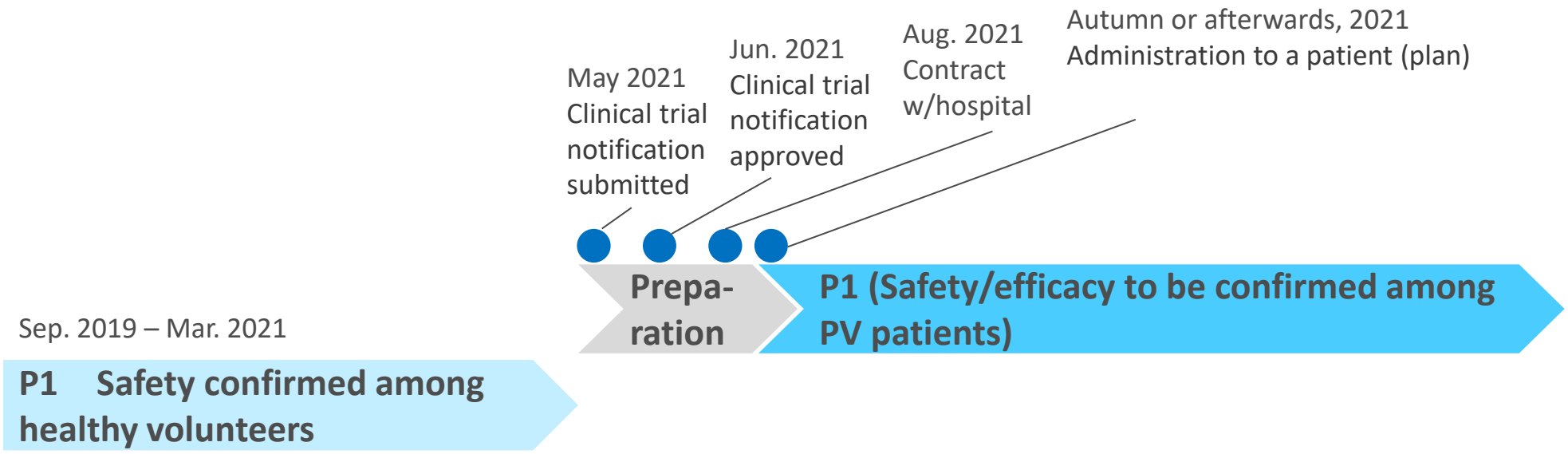
Topics

1. **PPMX-T003, Ab under development in house:**
   Started phase I clinical trial among polycythemia vera patients

2. **PPMX-T001:**
   Phase I clinical trial of ERY974 in combination with atezolizumab and bevacizumab by Chugai Pharmaceutical

1 PPMX-T003, Ab under development in-house: Started phase I clinical trial among polycythemia vera patients

Code No.	PPMX-T003
Applicable disease	Polycythemia vera (PV), various blood cancers
Stage	Phase I clinical trial (JP: preparation for first patient in)
Out-lisenced to	-



- **Clinical trial information**

jRCT
jRCT2051210083: https://jrct.niph.go.jp/en-latest-detail/jRCT2051210083
clinicaltrials.gov
NCT05074550： https://clinicaltrials.gov/ct2/show/NCT05074550

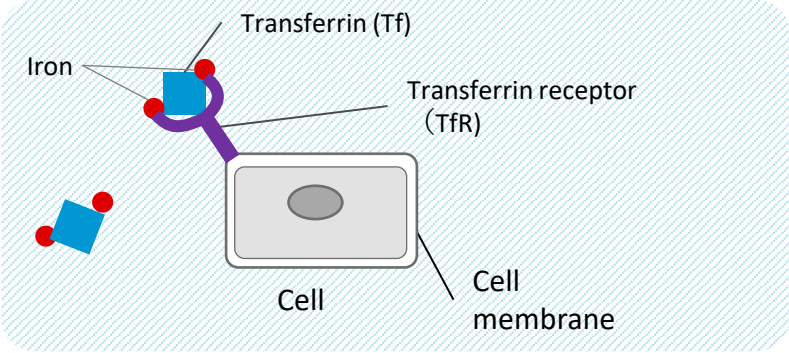
PPMX-T003

First-in-class anti-cancer drug candidate targeting transferrin receptor

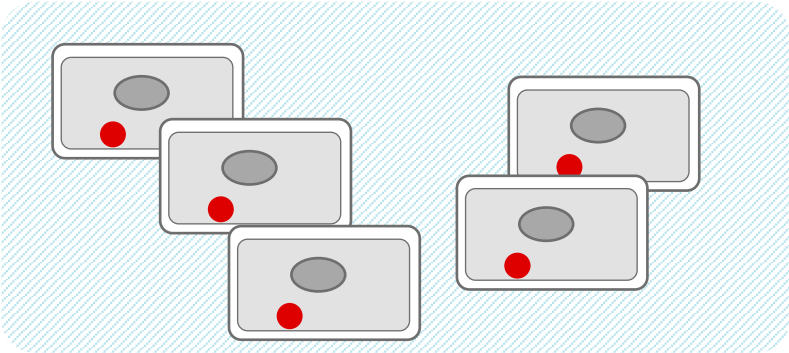
Transferrin receptor (TfR):

- Strong target molecule for anti-cancer drug
- Expressed on cell membrane. Binds to transferrin (Tf) carrying iron for cellular iron uptake

1 TfR binds to Tf



2 Cell proliferation



[Cells where TfR is highly expressed]

- Erythroblast (normal cell, RBC producing cell)
- Cancer cell (especially acute cancer which is actively proliferating)

Well-known concept

Blocking iron
⇒ Death or proliferation inhibition of cells

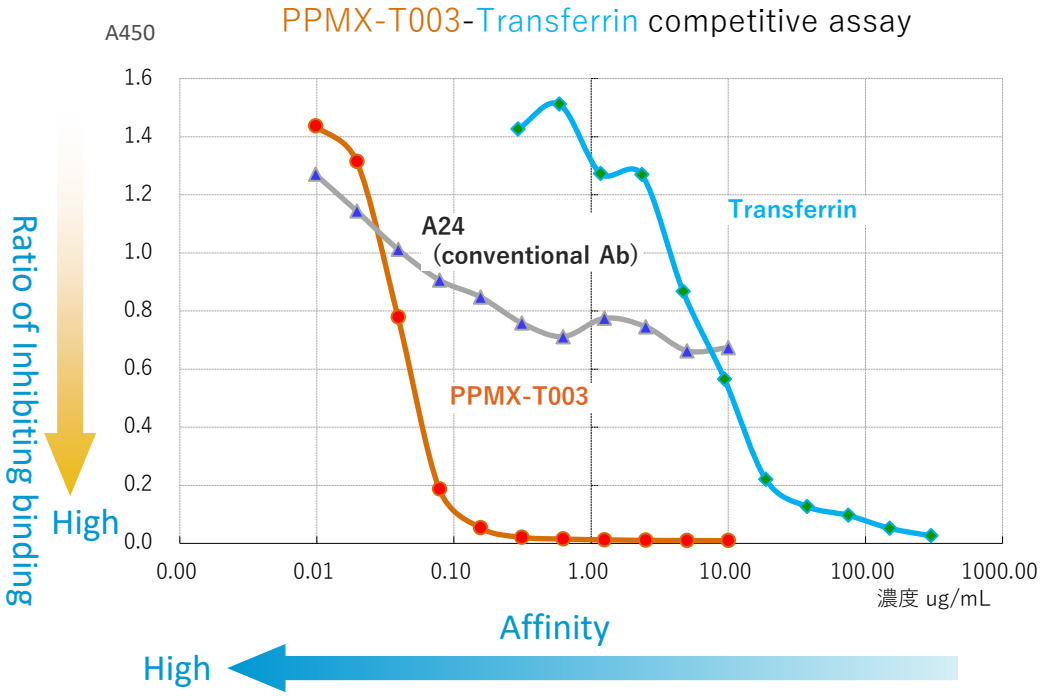
Inhibiting cellular iron uptake leads to death/proliferation inhibition of cancer cells

