

# Q2 2021 Results

August 2021

---



The Global Leader in Multiplex Molecular Diagnostics

## Disclaimer

Any statement in this presentation about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and are forward- looking statements. These statements are often, but not always, made through the use of words or phrases such as “believe”, “will”, “expect”, “anticipate”, “estimate”, “intend”, “plan” and “would”.

For example, statements concerning proposed financial guidance, macroeconomic conditions, future results of operations, growth opportunities, product development, clinical trials, regulatory timelines and approvals, industry ranking, plans and objectives of management, the market for our stock, and future management and organization structure are all forward-looking statements.

Forward-looking statements are not guarantees of performance and involve both known and unknown risks, uncertainties and assumptions that may impact actual results. Levels of activity, performance or achievements may differ materially from those expressed or implied.

Seegene assumes no obligation and expressly disclaims any duty to update any forward-looking statements based on events after the date of this presentation or to reflect subsequent events.

# Agenda

## ▪ 2021 Q2 Business Performance

- Q2'21 Highlights
- Q2'21 Financial Review
- Sales and OP Trend
- Sales Breakdown by Product Type
- Equipment Sales
- Sales Breakdown by Region
- Summarized B/S and C/F
- Financial Ratio
- [Appendix] Company Overview
  - ❖ Introductions of company including key products and core technology

# 2021 Q2 Business Performance



The Global Leader in Multiplex Molecular Diagnostics

# Q2'21 Highlights

## Finance

- **2Q Revenue KRW 303.7 B** : YoY 11% growth  
Gross Profit(margin): KRW 222.2 B(73%), Operating Profit(margin): KRW 144.2 B(47%), Net Income(margin): KRW 116.7 B(38%)
- **1H Revenue KRW 655.5 B** : YoY 84% growth, 58% achievement based on annual revenue FY2020  
Gross Profit(margin): KRW 491.6 B(75%), Operating Profit(margin): KRW 338.6 B(52%), Net Income(margin): KRW 280.9 B(43%)

## Product & Market

- **Allplex™ SARS-CoV-2 Variant II Assay, Allplex™ SARS-CoV-2/P681R Assay (RUO)**
  - Launch variant virus screening kit detecting major variants including Delta and Delta Plus
- **Showcased on-site mobile laboratory MOBILE STATION at 'Medlab 2021' (June)**
  - UAE based G42 Healthcare signed MOU for MOBILE STATION (June)
  - Korea Advanced Institute of Science and Technology(KAIST) signed joint research business agreement for next-generation molecular diagnostics platform (July)
- **Bio-RAD signed partnership agreement for the clinical development and commercialization of diagnostic tests (July)**
  - New partnership to seek U.S.FDA clearance and to drive U.S market opportunity
  - Bio-RAD to streamline FDA process for 8 multiplex diagnostic assays starting in late 2022 to aim the product launch in early 2023, targeting U.S. market
- **Notable signed deals:** Gov't contract of mass-testing in Italy, Germany, Scotland, Kuwait, etc. totaling approx. USD 160mn
- **Key sales growth countries:** (QoQ) Asia: Vietnam(123%), Thailand(103%), Singapore(45%)  
South America: Chile(180%), Columbia(163%), Brazil(130%)



# Q2'21 Financial Review

(Unit: B KRW)	H1'21	Q2'21	Q1'21	Q2'20	QoQ	YoY
<b>Revenue</b>	<b>655.5</b>	<b>303.7</b>	<b>351.8</b>	<b>274.8</b>	-14%	11%
Cost of Good Sold	163.9	81.5	82.4	68.2		
	(%) 25%	27%	23%	25%		
<b>Gross Profit</b>	<b>491.6</b>	<b>222.2</b>	<b>269.4</b>	<b>206.6</b>	-18%	8%
SG&A Exp.	138.7	78.0	60.7	32.0		
	(%) 21%	26%	17%	12%		
R&D Exp.	33.2	18.5	14.7	5.6		
	(%) 5%	6%	4%	2%		
<b>Operating Profit</b>	<b>338.1</b>	<b>144.2</b>	<b>193.9</b>	<b>169.0</b>	-26%	-15%
	(%) 52%	47%	55%	61%		
<b>Non-Operating Gain/Loss</b>	<b>12.3</b>	<b>5.9</b>	<b>6.5</b>	<b>6.8</b>		
Currency Exchange Gains (Loss)	12.3	9.9	2.5	(1.6)		
Income/(Loss) from Affiliates	6.1	2.0	4.1	9.5		
Other Non-Operating Inc. (Exp.)	-6.1	(6.0)	(0.1)	(1.0)		
<b>Pretax Income</b>	<b>350.4</b>	<b>150.0</b>	<b>200.4</b>	<b>175.8</b>	-25%	-15%
	(%) 53%	49%	57%	64%		
Income Tax Exp.	69.5	33.3	36.2	44.2		
<b>Net Income</b>	<b>280.9</b>	<b>116.7</b>	<b>164.2</b>	<b>131.6</b>	-29%	-11%
	(%) 43%	38%	47%	48%		

- **Sales KRW 303.7B (YoY ▲11% & QoQ▼14%)**

- Topline jumped 11% YoY, slid 14% QoQ
- Moderate slide in sales due to a modified pricing policy in reinforcing the market position as well as elevated inoculation rate in European countries

- **Operating Profit KRW144.2B (YoY ▼15% & QoQ ▼26%)**

- Operating profit scaled back 15% YoY, 26% QoQ
- Operating profit and OPM trimmed due to diminished sales and higher investments (talent acquisition and R&D) in future growth engine

- **Non-operating Gain/Loss KRW 5.9B**

- **Income Tax Expense of KRW 3.3B**

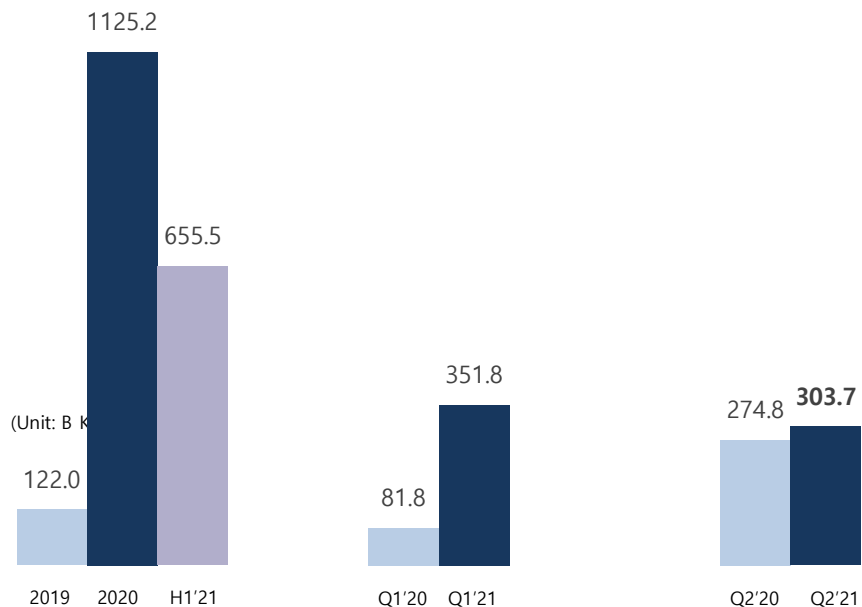
- **Net profit KRW116.7B (YoY ▼11% & QoQ ▼29%)**

# Sales & Operating Profit Trend

## ❧ Sales Trend

- H1'21 sales alone achieved 58% of FY2020 Sales
- Recorded 11% YoY increase and 14% QoQ drop in Revenue

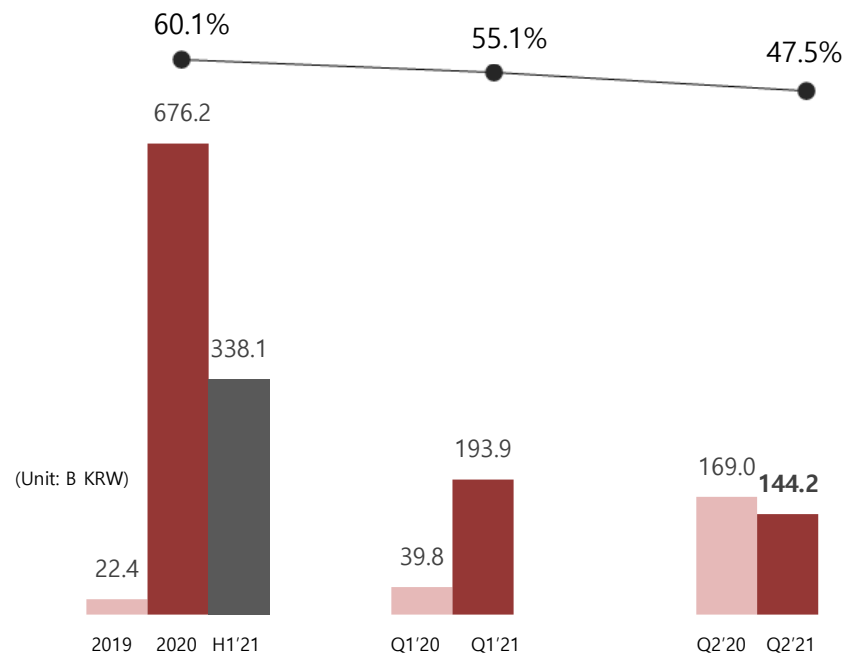
- ❖ Abating testing demands due to incremented vaccination rate among European countries
- ❖ Modification of pricing policy in expanding company's global market share



