Diagnostics and therapeutics for human healthcare

CONFIDENTIAL

Confidentiality Notice:

This presentation has been prepared by GENEMATRIX (hereinafter “the Company”), with an aim to provide the designated potential partners or customers (hereinafter “the Subscribers”), with the latest information about the Company.

The contents of this presentation and any attachments are intended solely for the Subscribers and may contain confidential and/or privileged information, which may be legally protected from disclosure. It is strictly forbidden to share or reproduce this presentation in whole or in part with any third party, without a written consent from the Company.

The Company

- Founded in 2000 in Seoul National University Cancer Research Institute, Seoul Korea.
- Strong management team : Operated by former Business Development and R&D Division teams of CJ Corp. that is the mother company of Samsung group and executives of multinational pharmaceutical company.

- Based in Korea BioPark, Korea, GeneMatrix' Major Molecular Diagnostics products focuses on STD, HPV, RI,GI Panels
- Vertical markets: Molecular Diagnostics, Molecular Medicine, Theranostics, Therapeutics
- Business Category: Healthcare, Molecular Diagnostics, Clinical genotyping assay
- Facilities
    - o Seoul National University Cancer Research Institute (2000~ 2005)
    - o Green Cross Research Complex (2005~2009)
    - o Korea Bio-Park (2010~Present)

- Acquired subsidiary company GenematrixBio (Previous company name, HBI Co., Ltd.) in 2011. GenematrixBio has immunology and chemistry based IVD reagents portfolios including rapid, general biochemistry and special chemistry IVD products.

- 4 M £ Investment into Vaccitech, a spin-out company from the University of Oxford's Jenner Institute, one of the most renowned vaccine research centers (2018)

The Investment

- IPO was held in 2009, currently listed in KOSDAQ, Korean version of NASDAQ stock market, leading the Molecular Diagnostics
- Market Capitalization: 100~200 M$, April 2020
- Strategic goal to maximize market value of company by Increasing sales revenue and partnering
- 5 M$ Investment by Korea Bank Investment and ID Ventures, July 2015
- 10 M$ Investment by Platform Partners Asset Management, Feb. 2018
- 7 M$ Investment by Korea Investment Partners, Dec. 2018
- Common stock : total 18,905,506

The Opportunity

- GeneMatrix is a leading player in Molecular diagnostics and Companion diagnostics with a broad R&BD portfolio incorporating three different genotyping platform technologies, including multiplex real-time PCR, liquid bead microarray based genotyping, and mass-spectrometry based genotyping.

In molecular diagnostics, GeneMatrix develops an extensive knowledge and product system based on genomic and proprietary data, which allows company differentiate the market with the advantages over exiting players

- o Single- tube reaction
- o High multiplicity in a single channel
- o High Flexibility of multiplex feature on any target

-GeneMatrix owns key Multiplex-molecular diagnostics(MDx) portfolios including sex transmitted disease(STD), gastrointestinal diagnostics(GI), and respiratory infection(RI) MDx panels.

- In Molecular diagnostics Multiplexing systems will not only reduce human error but also simplify the process of detecting and analyzing multiple variants. Introduction of favorable regulatory initiatives aimed at promoting MDx diagnosis over other forms is expected to serve the market as a high impact growth driver. For example, global STD Diagnostics Market will reach USD 166.50 Billion by 2021(Zion Market Research) The sexual transmitted diagnostic test market are expected to witness the highest growth over the forecast period.

-In Companion diagnostics is a major new market, valued at USD1.8bn in 2012 and forecast to grow at a CAGR of 18.5% to 21.6% (VisionGain1) to achieve a value of USD9.5bn by 2020.

-GeneMatrix successfully launched many valued products including Sex Transmitted Infection Panels , Respiratory Infection Panels, Gastrointestinal Panels, HPV genotyping, Antiviral Resistant HBV , HCV genotyping, HIV drug resistance, Glivec resistance, and Congenital Hearing Loss Genetic Tests.

- With the strong coalition with and continuing support from KOL clinician groups of infectious disease specialty, company has undertaken several collaborative study programs on clinical impact of genotypes of both host and viral genomes, and been pursuing the opportunity for providing new valued products enabling optimal monitoring for treatment response or outcomes.

Products/Technologies

- C-Tag™ technology* is the proprietary technology of GeneMatrix that enables simultaneous analysis of three or more target DNAs per fluorescence channel in a single PCR. It is a next-generation multiplex real-time PCR technology which overcomes the limitation of existing technology such as TaqMan by increasing the number of analysis per fluorescence channel. OmniPlex technology is a diagnostic system developed by the integration of GeneMatrix' multiplex PCR technology and Luminex bead technology. More than 50 micro-beads can be coded at different wavelengths of fluorescence, allowing simultaneous detection of multiple pathogens. RFMP (Restriction Fragment Mass Polymorphism) technology is the proprietary high-resolution genetic analysis technology that directly cuts target regions with genetic variation using enzymatic molecular scissors and analyzes the genetic sequence by measuring the mass of fragmented gene fragments.

-GeneMatrix' molecular diagnostic platform technologies provides easy, fast, and accurate tests for multiple genetic targets , thereby reducing costs, saving time, increasing convenience, and timely and personalized treatment at the early stage so that optimal treatment outcomes can be expected.

- o **NeoPlex™** series is a multiplex real-time PCR kit that can simultaneously detect multiple major pathogens by using C-Tag™ technology. NeoPlex STI-7 for detection of 7 major sexually transmitted pathogens is commercialized in Korea and Europe and other products that covers respiratory, gastrointestinal, HPV, and tropical infectious diseases are being developed or under registration process.
- o **OmniPlex-HPV** simultaneously identifies 40 HPV genotypes (15 high-risk, 4 probable high-risk, and 21 low-risk) in a single tube by bead array technology.
- o **HepB Typer** series are RFMP technology-based drug resistance test products that detects various drug resistance mutations in HBV genome for selection of personalized antiviral drugs (lamivudine, adefovir, entecavir, tenofovir) and monitoring treatment responses for chronic hepatitis B inc

- GeneMatrix' platform can be transferrable to many other areas including effective and hands-on assays of cancer-related markers for cancer prediction/diagnosis and assessing the efficacy of target-based anti-cancer drug candidates.
- Patents granted and pending for key technologies
-Partnerships with Luminex, Bruker, International Vaccine Institute (IVI), VIDRL (AU), Korean CDC and others.