* Erythroblast: primitive red blood cell (RBC)

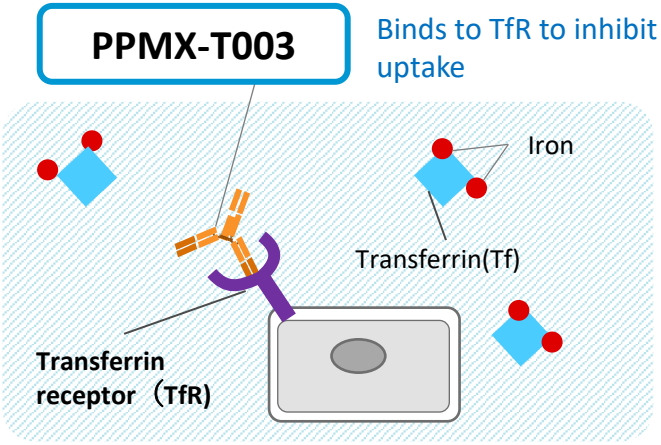
PPMX-T003

Highly functional Ab obtained by our phage display technology

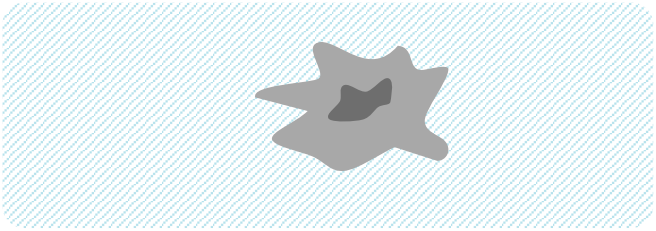
Shows unprecedented result in inhibiting ratio of binding Tf to TfR
Inhibits iron uptake into erythroblast and cancer cells and leads to cell death/proliferation inhibition



1 PPMX-T003 **binds to TfR more tightly than Tf**



2 Iron uptake inhibited. Death or proliferation inhibition of cells



Inhibition of iron uptake has been difficult, however, PPMX-T003 is expected to bring it to reality as the first therapeutic drug for cancer and PV.

Anti-Transferrin receptor Ab with incomparable function of inhibiting binding

PPMX-T003

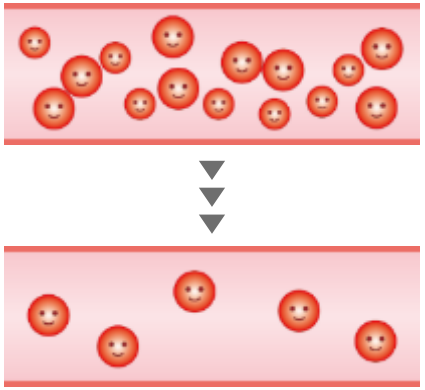
Indication: Polycythemia vera (PV)

- RBC increases to an abnormal level.
- Thrombosis is easily formed due to thick and slow blood flow. Various organs are affected by thrombosis.
- 2 out of 100,000 people develop this disease. Number of patients in Japan: 30,000 (estimated by PPMX. Average life expectancy: 16 yrs)

Current therapeutics

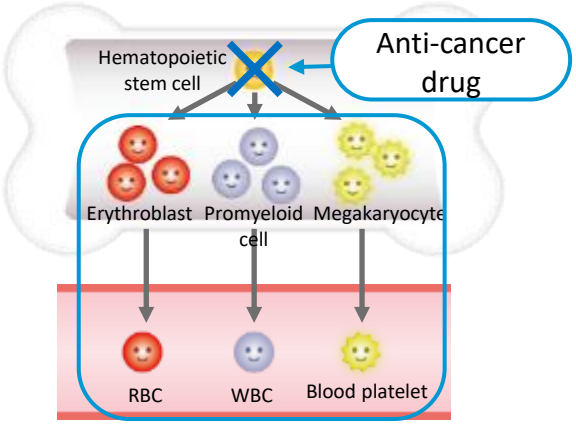
Therapeutic phlebotomy

Half of patients are treated by therapeutic phlebotomy only.



- Anemia
- Lassitude
- Depression
- Restless hands and legs
- Other diseases by iron deficiency

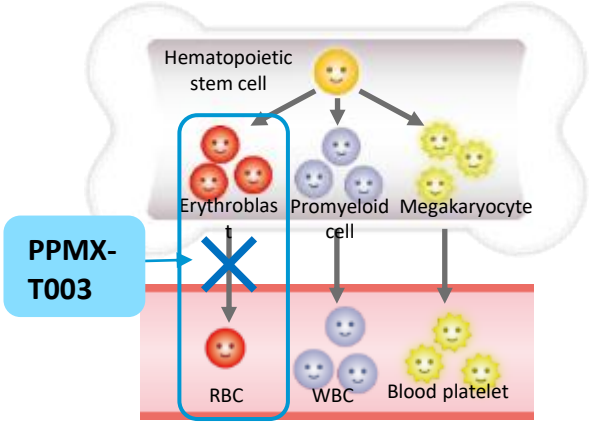
Anti-cancer drug, etc.



- Entire hematopoietic stem cell affected
- Secondary cancer risk
- Many side effects

New candidate

PPMX — PPMX－T003



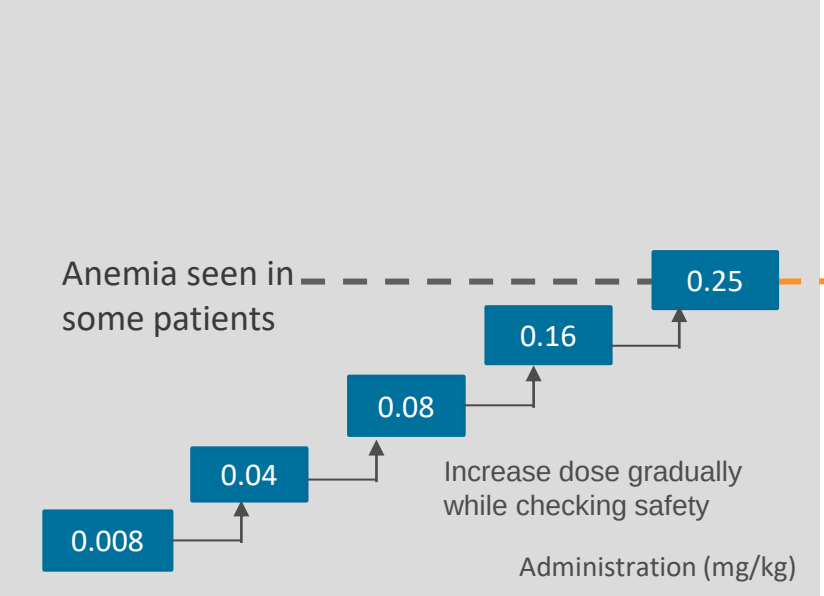
- **Acts only on erythroblast**
- **Few side effects**
- **Safe to use**

