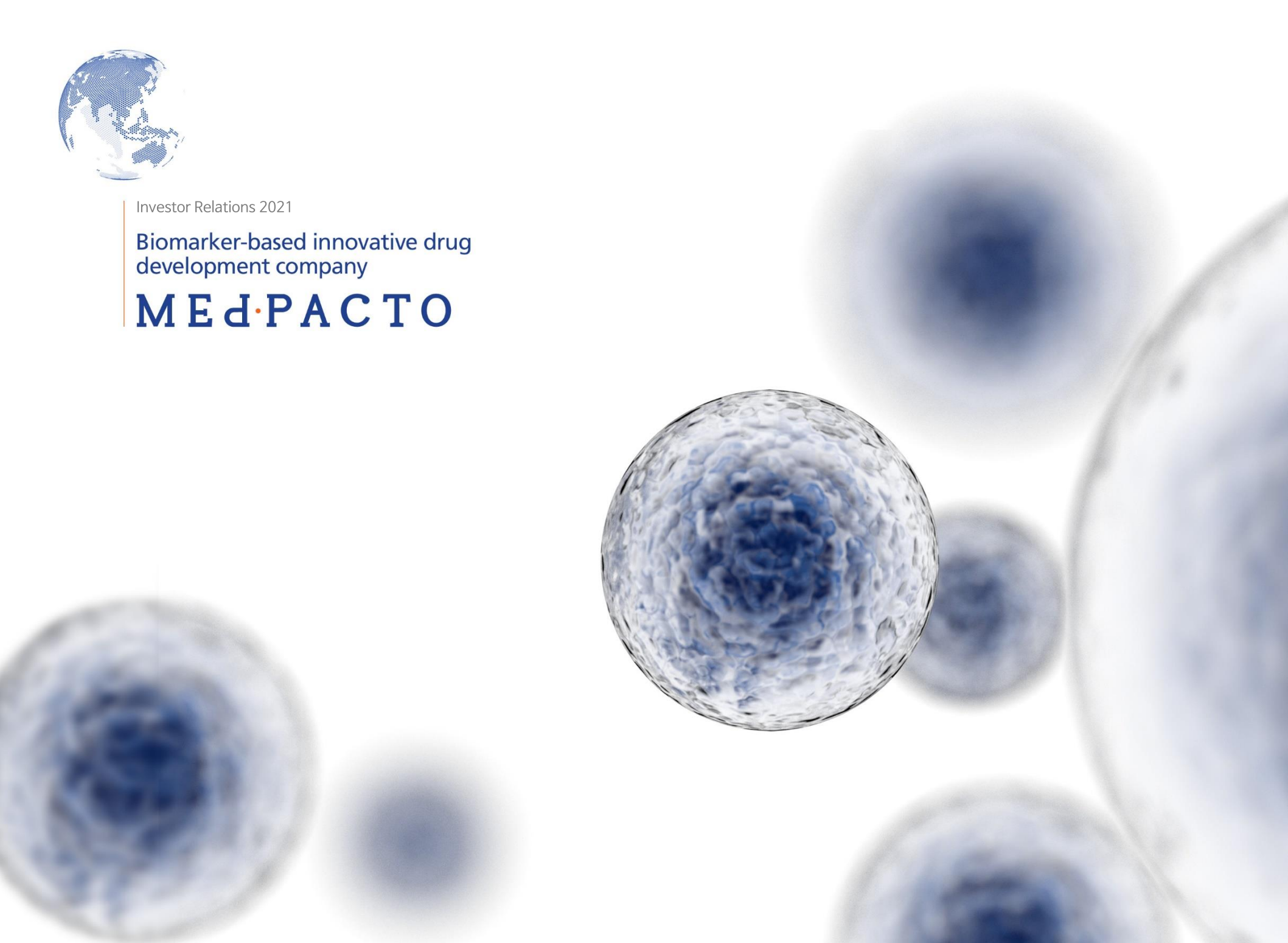
Investor Relations 2021

Biomarker-based innovative drug development company

MEDPACTO



Distinguished Scholar of TGF-β and Cancer Research

More than 300 published papers

Cancer, inflammation, TGF-β-related research findings in high impact scientific journals such as Nature

Cited over 4,200 times

Number of citations of Dr. Kim's TGF-β-related scientific papers

First Korean who Sequenced Personal Genome

Fifth personal genome sequenced in the world

Sequenced Korean Gastric Cancer

First to sequence MSI subtype of Korean gastric cancer

Seong Jin Kim
CEO

Career

- 2016.07 – current : CEO, MedPacto, Inc.
- 2007.01 – current : Inviting Professor, Case Western Research Univ. School of Medicine, Cleveland, OH, USA
- 2021.03 – current : Director, GILO Institute
- 2010.04 – current : Visiting Professor, Tsukuba University, Japan
- 2016.07 ~ 2021.02 : Director, Precision Medicine Research Center, : AITC, Seoul National University
- 2011.03 – 2018.12 : Vice Chairman/CSO, TheragenEtex Co., Korea
- 2018.01 – 2018.12 : President, Korean Society of Cancer Prevention
- 2010.09 – 2016.06 : Director, Cancer Research Institute, CHA Univ. of Medicine and Science, Korea
- 2007.01 – 2010.08 : Director, Lee Gil Ya Cancer and Diabetes Research Institute, Gachon Univ. of Medicine and Science
- 1987.03 – 2007.02 : Head, Gene Regulation Group, Laboratory of Cell Regulation and Carcinogenesis, NCI, NIH, USA

Honors & Awards

- Ho-Am Prize in Medicine (2002)
- Gangwondo Prize (2007)
- Sangrock Prize in Science (2008)
- Dongkok Prize (2011)
- Peru Congressional Medal (2011)
- Korean Society of Molecular and Cellular Biology Gold Ribbon Award (2015)
- Japan Cancer Association International Award (2017)

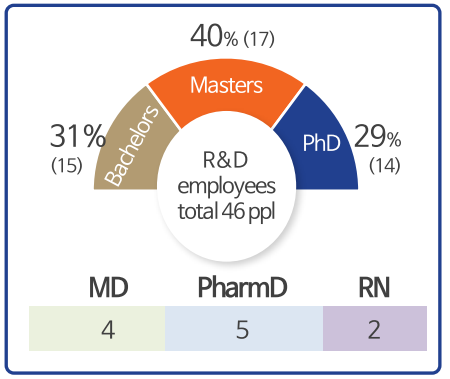
Strong leadership with extensive experience spanning the entire drug development process

Ki Baik Hahm
Executive Vice President, R&D

- Vice-Chair, Gastrointestinal, IUPHAR
- Chair, KACP
- Chair, Cha Cancer Prevention Research Center
- Professor, Internal Medicine, Cha University Bundang Medical Center
- Professor, Internal Medicine, College of Medicine, Gachon University

Sunjin Hwang
Chief Medical Officer

- Medical Director, Gilead Sciences
- Associate Director, MSD
- Medical Resident, Samsung Seoul Medical Center
- Medical Doctor