Genematrix

INVESTOR RELATIONS 2017

Contents

Chapter

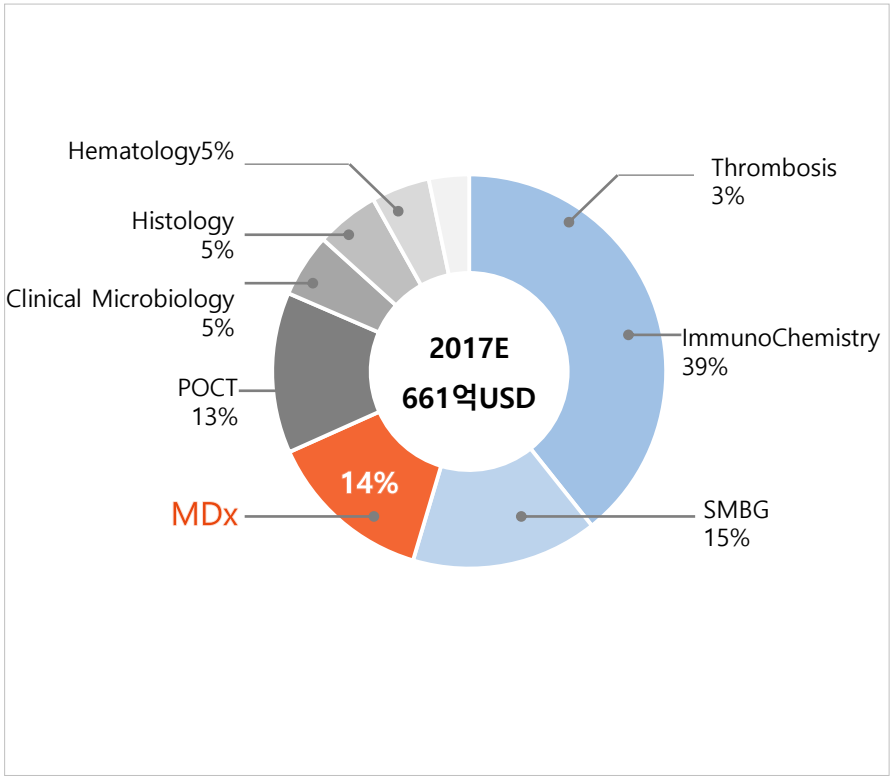
01 Industry Overview

1. In Vitro Diagnostics (IVD) & Molecular Diagnostics (MDx)
2. Market Potential of MDx
3. IVD Key Trends
4. Real-Time PCR
5. Multiplex Technology

1. In Vitro Diagnostics (IVD) & Molecular Diagnostics (MDx)

- Global IVD market $ 6.61B in 2017, with MDx accounting for 14% of IVD
- MDx, the most rapidly growing sector in IVD: CAGR of 12.7%

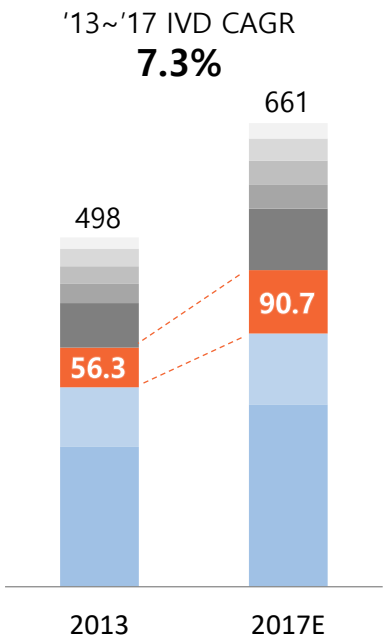
Global IVD Market by Application



Source: Frost & Sullivan, Analysis of the Global IVD Market, 2014.7

Global IVD Market Growth Rate

Unit : 0.1 Billion USD



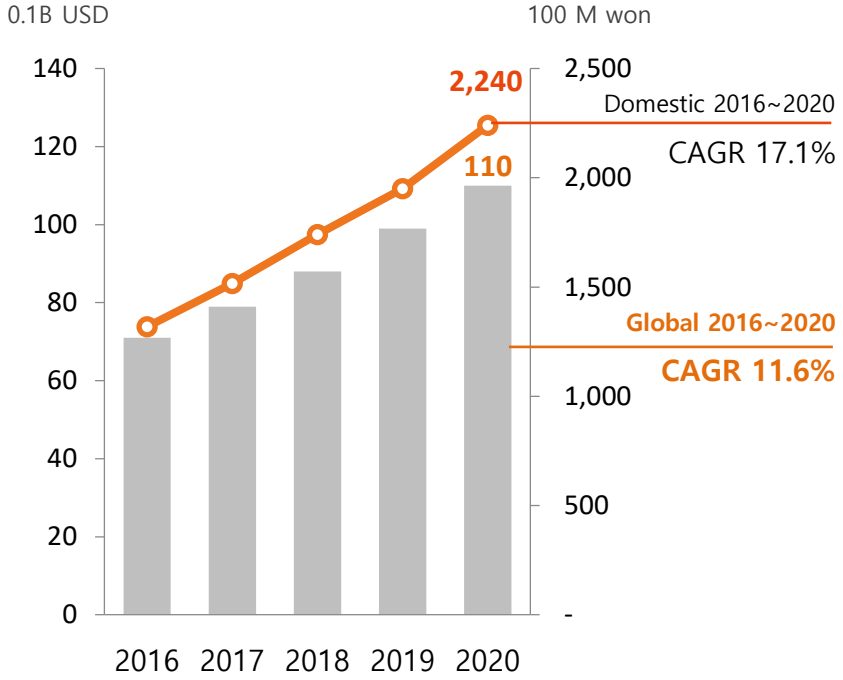
분야	'13~'17 CAGR
Thrombosis	7.7%
Hematology	6.1%
Histolgy	8.2%
Clinical Microbiology	5.6%
POCT	8.4%
MDx	12.7%
SMBG	4.4%
ImmunoChemistry	6.8%

Source: Frost & Sullivan, Analysis of the Global IVD Market, 2014.7

2. Market Potential of MDx

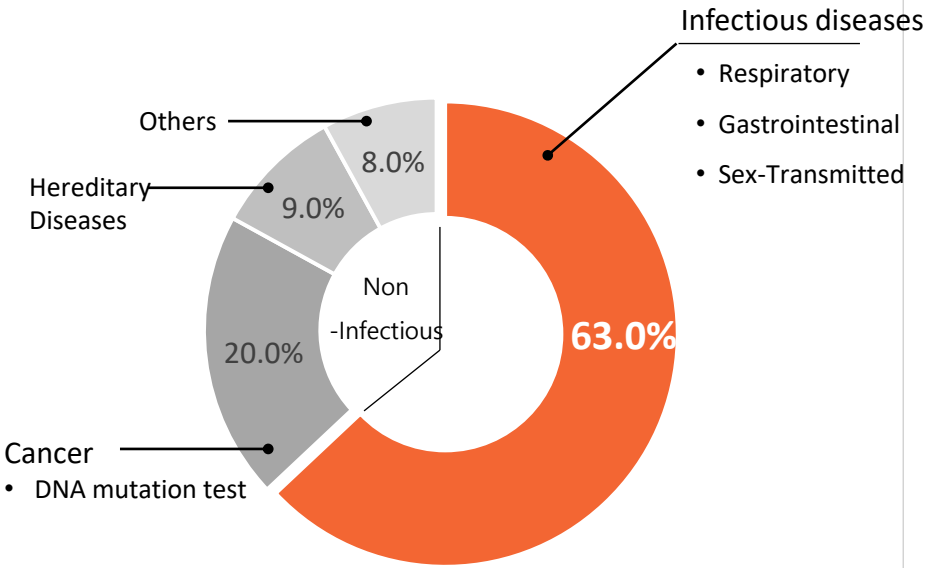
- Growing market needs for the MDx for the best treatment regimens according to personalized medicine trend
- Infectious diseases: The single most important area in MDx in market potential