PPMX-T003: effects on inhibiting abnormal proliferation of RBC expected

PPMX-T003: Development status

P1 details

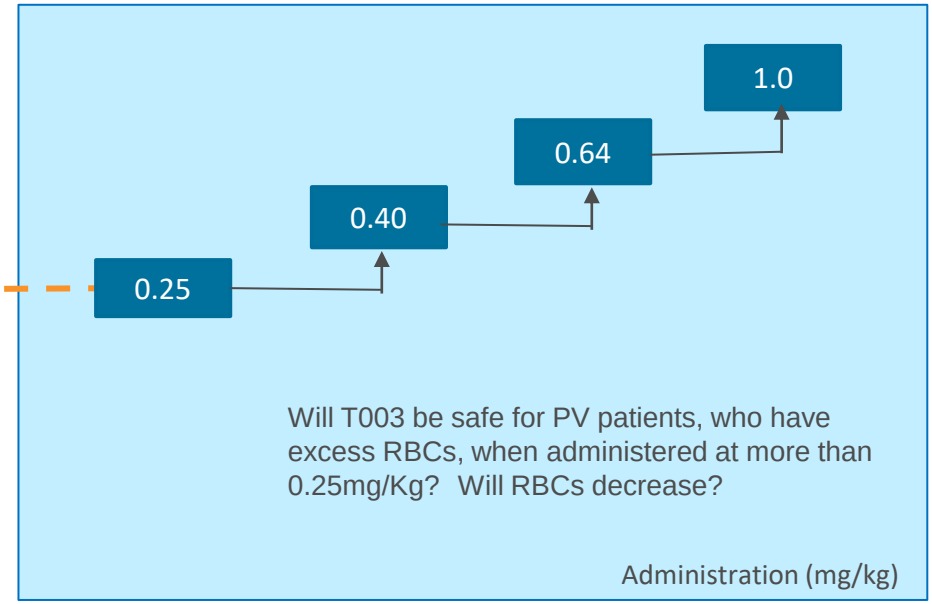
P1 among healthy volunteers (finished)



2019.11 (administration)- 2021.3 (CSR)

Subject: Healthy volunteers
Total number of patients: 40
Cohort： 5 (double-blind, placebo)

P1 among PV patients



2021.autumn (to be administered)- 2022.12 (plan)

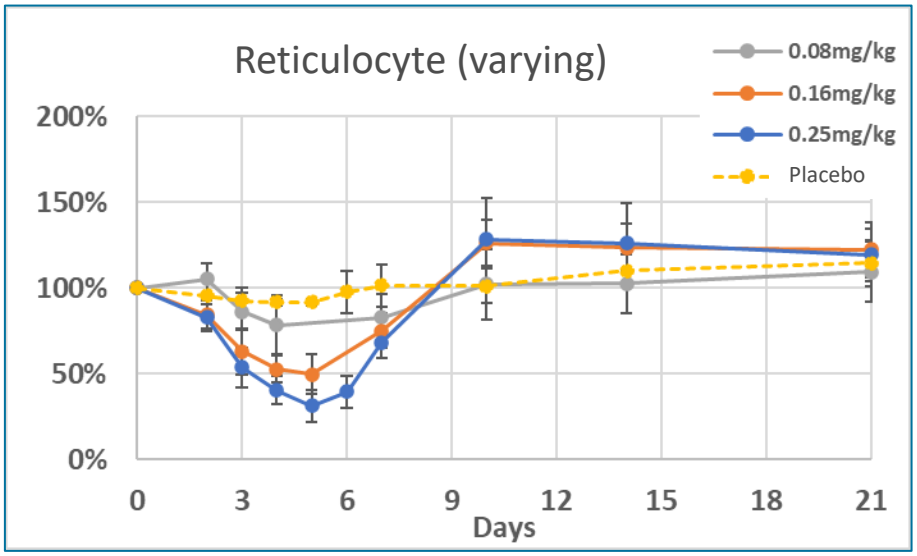
Subject: Polycythemia vera （PV) patients
Total number of patients: 6
Cohort： Ascending dose regimen (open)

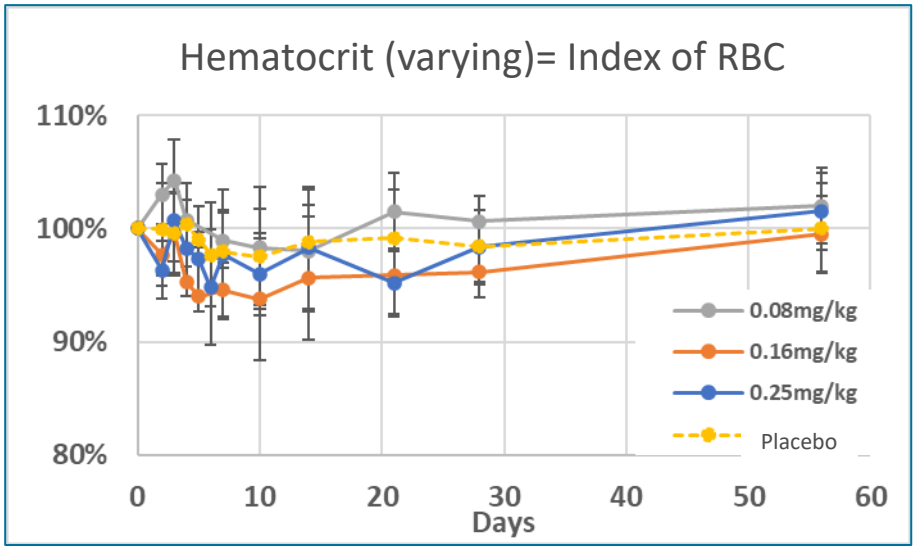
Administration to PV patients to start in or after autumn 2021

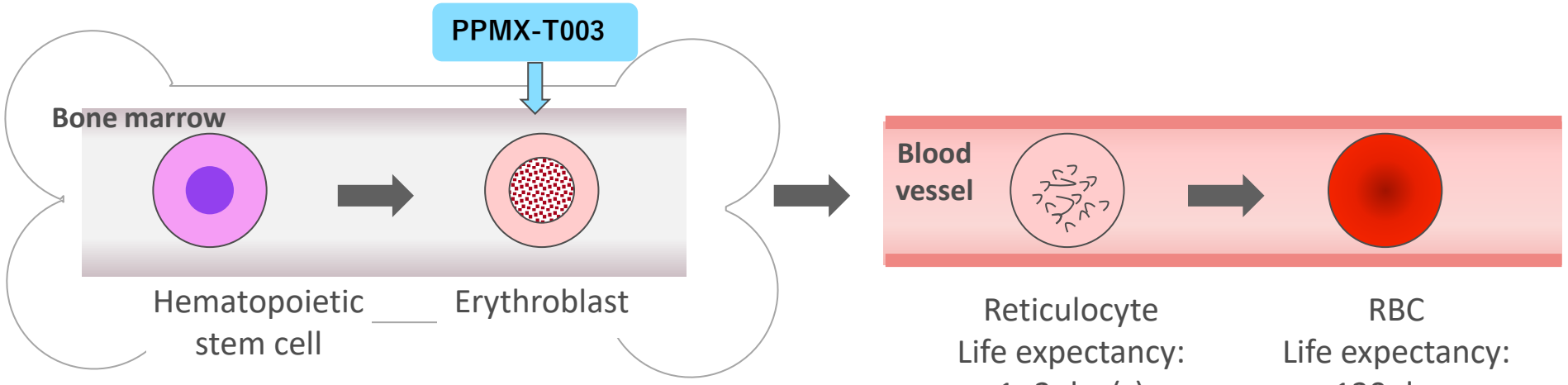
PPMX-T003: Results of P1 among healthy volunteers

Decrease in reticulocyte (immature RBC) and hematocrit (percentage of RBC) ⇒ Efficacy confirmed