Jung Im Huh
Chief Development Officer

- Managing Director, Corestem
- Senior Researcher, 3M Korea
- Senior Researcher, Safety Assessment Institute
- Postdoctoral Researcher, NCI/NIH
- Pharmacist

Dong Woo Kang
New Drug Target Discovery Lead

- Research Assistant Professor, Asan Medical Center
- Assistant Professor, College of Medicine, Ulsan University
- Postdoctoral Researcher, Pusan National University

In Pyo Hong
RA Lead

- RA Lead, Bayer Korea
- Team Lead, Korea Otsuka Pharmaceutical Development Team
- RA Manager, Korea BMS Pharmaceutical
- Ministry of Food and Drug Safety
- Pharmacist

Min Woo Kim
CMC Lead

- Specialist, Purification Team, Genexine
- Principal Investigator, GC-Research Center
- Senior Researcher, MOGAM Institute for Biomedical Research

Saerom Kim
Chief Licensing & Planning Officer

- Consultant, Deloitte Consulting
- Consultant, Ernst & Young Korea
- Marketing Director, GenomeCare Inc, USA

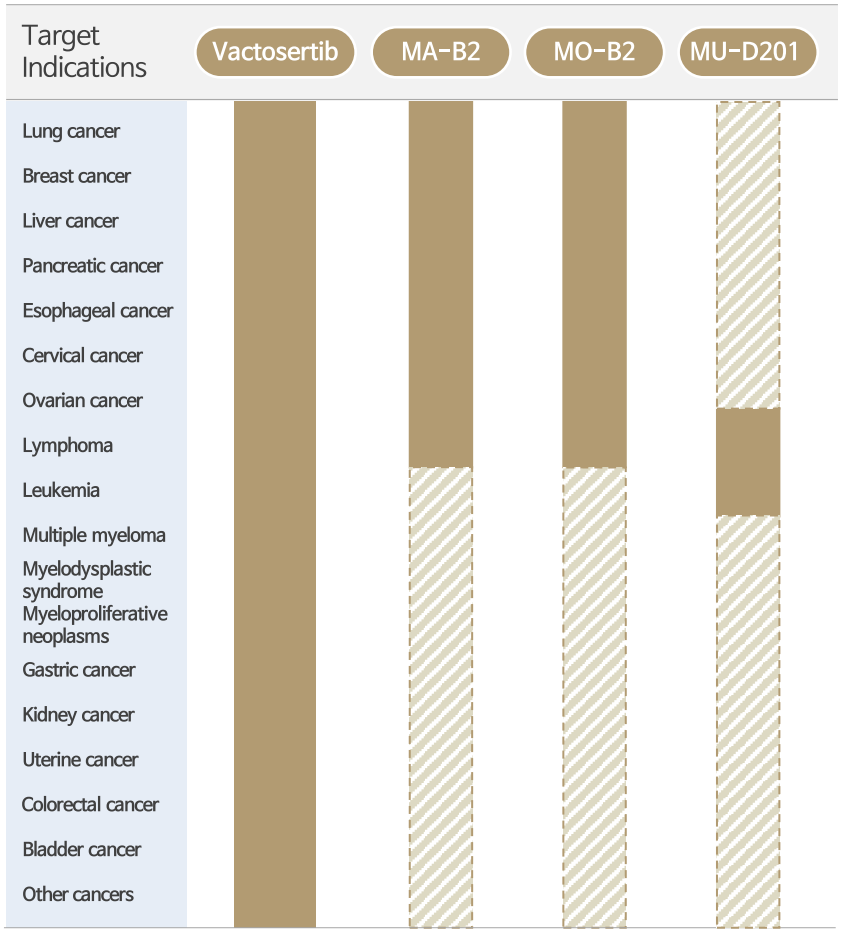
Min Jeong Kim
Patent Team Lead

- Director, Hanall Biophama
- Patent Attorney, Hanmi Pahrmaceutical
- Patent Attorney
- Pharmacist

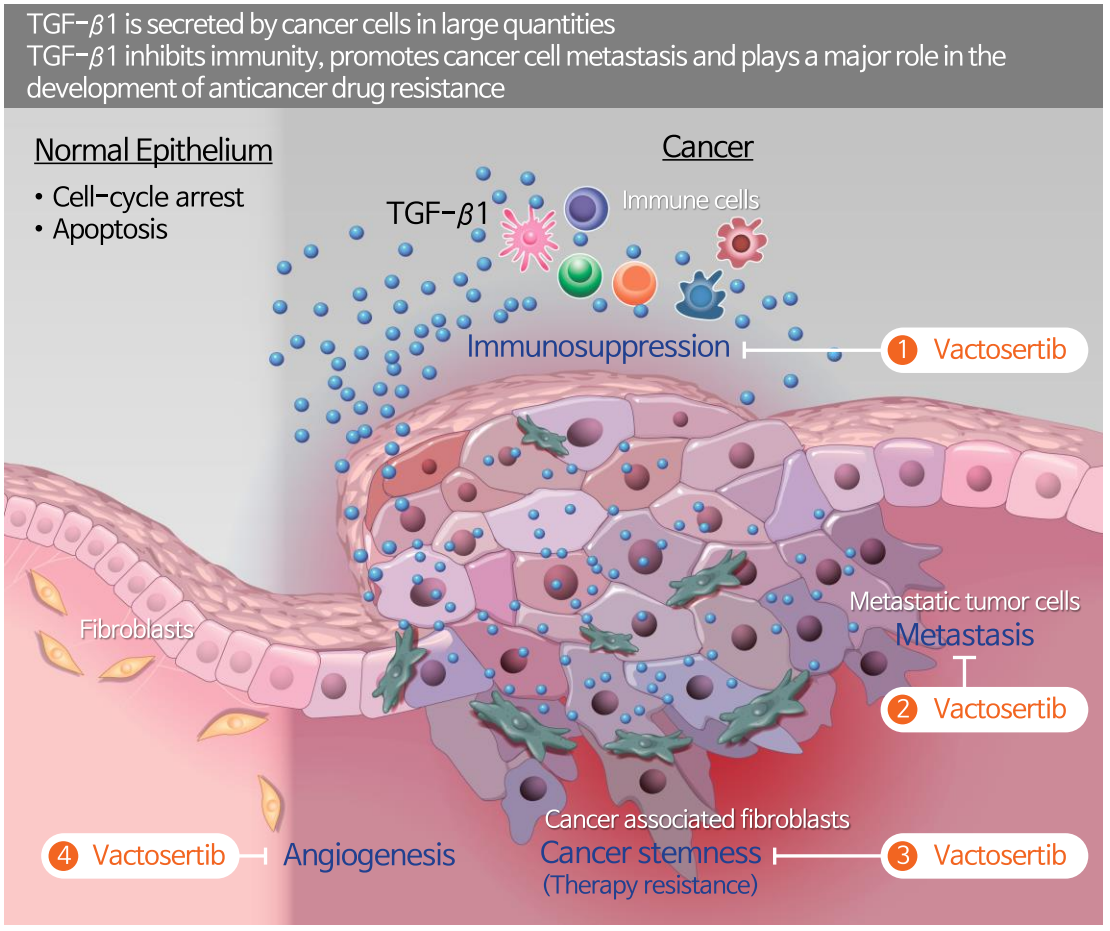
Tissue-agnostic Biomarker-based Innovative Drug Pipeline