MDx Market Outlook



Source : SMBA, Technology Toadmap 2017~2019
Transparency Market Research, Jun 2017

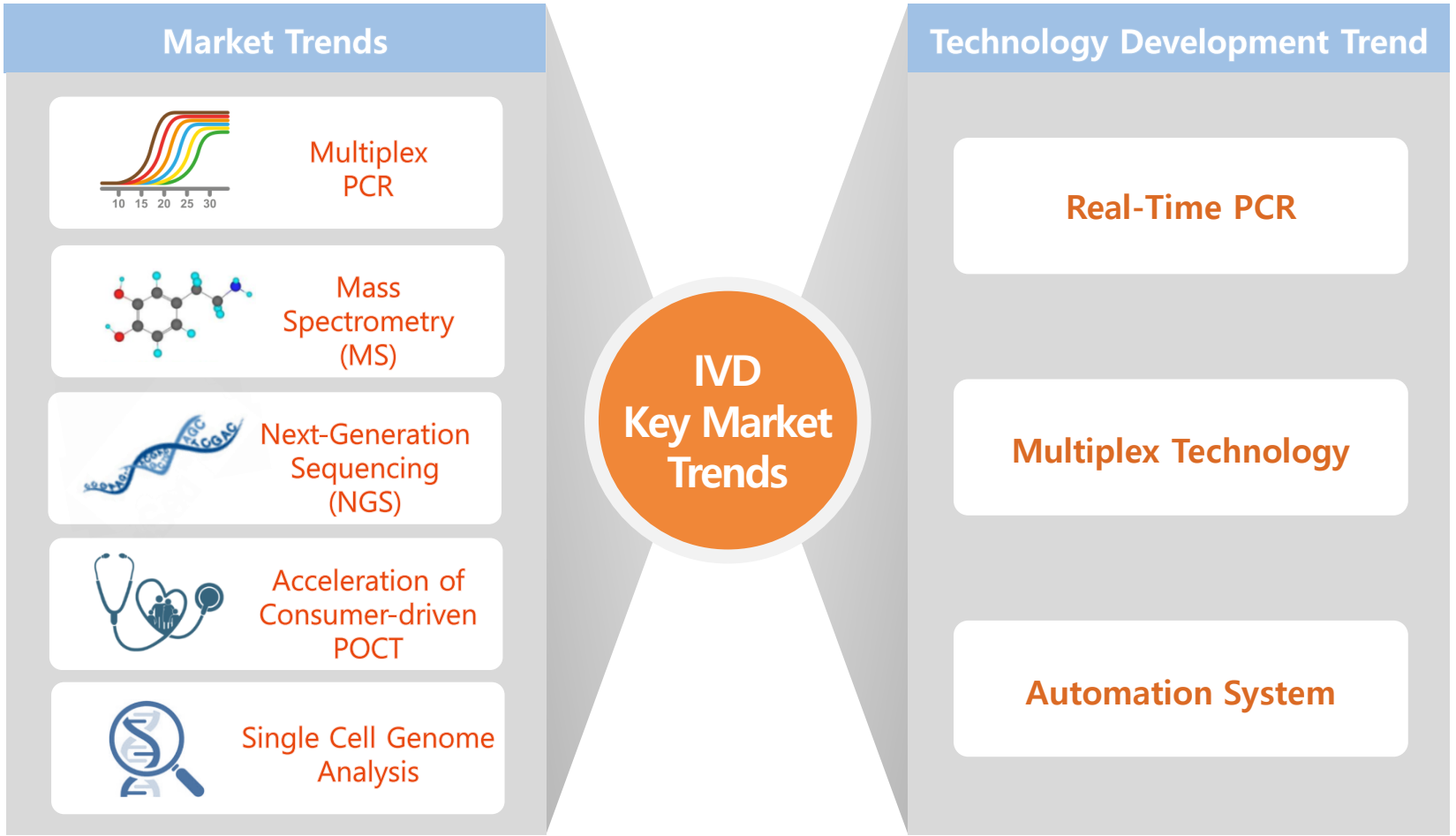
MDx Market by Diseases Groups



Source: KISTI, Market Report, 2014.04

3. IVD Key Trends

- MDx' key market trends: multiplex real-time PCR and automation
- The Platforms enabling fast, accurate, easy-to-use & efficient tests

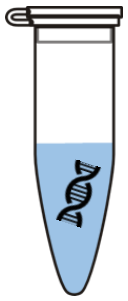


Source : Frost & Sullivan, Global Healthcare Industry Outlook 2017

4. Real-Time PCR

- Real-time PCR, the most routine platform installed in commercial laboratories
- The dominating technology in MDx: one-step DNA amplification and result acquisition make easy and fast result

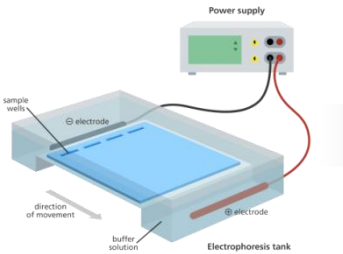
DNA Prep.

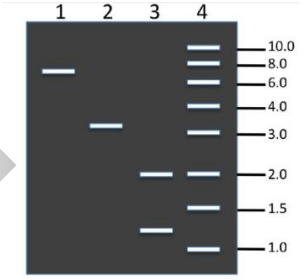


Conventional PCR

DNA Amp. 3~4 hr

Electrophoresis, 1~2 hr



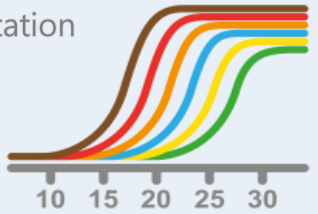


Labor-intensive, Less Specific

Real-time PCR

DNA Amp.+ Result interpretation

One-Step Diagnosis



RT -PCR

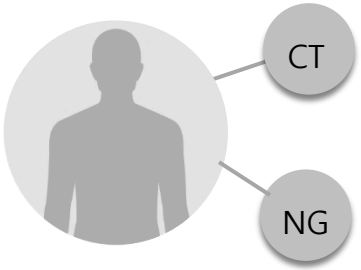
User-friendly, Highly Specific

5. Multiplex Technology

- Multiplex MDx: simultaneous diagnosis of multiple pathogens in one reaction
- Securing sensitivity and specificity is the major challenge