Human
(HV)
n=6



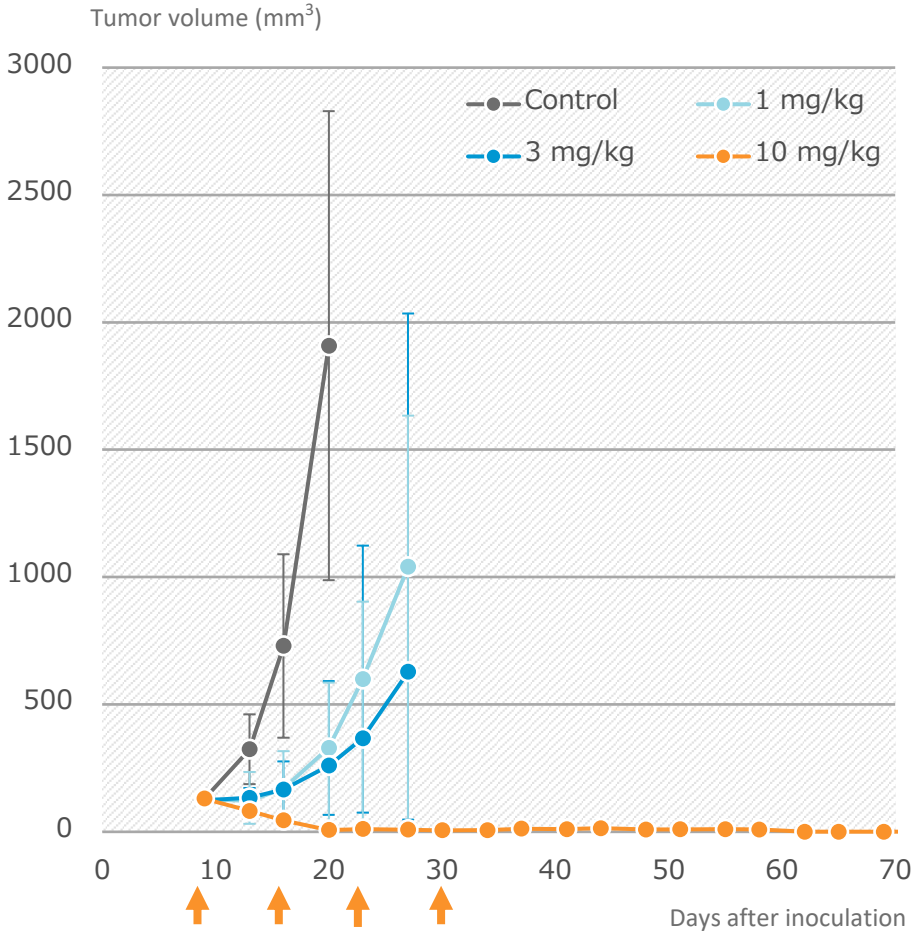




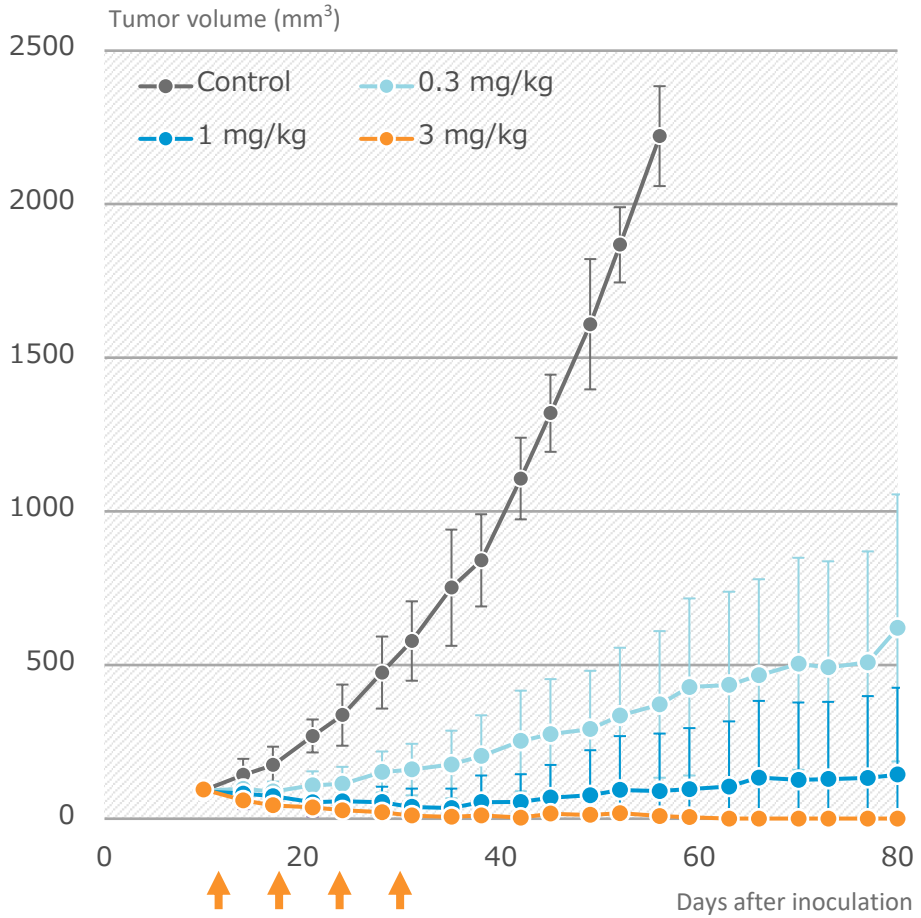
Confirmed decrease in RBC on human body PPMX-T003 dose-dependently

PPMX-T003: Confirmed efficacy against blood cancers in mice

AML



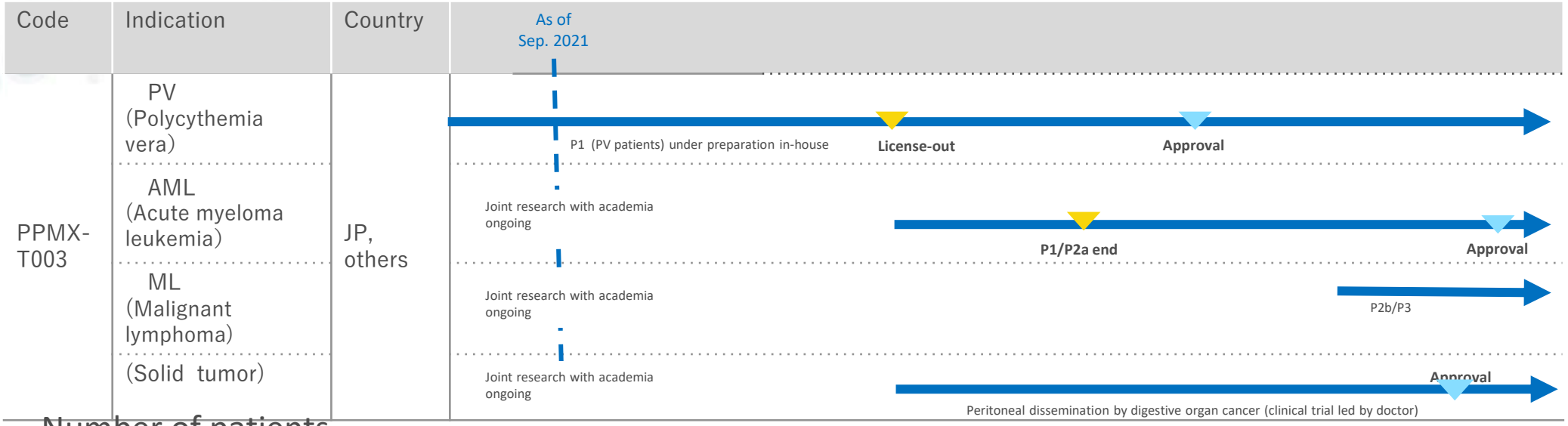
Malignant Lymphoma



Excellent efficacy against AML and various blood cancers is confirmed

Source: Zhang et al.(2017) AACR Annual Meeting, Chicago, USA DOI: 10.1158/1538-7445.AM2017-5586

