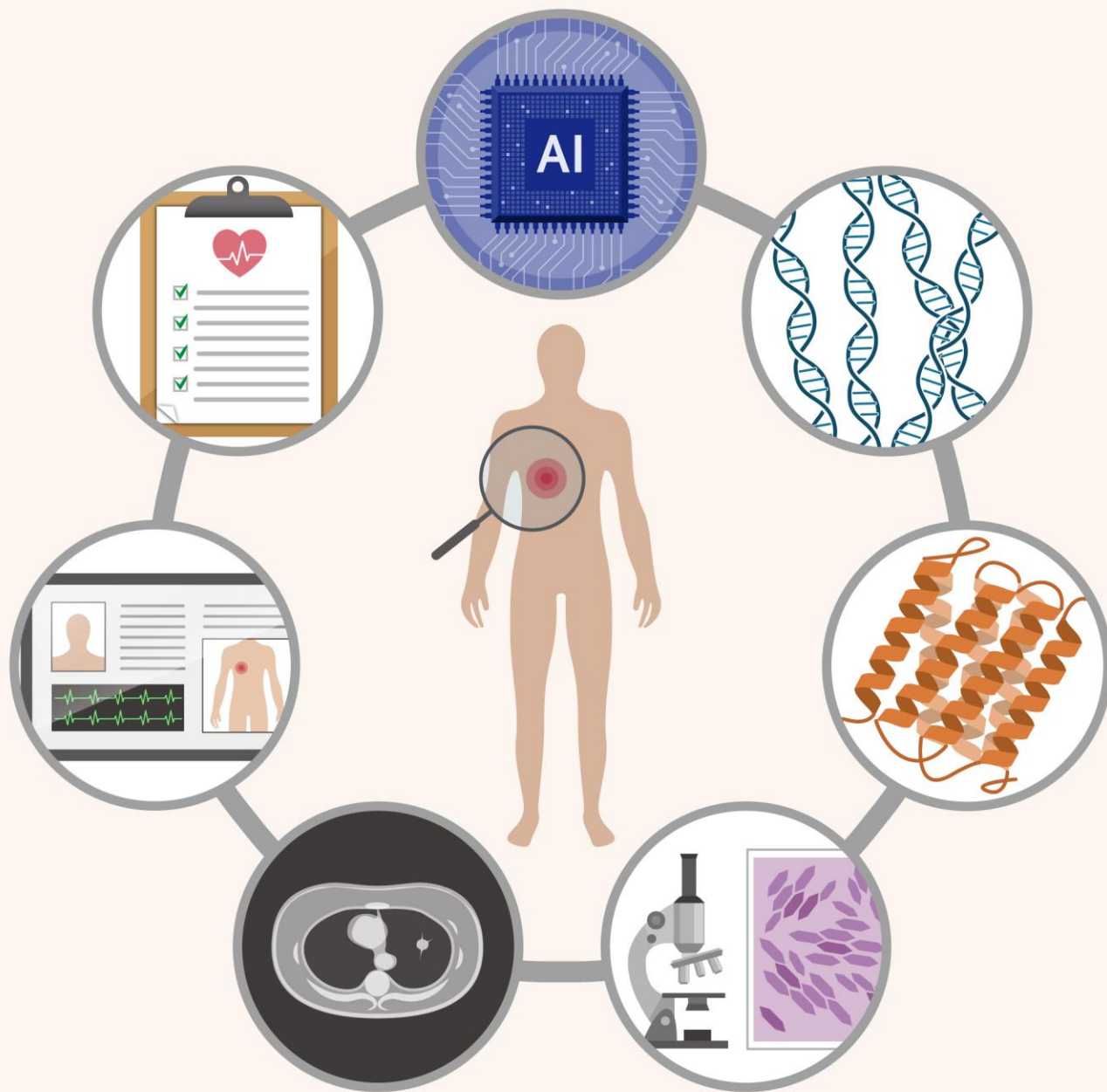




# HLB PANAGENE

## Company Profile

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# Disclaimer

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The purpose of this presentation is to inform about HLB Panagene's business.

This presentation contains certain "forward-looking statements". Any statements that are not historical fact should also be forward-looking statements. These statements are based on management's assumption and belief in light of information currently available. These statements may be identified by words such as 'expects', 'anticipates', 'intend', 'plan', 'seek', 'see', 'will', 'would', 'projects', 'believe', '(E)' or similar expressions. The assumptions involve risks and uncertainties and the material in this presentation is not a guarantee of the company's future business performance.

Since the "forward-looking statement" on this presentation are based on the information about current market status and business of HLB Panagene at the time the data were prepared, please be aware that the contents of this presentation are subject to change or deletion without advanced notice.

Please also be aware that HLB Panagene, its advisors and representatives assume no responsibility for any problems resulting from using this data (including but not limited to mistakes, errors and deficiencies).

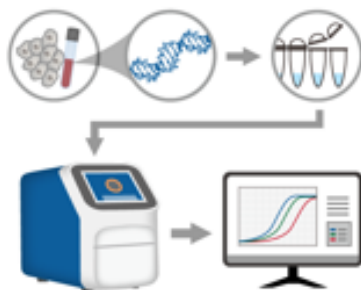
The information contained herein is subject to change without notice and should not be relied upon as such.

# Core Business

## Diagnostics

- Multiple platform technologies for biomarker detection
- Oncology-related mutation detection kits (Companion diagnostics)
- Infectious disease test kits

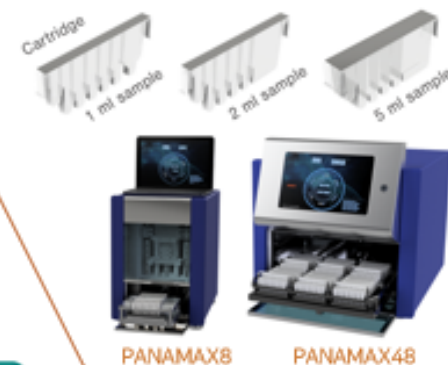
Commercialize  
molecular diagnostic kits  
based on superiority of PNA