MedPacto's anticancer assets are developed to treat based on biomarker expression,
which is agnostic to any specific tumor tissue type, and to combine with various therapeutic options

Pipeline	Type	Biomarker	Mode of Action
Vactosertib	Anticancer therapeutic (Small molecule)	TBRS	TGF-β receptor 1 kinase inhibitor
MA-B2	Anticancer therapeutic (Antibody)	Serum BAG2 protein	Anti-BAG2 antibody
MO-B2	Diagnostic kit	Serum BAG2 protein	Serum BAG2 diagnostic kit
MU-D201	Anticancer therapeutic (Small molecule)	EZH2 gene mutation, gamma delta T-cell receptor	DRAK2 inhibitor



TGF-β1 regulates the tumor microenvironment and promotes tumor growth and metastasis



Main Functions of Vactosertib

1 Promotes tumor cell killing activity by immune cells

- Activates cytotoxic function of T- and NK cells
- Inhibits activity of regulatory T-cells
- Prevents T-cell exhaustion

2 Inhibits Metastasis

- Inhibits epithelial-mesenchymal transition (EMT), cell migration and metastasis

3 Inhibits cancer stem cell production

- Suppresses TGF-β1-induced generation of cancer stem cells (cause of drug resistance to various anti-cancer drugs such as Gleevec, a treatment for CML, and paclitaxel)

4 Inhibits angiogenesis

MOA of Vactosertib

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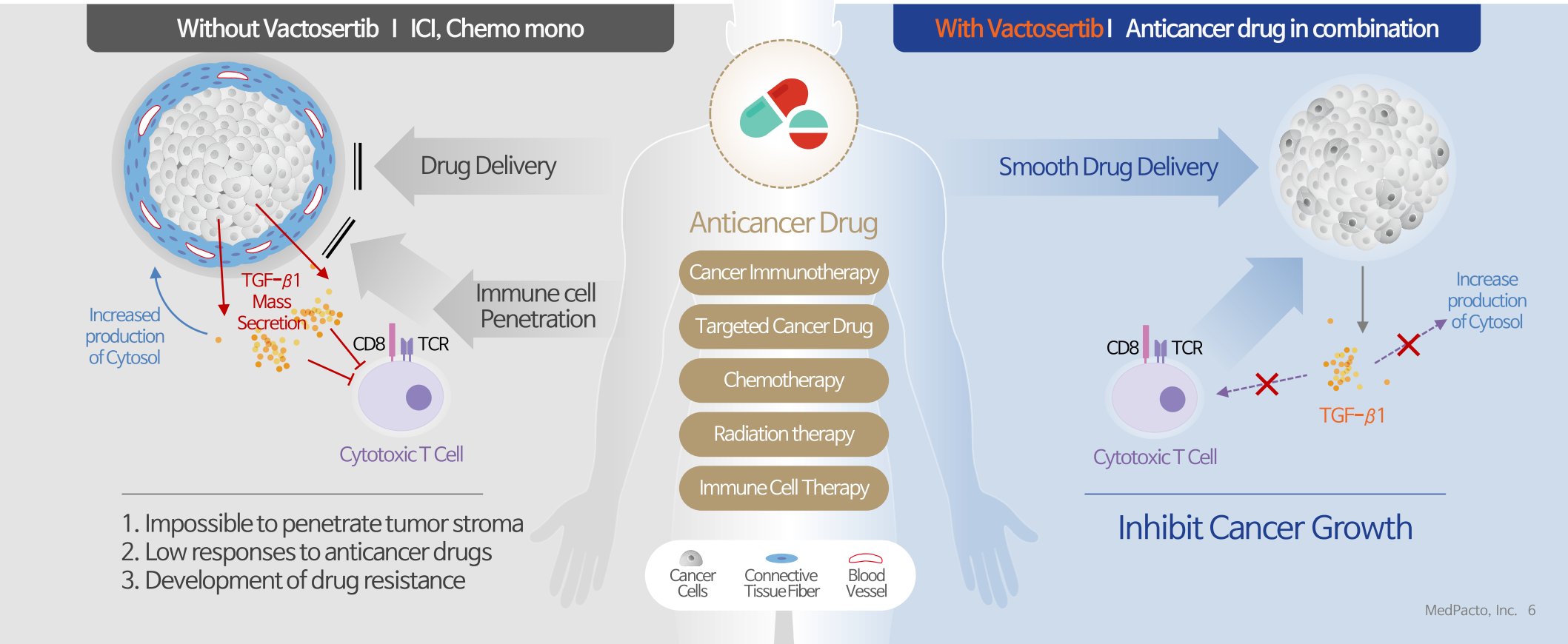
Vactosertib can be combined with all existing cancer treatment

- TGF-β1 acts on stromal cells around cancerous tissues to produce large quantities of extracellular matrix, creating a barrier surrounding the tumor
  → prevent anticancer drugs and immune cells from attacking cancer tissue
- Vactosertib, a TGF-β1 signaling inhibitor, prevents the formation of matrix walls around cancerous tissues
  → Various cancer therapies help attack cancer cells



Collaboration with Blockbuster Immuno-oncology Drugs

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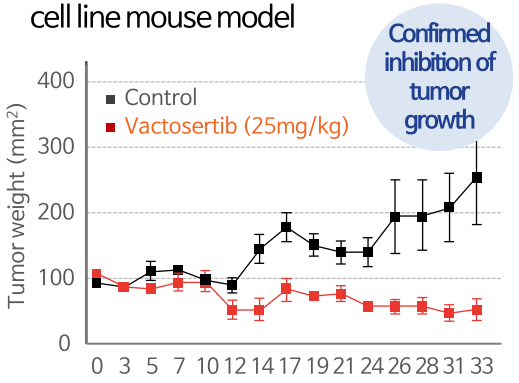
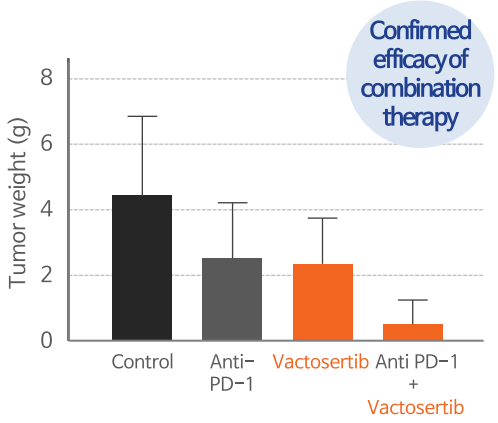
Ongoing clinical trials combining vactosertib, a well-tolerated and effective compound, with leading IO drugs developed by global pharma

Preclinical Results

In vivo study using vactosertib monotherapy in a gastric cancer cell line mouse model



In vivo study combining vactosertib and anti-PD-1 in a gastric cancer model



US Phase 1 Results

Advanced solid tumors

Vactosertib is safe and well-tolerated as a monotherapy

- Mild adverse events seen even in high dose groups
- Stability confirmed in ongoing combination trials