PPMX-T003: Development plan



Number of patients

Indication		Number of patients ww (rounded)	Note
PV (Polycythemia vera)	Chronic blood disease	280,000	Calculated with onset risk rate at 2 in 100,000*, life expectancy at 14 years*, population at 1 billion (developed countries)
AML (Acute myeloma leukemia)	Blood cancer	200,000	WHO data (assumes 40% of leukemia)
Malignant lymphoma	Blood cancer	590,000	WHO data (number of non-Hodgkin lymphoma patients)
Multiple myeloma	Blood cancer	190,000	WHO data
Peritoneal dissemination of cancer	Solid tumor	N/A	Over 10,000 and several thousand new patients annually in Japan

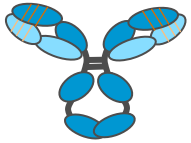
* This chart is based on our assumption and does not guarantee the progress as shown here.
* All the development after out-licensing is determined by the development strategies of licensing partners.

PPMX-T001:

2 Phase I clinical trial of ERY974 in combination with atezolizumab*1 and bevacizumab *2 by Chugai Pharmaceutical

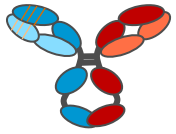
Code No.	PPMX-T001
Applicable disease	Liver cancer, solid tumor
Stage	• GC33 in combination with immune checkpoint inhibitor (ICI): P1 ongoing (JP, TW) • ERY974 monotherapy: P1 finished (US, EU), P1 ongoing (JP) New ERY974 in combination with ICI and angiogenic inhibitor: P1 started (JP, TW)
Out-licensed	Chugai Pharmaceutical

Chugai Pharmaceutical development code: GC33, ERY974



GC33

● GPC3 Ab
Binds to cancer cell



● CD3 Ab
Binds to T cell

ERY974 (bispecific Ab)
2 arms respectively bind to different antigens.

*1: immune checkpoint inhibitor *2: angiogenic inhibitor

Patents on PPMX-T001 will expire in June 2022.

02 Pipeline details

Pipeline progress

Code	Indication	Region	Drug discovery/ Research	Preclinical	P1	P2	P3	Out-licensed
PPMX-T002	Solid tumor	USA Japan	RIT					FUJIFILM
PPMX-T003	Blood cancer	Japan						–
PPMX-T004	Solid tumor		ADC					FUJIFILM
PPMX-T001	Liver cancer	Japan USA Europe			GC33 Monotherapy			Chugai Pharmaceutical
		Japan Taiwan			GC33 w/ICI			
	Solid tumor	USA Europe Japan			ERY974 monotherapy			
	Liver cancer	Japan Taiwan			ERY974 w/ICI, angiogenic inhibitor			

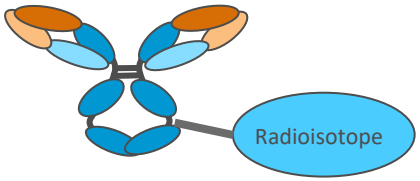
Clinical trial of GC33 monotherapy is not ongoing.

Patents on PPMX-T001 will expire in June 2022.

PPMX-T002：
Ab labeled with radioisotope

Code	PPMX-T002
Applicable disease	Biliary tract cancer, ovarian cancer, head and neck cancer, etc.
Stage	Enhanced P1 ongoing (USA) , P1 ongoing (JP)
Out-licensed	Fujifilm

Fujifilm development code: FF-21101

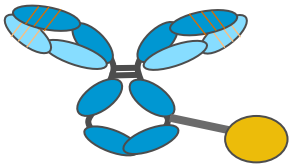


Armed Ab labelled with radioisotope.
Binds to CDH3, which is often expressed on various cancers, and kills cancer cells with beta ray (RIT)

Ab Accumulates on cancer only ＋ Radio isotope Known effect against cancer ＝ **Patient-friendly anti-cancer drug**

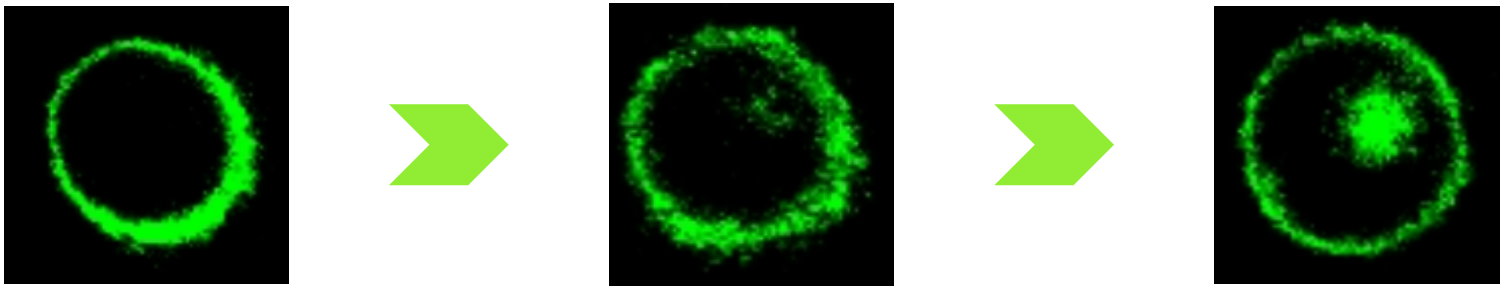
PPMX-T004：
Ab-drug conjugate (ADC)

Code	PPMX-T004
Applicable disease	Solid tumor expressing CDH3
Stage	Drug discovery
Out-licensed	Fujifilm



Small molecule anti-cancer drug

Armed Ab labeled with small molecule anti-cancer drug.
Designed to make cancer cells take up ADC so that the drug released inside may kill cancer cell.