## Automation

Solution optimized for  
molecular diagnostic products

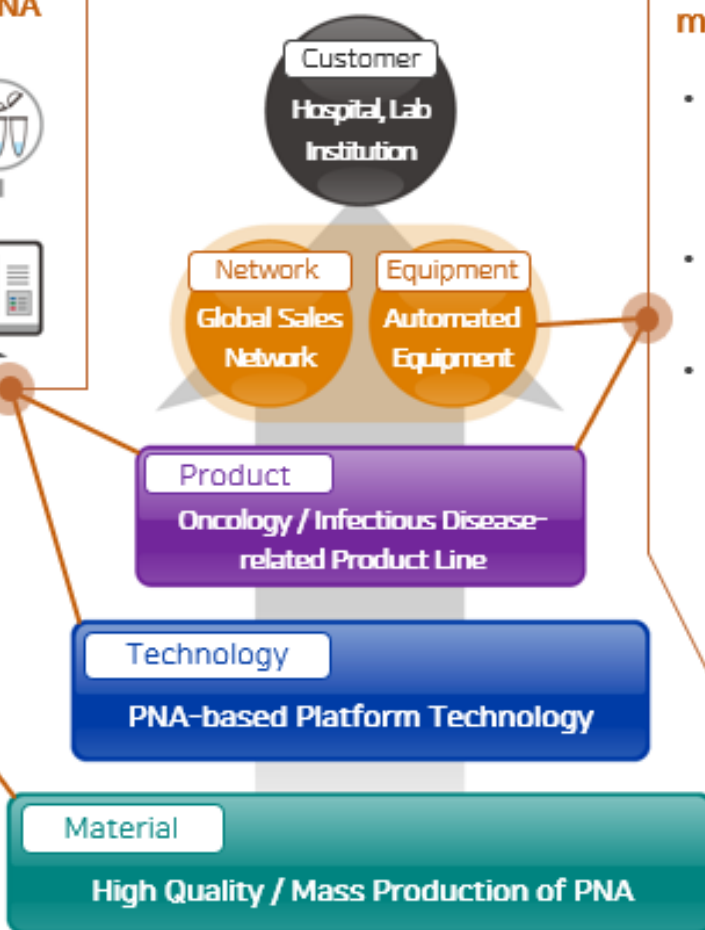
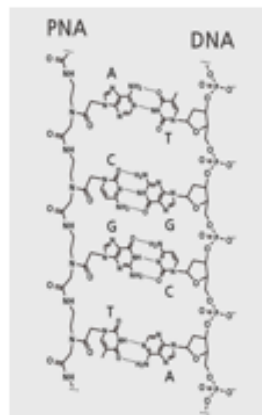
- Automated nucleic acid extraction solutions applied to various sample types
- Create synergy through connection with diagnostic kits
- 100% Self-developed



## Materials

No.1 mass production &  
modification of PNA

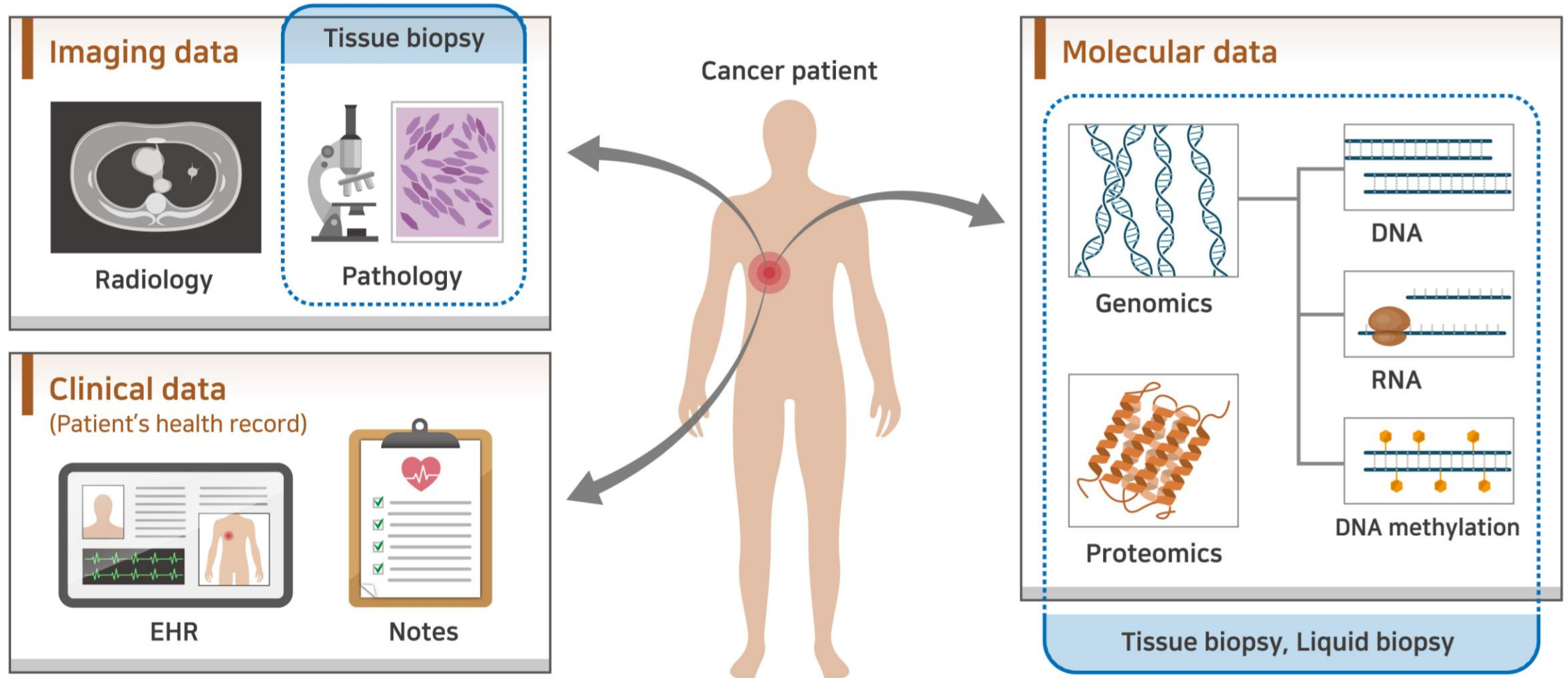
- PNA is DNA/RNA analogue which can be used to various application
- Has potential to be applied as new therapeutics material