## ❧ Operating Profit & OPM Trend

- Reported a 15% YoY / 26% QoQ decline in Operating profit
- OPM tumbled 8% p QoQ

- ❖ Decline in OPM attributed to reduced topline and inclined investments buoyed by SG&A/R&D cost for robust long-term growth



# Sales Breakdown by Product Type

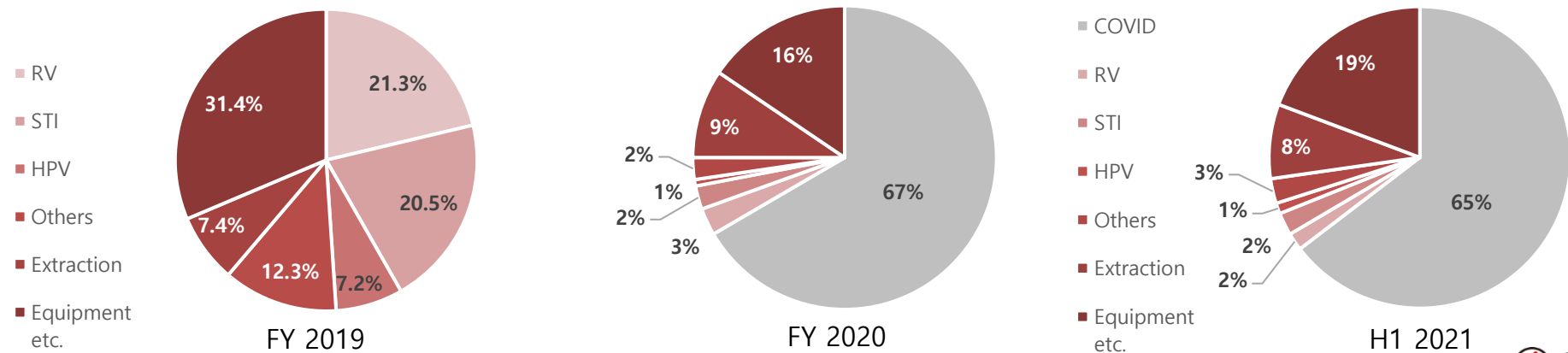
## Reagent/Equipment Sales

- H1'21 COVID-19 Assays sales share down 2%p over FY'20
- Q2'21 Non-COVID Assays sales up QoQ by 5.4%

(Unit : KRW Billion)	Q1'20	Q2'20	Q3'20	Q4'20	FY2020	Q1'21	Q2'21
<b>Reagent</b>	<b>58.4</b>	<b>232.1</b>	<b>283.2</b>	<b>376.7</b>	<b>950.5</b>	<b>282.5</b>	<b>246.6</b>
- COVID	26.4	195.1	219.6	308.2	749.3	224.8	198.8
- Non-COVID	27.6	14.1	26.2	26.7	94.7	25.9	27.3
RV	9.5	6.3	8.7	8.1	32.6	7.2	5.1
STI	8.3	3.7	7.5	8.6	28.1	7.5	8.5
HPV	1.5	0.3	2.8	3.1	7.7	3.5	4.0
Others	8.3	3.8	7.1	6.9	26.2	7.7	9.7
- Extraction	4.3	22.9	37.4	41.8	106.5	31.8	20.5
<b>Equipment etc.</b>	<b>23.4</b>	<b>42.7</b>	<b>43.6</b>	<b>65.0</b>	<b>174.7</b>	<b>69.3</b>	<b>57.1</b>
<b>Total</b>	<b>81.8</b>	<b>274.8</b>	<b>326.9</b>	<b>441.7</b>	<b>1,125.2</b>	<b>351.8</b>	<b>303.7</b>

\*Equipment etc.: equipment, accessories, service

## Reagent/Equipment Sales Contribution Trend



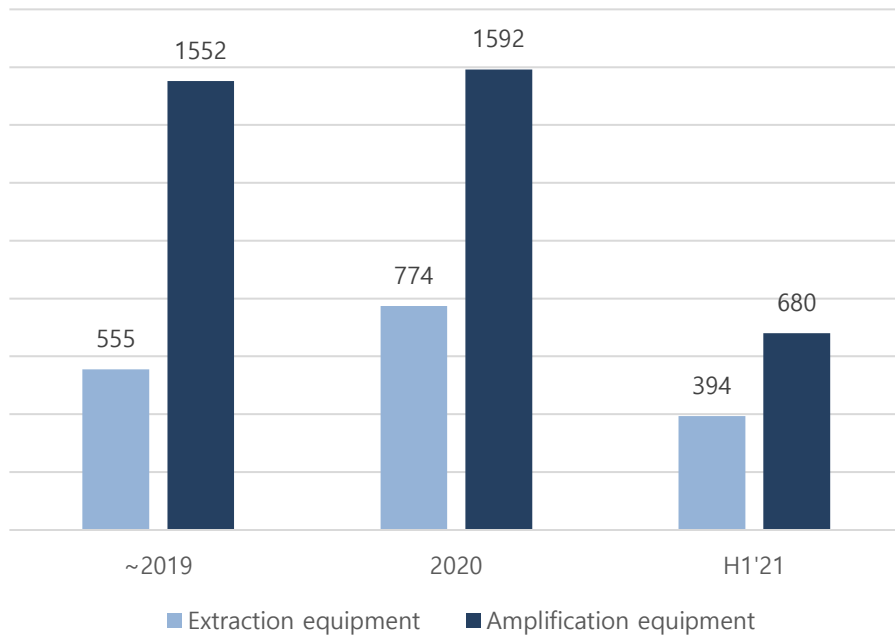


# Equipment Sales

## ✦ Highlights

### H1'21 1,168 units sold(extraction • amplification)

- Q2'21, extraction equipment (STARlet, NIMBUS, etc.) 228units; amplification equipment (CFX96) 351units newly installed
- Equipment installation growth in emerging markets including Asia(Malaysia, Thailand) and Central-South America(Chile, Brazil)
  - ※ Central-South America: **FY2020** proportion, Extraction 15%/ Amplification 11% → **H1'21**, Extraction 26%/ Amplification 25%
  - ※ Asia: **FY2020** proportion, Extraction 11%/ Amplification 15% → **H1'21**, Extraction 12%/ Amplification 21%



#### ※ Extraction Equipment



SEEPREP32™



Maelstrom™ 9600

#### ※ Extraction and PCR set-up Equipment



NIMBUS



STARlet

#### ※ Amplification Equipment



CFX96 Dx

# Sales Breakdown by Region

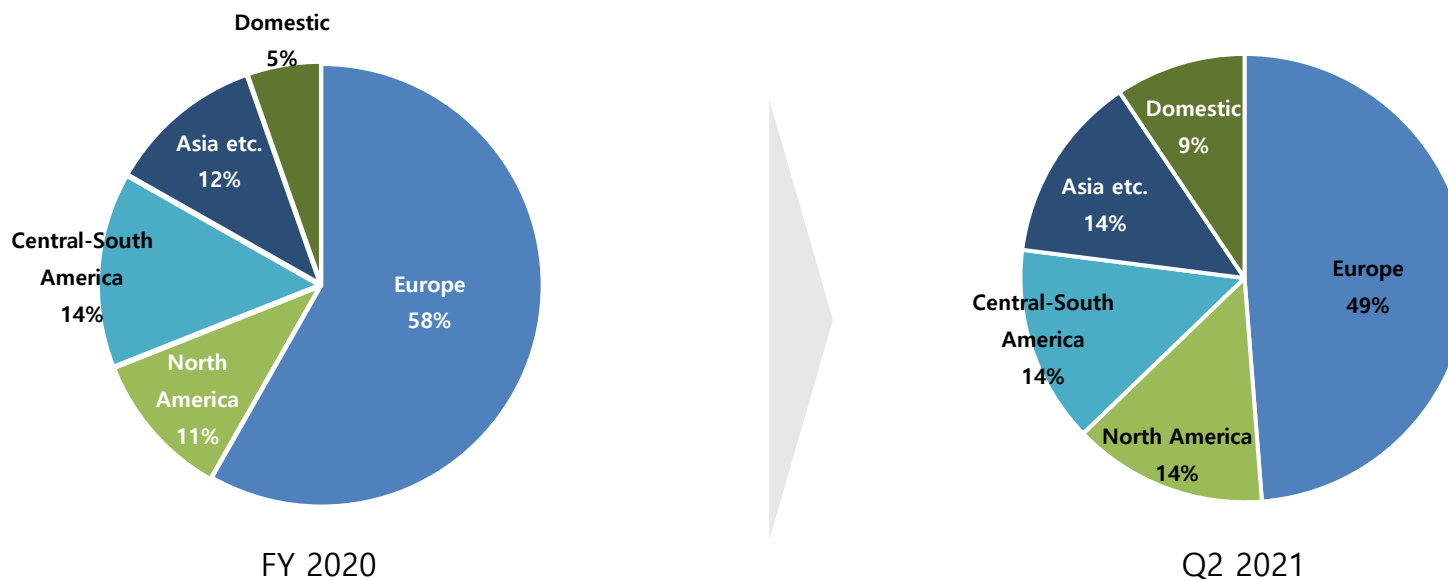
## Sales by Region

- Europe regional sales shares down (-9%p)
- North America and Asia regional sales shares up (+3%p and +2%p, respectively)