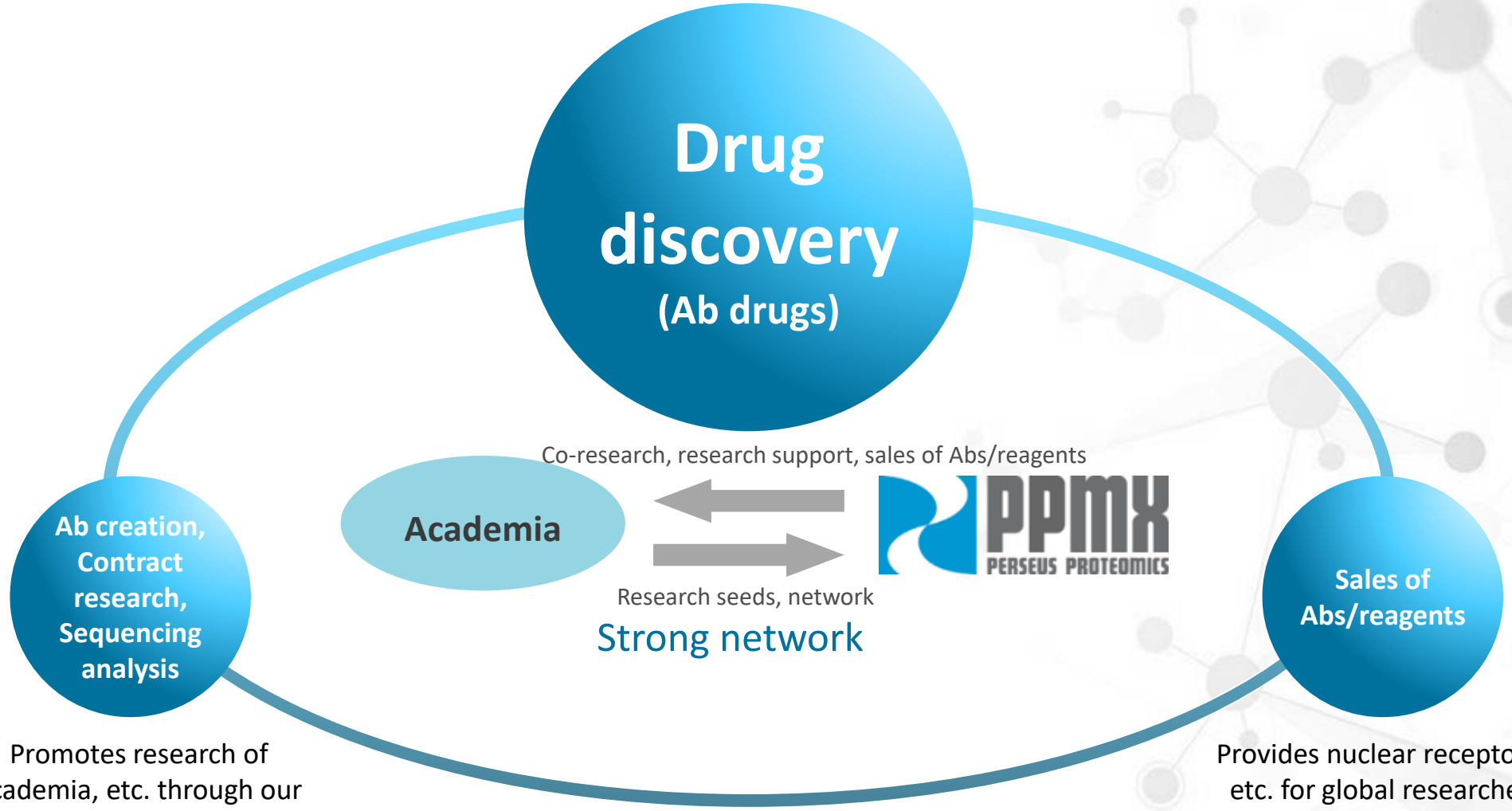


Uptake of PPMX-T004 and drug into a cancer cell.
Fluorecsence-labelled PPMX-T004 and cancer stem cells derived from human are made coexist and are observed with a confocal microscope.

03 Financial results of first half FY2021

Our business

Develops seeds of academia through our technologies and provides for patients after licensing out

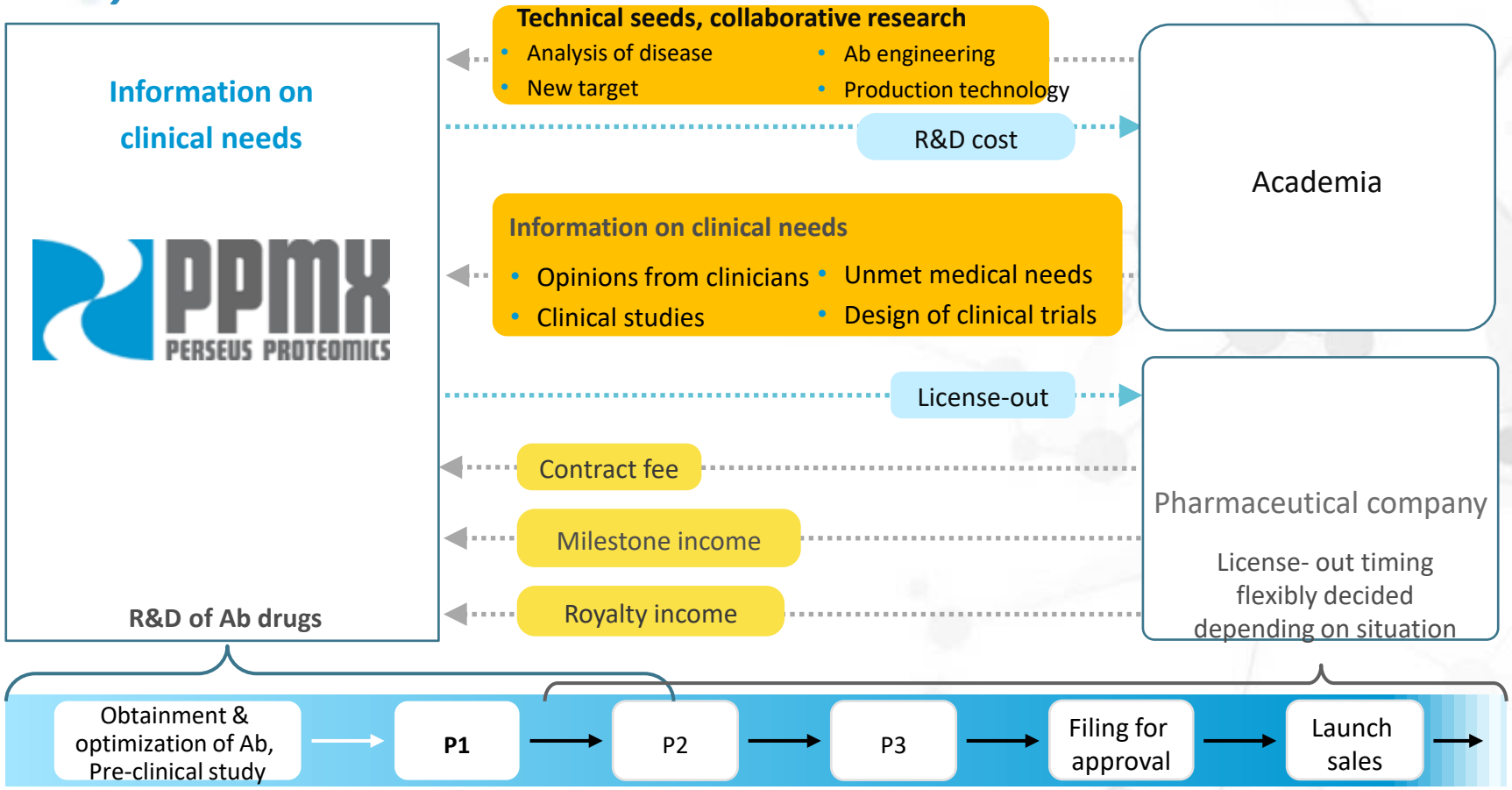


Promotes research of academia, etc. through our technologies. Contributes to enhance network and sales.

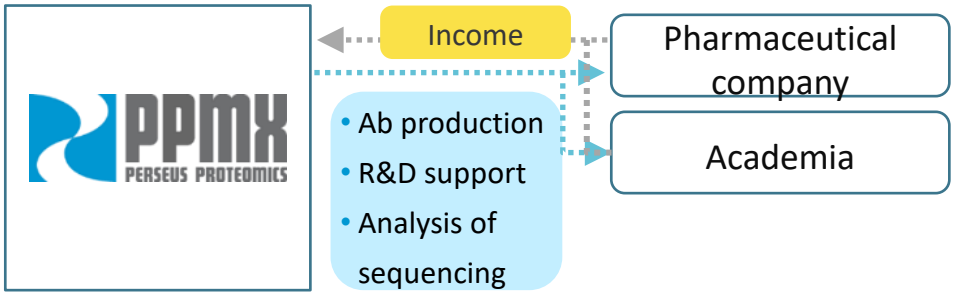
Provides nuclear receptor Abs, etc. for global researchers in life science, drugs and basic research on Abs field. A stable state of the selling line forecasted.