# Future Medical Diagnostic – Multimodal

## Data modalities in oncology

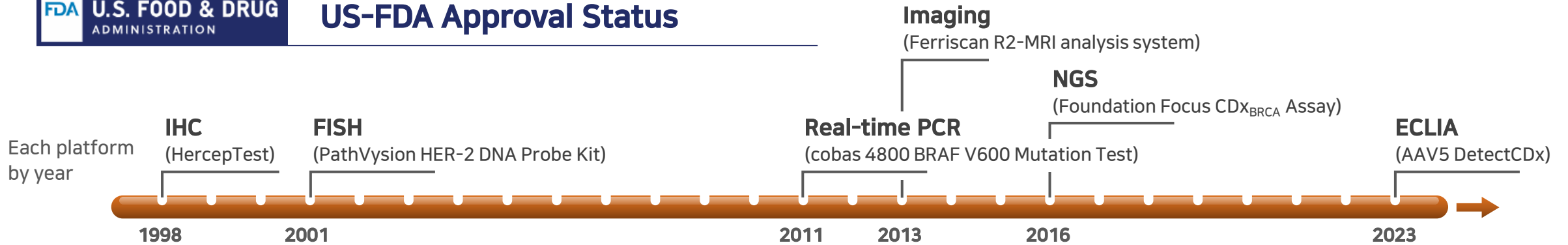
출처: Waqas, A. et al., 2024. Front. Artif. Intell. 7:1408843. | He, W. et al., 2024. MedComm. 5:e722.



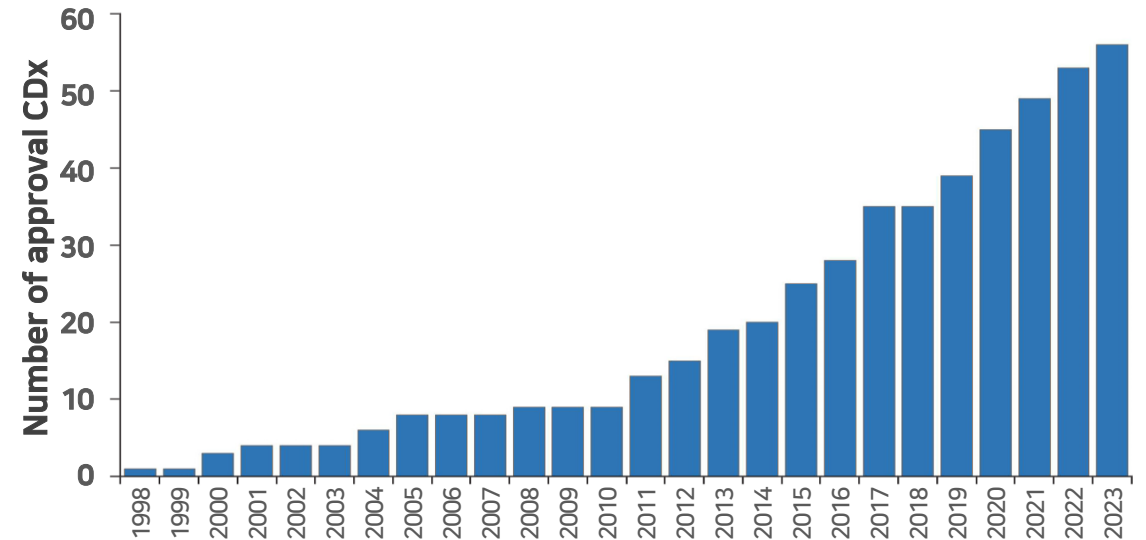
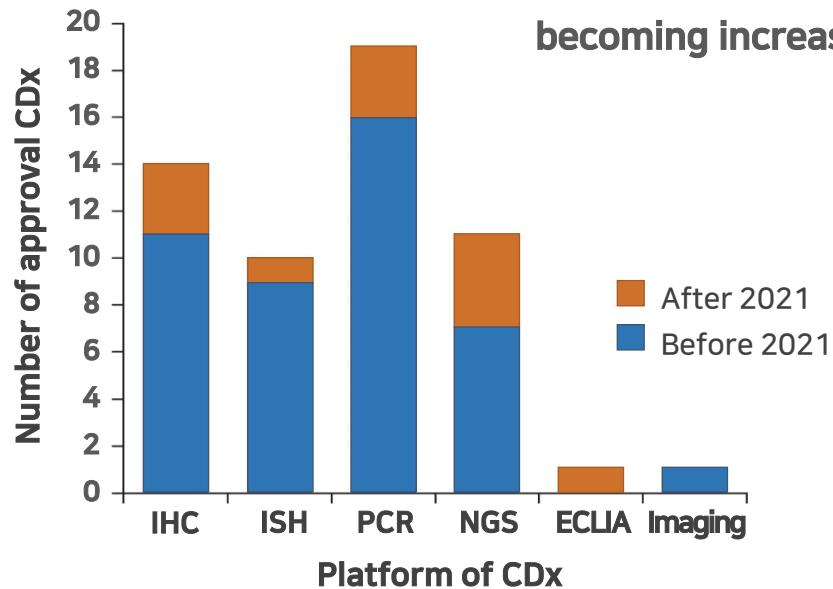
# Current status of Companion Diagnosis