Ongoing Clinical Collaborations

MSD

Keytruda (anti-PD-1) + Colorectal, NSCLC 1L

Among all IO drugs, obtained the greatest number of FDA approvals - more than 20 indications

Forecasted to be global top-selling drug by revenue by 2021

AstraZeneca

Imfinzi (anti-PD-L1) + NSCLC 2L, Bladder cancer

AstraZeneca's main immunooncology product

Forecasted to be a blockbuster drug in the near future

Ongoing combination therapy trials with blockbuster IO drugs

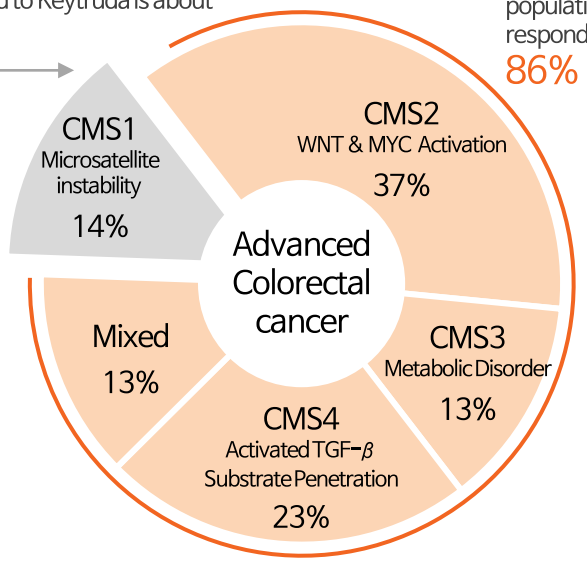
Free supply of Keytruda & Imfinzi by MSD & AZ

Co-development of clinical trial strategy and design

Breakthrough responses are demonstrated in combination with Keytruda in advanced colorectal

Patients who are likely to respond to Keytruda is about 14%

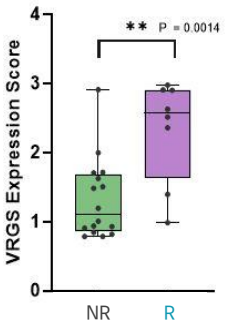
Due to various factors including high TGF-β1 signaling, the population that is unlikely to respond to Keytruda is about 86%



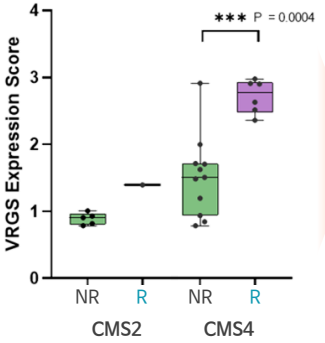
VRGS Analysis Results and CBR Comparision

Responder vs. Non-responder

VRGS Expression Score

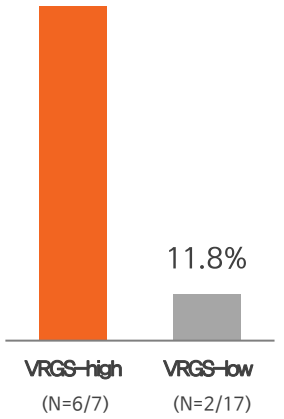


CMS Type



$$VRGS\ score = \frac{Mean\ of\ VRGS\ gene\ expressions}{Mean\ of\ Housekeeping\ gene\ expressions}$$

Clinical Benefit Rate
Cut-off value: 2.179



VRGS Development Progress and Plans

- VRGS (Vactosertib Response Gene Signature) was developed as a predictive biomarker for the purpose of combined treatment with vactosertib + pembrolizumab in MSS colorectal cancer patients, and confirmed that there is a high correlation with patients that respond to vactosertib + pembrolizumab treatment
- The VRGS-high patient group showed a higher clinical benefit rate (CBR) compared to VRGS-low patient group, and showed an accuracy of about 88% in predicting responders to the combination treatment
- In future studies, VRGS will be tested as a patient selection biomarker

Clinical Validation of Vactosertib in Lung Cancer _ AstraZeneca

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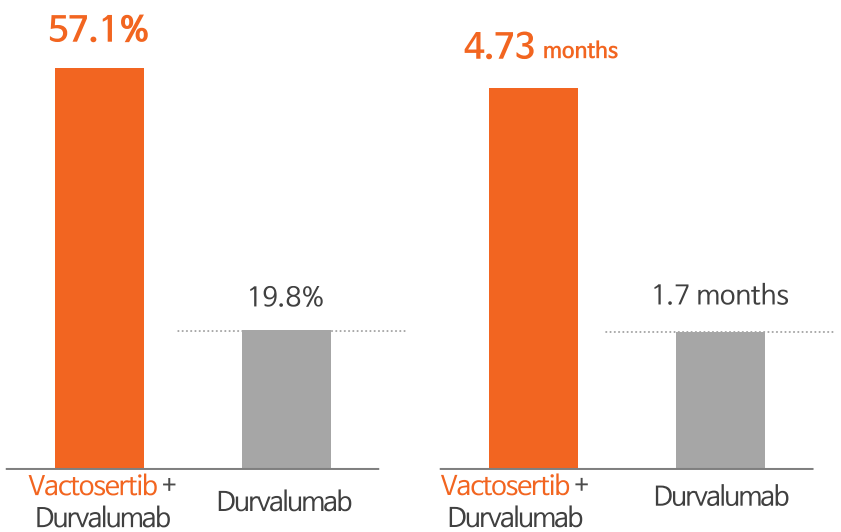
Significant responses are observed in combination with Durvalumab in advanced non-small cell lung cancer

Combination trials in NSCLC (P2 interim result)

Objective Response Rate (ORR) | Progression Free Survival (PFS)



Source: AstraZeneca DCR, ORR data,
Antonia et al. Journal of Clinical Oncology 2017;35:9085-9085
Note: A study directly comparing the combination therapy vs. Imfinzi was not conducted.

Comparison of NSCLC 2L Clinical Trial Results

		Vactosertib Study 203	Durvalumab Study 1108	Pembrolizumab Keynote 010	Atezolizumab Oak
Stage		IIa	I/II	II/III	III
PD-L1		≥1%	Any	≥1%	Any
ORR (ITT)	PD-L1≥1%	**33.3% (10/30)**	-	18% (62/344)	-
	PD-L1<25%	**12.5% (2/16)**	5.1% (5/98)	-	-
	PD-L1≥25%	**57.1% (8/14)**	19.8% (21/106)	-	-
	PD-L1<50%	**22.2% (4/18)**	-	9.8% (20/205)	12.6 (35/288)
	PD-L1≥50%	**50.0% (6/12)**	-	30.2% (42/139)	30.6 (22/72)
mPFS		**4.73 months**	1.7 months	4.0 months	-

Source : Vactosertib Study MP-VAC-203: Cho BC et al. SITC 2020, #P363
Durvalumab Study 1108: Antonia et al. Journal of Clinical Oncology 2017;35:9085-9085
Pembrolizumab Keynote 010: Herbst et al. The Lancet 2016;387:1540-50
Atezolizumab Oak: Rittmeyer et al. The Lancet 2017;389:255-265