(Unit: KRW B)	Q1'20	Q2'20	Q3'20	Q4'20	FY 2020	Q1'21	Q2'21	QoQ	YoY
Europe	53.4	109.2	198.8	293.8	655.3	221.6	148.1	▼ 33.2%	▲ 35.7%
North America	5.5	25.3	32.9	57.4	121.1	43.6	42.6	▼ 2.2%	▲ 68.7%
Central-South America	2.6	79.1	42.6	35.7	160.0	25.2	43.2	▲ 71.2%	▼ 45.4%
Asia etc.	9.7	50.6	35.7	32.4	128.3	34.1	41.2	▲ 20.8%	▼ 18.5%
Domestic	10.5	10.7	16.8	22.5	60.5	27.2	28.6	▲ 5.3%	▲ 167.8%
<b>Total</b>	<b>81.8</b>	<b>274.8</b>	<b>326.9</b>	<b>441.7</b>	<b>1,125.2</b>	<b>351.8</b>	<b>303.7</b>	▼ 13.7%	▲ 10.5%

\* Asia etc.: Asia, Africa, Oceania

## Regional Sales Contribution Trend



# Summarized B/S and C/F

(Unit: KRW B)

Category	Q2'21	Q1'21	Q2'20
<b>Assets</b>	<b>1,227.1</b>	<b>1,229.0</b>	<b>500.1</b>
· Cash and Equivalents	264.0	312.5	117.0
· Account/other Receivables	240.6	285.7	190.1
· Inventory	280.6	221.9	63.3
· Accounts Receivable Long-Term	23.8	22.9	10.8
· Gross PP&E	208.4	199.3	44.9
· Other Assets	209.6	186.8	73.9
<b>Total Assets</b>	<b>1,227.1</b>	<b>1,229.0</b>	<b>500.1</b>
<b>Liabilities</b>	<b>355.3</b>	<b>458.1</b>	<b>190.3</b>
· Account/other Payables	114.0	173.6	80.7
· Short-term Borrowings	39.5	37.0	7.5
· Curr. Port. Of LT Debt	0.9	0.8	0.9
· Income Taxes Payable	86.9	140.0	53.2
· Long-Term Debt	43.9	44.1	1.4
· Other Liabilities	70.1	62.7	46.6
<b>Equity</b>	<b>871.9</b>	<b>770.9</b>	<b>309.8</b>
· Common Stock	26.1	13.1	13.1
· Additional Paid In Capital	42.5	67.0	68.2
· Retained Earnings	801.6	690.0	227.3
· Minority Interest	2.0	0.7	1.3
<b>Total Liabilities and Equity</b>	<b>1227.1</b>	<b>1229.0</b>	<b>500.1</b>

(Unit: KRW B)

Category	Q2'21	Q1'21	Q2'20
<b>Beginning Cash Balance</b>	<b>312.5</b>	<b>308.1</b>	<b>49.1</b>
<b>Cashflow From Operations</b>	<b>17.0</b>	<b>23.0</b>	<b>91.7</b>
· Net Income	116.7	164.2	165.3
· Change in Net Capital Mngt	(41.1)	(106.8)	(111.4)
· Income Tax Paid	(97.9)	(76.7)	(13.9)
<b>Cashflow From Investments</b>	<b>(13.5)</b>	<b>(17.0)</b>	<b>(20.7)</b>
· Sale (Purchse) of PP&E	(8.2)	(16.1)	(24.6)
· Sale (Purchase) of Intangible Assets	(3.3)	(0.3)	(0.5)
<b>Cashflow From Finance</b>	<b>(54.0)</b>	<b>(3.4)</b>	<b>(2.6)</b>
· Short Term Debt Issued (Repaid)	2.5	(0.2)	1.7
· Long Term Debt Issued (Repaid)	0.2	(0.2)	0.1
· Repurchase of Common Stock	(14.6)	-	-
· Dividends Paid	(39.0)	-	(2.6)
<b>Net Change in Cash</b>	<b>(48.5)</b>	<b>4.3</b>	<b>67.9</b>
<b>Ending Cash Balance</b>	<b>264.0</b>	<b>312.5</b>	<b>117</b>

# Key Ratios

<b>Profitability Ratios</b>	<b>Q2'21</b>	<b>H1'21</b>
<b>OPM</b>	<b>47.5%</b>	<b>51.6%</b>
<b>Net Profit Margin</b>	<b>38.4%</b>	<b>42.9%</b>
<b>EBITDA Margin*</b>	<b>49.9%</b>	<b>53.8%</b>
<b>ROE</b>	<b>56.8%</b>	<b>74.0%</b>
Profitability (Net Profit/Sales)	0.38	0.43
Asset Turnover (Sales/Asset)	0.99	1.13
Leverage (Asset/Equity)	1.51	1.52

\* EBITDA = Operating profit + Depreciation + Amortization

<b>Liquidity Ratios</b>	<b>Q2'21</b>	<b>H1'21</b>
<b>Current Ratio (Current Asset/Current Liabilities)</b>	<b>318.7%</b>	<b>318.7%</b>
<b>Debt Ratio (Total Debt/Equity)</b>	<b>40.8%</b>	<b>40.8%</b>
<b>Borrowing Ratio (IBD*/Equity)</b>	<b>9.7%</b>	<b>9.7%</b>
<b>Inventory Turnover**</b>	<b>5.8x</b>	<b>6.2x</b>

\* Total Borrowing: Total Interest-Bearing Debt including Lease Payment

\*\* Inventory Turnover:  $[\text{Annualized Sales} \div \{(\text{Beg. Inv} + \text{End. Inv}) \div 2\}]$

# [Appendix] Company Overview



The Global Leader in Multiplex Molecular Diagnostics



## ▪ **[Appendix] Company Overview**

- About Company
- Stock Information
- Multiplex Molecular Diagnostics Solution
- Top selling Multiplex Assay
- COVID-19 Variants Assay
- HPV Assay
- R&D Capability and Competitiveness
- Product Expansion (Assay Menu and Equipment)
- Assay Pipeline and Approval Status
- Global IVD outlook
- Global MDx segment outlook
- Seegene's Proprietary PCR Technologies: DPO™, TOCE™, MuDT™, mTOCE™



# About Company

## Seegene Inc.

- CEO/CTO: Dr. Jong-Yoon Chun
- Established: Sept. 15, 2000 / Listed: Sept. 10, 2010
- Capital: KRW 13,117mn
- Number of employees: 897 (HQ, as of Jun. 30, 2021)
- Product: Molecular Diagnostics (MDx) Reagent
- Key proprietary MDx technologies:  
DPO™(2004), TOCE™(2011), MuDT™(2015)

## Main Products

### Reagent Product



DNA/RNA  
Extraction Kit

- Infectious Disease
- Antibiotic-resistance Typing
- SNP Genotyping



Multiplex  
Assay

### Equipment



Nimbus (Hamilton)



STARlet (Hamilton)

[Extraction]



CFX96 (Bio-Rad)

[Real-time PCR]

## Global Network

- 7 Foreign subsidiaries (Employees: 198) \*including 7 HQ dispatched  
Italy, UAE, US, Canada, Germany, Brazil, Mexico
- Over 100 distributors worldwide

Subsidiaries	Date of est.
Arrow Diagnostics (Italy)	Jan. 2014
Seegene Middle East (UAE)	Oct. 2014
Seegene Technologies (USA)	Apr. 2015
Seegene Canada (Canada)	Jul. 2015
Seegene Mexico (Mexico)	Apr. 2016
Seegene Germany GmbH (Germany)	Jul. 2016
Seegene Brazil (Brazil)	Jun. 2019