## US-FDA Approval Status

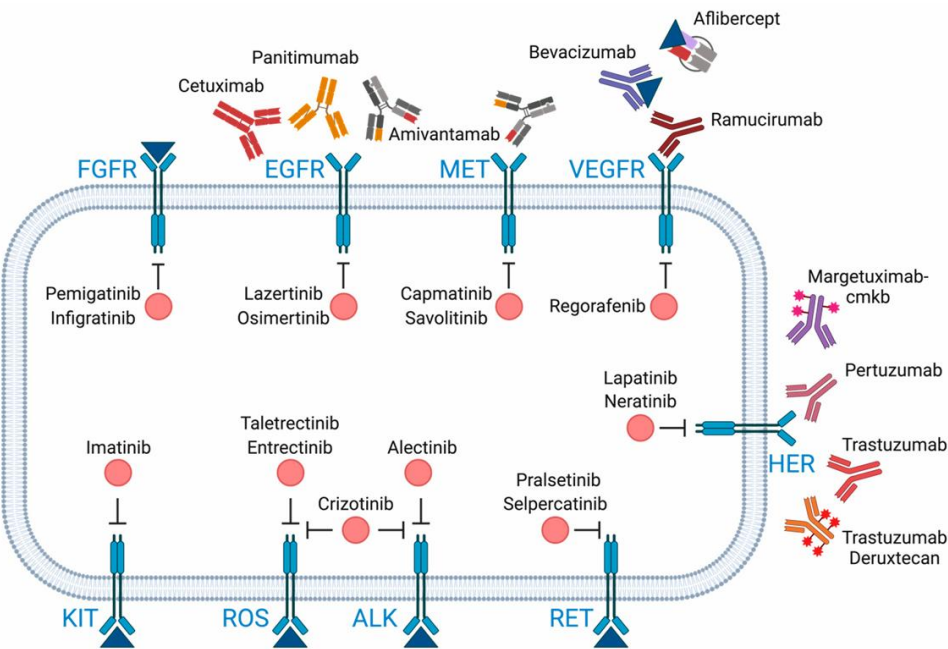


"Platforms related to companion diagnosis are becoming increasingly diverse"



# Molecular Diagnostic Platform

## Nucleic acid biomarkers associated with CDx



출처: Mechahougui, H. et al., 2024. Cancers 16:2862.

AML: Acute Myeloid Leukemia  
ASM: Aggressive Systemic Mastocytosis  
BC: Breast Cancer  
CLL: Chronic Lymphocytic Leukemia  
CML: Chronic Myeloid Leukemia  
CRC: Colorectal Cancer  
FL: Follicular Lymphoma

GC: Gastroesophageal Cancer  
GIST: Gastrointestinal Stromal Tumors  
MDS: Myelodysplastic Syndromes  
mCRPC: Metastatic Castrate Resistant Prostate Cancer  
NSCLC: Non-Small Cell Lung Cancer  
TC: Thyroid Cancer  
UC: Urothelial Cancer