Exiting MDx

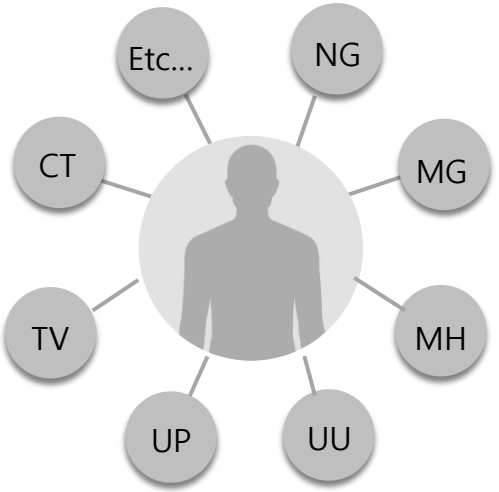
Limited Number of Pathogens per Test



versus

Multiplex MDx

Multiple Pathogens per Test



Reduced Cost	Early and Timely Diagnosis	Frequent Mixed Infection
• Decreased Laboratory Cost • Low Insurance Imbursement • Reduced Patient Charge	• Early and Rapid Diagnosis of Potential Pathogens • Timely Medical Intervention	• Mixed Infections Frequently occurred in Infectious Diseases • Tailored Therapy to Causative Agent

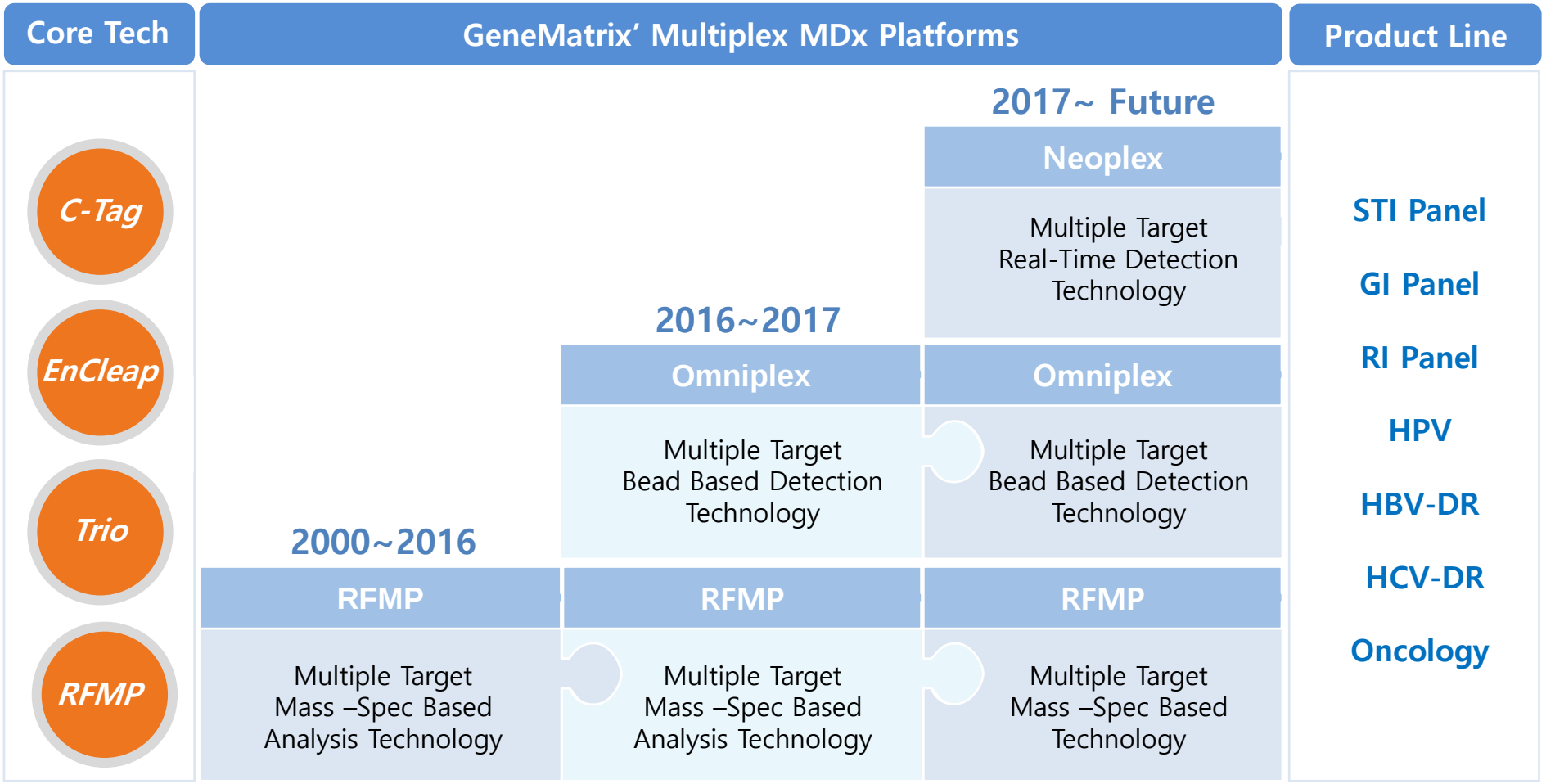
Chapter

02 About Genematrix

1. A Company Specialized in Multiplex MDx
2. Highly Committed Management with Solid Vision
3. Core Competence Based on Proprietary Technologies
4. RFMP, High-Resolution Genotyping Technology
5. NeoPlex , Multiplex MDx Platforms
6. Diversified Product Portfolio

1. Multiplex MDx-Specialized Company

- Gaining competitive advantage through continuous development of core technologies
- C-Tag Technology: the new technological breakthrough in real-time PCR -based MDx



2. Highly Committed Management with Solid Vision

Soo-Ok Kim CEO

- PhD, The Univ. of Texas at Austin (1991)
- BS, MS, Yonsei Univ. in Seoul (1982,1984)

- National Committee, Ministry of Science & Technology
- Vice President, Korean Biotechnology Industry Organization
- General Manager, CJ Corp. Pharmaceutical Division
- Patent Technology Award (1st place), Korean Intellectual Property Office
- A New Drug Licensing-Out (VaccGen, USA): Now Norvatis' Product Right
- Collaboration Agreement with Variagenics, LANL, WRAIR in USA

Sun Pyo Hong VP, R&D

- PhD, Seoul Natl. Univ.
- BS, Seoul Natl. Univ.