### Foreign Offices

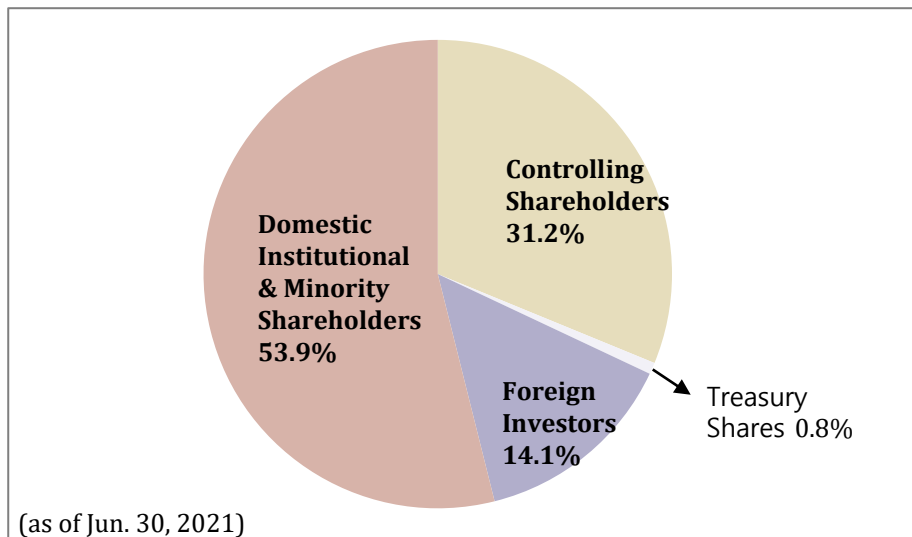


# Stock Information

## Snapshot

- Ticker: 096530 (KOSDAQ)
- Shares Outstanding: 52,225,994
- Par value: KRW 500
- Market Cap: KRW 4.32 Tr (as of Jun. 30, 2021)
- Avg. Daily Trading Volume: 1,651,352 (Most recent 3months avg.)
- 52 week High / Low: KRW 104,700 / 60,600

## Shareholder Structure



## Voting Right Status

Classification	Type of Shares	# of Shares	Note
Shares Outstanding (A)	Common Shares	52,225,994	-
	Preferred Shares	-	-
Non-Voting Shares(B)	Common Shares	430,521	Treasury Stock
	Preferred Shares	-	-
Voting Shares(C=A-B)	Common Shares	51,795,473	-
	Preferred Shares	-	-

※ As of April 26, '21, the total number of shares increased from 26,234,020 shares to 25,991,974 shares as a result of the free capital increase (100%)

## Dividend Payout

Classification	2019	2020	2021 2Q (Quarterly Div.)
Dividend Payment (Unit: mm KRW)	2,599	38,988	20,718
Div. Per Share (Unit: KRW)	100	1,500	400

※ As quarterly dividends are implemented from the 2nd quarter, the 2nd quarter dividend is the amount that takes into account the unpaid 1st quarter.

# Multiplex Molecular Diagnostics Solution

## All MDx Assays in One Platform

- ✓ Seegene's **All in One Platform** provides one-step testing solution via single platform compatible with all SG multiplex assay menu

### Automated extraction & PCR setup

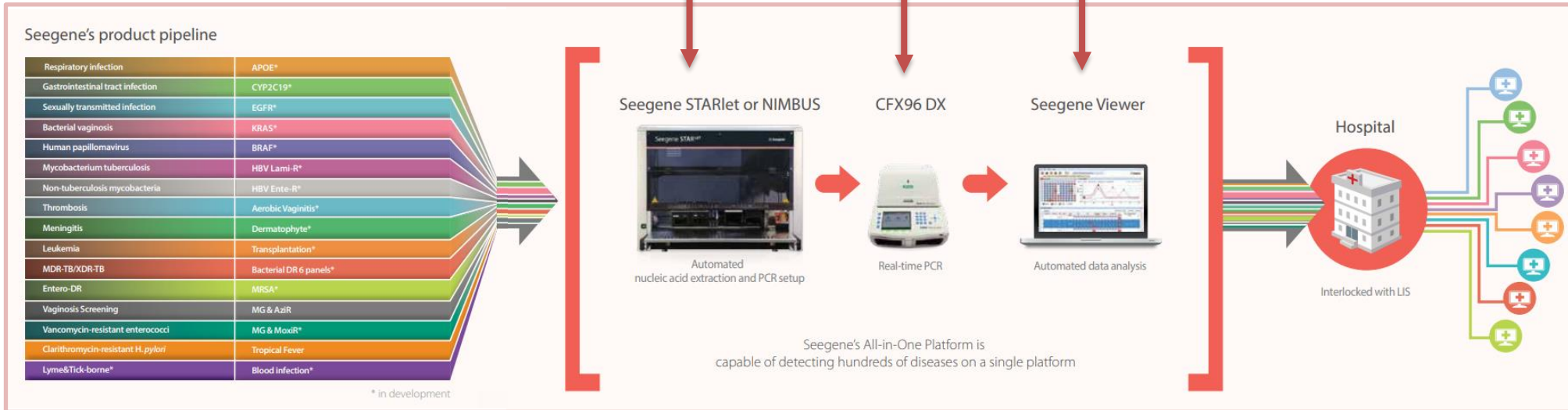
- One-step process of Nucleic acid extraction & PCR setup
- applicable with wide range of specimen sample type
- All equipment compatible with SG launcher and viewer

### Real-time PCR

- Accurate multiplex real-time PCR results driven by DPO™, TOCE™, MuDT™
- Availability of over 120 assay menus
- Multiplex assay with qualitative and quantitative result

### Automatic analysis of test results

- Interface optimized for high-multiplex MDx test
- Convenient result analysis with Melting curve analysis and Ct value
- Lab Information System(LIS) connectivity



# Top selling Multiplex Assay



## Seeplex<sup>®</sup> Multiplex PCR line

H.pylori-ClaR ACE Detection

VRE ACE Detection

RV15 Onestep ACE Detection

RV15 ACE Detection

MTB/NTM ACE Detection

STI Master ACE Detection

STD6 ACE Detection

Diarrhea-V ACE Detection

Diarrhea-B1 ACE Detection

Diarrhea-B2 ACE Detection

HPV4A ACE Screening

HSV2 ACE Detection

Meningitis-V1 ACE Detection

Meningitis-V2 ACE Detection

Meningitis-B ACE Detection

Leukemia BCR/ABL

ApoE ACE Genotyping



## Anyplex<sup>™</sup>

High Multiplex Real-time PCR line

CT/NG Real-time Detection

FluA/B Typing Real-time Detection

MERS-CoV (upE & orf1a)  
Real-time Detection

BRAF V600E Real-time Detection

VanR Real-time Detection



## Anyplex<sup>™</sup> II

High Multiplex Real-time PCR line

HPV28 Detection

HPV HR Detection

RV16 Detection

RB5 Detection

MTB/MDR Detection

MTB/XDR Detection

MTB/MDR/XDR Detection

STI-7 Detection

STI-5 Detection

Thrombosis SNP Panel Assay



## Allplex<sup>™</sup>

The Next Generation Real-time PCR line

Respiratory Panel Assays

RV Essential Assay

SARS-CoV-2 Master Assay

SARS-CoV-2 Variant I Assay

SARS-CoV-2 Variant II Assay

SARS-CoV-2/FluA/B/RSV Assay

MTB/MDRe Detection

MTB/MDR/XDRe Detection

Gastrointestinal Panel Assays

GI-Helminth(I) Assay

GI-EB Screening Assay

Enterobacter Assay

STI/BV Panel Assays

STI Essential Assay Q (MH, UU)

Vaginitis Screening Assay

Bacterial Vaginosis plus Assay

CT/NG/MG/TV Assay

MG & AziR Assay


MG & MoxiR Assay

H. pylori & Clair Assay

Meningitis Panel Assays

\*ACE: Auto- Capillary Electrophoresis

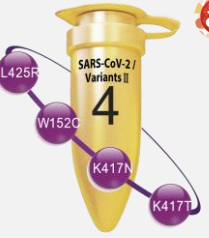
# COVID-19 Variants Assay



**all Allplex™ SARS-CoV-2 Variants I Assay**

- **Analytes**
  - RdRP gene
  - E484K in S gene
  - N501Y in S gene
  - HV69/70 deletion in S gene
  - Endogenous IC
- **Screening of COVID-19(wild type), Alpha, Beta and Gamma variants**

**CE-IVD**



**all Allplex™ SARS-CoV-2 Variants II Assay**

- **Analytes**
  - L452R in S gene
  - W152C in S gene
  - K417T in S gene
  - Endogenous IC
- **Screening of Delta, Delta plus, Gamma, Beta and Epsilon variants**

**CE-IVD**

Product	Target	Detection										
Allplex™ SARS-CoV-2 Variant I	N501Y	■	■		■							■
	69/70del	■				■						
	E484K		■	■	■	■				■		■
Allplex™ SARS-CoV-2 Variant II	L452R						■	■	■		■	
	W152C						■					
	K417N				■				■			
	K417T		■									
Novaplex™ SARS-CoV-2 / P681R (RUO)	P681R							■	■			
Associate Variants	B.1.1.7	P.1	P.2	B.1.351	B.1.525	B.1.429/ B.1.427	B.1.617.2	B.1.617.2.1	B.1.618	B.1.526.1	P.3	
	UK	BR	BR	SA	NG	US	IND	IND	IND	US	PHIL	
WHO Label	Alpha	Gamma	Zeta	Beta	Eta	Epsilon	Delta	Delta Plus	-	Iota	Theta	