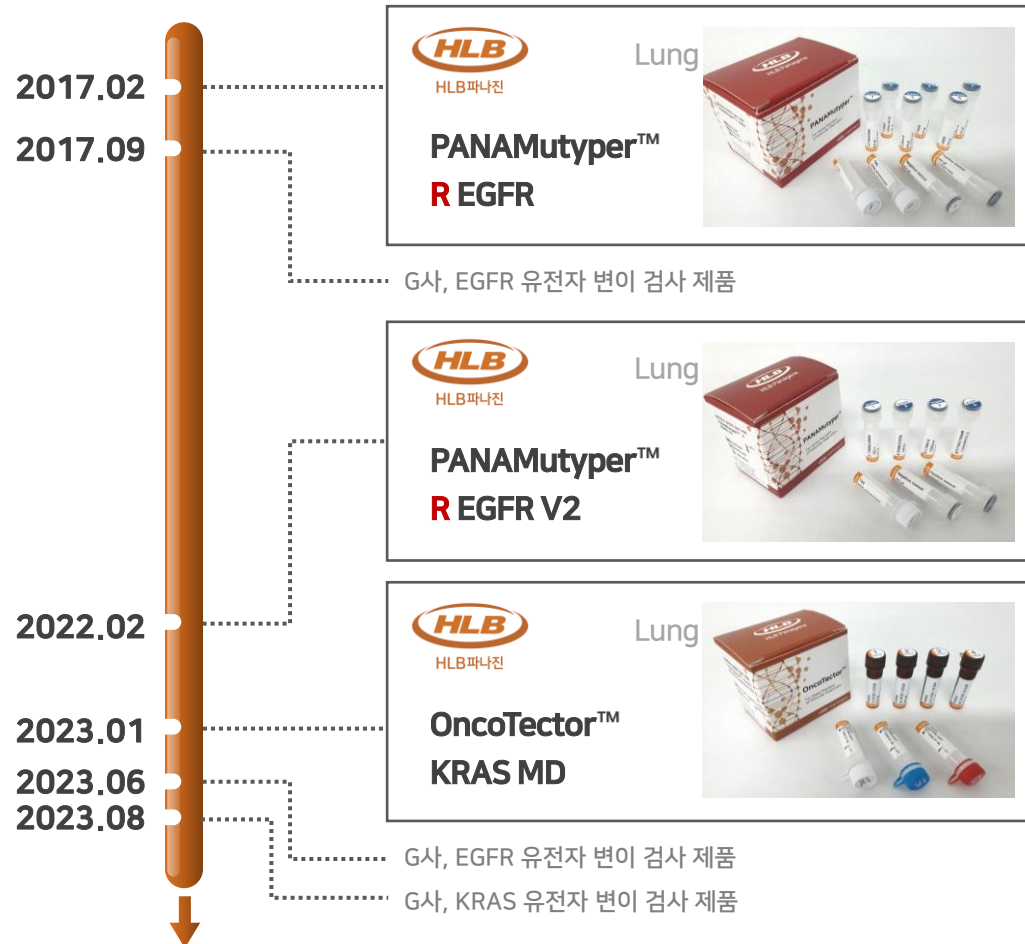
Source: US-FDA

| Target Gene       | Biomarker               | Indication                   | Platform        |
|-------------------|-------------------------|------------------------------|-----------------|
| ALK               | Rearrangement           | NSCLC                        | FISH, NGS       |
| BCR-ABL           | Gene fusion             | CML                          | PCR             |
| BRAF              | Mutation                | Melanoma, mCRC, NSCLC, TC    | PCR, NGS        |
| BRCA1/BRCA2       | Mutation                | Various cancers              | PCR, NGS        |
| EGFR              | Mutation                | NSCLC                        | PCR, NGS        |
| ESR1              | Mutation                | BC                           | NGS             |
| EZH2              | Mutation                | FL                           | PCR             |
| FGFR2             | Gene fusion             | Cholangiocarcinoma           | NGS             |
| FGFR3             | Gene fusion, Mutation   | UC                           | PCR             |
| FLT3              | Mutation                | AML                          | PCR             |
| HER2              | Amplification, Mutation | BC, GC, NSCLC                | CISH, FISH, NGS |
| HRR genes         | Mutation                | mCRPC                        | NGS             |
| IDH1              | Mutation                | AML, Cholangiocarcinoma, MDS | PCR, NGS        |
| IDH2              | Mutation                | AML                          | PCR             |
| KIT               | Mutation                | ASM                          | PCR             |
| KRAS              | Mutation                | CRC, NSCLC                   | PCR, NGS        |
| MET               | Mutation                | NSCLC                        | NGS             |
| Microsatellite    | MSI-High                | Solid tumor                  | NGS             |
| NRAS              | Mutation                | CRC                          | PCR, NGS        |
| NTRK1/NTRK2/NTRK3 | Gene fusion             | Solid tumor                  | NGS             |
| PDGFRA            | Mutation                | GIST                         | PCR             |
| PDGFRB            | Rearrangement           | MDS                          | FISH            |
| PIK3CA            | Mutation                | BC                           | PCR, NGS        |
| POMC/PCSK1/LEPR   | Mutation                | Obesity                      | NGS             |
| RET               | Gene fusion             | NSCLC, Solid tumor, TC       | NGS             |
| ROS1              | Gene fusion             | NSCLC                        | NGS             |
| TP53              | Deletion                | CLL                          | FISH            |



# Commercialization Case of CDx (Molecular Diagnosis)

## MFDS "CDx genetic testing reagent approval"



## Korea's first "liquid biopsy Kit"

2017.10.18

MedicalTimes

### 파나진 '액체 생검 키트' 신의료기술 인정

#### ‘파나뮤타이퍼 EGFR’ 글로벌 제품과 경쟁

파나진(대표이사 김성기)은 ‘파나뮤타이퍼 EGFR(PANAMutyper EGFR) 유전자 돌연변이 검사키트’와 ‘PNA클램프 BRAF(PNAClamp BRAF) 유전자 돌연변이 검사키트’가 한국보건 의료연구원 신의료기술 인정을 받았다고 밝혔다.  
(중략) 이번 신의료기술 인정으로 파나진은 국내 최초로 제품을 출시하게 됐다.

## The first "Original CDx approval" in Korea

2023.07.01

MEDI:GATE NEWS

### 파나진, 유한양행 '렉라자' 오리지널 동반진단 (Original CDx) 허가 획득

파나뮤타이퍼 R EGFR 통해 표적 유전자 변이 검출 가능



PANAMutyper™ R EGFR



# Commercialization Reference

## “High competitiveness compared to competitors”

HLB PANAGENE OncoTector™ KRAS MD

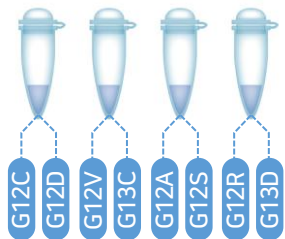
“Q” Company



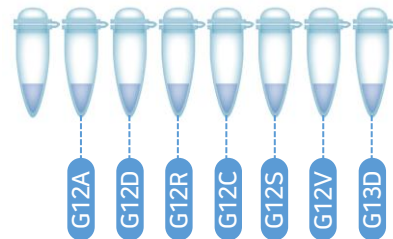
VS



4 tubes 8 Targets



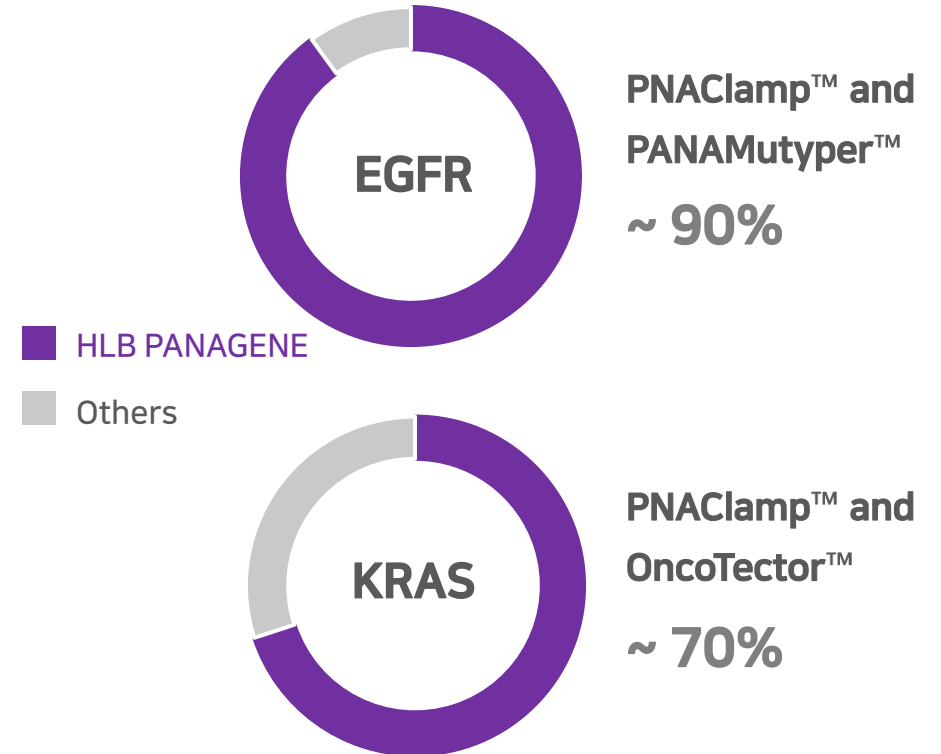
8 tubes 7 Targets



High user convenience, competitive edge in the market

## “High market share in Korea”

In use at 80 sites including major hospitals in Korea



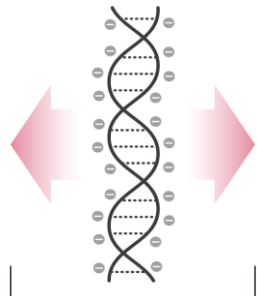


# HLB PANAGENE's molecular diagnostic technology

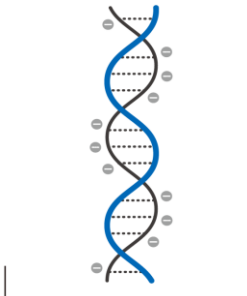
## "Utilizing PNA materials"