- Senior Research Scientist, CJ Corp.
- Committee, Natl. Pharmacogenomics Network
- Assistant Administrator, Soc. of Cancer Prev.
- Editorial Board, Future Microbiology

Suk Joon Kim VP, Management & Planning

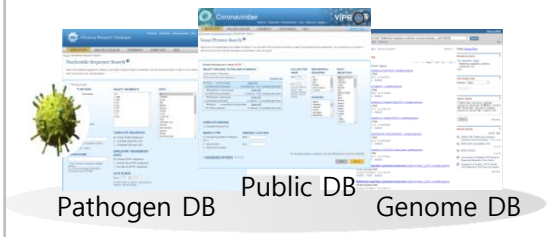
- MS, Seoul Natl. Univ.
- BS, Seoul Natl. Univ.

- Business Strategy & Legal Dept., CJ Corp.
- Research Committee, Ministry of Industry & Commerce
- Investigating Committee, KIPO
- Examining Committee, Ministry of Health & Welfare

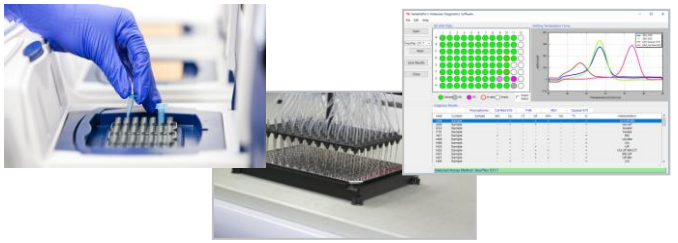
3. R&D Core Competence Based on Proprietary Technologies

- Development of competitive product with advanced multiplicity and specificity
- Fast and effective development through technology expertise and well-established infrastructure

Proprietary Standalone BLAST DB



Development Expertise & Excellence



In silico R&D

Exploring Multiplex MDX

R&D Core Competance

Exploring High-Fidelity MDX

Enabling Fast & Validated Development

Core Technology Platforms

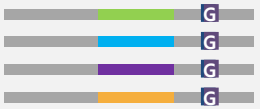
C-Tag

Multiplex RT-PCR

EnCleap

High Specificity PCR

TriO



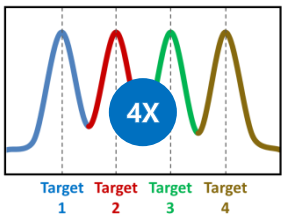
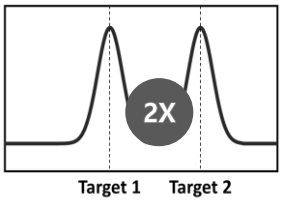
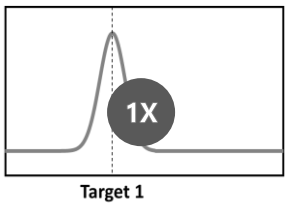
High Inclusivity PCR

RFMP

High-Resolution Genotyping

4. What is NeoPlex ?

- Innovative multiplex real-time PCR: able to detect 4 times more targets per channel compared to TaqMan
- TaqMan: 1 Pathogen / Channel → NeoPlex: 4 Pathogens / Channel

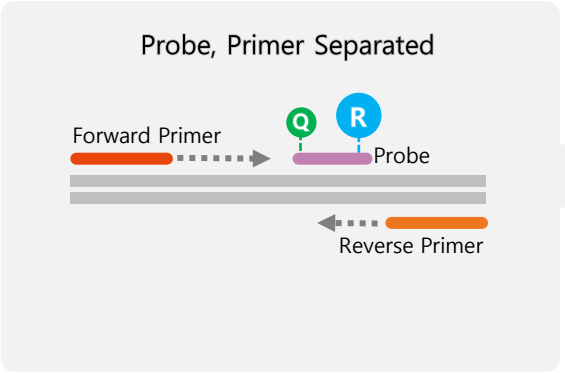
	NeoPlex	A (Domestic)	R (Overseas)
1-Channel			
3-Channels	 12 Targets	 6 Targets	 3 Targets
Principle	C-Tag (Multi Tm)	Mudt (Dual Ct)	TaqMan (Ct)
Device	Open	Open	Dedicated
Cost	Low	Low	High
IP	Patented	Patented	Off Patent

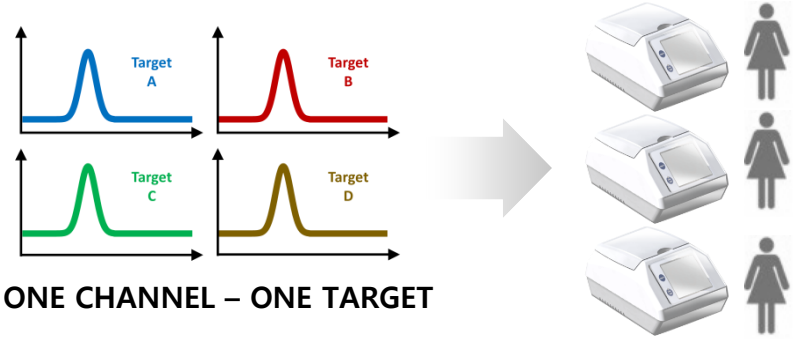
5. Why NeoPlex ?

- Groundbreaking reduction in devices, labor force, cost and TAT
- Meeting clinical unmet needs in medical laboratory

If TaqMan Adopted

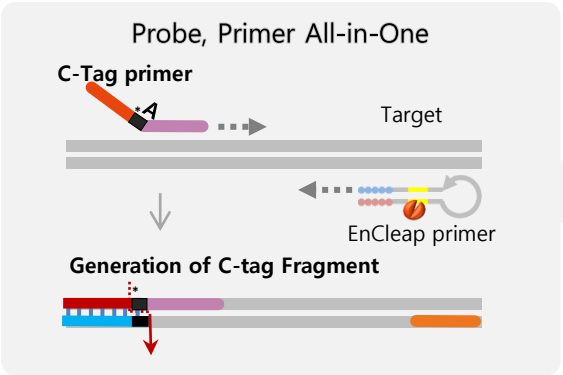
For 12 pathogens, 3 Tubes needed, For 96 specimens, 3 Technicians & 3 Devices, Results Integration Needed

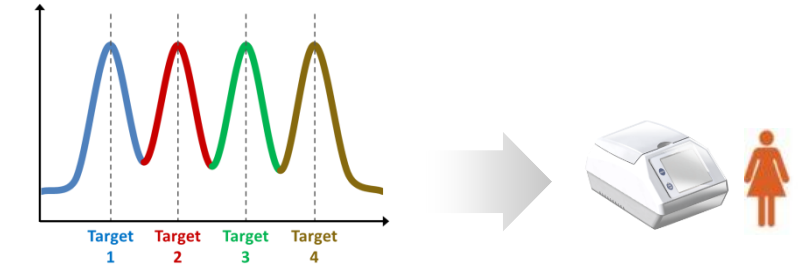




If NeoPlex Adopted

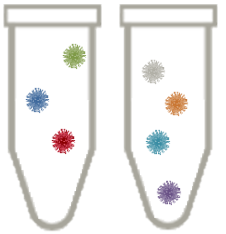
For 12 pathogens, 1 Tube needed, For 96 specimens, 1 Technicians & 1 Device, Results One Batch-Processing