# HPV Assay

## Comparison of Cervical cancer(HPV) Products "Much more informative with 1 product"



## Performance of Cervical cancer(HPV) products "More accurate"

WHO LabNet 2014 HPV DNA Proficiency study, 2015 IPV conference, Portugal, 2015

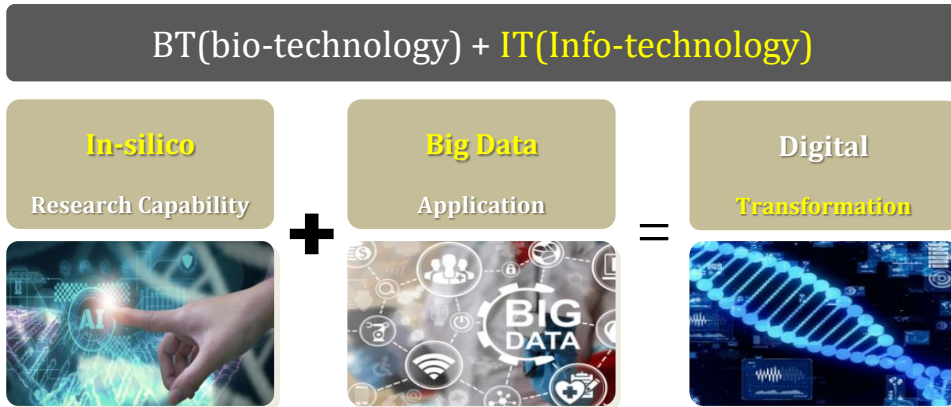
- 100% proficiency at all 11 Lab participants.
- Detection of all 5 HPV subtypes and its multiple co-infection
- The best Results regarding Sensitivity, Specificity and Reproducibility

Type of HPV assay	No. of datasets	100% proficient	99-90%	89-80%	<80 %	Not proficient
All assays	148	89	14	9	5	31
<b>Anyplex II HPV28 (Seegene)</b>	<b>11</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Onclarity (BD)	5	5	0	0	0	0
Linear Array (Roche)	14	7	1	1	0	5
HPV Direct Flow-chip (Master Diagnostica)	14	9	0	0	0	5
Papillocheck (Greiner)	5	4	0	1	0	0
CLART HPV 2/3 (Genomica)	4	0	1	1	2	0
In- house PCR (Luminex)	8	3	1	1	0	3
Realtime PCR (Abbott)	3	1	0	2	0	0

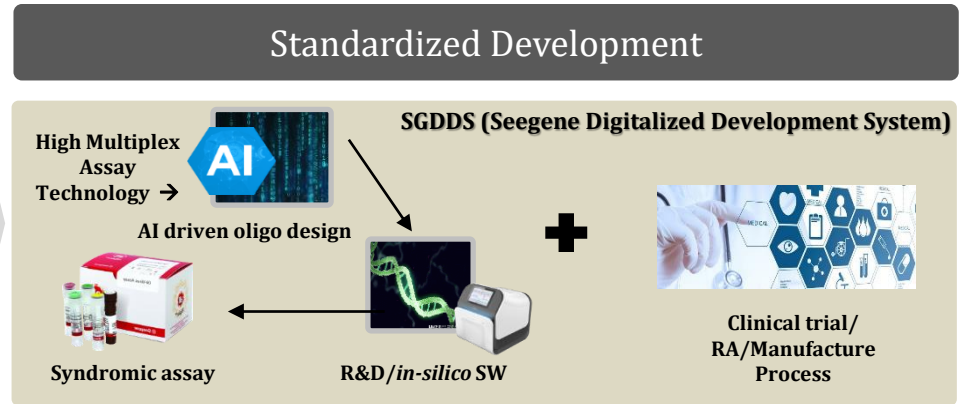


# R&D Capability and Competitiveness

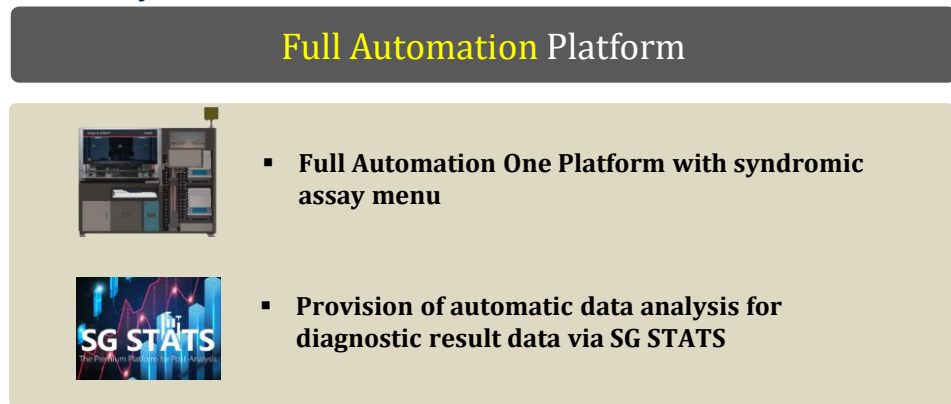
**Value creation by combining core technology and diagnostic data**