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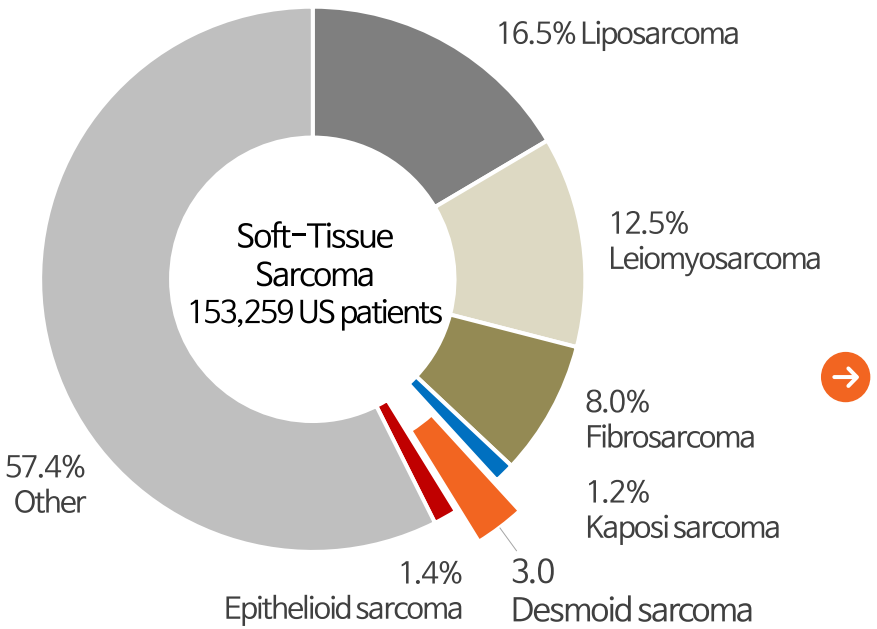
Desmoid Tumor (Aggressive Fibromatosis), Result of Phase 1b Combination Trial with Imatinib

Soft-tissue Sarcoma Types



FDA Approval of Orphan Drugs

Date	Product	Cancer Type	Stage	Patient Number	FDA Approval
Jan, 2020	Tazverik	Epithelioid sarcoma	2	62	Accelerated Approval
May, 2020	Pomalyst	AIDS-related Kaposi sarcoma	1/2	28	Accelerated Approval

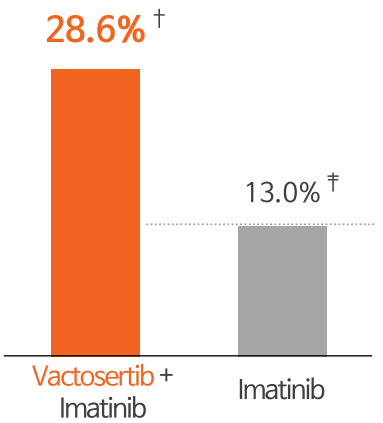
Desmoid Tumor Combination Therapy Trials

1 Korea P1b/2a Trial

2 Global P2 Plans

Phase 1b : ORR

Trial Sites: US, KOR



6-month PFS

- Vactosertib + Imatinib 100% vs. Imatinib mono 65~80%

2021 plans

☑ Republic of Korea, the US IND application

☑ FDA Fast Track Applications

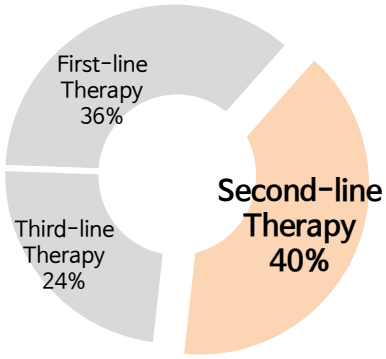
☑ Orphan drug designation (ODD)

Source:
† MedPacto Phase 1b Trial Results: as of May 2020 (5-8 months of therapy)
‡ Imatinib Mono ORR: 1) Penel et al. Ann Onco 2011 Feb 22 (2):452-7: Imatinib Mono 12 months ORR: 11%, 2) Kasper et al. Eur J Cancer. 2017 May;76:60-67: Imatinib Mono 12 months ORR: 13%
Note: A study directly comparing the combination therapy vs. Keytruda was not conducted.

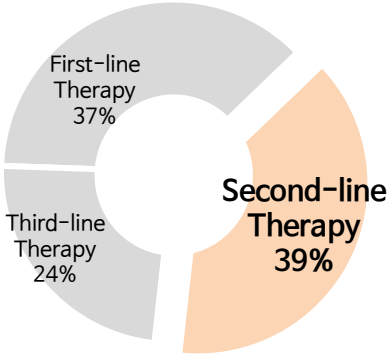
Durable responses are demonstrated in combination with Paclitaxel in advanced Gastric Cancer

Frequency of Use of Second-Line Therapy*

Local recurrence



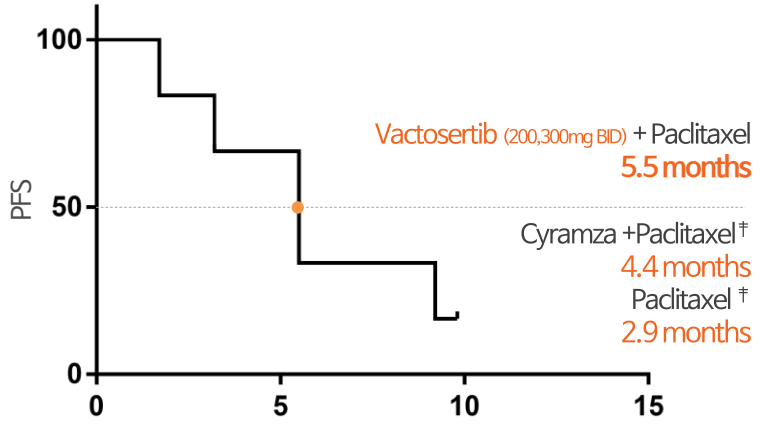
Stage 4 metastasis and distant recurrence Patients



Source : * Datamonitor 2016 Gastric Cancer Database
Note : Market share between second-line therapies was not considered.

Gastric Tumor Combination Therapy Trial
(Results from phase 1b stage)

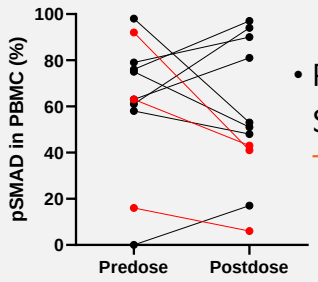
Progression-free survival (PFS) †



Source : † MedPacto ESMO 2020 Poster, ‡ Lancet Oncol. 2014 Oct;15(11):1224-35.
Note : A study directly comparing the combination therapy vs. Cyramza was not conducted.