**Strong binding affinity**

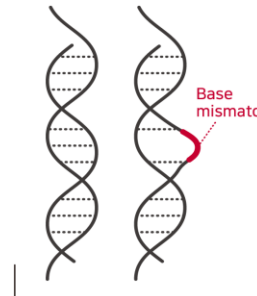


DNA:DNA duplex  
**Repulsion**

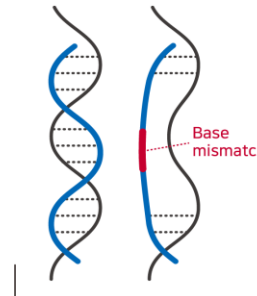


PNA:DNA duplex  
**No repulsion**

**High binding specificity**



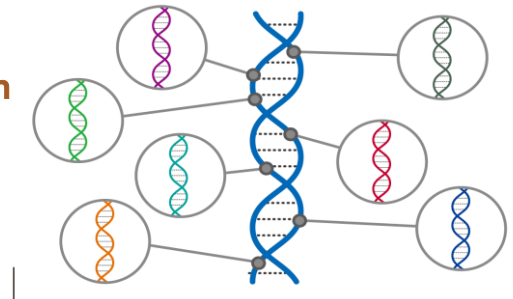
DNA probe  
**Small Tm difference**



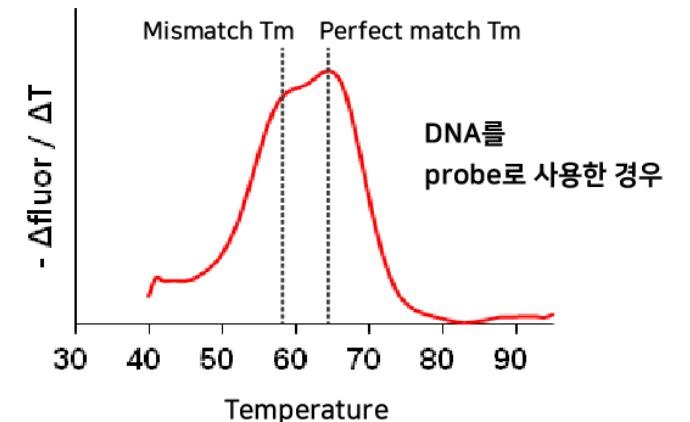
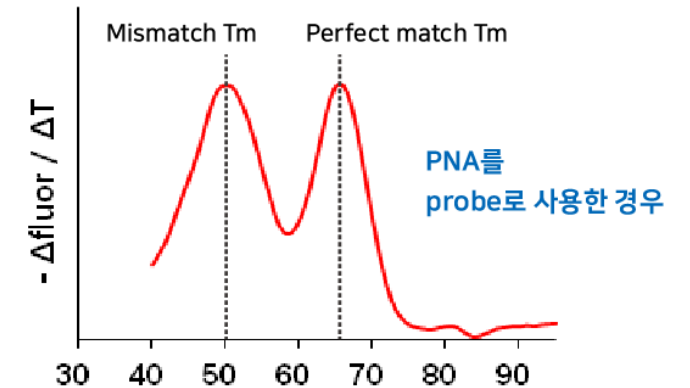
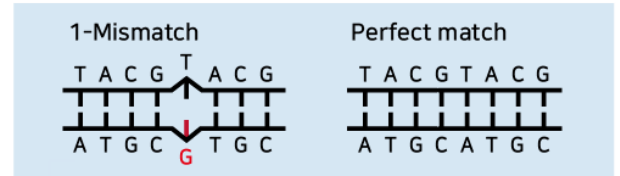
PNA probe  
**Large Tm difference**

\* Tm: melting temperature

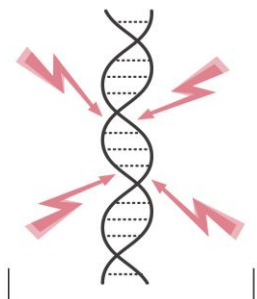
**Secondary modification available**



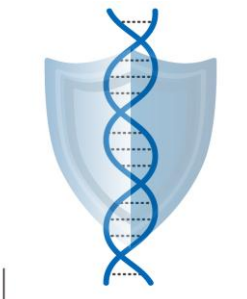
Additional modification of PNA backbone to **change physical properties**