6. Neoplex' Competitive Advantage

» Leading STI diagnosis market with the Fast and Easy test kit to detect a wide range of pathogens in Single-Tube

Comparison	**Neoplex STI-12 (GM)**	A (Domestic)	F (Belgium)
Principle of Real-Time PCR	C-Tag™	Multiplex Ct	TaqMan
Tested Pathogens	12	7	7 (3+4)
PCR Tube			
Tested Specimen/ 1 PCR	96	96	48
PCR cycler/ 96 samples			
TAT/ 96 samples	2h 30m	3h 50m	3h
Automatic Result Reporting	Possible	Possible	NA

7. Neoplex Multiplex IVD Portfolio

- Providing assorted diagnosis panel to customers' needs
- NeoPlex Viewer Software enables easy and fast result reporting

Sex Transmitted Infection Panels

Neoplex STI-7**	Sex Transmitted Infection Panels
Neoplex STI-12	
Neoplex STI-14	

Respiratory Infection Panel

Neoplex RI-Flu-RSV	Influenza and RSV
Neoplex RB8	Respiratory Bacteria 8
Neoplex RV-A	Respiratory Virus A
Neoplex RV-B*	Respiratory Virus B

Gastrointestinal Infection Panel

Neoplex GI- V6	Gastrointestinal virus 6
Neoplex GI-BacA*	Gastrointestinal Bacteria A
Neoplex GI-BacB*	Gastrointestinal Bacteria B

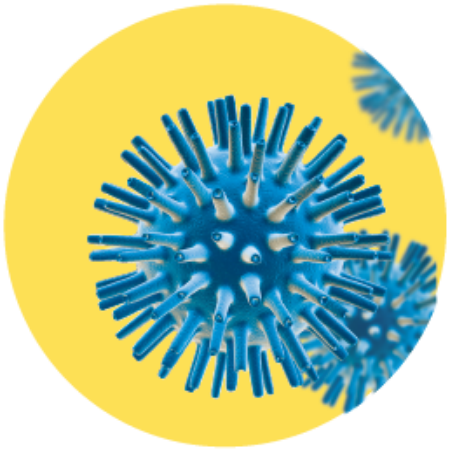
* Coming soon * * Number, # of pathogens per each panel

Easy and Fast

NeoPlex™
Multiplex Real-Time PCR

STI-14
Detection Kit

Simultaneous Detection of
14 STI-Causing Pathogens with
Multiplex Real-Time PCR



STI-14

Genematrix
www.genematrix.net

NeoPlex™
Multiplex Real-Time PCR

STI-14 Detection Kit

IVD CE0123

Sexually transmitted infections (STIs) are infections that cause more than 1 million new patients every day. The symptoms of many STIs may not be obvious initially, and this results in a greater risk of unintended transmissions. The undetected or mistreated STIs can progress to cause many symptoms including discharge from the penis, vagina or anus, genital ulcers, abdominal or pelvic pain, and even miscarriage or infertility. Therefore an early and accurate detection of STIs is essential to promote patient's health and prevent morbidity.

NeoPlex™ STI-14 Detection Kit is the multiplex real-time PCR kit that can detect 14 STI-causing pathogens simultaneously with a single-tube PCR reaction. Based on proprietary C-Tag™ technology, NeoPlex™ STI-14 Detection Kit is able to report the result within 4 hours from DNA extraction to analysis for up to 96 samples with high clinical sensitivity and specificity.

NeoPlex™ STI-14 | Conventional Product

NeoPlex offers less bench space, labor force, cost and TAT and ensures quality assurance with integrated results.

Simple and Fast Workflow

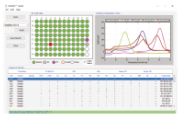
Automated Extraction / 1hr 1

Microlab STARlet

Real-Time PCR / 2hr 2

CFX96™ Real-Time PCR

Data Analysis / 5min 3



NeoPlex™ Viewer

NeoPlex™ STI Panel Comparison Chart

Targets	NeoPlex™ STI-7	NeoPlex™ STI-7 PLUS	NeoPlex™ STI-14
Chlamydia trachomatis (CT)	o		o
Neisseria gonorrhoeae (NG)	o		o
Trichomonas vaginalis (TV)	o		o
Mycoplasma hominis (MH)	o		o
Mycoplasma genitalium (MG)	o		o
Ureaplasma urealyticum (UU)	o		o
Ureaplasma parvum (UP)	o		o
Herpes simplex virus type 1 (HSV-1)		o	o
Herpes simplex virus type 2 (HSV-2)		o	o
Treponema pallidum (TP)		o	o
Gardnerella vaginalis (GV)		o	o
Candida albicans (CA)		o	o
Haemophilus ducreyi (HD)		o	o
Group B *Streptococcus* (GBS)		o	o

NeoPlex™ STI Order Information

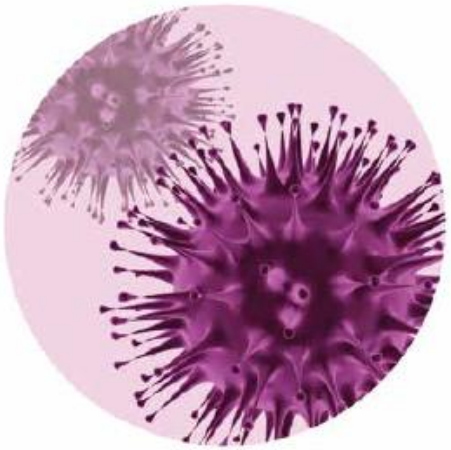
Cat. No.	Product	Description	Size
NS01A	NeoPlex™ STI-14 Detection kit	Simultaneous detection of 14 STI Pathogens	96 tests/kit
GM3500	NeoPlex™ STI-7 Detection kit	Simultaneous detection of 7 major STI Pathogens	96 tests/kit
GM3600	NeoPlex™ STI-7 PLUS Detection kit	Simultaneous detection of 7 additional STI Pathogens	96 tests/kit

Easy and Fast

NeoPlex™
Multiplex Real-Time PCR

Respiratory
Infection Panels

Simultaneous Detection of
28 Respiratory Pathogens with
Multiplex Real-Time PCR



Respiratory

Genematrix
www.genematrix.net

NeoPlex™
Multiplex Real-Time PCR

Respiratory Infection Panels

Acute respiratory tract infections (RTIs) are one of the most prevalent infections in children and adults and could be critical to patients over 60 years of age or with immunosuppressant therapy. RTIs include common cold and influenza to more serious pneumonia. Both viruses and bacteria can cause RTIs, but the clinical signs and symptoms of many respiratory pathogens are very similar, making it difficult to diagnose with slow and inaccurate traditional methods. Therefore an early and accurate detection of RTIs is crucial for rapid diagnosis and timely treatment.