Sales/Profit creating structure

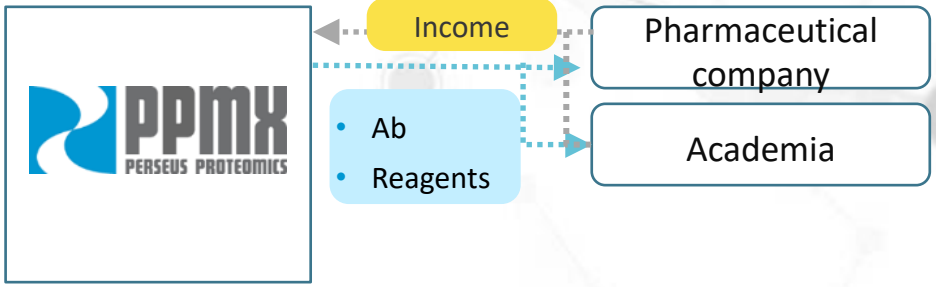
1. *Drug discovery*



2. *Support of Ab research*



3. *Sales of Abs/reagents*



FY2021 first half business results and forecast

Profit & loss

(million yen)

	FY2020 result	FY2021 1st half	FY2021 forecast
Sales	**67**	**29**	**70**
Gross profit	64	29	65
R&D cost	313	154	411
Other	162	120	219
SG & A	475	275	630
Operating income	**-411**	**-245**	**-564**
Ordinary income	**-410**	**-263**	**-583**
Extraordinary income	1	9	40
Net income	**-413**	**-274**	**-625**

Ab/reagent sales

PPMX-T003
Other drug discovery

- Sales/Profit: Support research on Ab sales were weak, but Ab/reagent sales were almost as planned
- FY2021 forecast: No change in both business results and P1

FY2021 first half financial status

Balance sheet

(million yen)

Assets	2021/3/31	2021/9/30
Cash & deposits	1,069	3,506
Accounts receivable - trade	8	4
Other	31	29
Total current assets	**1,108**	**3,540**
Non-current assets	**9**	**9**
Total assets	**1,118**	**3,550**

Liabilities	2021/3/31	2021/9/30
Current liabilities	34	70
Total liabilities	**34**	**70**
Share capital	604	1,939
Capital surplus	889	2,225
Retained earnings	-413	-687
Total shareholders' equity	**1,080**	**3,477**
Total net assets	**1,083**	**3,479**
Total liabilities and net assets	**1,118**	**3,550**

- Cash & deposits, share capital, capital surplus: increased due to IPO
- Capital ratio: 97.9%

About us

Company name and corporate philosophy

Company name

Perseus and Andromeda by François Lemoyne

Perseus X **Proteomics**

Hero in Greek myths

Study of structure and functions of protein

"Perseus Proteomics" represents the mission of the Company that we save patients (Andromeda) by fighting with refractory diseases including cancer (monster) through our antibody technology (Perseus' weapon).

Corporate philosophy

We are committed to contributing to global medical care with our cutting-edge antibody technologies.

Company outline

Business	● Develop Ab drugs ● Support research on Ab ● Sales of Abs/reagents
Company name	Perseus Proteomics Inc.
Established	February 2001
Office	HQ : 4-7-6 Komaba, Meguro-ku, Tokyo, Japan Nagoya : 2-22-8 Chikusa-ku, Nagoya-shi, Aichi, Japan
Capital	1,939 million yen
Employee	22 (R&D: 16, Administration: 6) as of 30 Sep. 2021

Board members

Directors

Takuya Yokokawa (President & CEO)
Director, FUJIFILM Medical Drug Laboratories (drug discovery, research); Deputy Division Manager, FUJIFILM Medical Drug Div.(Clinical development, business development)

Shinichi Suzukawa
Director-general, KDDI Global ICT; President, Telehouse Europe; President, overseas subsidiaries of KDDI

Tadashi Matsuura (Manager, R&D Dept)
Faculty of Medicine, Shinshu University; Faculty of Medicine, Dartmouth University; National Institute of Bioscience and Human-Technology, Agency of Industrial Science and Technology, MITI

Kinichiro Kominami (CEO, Tech & Fin Strategy Co., Ltd)※
Institute of Cancer Research, Nomura Securities, Mizuho Securities)

Toshikazu Ban (Executive Director, FUJIFILM) ※
Takeda Pharmaceutical (Preclinical development), 15-year-experience of business development in USA

Nobuo Hanai (Outside director, Shimadzu Corporation)※
Kyowa Kirin (President & CEO, Chairman)
Development and license-out of Potelligent technology)

Directors, Audit & Supervisory Committee Member

Kazuo Miwa (Standing Statutory Auditor)
Head of East Asia Region and President of KDDI China, KDDI Global Business Division

Takao Hamakubo ※ (Professor, Nippon Medical School)
Faculty of Medicine, Kyoto University; Ex-professor, Research Center for Advanced Science and Technology, University of Tokyo; Doctor; our founder

Tadashi Horiuchi (Professor, Clinical Research Promotion Center, Keio-gijuku University Hospital)※
Chief Manager, Daiichi Sankyo Drug Discovery Development Research Center, Standing Statutory Auditor, Asubio Pharma)