**Establish standardized product development process**



**Accumulation of diagnostic data generated by SG One Platform**

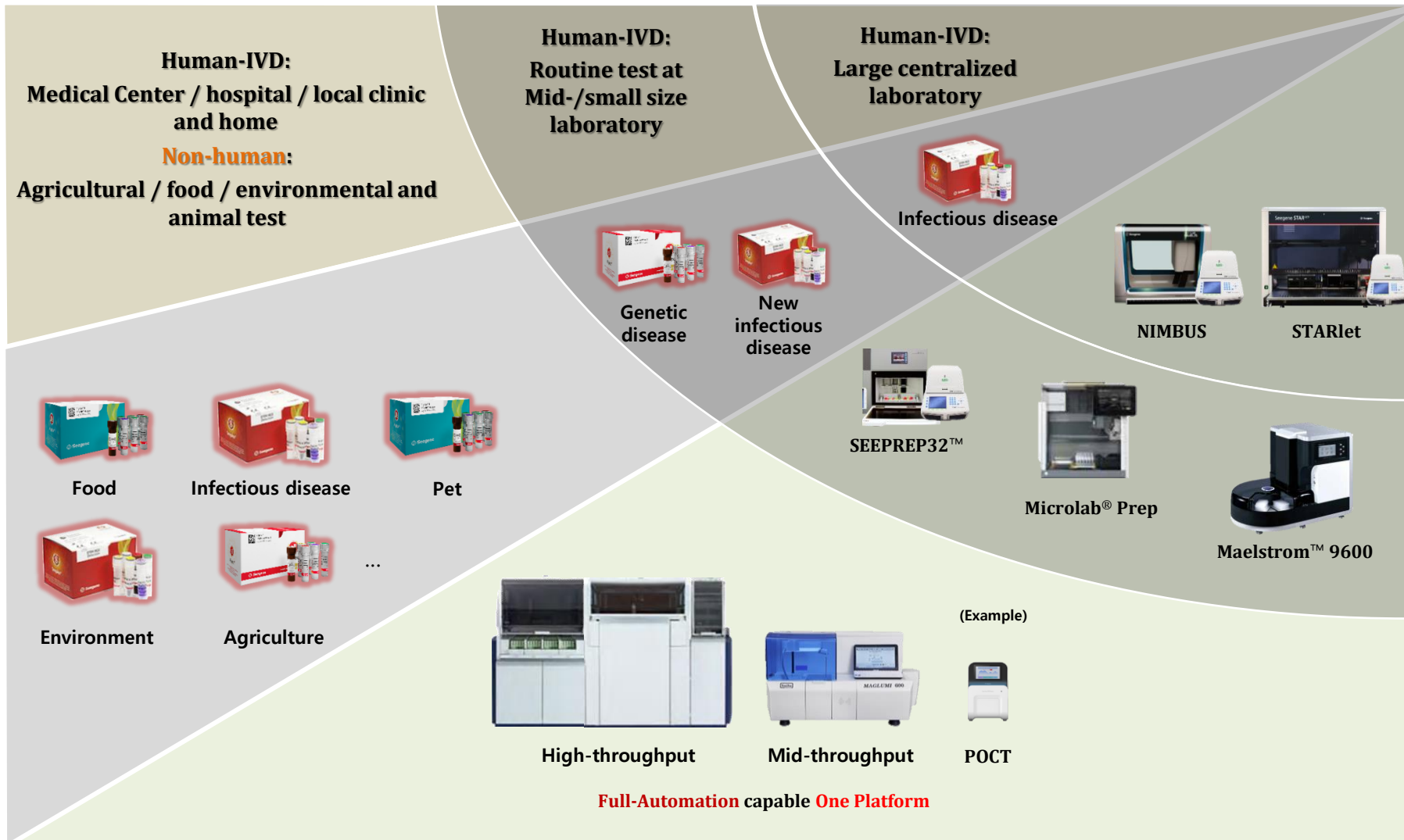


**Target market oriented syndromic assay development**



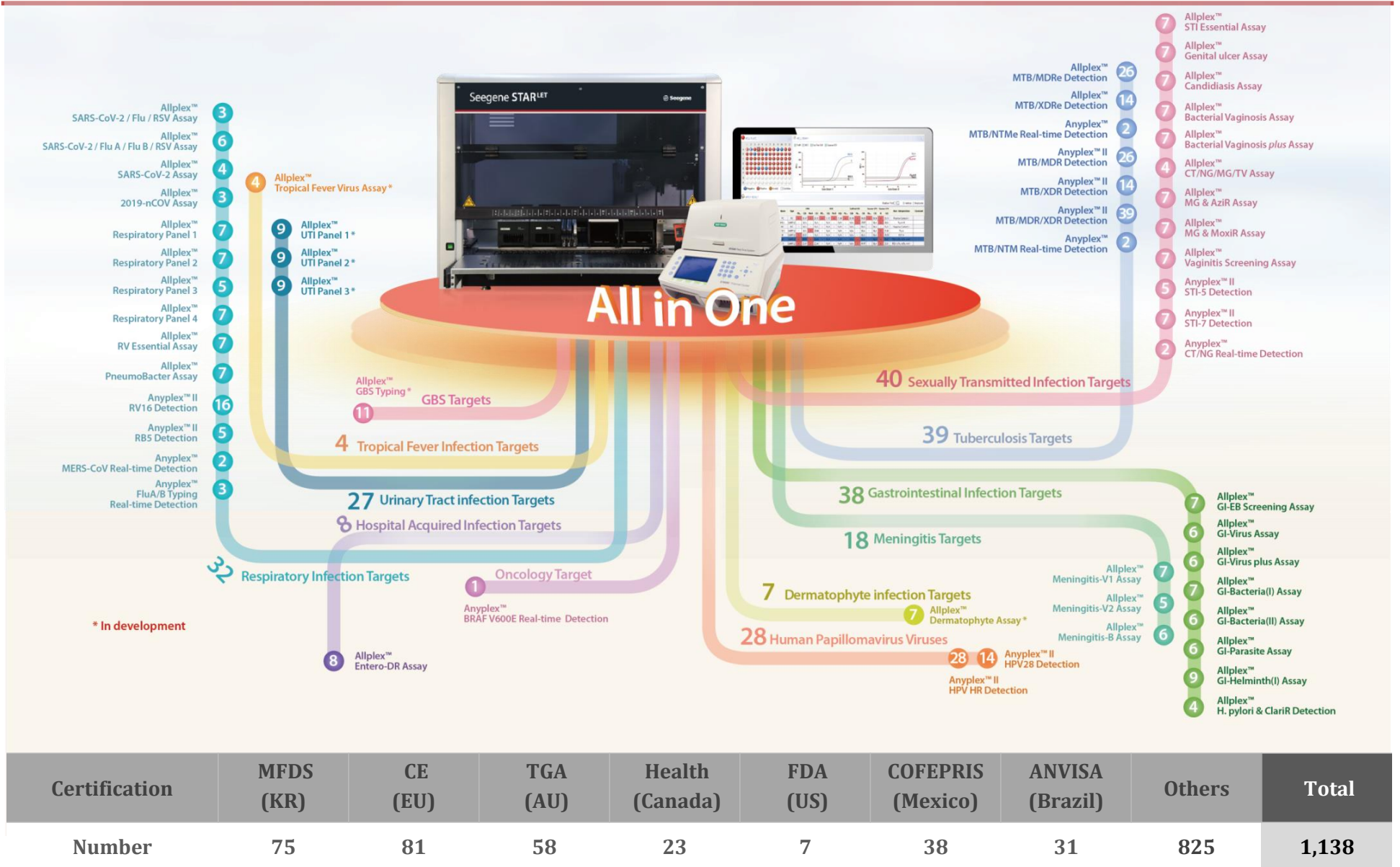
# Product Expansion (Assay Menu and Equipment)

## Syndromic Assay Menu



Automated Equipment

# Assay Product Pipeline and Approval Status



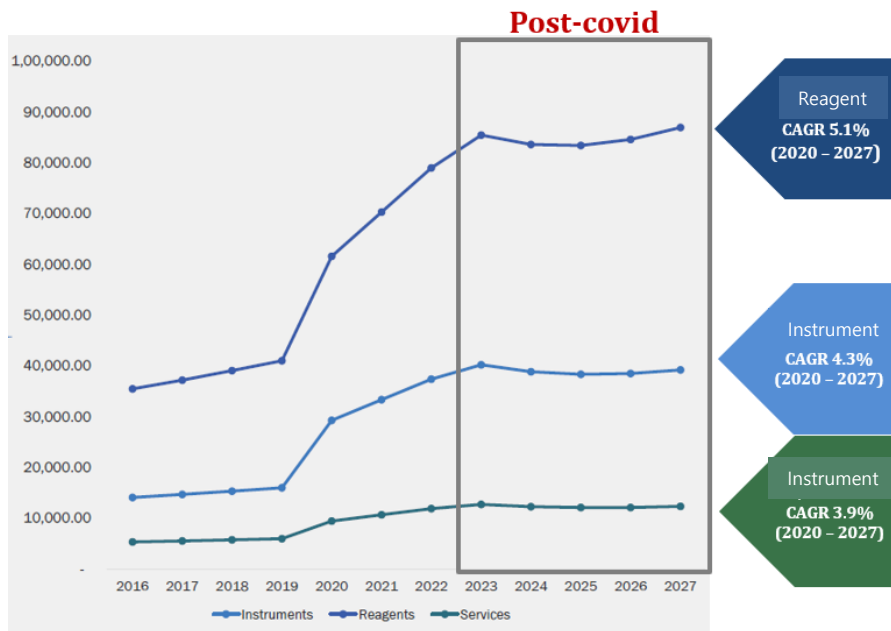
※ Acquired and in progress certifications in more than 30 other countries

※ As of 2021.07

# Global In-vitro Diagnostics(IVD) Market Outlook

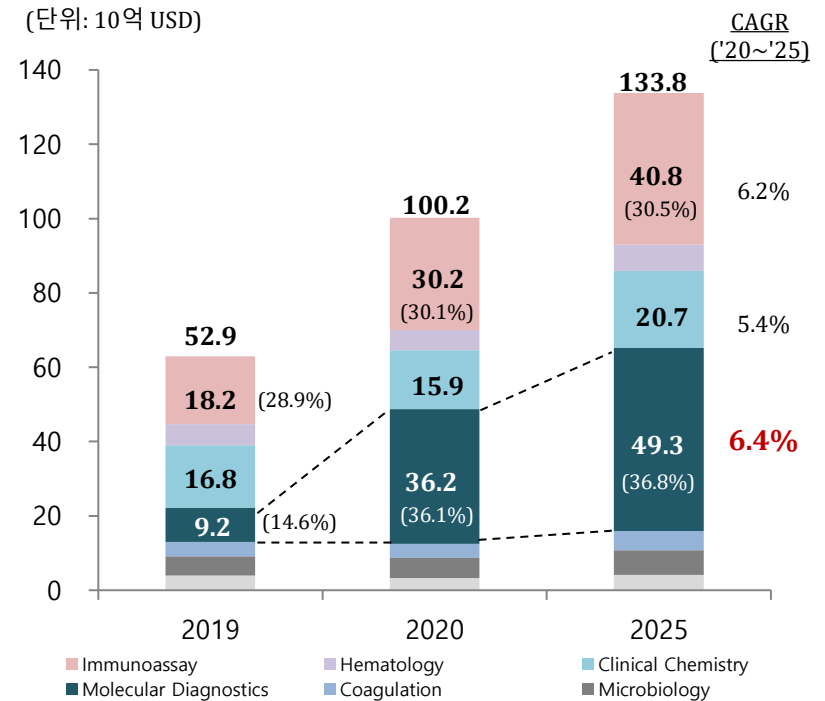
 **Global IVD Total Value: 100.2 B USD (2020); 133.8 B USD (2025), CAGR: 6.0%**  
 (Grand View Research, 2021)

## Global IVD Market Outlook by product



Source: Grand View Research (2021)

## Global IVD Market Outlook by technology

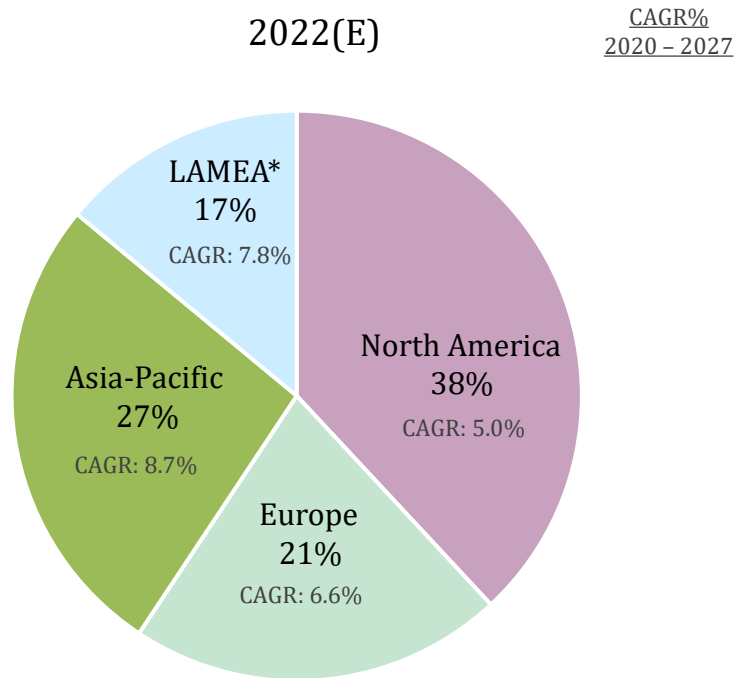


Source: Seegene, Grand View Research (2021)