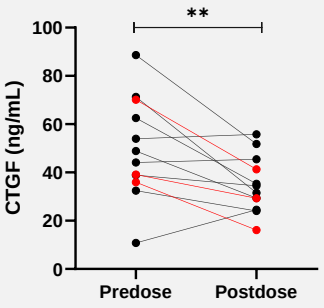
Pharmacodynamic Markers

pSMAD

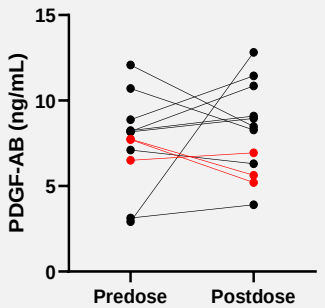


- Reduced phosphorylation of SMAD, a major marker of TGF-β signaling

CTGF



PDGF



- Reduction of target gene expression of the TGF-β signaling pathway

Ongoing Trials with Leading Combination Agents

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Clinical trials will demonstrate the combination potential with existing anticancer therapies to maximize Vactosertib's commercial value

Category		Cancer Type	Target Patient Number	[Country] Regimen	Clinical Development Plan
Solid cancer	Chemo-therapy combination	Gastric cancer	68	[KOR] + Paclitaxel	Phase 1b·2a → Phase 2 → Phase 3
			43	KOR] + Paclitaxel + ramucirumab	Phase 2 → Phase 3
		Pancreatic cancer	36	[KOR] + FOLFOX	Phase 1b·2a → Phase 2 → Phase 3
			18	[KOR] + 5FU/LV/Onivyde (SERVIER)	Phase 1b·2a → Phase 2 → Phase 3
	Targeted therapy combination	Desmoid sarcoma (Invasive fibrosis)	33	[KOR] + Imatinib	Phase 1b·2a
			-	[US, KOR] + Imatinib	Phase 2 → Phase 3
	Immuno-therapy combination	Colorectal / Gastric cancer	85	[KOR] + Keytruda (anti-PD-1) (MSD)	Phase 1b·2a → Phase 2 → Phase 3
		NSCLC 1L	55	[KOR] + Keytruda (anti-PD-1) (MSD)	Phase 2 → Phase 3
		NSCLC 2L	63	[KOR] + Imfinzi (anti-PD-L1) (AstraZeneca)	Phase 1b·2a → Phase 2 → Phase 3
		Bladder cancer	48	[US] + Imfinzi (anti-PD-L1) (AstraZeneca)	Phase 2 → Phase 3

Clinical Development Plan: 2020 | 2021 | 2022 | 2023 | 2024 | 2025

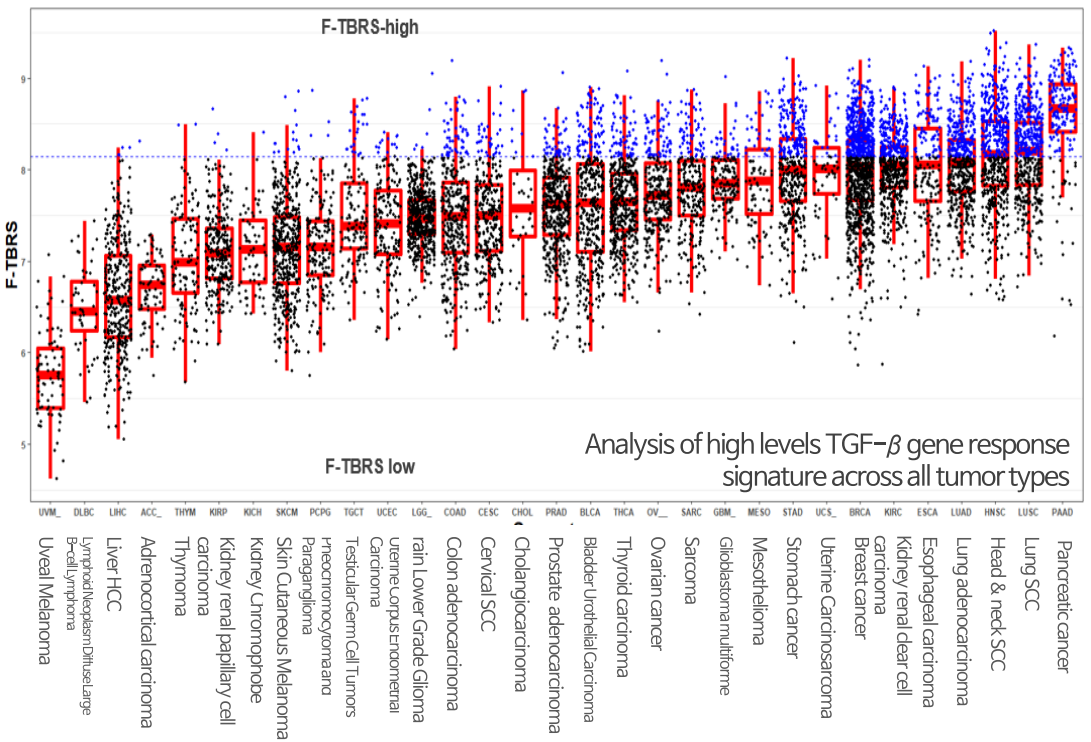
Vactosertib is targeting indications with high expression levels of the biomarker, TBRS

Vactosertib can be used in combination with any cancer therapy

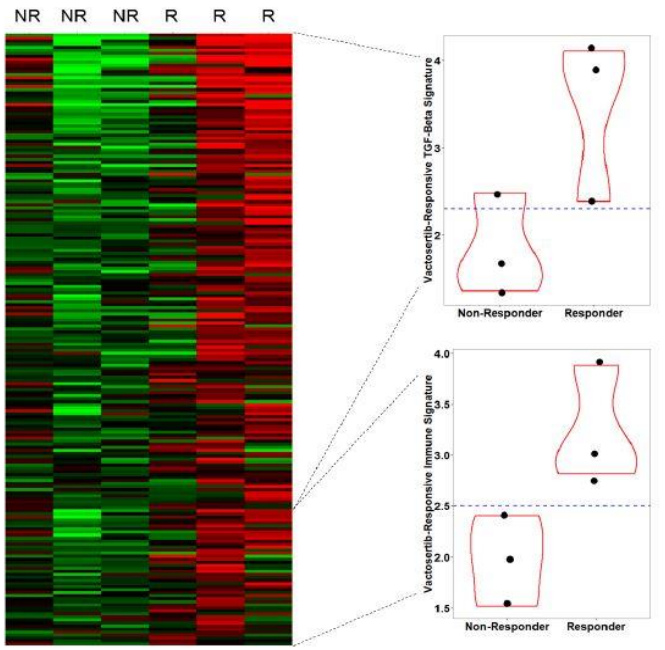
- Immunotherapy
- Chemotherapy
- Targeted therapy
- Cell therapy
- Radiation therapy

+ Vactosertib

Biomarkers show that all cancers can be treated by Vactosertib



Vactosertib response by metastatic CRC gene signature (Vactosertib+ Keytruda combination)



Source : Vactosertib Response Gene Signature (SITC 2019)