NeoPlex™ Respiratory Detection Panels are multiplex real-time PCR kits that can detect and differentiate 20 viruses, including 3 Flu A subtypes, and 8 bacteria pathogens. Based on proprietary C-Tag™ technology, NeoPlex™ Respiratory Infection Panels enable a single-tube PCR test for multiple pathogens and same day report from DNA/RNA extraction to analysis with high clinical performance.

NeoPlex™ Respiratory Infection Panels Single-Tube Real-Time PCR per Panel

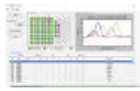
RV-Flu/RSV (CE-IVD Marked)	RV-Panel A (CE-IVD Marked)	RV-Panel B	RB-8 (CE-IVD Marked)
Influenza A Virus (Flu A)	Influenza A Virus (Flu A)	Coronavirus OC43 (CoV-OC43)	*Streptococcus pneumoniae* (SP)
Influenza A H1N1 (Flu A-H1N1)	Influenza A H1N1pdm09 (Flu A-H1N1pdm09)	Coronavirus NL63 (CoV-NL63)	*Mycoplasma pneumoniae* (MP)
Influenza A H1N1pdm09 (Flu A-H1N1pdm09)	Influenza A H3N2 (Flu A-H3N2)	Coronavirus 229E (CoV-229E)	*Chlamydophila pneumoniae* (CP)
Influenza A H3N2 (Flu A-H3N2)	Influenza B Virus (Flu B)	Coronavirus HKU1 (CoV-HKU1)	*Legionella pneumophila* (LP)
Influenza B Virus (Flu B)	Respiratory Syncytial Virus A (RSV A)	Human bocavirus (hBoV)	*Haemophilus influenzae* (HI)
Respiratory Syncytial Virus A (RSV A)	Respiratory Syncytial Virus B (RSV B)	Human rhinovirus (hRV)	*Bordetella pertussis* (BP)
Respiratory Syncytial Virus B (RSV B)	Parainfluenza Virus 1 (PIV 1)	Human enterovirus (hEV)	*Bordetella parapertussis* (BPP)
	Parainfluenza Virus 2 (PIV 2)	Parainfluenza Virus 4 (PIV 4)	*Moraxella catarrhalis* (MC)
	Parainfluenza Virus 3 (PIV 3)	Human metapneumovirus (hMPV)	
	Adenovirus (AdV)		

Simple and Fast Workflow

DNA/RNA Extraction / 1 hr 1 — Real-Time PCR / 3,5 hr 2 — Data Analysis / 5 min 3


Microlab STARlet


CFX96™ Real-Time PCR


NeoPlex™ Viewer

Superior Multiplexity with High Flexibility

Clinical Manifestation		RV-Flu/RSV	RV-Panel A	RV-Panel B	RB-8
Basic Testing • Initial screening for suspected viral RTI in the flu season		o			
Combination Testing	• Suspected upper respiratory tract infection		o	o	
	• Suspected lower respiratory tract infection				o
Full panel testing • High risk patients • Patients with critical care • Immunosuppressed patients			o	o	o

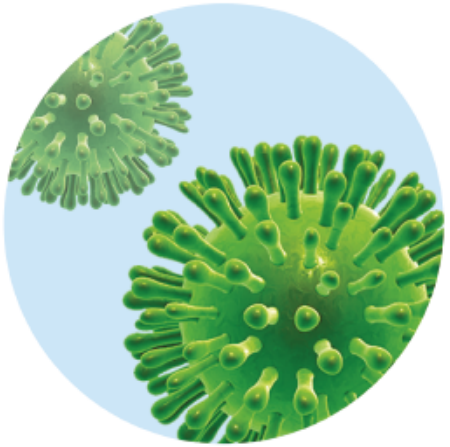
- With high multiplexity, **NeoPlex™ Respiratory Infection Panels** can optimize the test procedures to allow your laboratory smarter workflow, productivity, and efficiency with less space and operational costs.
- Also the laboratories can select the individual kit based on the patient characteristics, clinical symptoms, and suspected pathogens for optimized patient care with reduced costs.

Easy and Fast

NeoPlex™
Multiplex Real-Time PCR

Gastrointestinal Infection Panels

Simultaneous Detection of
19 Gastrointestinal Pathogens with
Multiplex Real-Time PCR



Gastrointestinal

NeoPlex™
Multiplex Real-Time PCR

Gastrointestinal Infection Panels

Gastrointestinal infections are the second leading cause of mortalities in children under five years of age, and gastroenteritis outbreaks are becoming an increasing threat to the developed world. It is difficult to diagnose the causative pathogens due to their similar clinical signs and symptoms, and more than 80% of diarrheal cases are attributed by unidentified pathogens. Therefore an early and accurate detection and identification is necessary for rapid diagnosis, timely treatment, and prompt outbreak prevention.

NeoPlex™ Gastrointestinal Detection Panels are multiplex real-time PCR kits that can detect and differentiate 6 viruses and 13 bacteria. Based on proprietary C-Tag™ Technology, NeoPlex™ Gastrointestinal infection Panels provide a single-tube PCR test for multiple pathogens and enables same day report from DNA/RNA extraction to analysis with high clinical sensitivity and specificity.

NeoPlex™ Gastrointestinal Infection Panels Single-Tube Real-Time PCR per Panel

GI-Virus 6 (CE-IVD Marked)	GI-Bac 8	GI-Bac 5
Norovirus GI (NoV GI)	*Salmonella* spp.	Enteropathogenic *Escherichia coli* (EPEC, eaeA)
Norovirus GII (NoV GII)	*Shigella* spp./*Enteroinvasive Escherichia coli* (EIEC)	Shiga toxin-producing *Escherichia coli* (STEC, stx1/stx2)
Rotavirus (RoV)	*Vibrio* spp.	Enterotoxigenic *Escherichia coli* (ETEC, lt/st)
Adenovirus (AdV)	*Campylobacter* spp.	Enteroaggregative *Escherichia coli* (EAEC, aggR)
Astrovirus (AsV)	*Clostridium perfringens* spp.	*Escherichia coli* O157:H7
Sapovirus (SaV)	*Clostridium difficile* Toxin B	
	Yersinia enterocolitica	
	Aeromonas spp.	

Easy Result Analysis

NeoPlex™ Viewer is an automatic analysis software for NeoPlex™ Real-Time PCR assays.

NeoPlex™ Viewer can:

- Analyze results from the melting curve
- Export analysis results in an Excel form
- Provide more convenient data sorting in the software result table

Comparison of Different Diagnostic Methods

Symptoms	Exposure / Condition	Pathogens	Diagnostic Methods
Diarrhea	Foodborne?	Norovirus?	NAAT*
Abdominal Pain	Waterborne?	Rotavirus?	NAAT
Fever	Other exposures?	*Salmonella* ?	Culture or NAAT
Vomit	Immunocompromising?	*Vibrio*?	Culture or NAAT
		E. Coli ?	Ag Test

* Nucleic Acid Amplification Test

NeoPlex™ Gastrointestinal Infection Panels simultaneously detect and differentiate 6 viruses and 13 bacteria for maximum productivity.