Takashi Ohno ※
Representative, Ohno Certified Public Accountant's Office

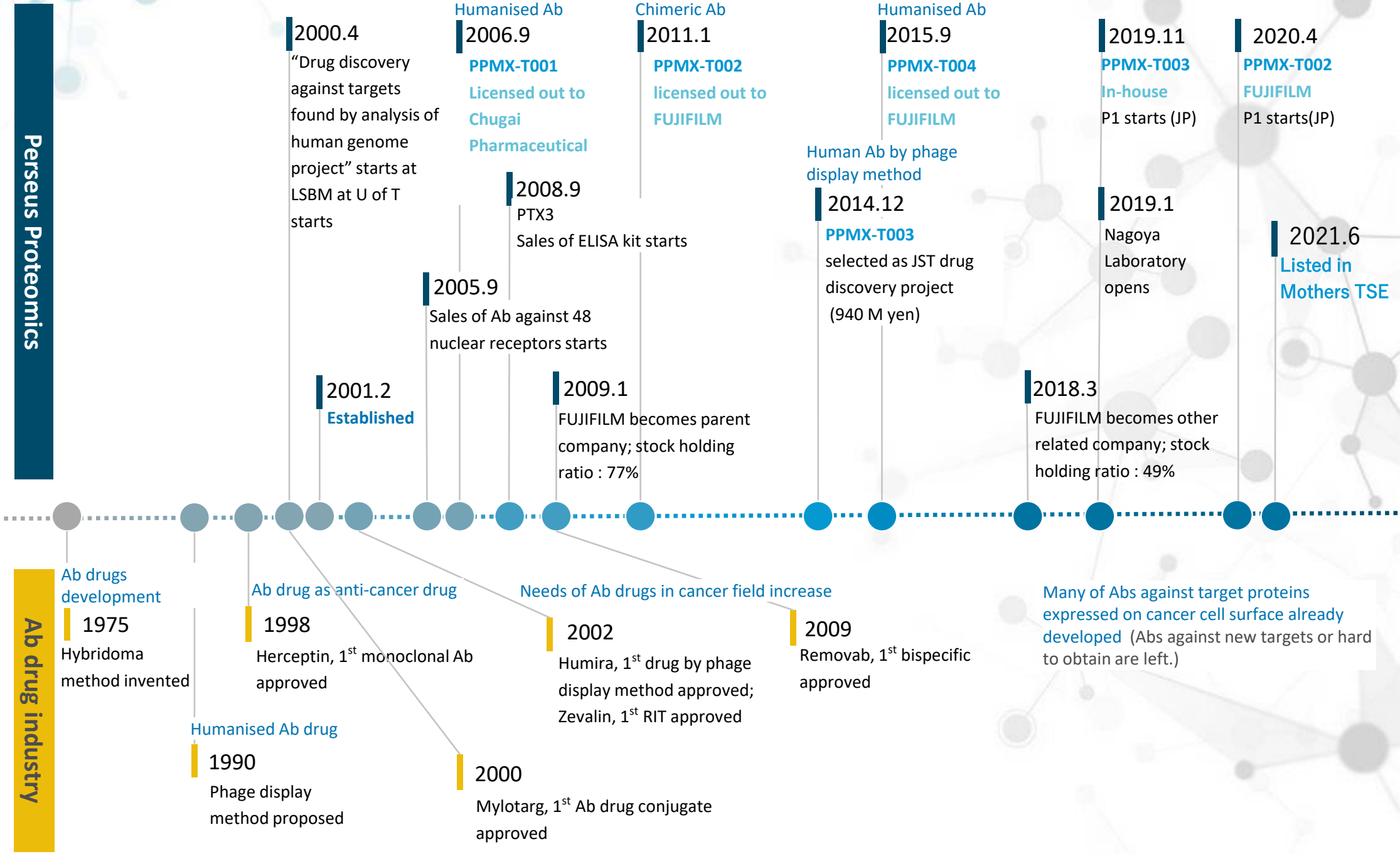
Technical Advisors

Fuyuki Ishikawa
Professor, Graduate School of Biostudies, Kyoto University; Member, Science Council of Japan

Kohei Tsumoto
Professor, Graduate School of Engineering, University of Tokyo; Director, Center for Drug Design Research, National Institutes of Biomedical Innovation, Health and Nutrition

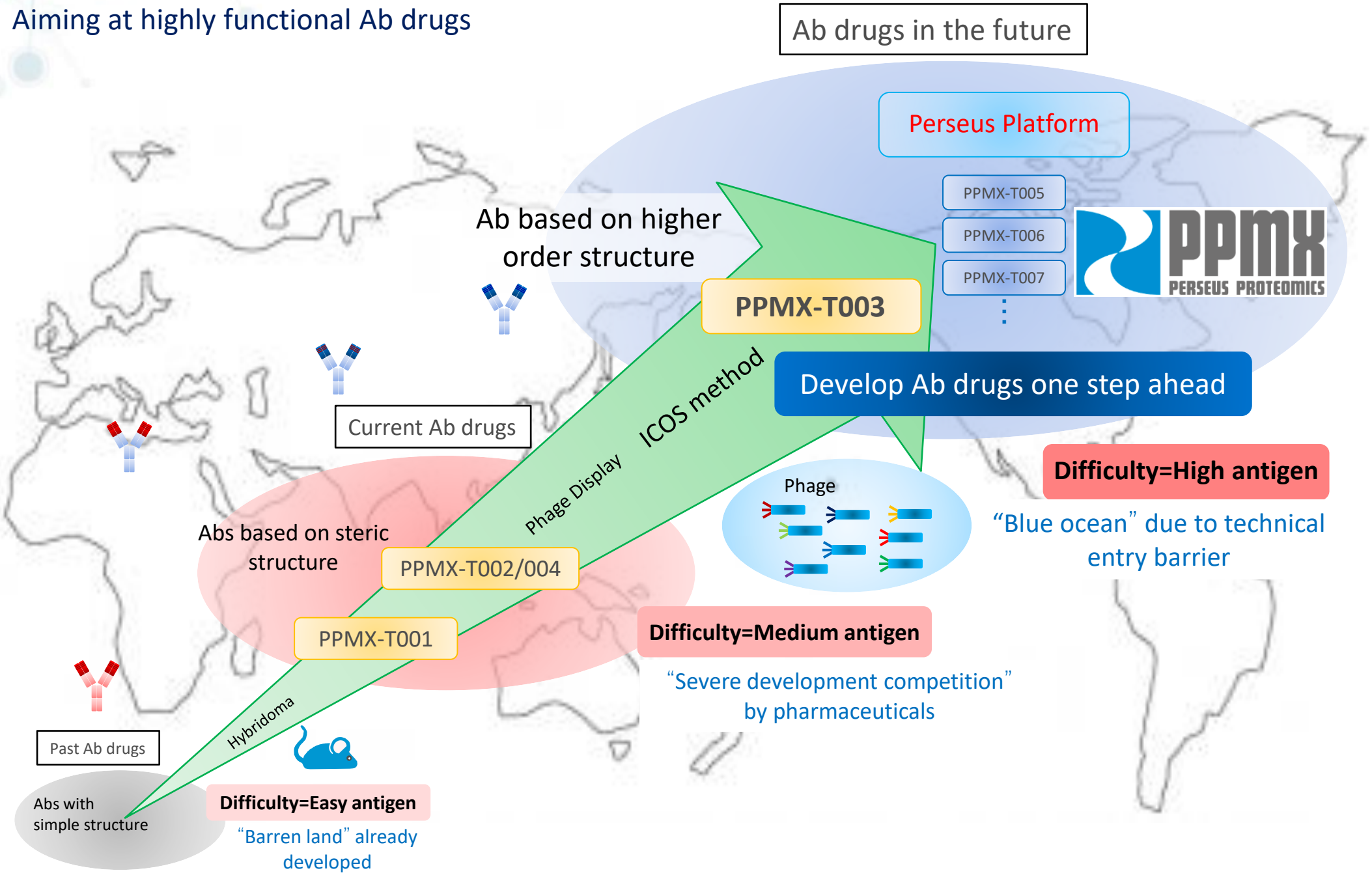
※ Part-time

History


Perseus Proteomics
2000.4
"Drug discovery against targets found by analysis of human genome project" starts at LSBM at U of T starts
Humanised Ab
2006.9
PPMX-T001
Licensed out to Chugai Pharmaceutical
Chimeric Ab
2011.1
PPMX-T002
licensed out to FUJIFILM
Humanised Ab
2015.9
PPMX-T004
licensed out to FUJIFILM
2019.11
PPMX-T003
In-house
P1 starts (JP)
2020.4
PPMX-T002
FUJIFILM
P1 starts(JP)
2008.9
PTX3
Sales of ELISA kit starts
Human Ab by phage display method
2014.12
PPMX-T003
selected as JST drug discovery project
(940 M yen)
2019.1
Nagoya Laboratory opens
2021.6
Listed in Mothers TSE
2005.9
Sales of Ab against 48 nuclear receptors starts
2001.2
Established
2009.1
FUJIFILM becomes parent company; stock holding ratio : 77%
2018.3
FUJIFILM becomes other related company; stock holding ratio : 49%
Ab drug industry
Ab drugs development
1975
Hybridoma method invented
Ab drug as anti-cancer drug
1998
Herceptin, 1st monoclonal Ab approved
Needs of Ab drugs in cancer field increase
2002
Humira, 1st drug by phage display method approved; Zevalin, 1st RIT approved
2009
Removab, 1st bispecific approved
Many of Abs against target proteins expressed on cancer cell surface already developed (Abs against new targets or hard to obtain are left.)
Humanised Ab drug
1990
Phage display method proposed
2000
Mylotarg, 1st Ab drug conjugate approved

Bring more Ab drugs to patients

Aiming at highly functional Ab drugs



Perseus Proteomics Inc.

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URL : https://www.ppmx.com/en/