# Global Molecular Diagnostics(MDx) Segment Outlook

 **Global MDx Total Value: 36.2 B USD (2020); 49.3M USD (2025), CAGR: 6.4%**  
 (Grand View Research, 2021)

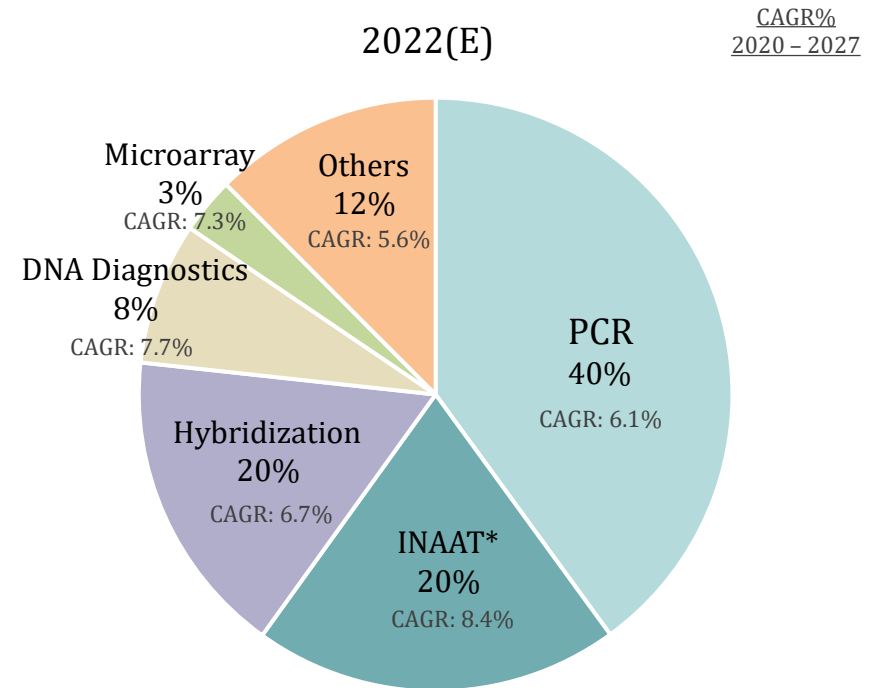
## Global MDx by region



\*LAMEA: Latin America, Middle East & Africa

Source: Market Allied Research (2020)

## Global MDx by technology



\*INAAT: Isothermal nucleic acid amplification technology

Source: Market Allied Research (2020)

# Seegene's Proprietary PCR Technology

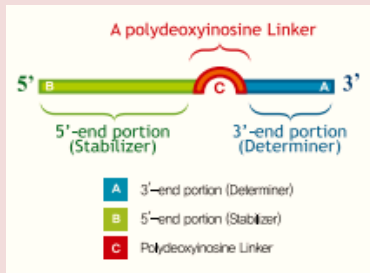
## Amplification

Seeplex™

DPO™

Dual Priming Oligonucleotide

2006



- ✓ Only target genes can be specifically amplified through Dual Priming

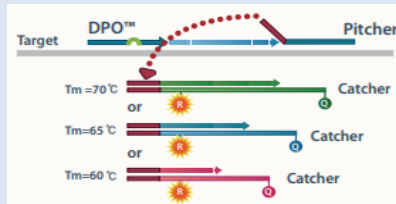
## Detection

AnyplexII™

TOCE™

Tagging Oligonucleotide Cleavage & Extension

2011



- ✓ Diagnostic technology that expands the ability to amplify multiple genes at the same time

Multiple melting peaks with Elaborately Defined T<sub>m</sub> Values in a single channel

✧ Currently patented in over 40 countries

## Analysis

Allplex™

MuDT™

Multiple Detection Temperatures

2014

- ✓ Provide multiple Ct values in one channel

Multiple Ct Value in a single channel

✧ International patent application completed

Multiplex Target Amplification with Dramatic Specificity

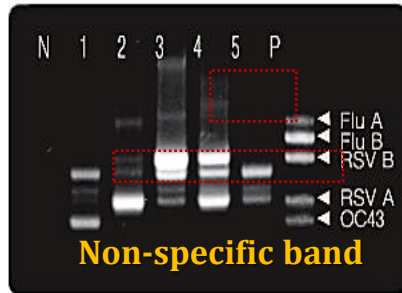
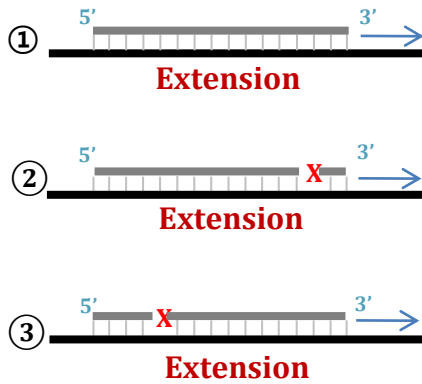
✧ Currently patented in over 40 countries



# DPO™ (Dual Priming Oligonucleotide)

## Conventional PCR

<Conventional Primer>

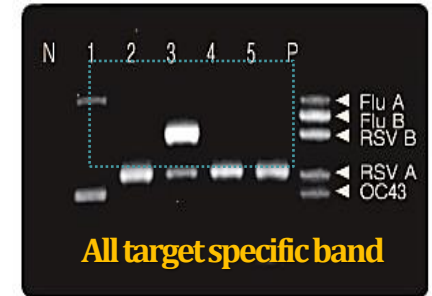
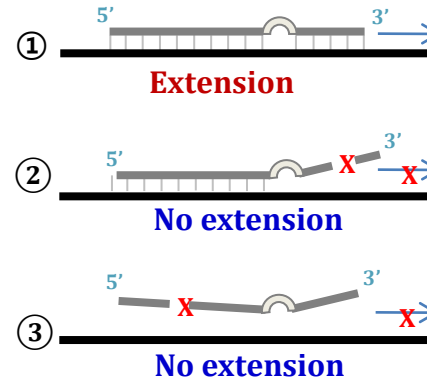


P: Positive marker N: Negative marker / Lane 1~5: patients

- Non-target genes are amplified together
- Limited multiplexing

## DPO PCR

<DPO Primer>



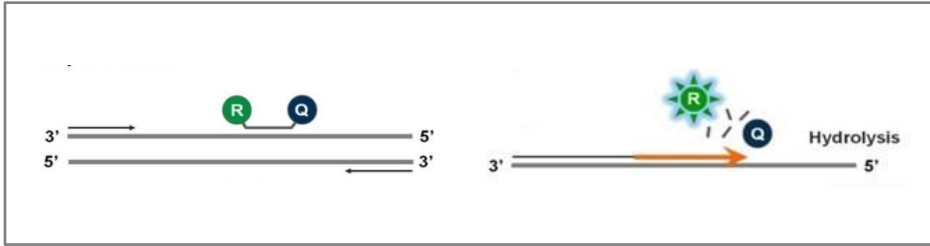
P: Positive marker N: Negative marker / Lane 1~5: patients

- Only the target gene is specifically amplified
- Highly reliable multiple target amplification

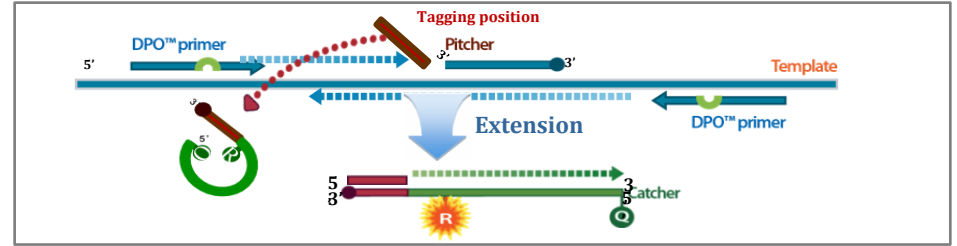
**Multiplex + High Accuracy = Realization of Multiplex MDx**

# TOCE™ (Tagging Oligonucleotide Cleavage & Extension)

## Conventional Real-time PCR



## TOCE Real-time PCR



Detect 1 pathogen per 1 channel  
→ Detect 4 pathogens using 4 fluorescence channel

- virus1
- virus2
- virus3
- virus4

- virus4
- virus3
- virus2
- virus1

- Detection of 1 target per a single channel
- The Maximum limit 4 targets

Detect 5 pathogen per 1 channel  
→ Detect 20 pathogens using 4 fluorescence channel

