

One Platform Solution for Molecular Diagnostics

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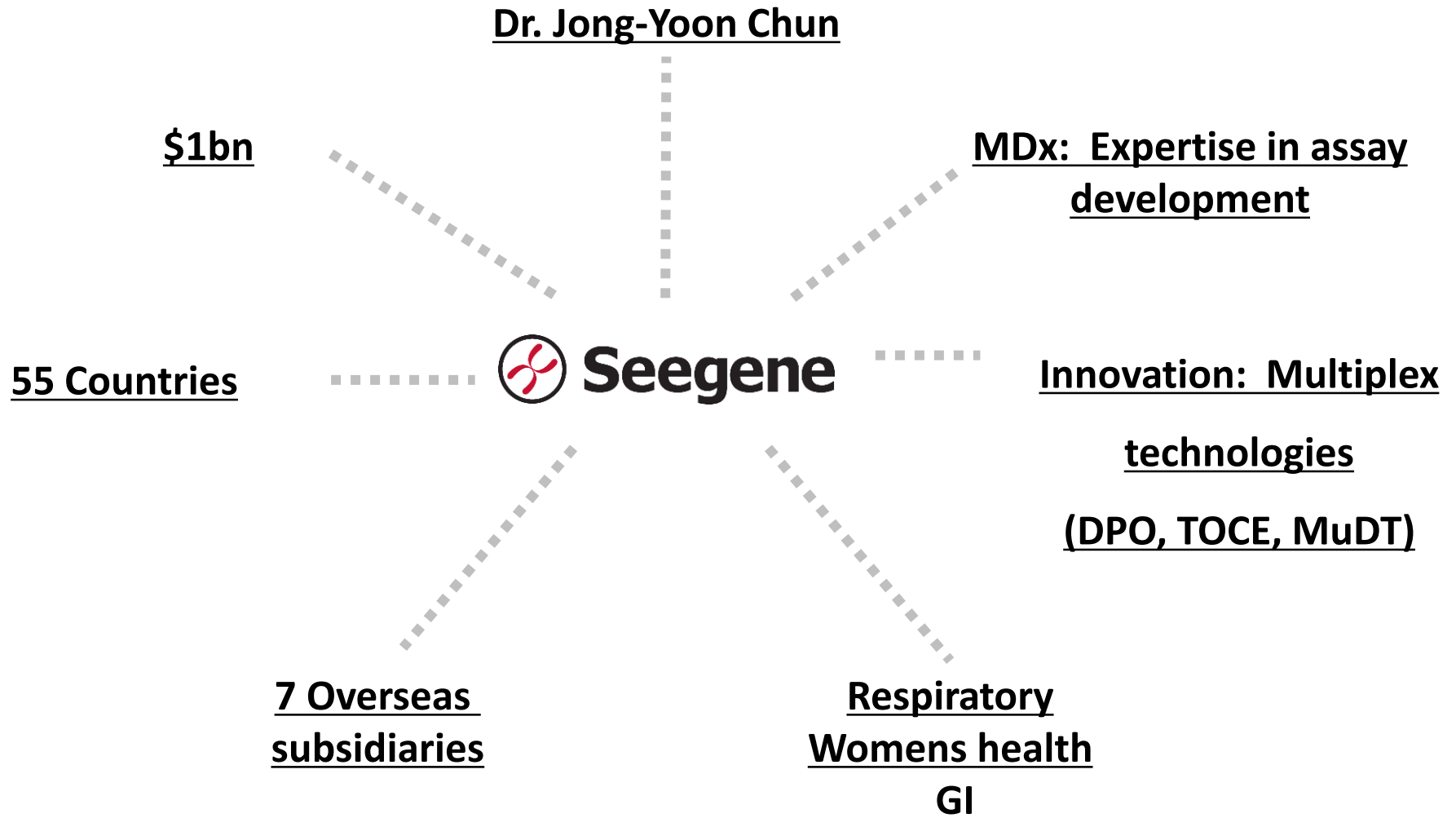
1. Introducing Seegene

2. 2016 Review

3. 2017 Initiatives

- **Innovation: Automated assay development**
- **Product Portfolio expansion**
- **Market expansion: United States**