**High stability**



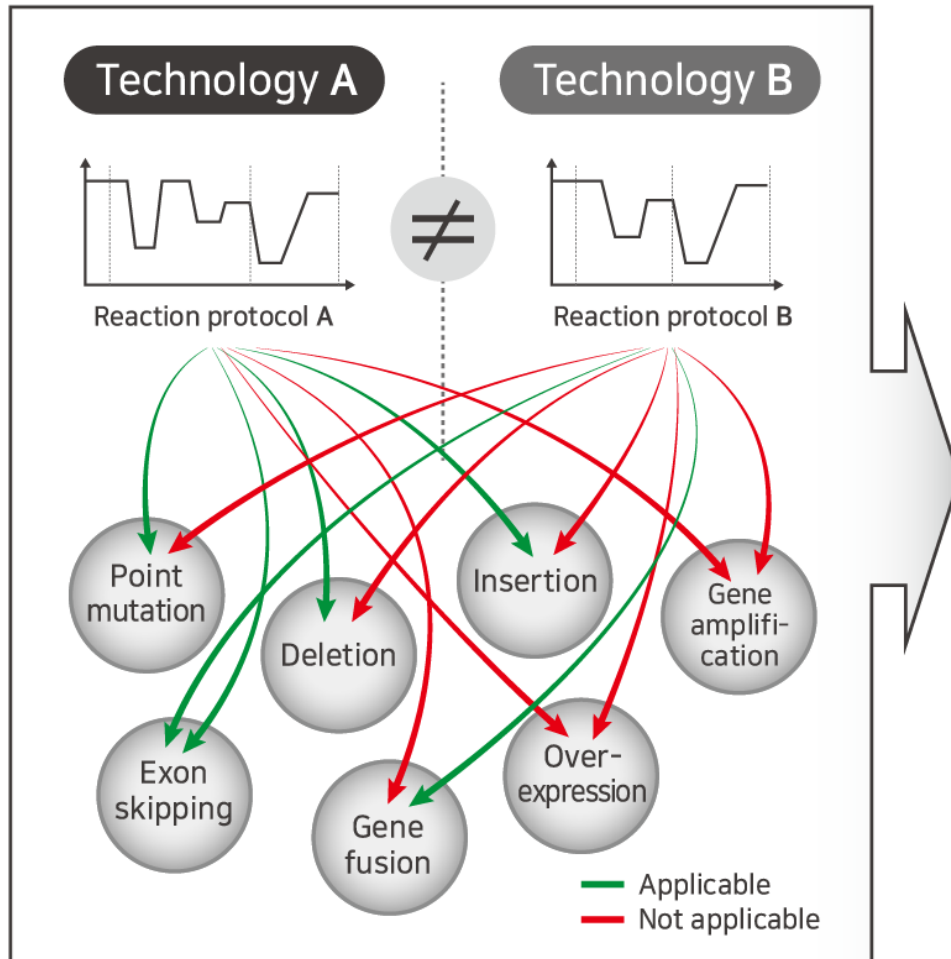
DNA - **Enzymatic degradation**



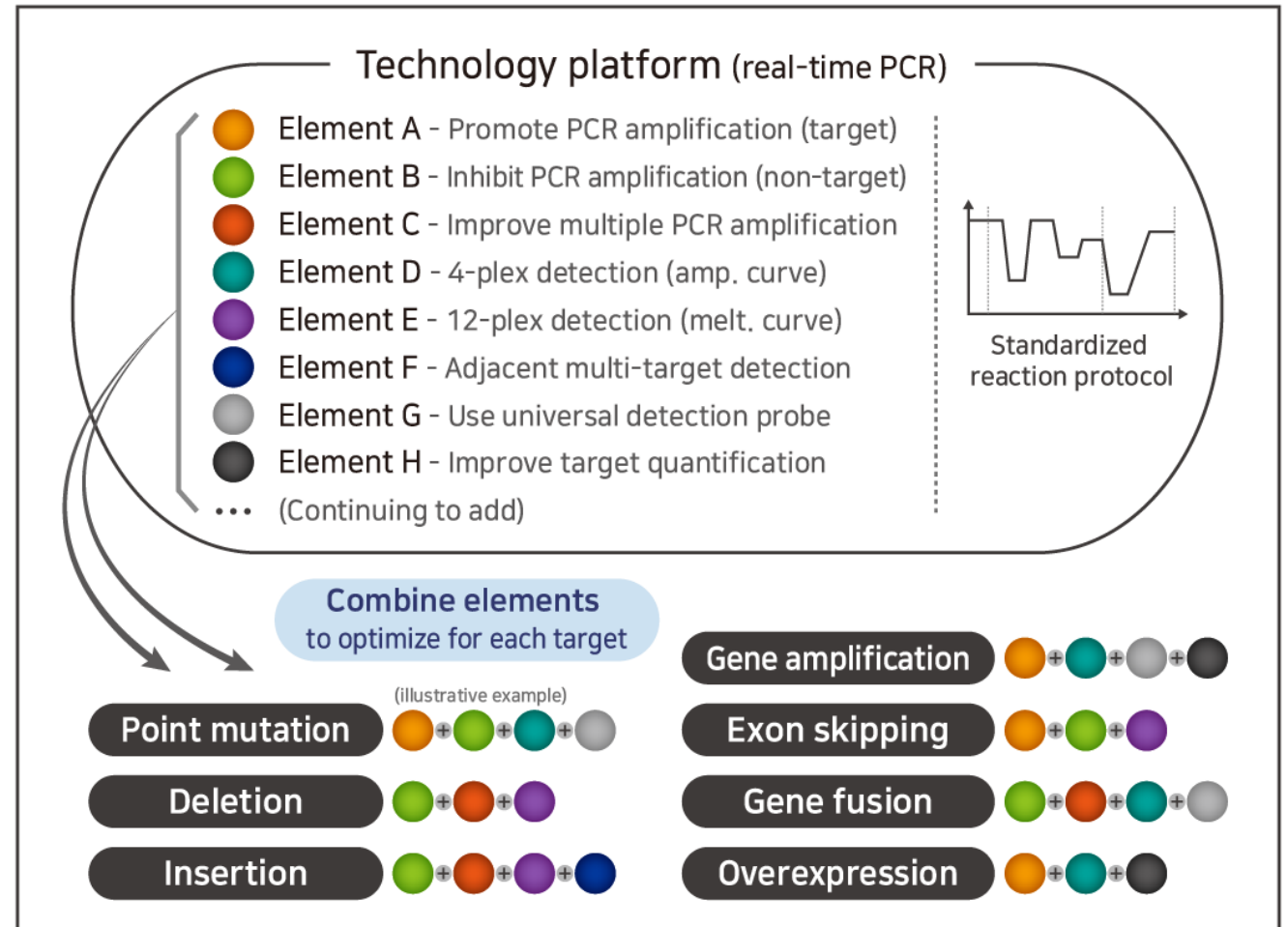
PNA - **Resistant to DNase/Proteinase**

# HLB PANAGENE's molecular diagnostic technology

## Current Technology-driven Strategy



## "Our Target-driven Strategy"



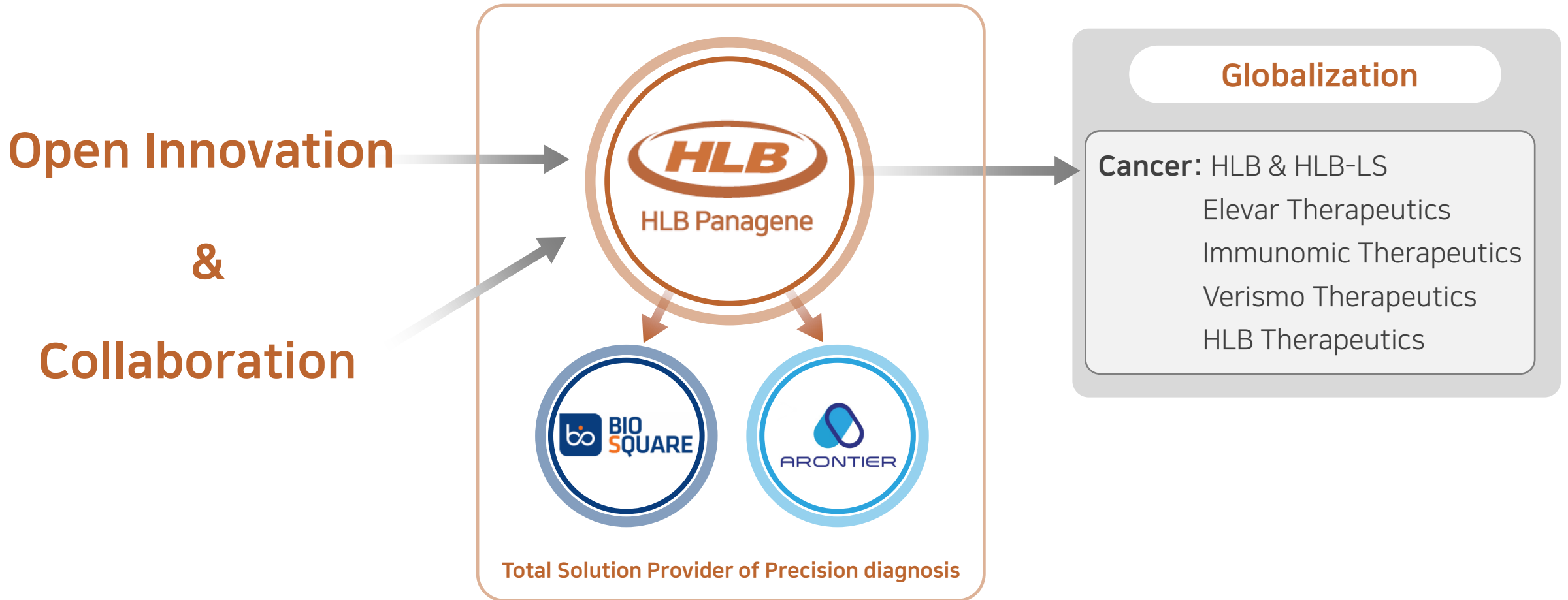
# Molecular Diagnostic product Lines



|                    | Products        | Targets           | Related diseases                           | Status    | CE | MFDS                                                                                  |
|--------------------|-----------------|-------------------|--------------------------------------------|-----------|----|---------------------------------------------------------------------------------------|
| Oncology           | PNAClamp™       | EGFR              | Lung cancer                                | Completed | CE |    |
|                    |                 | KRAS              | Colon / Lung / Thyroid cancer              | Completed | CE |    |
|                    |                 | NRAS              | Colon / Lung cancer / Melanoma             | Completed | CE |    |
|                    |                 | BRAF              | Thyroid / Colon / Lung cancer / Melanoma   | Completed | CE |    |
|                    |                 | PIK3CA            | Breast cancer                              | Completed | CE |    |
|                    |                 | IDH1              | Glioblastoma multiforme                    | Completed | CE |    |
|                    |                 | IDH2              | Glioblastoma multiforme                    | Completed | CE |                                                                                       |
|                    |                 | JAK2              | Myelofibrosis / Polycythemia Vera          | Completed | CE |                                                                                       |
|                    |                 | BCR-ABL           | Chronic myelogenous leukemia               | Completed | CE |                                                                                       |
|                    |                 | c-KIT             | Glioblastoma / Myeloproliferative Neoplasm | Completed | CE |                                                                                       |
|                    |                 | TERT              | Thyroid / Lung cancer                      | Completed | CE |    |
|                    | PANA Mutyper™   | EGFR (ver. 1)     | Lung cancer                                | Completed | CE |    |
|                    |                 | EGFR (ver. 2)     | Lung cancer                                | Completed | CE |    |
|                    |                 | KRAS              | Colon / Lung / Thyroid cancer              | Completed | CE |                                                                                       |