- virus 1
- virus 2
- virus 3
- virus 4
- virus 5

- virus 6
- virus 7
- virus 8
- virus 9
- virus 10

- virus 11
- virus 12
- virus 13
- virus 14
- virus 15

- virus 16
- virus 17
- virus 18
- virus 19
- virus 20

Melting curve Analysis

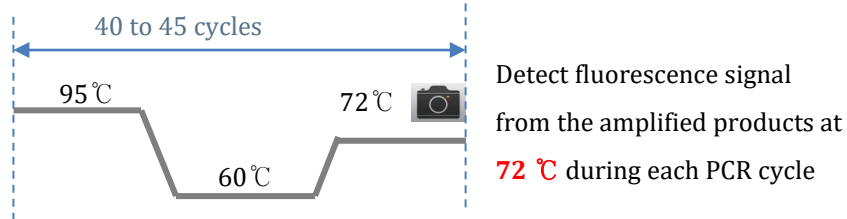
- Detection of 5 targets per a single channel
- Multiplex in a single channel using Catcher-Tm
- As sensitive as singleplex real-time PCR

**High Multiplex Real-time PCR + Quantitative Analysis(Melting Curve Analysis)**

# MuDT™ (Multiple Detection Temperatures)

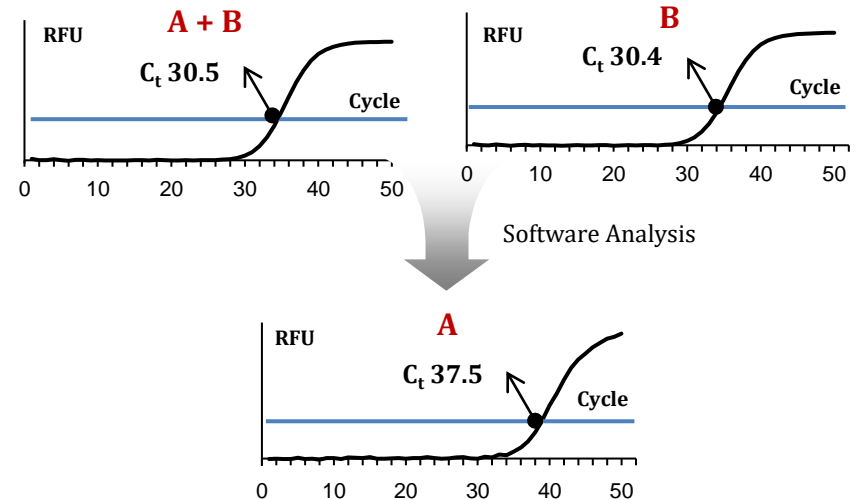
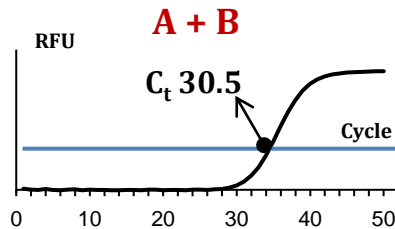
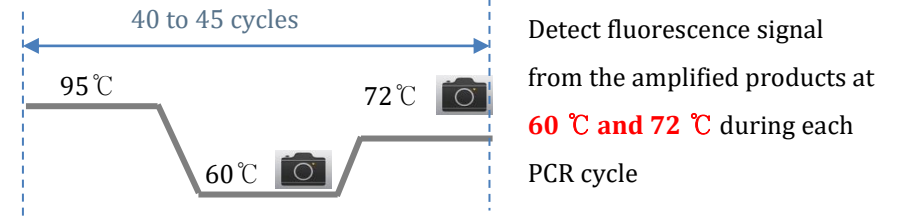
## Conventional Real-time PCR

[PCR cycle]



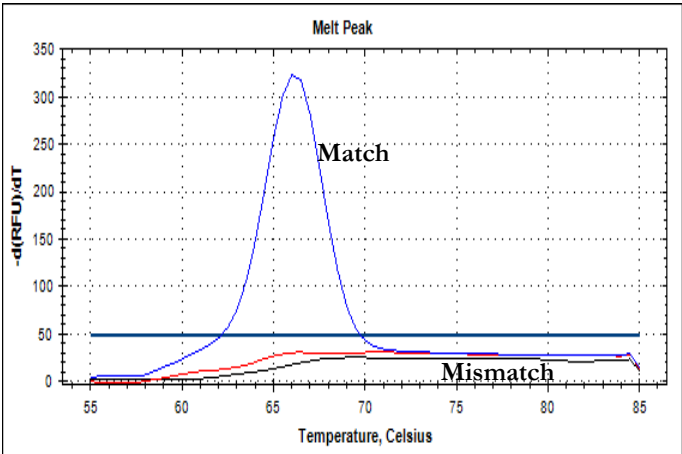
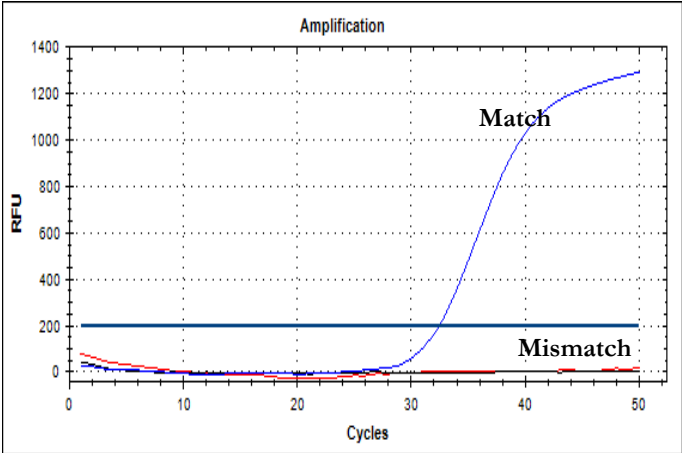
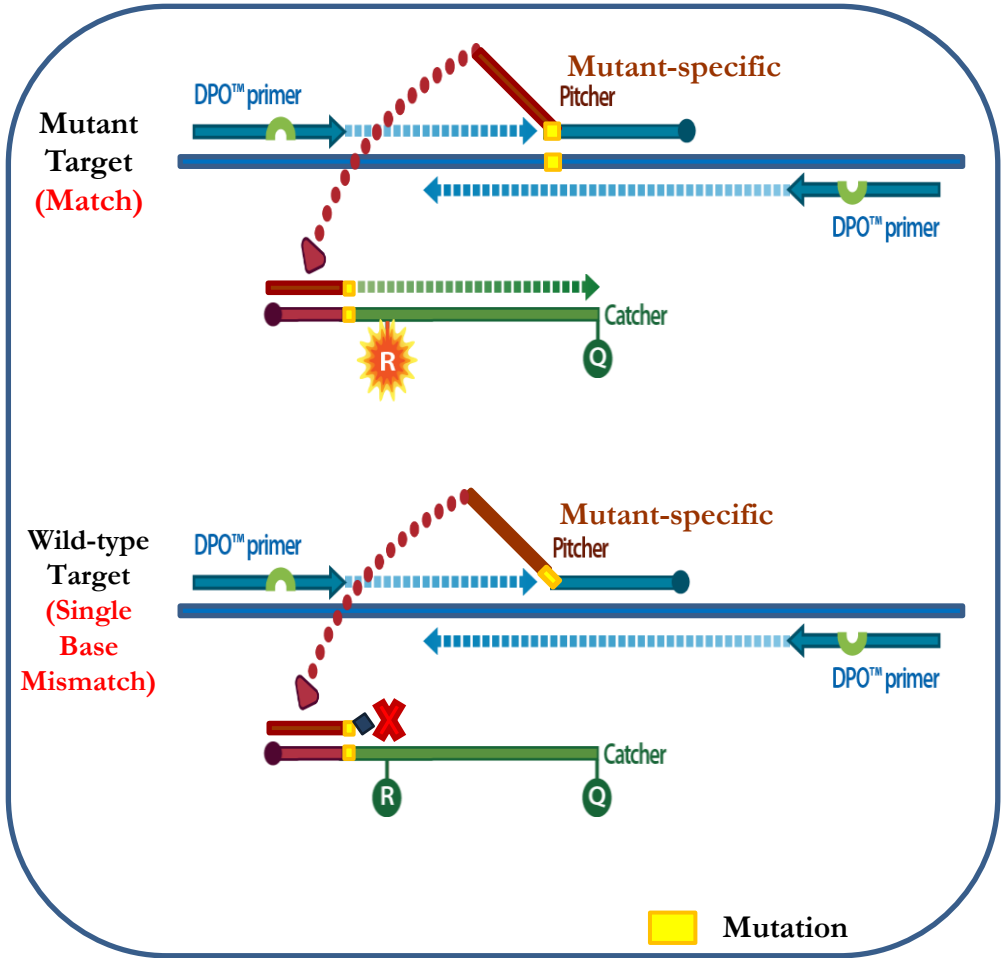
## MuDT Real-time PCR

[PCR cycle]



Multi qualitative/quantitative Analysis in Single channel = **Multi Ct value in Single channel**

# mTOCE™ – Mutation Detection



Identical results amid unique and various melting temperatures → Enables detection of numerous variants