1. Introducing Seegene



2. 2016 Review

Successful launch of Allplex products


Continued expansion in EU

Superiority of Seegene's real-time PCR technologies

3. 2017 Initiatives

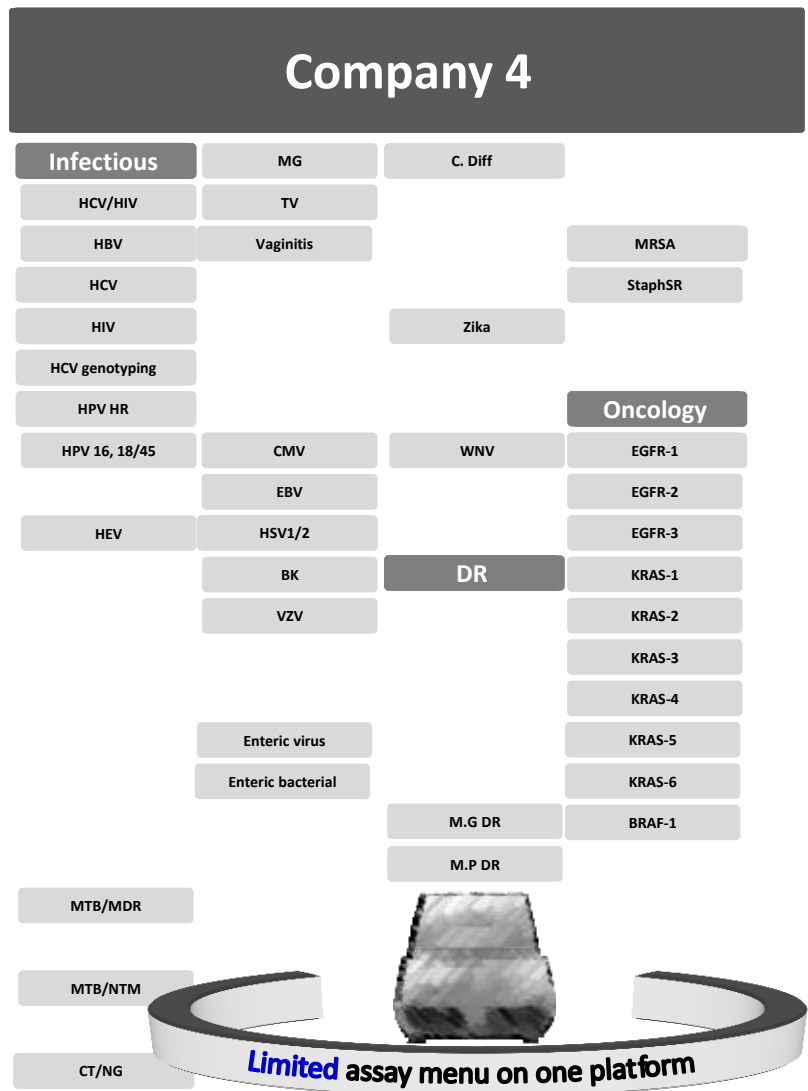
- Innovation: Automated assay development**

Example of a MDx Lab: **Multiple Instruments for Assays**

| | | | | | | | |
|---------------------|---|------------------------|-------------------------|-------------------|------------------|---------------------|-----------------|
| HBV/HCV/HIV | HBV (Q) | HCV (Q) | HIV (Q) | HCV genotyping | HSV1/HSV2/VZV | BK/JC virus | AdV/B19 |
| CMV/EBV/HHV6 | Flu/RSV/Flu A subtyping | AdV/HEV/PIV /MPV | Flu A typing | CoV typing | MTB/MDR | MTB/XDR | MTB/NTM |
| MTB/MAC |  | | | | | | H.pylori Cla-DR |
| NTM Typing | | | | | | | M.G DR |
| GI virus | | | | | | | M.P DR |
| GI bacteria | | | | | | | AmpC |
| GI parasite | | | | | | | GBS-R |
| • | | | | | | | • |
| • | | | | | | | • |
| HPV Screening | | | | | | | ESBL |
| HPV typing | | | | | | | APOE |
| Genital ulcer | | | | | | | PIK3CA |
| Candidiasis | BRAF | | | | | | |
| STI Essential | JAK2 | | | | | | |
| Bacterial vaginosis | Thrombosis | | | | | | |
| CT/NG/MG/TV | BV reflex | BV/Vaginitis screening | Streptococcus screening | TORCH | Meningitis virus | Meningitis bacteria | EGFR |
| Vaginitis | Lyme disease | Non-Lyme tick borne | Viral encephalitis | C. Diff screening | HBV DR | KRAS | MDRO |

3. 2017 Initiatives

- Innovation: Automated assay development**



- **Innovation: Automated assay development**

Current limitations

1) Limitation of technologies

- **Multiplex (> 10-plex)**
- **SNP (> 10 point mutations)**
- **Quantification (>10-plex)**