|                    |                 | NRAS              | Colon / Lung cancer / Melanoma             | Completed | CE |                                                                                       |
|                    |                 | ROS1              | Lung cancer                                | Completed | CE |   |
|                    | OncoTector™     | KRAS              | Lung cancer                                | Completed | CE |  |
|                    |                 | BRAF              | Thyroid / Colon / Lung cancer / Melanoma   | Completed | CE |                                                                                       |
| Infectious Disease | PANA qPCR™      | TB/NTM            | Tuberculosis                               | Completed | CE |  |
|                    | PANA RealTyper™ | HPV genotyping    | Cervical cancer                            | Completed | CE |  |
|                    |                 | HPV screening     | Cervical cancer                            | Completed | CE |  |
|                    |                 | HPV 32 genotyping | Cervical cancer                            | Completed | CE |                                                                                       |
|                    |                 | STD               | Sexually transmitted disease               | Completed | CE |  |
|                    |                 | CRE               | Resistance to antibiotics                  | Completed | CE |  |

# HLB PANAGENE's Open Innovation

Promoting various forms of Open Innovation and Collaboration



# Company Profile

## General status

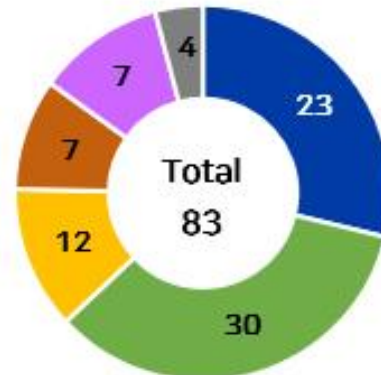
(Year of 2025)

|            |                                                              |                      |                 |
|------------|--------------------------------------------------------------|----------------------|-----------------|
| Name       | HLB Panagene                                                 | Ticker               | 046210 (KOSDAQ) |
| Foundation | April, 2001                                                  | Listed date          | October, 2008   |
| CEO        | In-Keun Jang                                                 | No. of issued shares | 43,657,588      |
| Address    | 54, Techno 10-ro, Yuseong-gu, Daejeon, South Korea           | Capital              | ₩20.5 billion   |
| Homepage   | www.hlbpanagene.com                                          | Par value            | ₩500            |
| Business   | Manufacturing PNA and PNA-based molecular diagnostic product |                      |                 |

## Employee composition

(Year of 2025)

- R&D 23 (27%)
- Manufacture 30 (36%)
- Marketing 12 (14%)
- Management 7 (9%)
- Executive 7 (9%)
- Other 4 (5%)



[Complete view of HLB Panagene]





감사합니다