Genematrix
www.genematrix.net

1. Maximization of Synergy through Joint R & D

Domestic Joint Research

Performing Joint Research with Major College of Medicines and National Policy Research Agencies

Alliance for Domestic and Overseas Cooperation

Alliance Cooperation for Product Development and Marketing

International Joint Research

Creating Synergy Effects through Joint Research with Core Experts of Overseas Universities

Clinical Joint Research and Translational Study

Market Penetration through partnering with Key Doctors and Medical Institutions

Partnerships with industry, academia and government agencies have been an integral part of GeneMatrix culture since 2001.

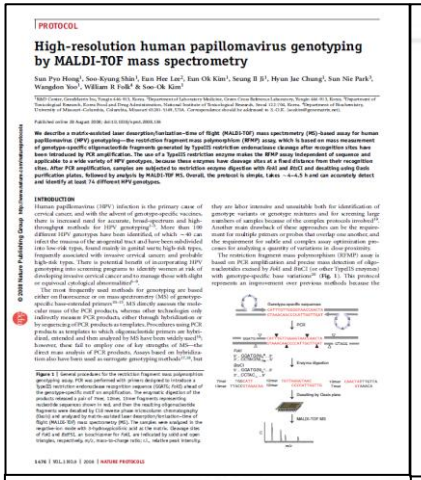
2. Joint Research Outcomes with Clinical KOLs

Scope of Project	Collaborator	Status
Clinical responses of antiviral treatments in chronic hepatitis B patients in Korea	Yonsei University Hospital	Completed
Combination therapy of antiviral resistant chronic hepatitis B patients n Korea	Korea University Hospital	Completed
Comparison study of various HPV genotyping assays for high-risk HPV genotype in Korean women	KonKuk University Hospital	Completed
Development of multi-marker diagnostic platforms for early diagnosis of hepatocellular carcinoma and prediction of Sorafenib efficacy	Seoul University Hospital	Under clinical evaluation
Adefovir treatment and resistance in chronic hepatitis B patients in Korea	Korea University Hospital	Completed
Early diagnosis of lamivudine resistance in chronic hepatitis B patients in Korea	Seoul Asan Hospital	Completed
Detection of HCV genotypes for decision of treatment regimes of hepatitis C patients in Korea	Seoul University Hospital	Completed
Multi-drug resistance in chronic hepatitis B patients	Yonsei University Hospital	Completed
Development of new diagnostic kit for HPV genotyping assays and its comparison to Roche Linear Array	Seoul University Hospital	Completed
Clinical evaluation study of add-on treatment of novel antiviral in recurrent chronic hepatitis B	Ajou University Hospital	Completed
Development of Zika virus recombinant vaccines and its efficacy in primate model animal	Korean Centers for Disease Control and Prevention	Completed

Genematrix

3. Industry-Leading Science in World Top Journals

Nature Protocols



PROTOCOL

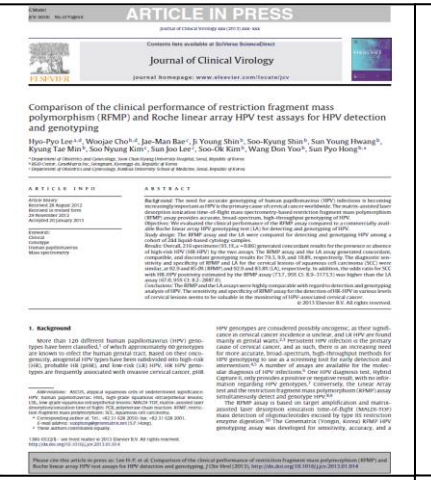
High-resolution human papillomavirus genotyping by MALDI-TOF mass spectrometry

Sun Pyo Hong[1], Soo-Kyung Shin[1], Eun Hee Lee[2], Eun Ok Kim[1], Seung Il Ji[3], Hyun Jae Chung[1], Sun Nie Park[3], Wangdon Yoo[1], William R Folk[4] & Soo-Ok Kim[1]

BMC genomices

BMC Genomics

J Clin Virol



ARTICLE IN PRESS

Journal of Clinical Virology

Comparison of the clinical performance of restriction fragment mass polymorphism (RFMP) and Roche linear array HPV test assays for HPV detection and genotyping

Hyo-Pyo Lee[1,2], Woojae Cho[3,4], Jae-Man Bae[1], Ji Young Shin[3], Soo-Kyung Shin[3], Sun Young Hwang[3], Kyung Tae Min[3], Soo Nyung Kim[1], Sun Joo Lee[1], Soo-Ok Kim[3], Wang Don Yoo[3], Sun Pyo Hong[3,*]

J Med Vriol

Analytical and Clinical Performances of a Restriction Fragment Mass Polymorphism Assay for Detection and Genotyping of a Wide Spectrum of Human Papillomaviruses

Hyo-Pyo Lee,[1] Soo-Ok Kim,[2] Tae Sook Hwang,[3] Jae-Man Bae,[1] Soo Nyung Kim,[1] Jae Won Kim,[4] Sun Young Hwang,[4] Hae Kyung Shin,[5] Woojae Cho,[6] and Sun Pyo Hong[4]*

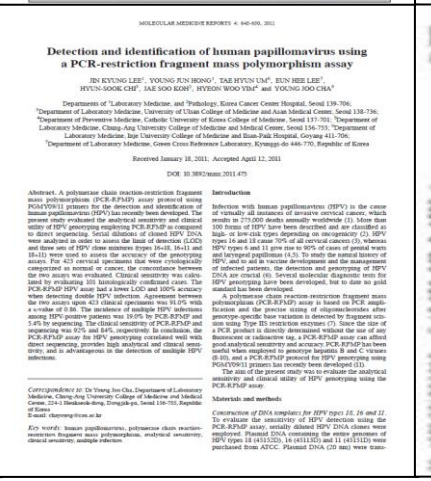
Gastroenterology

Antiviral Therapy

Clinical Chem

Population Genotyping of Hepatitis C Virus by Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry Analysis of Short DNA Fragments

Mol Med Report



MOLECULAR MEDICINE REPORTS 4: 645-650, 2011

Detection and identification of human papillomavirus using a PCR-restriction fragment mass polymorphism assay

JIN KYUNG LEE[1], YOUNG JUN HONG[1], TAE HYUN UM[1], EUN HEE LEE[2], HYUN-SOOK CHI[3], JAE SOO KOH[2], HYEON WOO YIM[4] and YOUNG JOO CHA[4]

J Hepatol

Gut

Genematrix

Diagnostics and Therapeutics For Human Healthcare

Order Information: Tel : +82-31-628-2020 / sales@genematrix.net

Technical Support: Tel : +82-31-628-2000 / support@genematrix.net / www.genematrix.net