External Validation of Vactosertib

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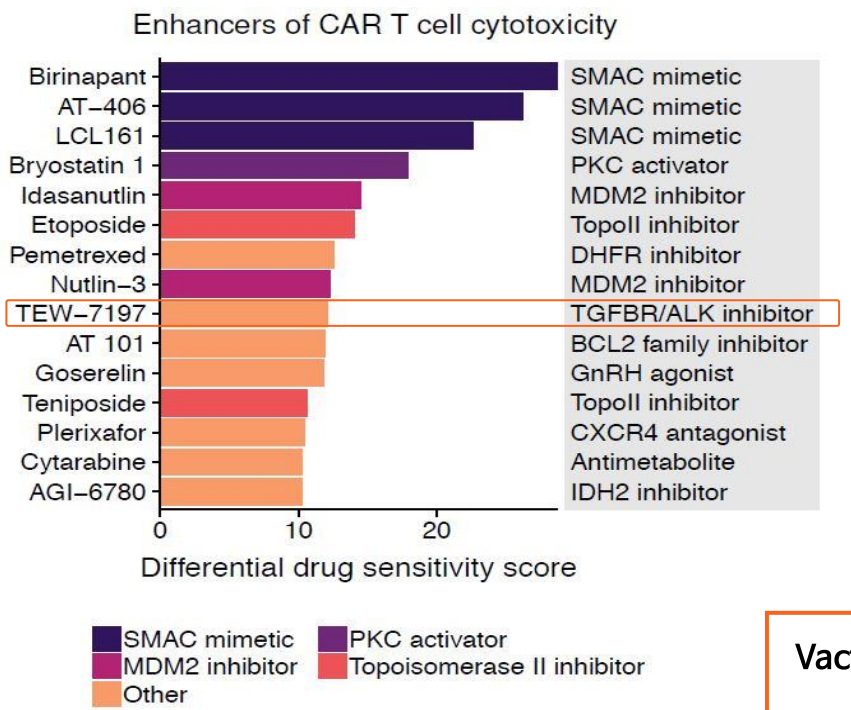
Among clinical-stage TGF-β inhibitors, Vactosertib is most advanced and extensively studied

- University of Helsinki research team published combination trial results with CAR-T therapy for 500+ small molecules worldwide in prominent US hematology journal, 'Blood'
  → Vactosertib showed most success among TGF-β inhibitors in killing cancer cells (Top 10 among 500+ drugs)

- Prominent journals such as 'Immunity' continuously cover TGF-β research developments
  → 'Vactosertib' has high competitive advantage among small molecule TGF-β inhibitors in terms of safety and efficacy
  → Eli Lilly removed competitor, Galunisertib, from their pipeline



Source: Blood (2020) 135 (9) : 597 - 609.

Table 1. Therapeutic Strategies to Block TGF-β Signaling in Cancer and Their Progress to the Clinic

Therapy	Target	Drug	Progress to Clinic
Small-molecule inhibitors	TGFBR1 kinase	Galunisertib	Multiple completed safety and efficacy phase 1 clinical trials in HCC, glioblastoma and other tumor types. Several ongoing phase 1/2 trials: metastatic breast cancer (GAL + radiation therapy), metastatic pancreatic cancer (GAL + Durvalumab), advanced hepatocellular carcinoma (GAL + stereotactic radiotherapy), metastatic androgen receptor negative triple, ngative breast cancer (Galunisertib and Paclitaxel), colorectal cancer (GAL + Capecitabine), rectal cancer (GAL + chemoradiation), advanced refractory solid tumors (GAL + Nivolumab), and metastatic prostate cancer (GAL + Enzalutamide).
		Vactosertib	Safety and efficacy phase trials in advanced-stage solid tumors. Several ongoing phase 1/2 trials: metastatic gastric cancer (VAC + Paclitaxel), advanced NSCLC (VAC + Durvalumab), metastatic colorectal and gastric cancer (VAC + Pembrolizumab), advanced desmoid tumors (VAC + Imatinib)
		LY3200882	Phase 1: safety and dose escalation in solid tumors.
		PF-06952229	Phase 1: safety and dose escalation in breast cancer and prostate cancer in monotherapy or combination with several drugs (palbociclib, Letrozole, Enzalutamide).
		AZ12601011 AZ12799734	Pre-clinical development (Spender et al., 2019).
Antibodies	Blocking pan-TGF- β (TGF-β1, TGF-β2, TGF-β3)	Fresolimumab	Completed safety and efficacy phase 1 trials in renal cell carcinoma, melanoma, and glioma. Ongoing phase 1/2 trials: relapsed malignant mesothelioma, advanced renal cell carcinoma and melanoma, early-stage NSCLC (FRESO + stereotactic ablative radiotherapy), and metastatic breast cancer (FRESO + radiation).
	Blocking pan-TGF-β	SAR439459	Phase 1 (safety and dose escalation) for advanced solid tumors in monotherapy or combination with anti-PD1 antibodies.
	Blocking pan-TGF-β	NIS793	Phase 1 in combination with anti-PD-1 antibodies for patients with advanced malignancies (breast, lung, HCC, CRC, pancreatic cancer, renal cancer).
	Blocking TGF-β1 and TGF-β2 specific	XPA-42-089	Pre-clinical cancer models (Dodagatta-Marri et al., 2019).
	Chimeric antibody-TGF-β traps	CTLA4- TGFβRII	Pre-clinical cancer models (Ravi et al., 2018).
		PDL1-TGFβRII (M7824)	Ongoing phase 1/2 trials: NSCLC (compared to Pembrolizumab), triple-negative breast cancer (M7824 + Eribulin), prostate cancer, metastatic colorectal cancer, and cholangiocarcinoma and gallbladder.
	GA	ABBV151	Phase 1 trials for advanced solid tumors as monotherapy or in combination with
	αvβ8 Integrins		Pre-clinical cancer models (Takasaka et al., 2018).
Adoptive cell transfer			Hodgkin lymphoma.

Vactosertib Safety and efficacy phase trials in advanced-stage solid tumors. Several ongoing phase 1/2 trials: metastatic gastric cancer (VAC + Paclitaxel), advanced NSCLC (VAC + Durvalumab), metastatic colorectal and gastric cancer (VAC + Pembrolizumab), advanced desmoid tumors (VAC + Imatinib)

Source: Immunity 50, April 15, 2019

Development of MA-B2, an antibody therapeutic targeting BAG2

First Discovery of BAG2 Target Protein

- Plays a role in deactivating immune cell activity
- In various cancers, a large amount of BAG2 is secreted into the blood when cancer recurs or metastasizes

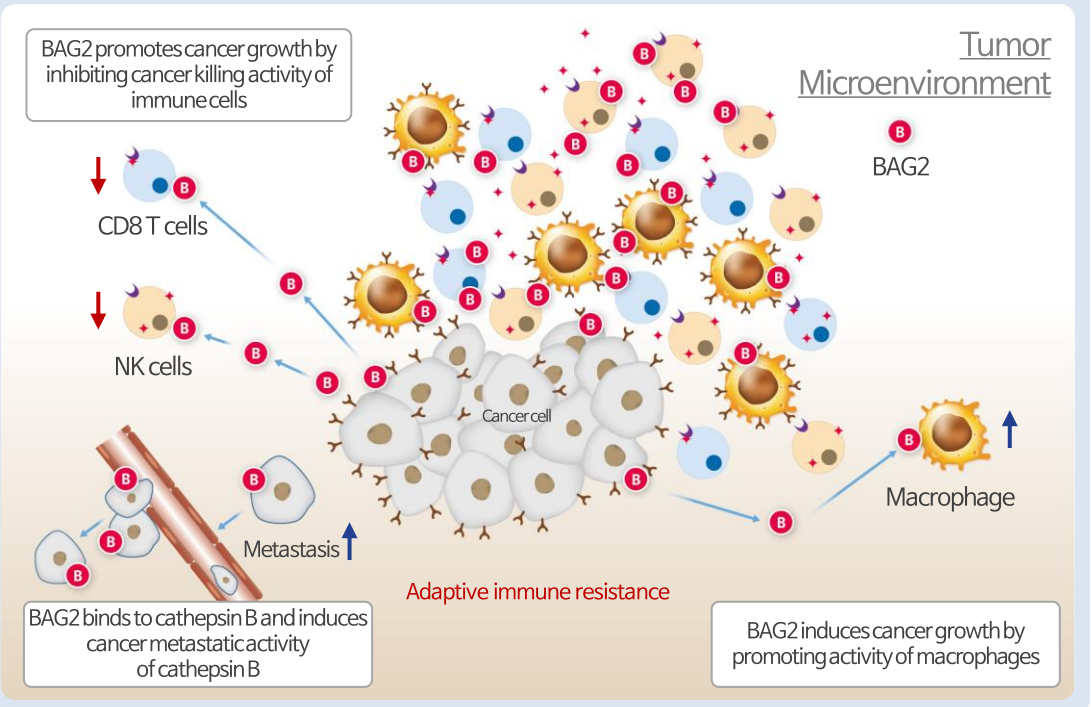
Development Roadmap of BAG2 Therapeutic and Diagnostic

Antibody therapeutic	Diagnostic Kit
MA-B2	MO-B2

- Cancer metastasis / relapse predictive biomarker
- Companion diagnostic development to propose optimal treatment method and confirm response rates

Mechanism of Action of Antibody Therapeutic (MA-B2)

During carcinogenesis, MA-B2 inhibits the metastatic activity of cathepsin B, an enzyme involved in cancer metastasis, and activates the immune system by blocking the immune activity inhibitory effect of BAG2 protein



Diagnostic for Prediction of Metastasis and Relapse : MO-B2

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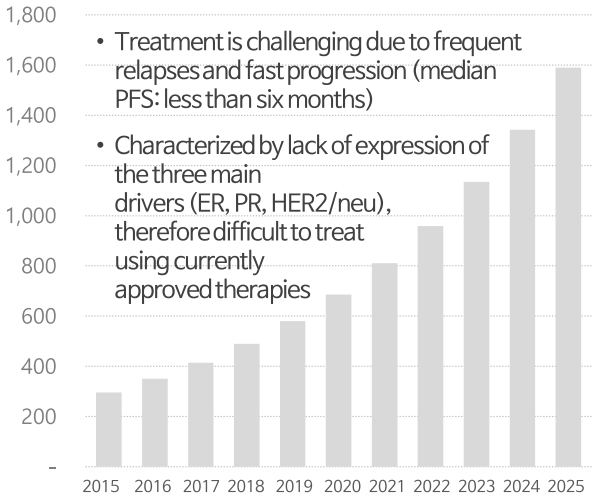
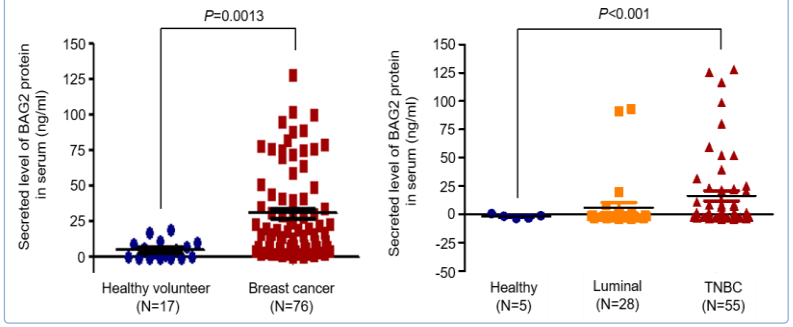
Early approval expected as MO-B2 will be the first diagnostic that predicts metastasis and recurrence of triple-negative breast cancer

Global TNBC Market Forecast (M$)

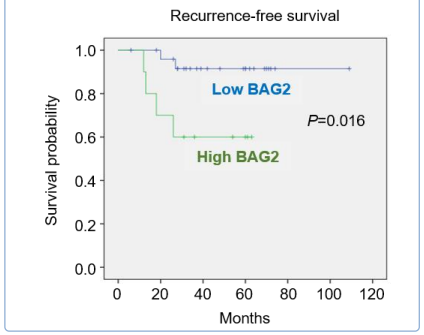


- Treatment is challenging due to frequent relapses and fast progression (median PFS: less than six months)
- Characterized by lack of expression of the three main drivers (ER, PR, HER2/neu), therefore difficult to treat using currently approved therapies

BAG2 is specifically secreted into the serums of patients with aggressive breast cancer



ELISA analysis showing BAG2 protein levels in the serums of breast cancer patients



Kaplan-Meier analysis showing recurrence-free survival depending on secreted BAG2 protein level in patients with breast caner

US FDA Recommendation to couple drug development with diagnostics

RT-PCR

Genomic Health LIFE, CHANGING.

YoY Revenue Growth:
$254m USD (2017)
$299m USD (2018)

Oncotype Dx (ER+, HER2-)

HercepTest Kits

Dako An Agilent Technologies Company

Agilent acquired Dako for $2.2b USD (2010)

HercepTest (HER2+)

MO-B2 (BAG2 Kits)

MEDPACTO

Diagnosis of cancer metastasis and recurrence as well as biomarker-based companion diagnostic kit

MO-B2 : ER-, PR-, HER2- (Triple Negative)

Upcoming Major Society Presentation Events

MEDPACTO

Event date	Pipeline	Cancer Type	Regimen	Contents
2021.04 AACR	Vactosertib	Pancreatic cancer	Onivyde combination	Preclinical results
		Desmoid tumor	-	TBRS analysis results
	BAG2	Breast cancer	-	Research results
	DRAK1	cervical cancer	-	Research results
2021.06 ASCO	Vactosertib	Colorectal cancer	Keytruda (anti-PD-1) combination	Phase2a results
2021.09 ESMO	Vactosertib	NSCLC	Keytruda (anti-PD-1) combination	Phase2a interim results
2021.11 SITC	Vactosertib	NSCLC	Imfinzi (anti-PD-L1) combination	Phase2a results

Event Date	Major Business Development Conferences
2021.03	BIO-Europe 2021
2021.06	BIO 2021

MEd·PACTO

Global Pioneer in Innovative Drug Development

Growth Roadmap

Stage 1 →
Successful commercialization of Vactosertib

Stage2 →
Pipeline development of various drug substances

Stage 3 →
Therapeutic area expansion to autoimmune diseases and obesity