2) Time and resource limitations

3. 2017 Initiatives

- **Innovation: Automated assay development**

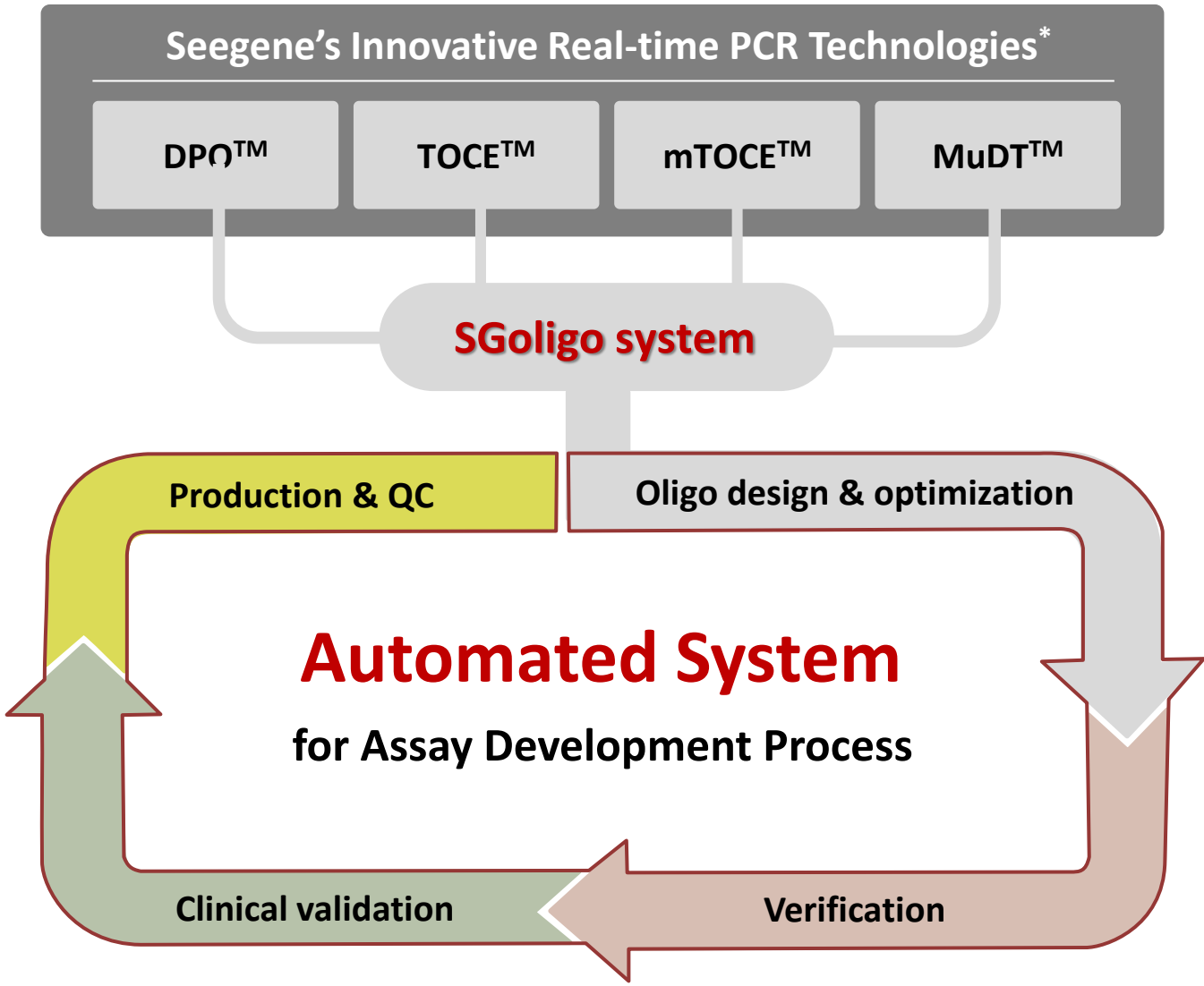
What would be **Ideal** for a Lab?

All the assays you need on One Platform



- **Innovation: Automated assay development**

**Introduced in 2016 JPM "Completion of Real-time PCR technology"*



3. 2017 Initiatives

- Innovation: Automated assay development**



3. 2017 Initiatives

- **Product portfolio expansion: Project 100**

**New 95 product portfolio built on Seegene's automated development system
(2017~2018)**

| Category | No. of Assay | No. of Analytes |
|---------------------------|---------------------|------------------------|
| Infectious Disease | 54 | 267 |
| Drug Resistance | 12 | 54 |
| Oncology | 21 | 90 |
| Genetics | 8 | 33 |
| Total | 95 | 444 |

3. 2017 Initiatives

• Product portfolio expansion: Project 100

“2018”

| | | | | |
|---------------------------|-------------------------|-------------------------|-----------------------------|----------------------------|
| Blood infection | Meningitis | Respiratory | HAI | Mastocytosis, etc. |
| HBV/HCV/HIV | Virus-1 | Flu/RSV/Flu A typing | C. Diff screening | C-KIT |
| HBV Q | Virus-2 | Virus-1 | Prenatal test | Glioma |
| HIV Q | Virus-3 | Virus-2 | TORCH | IDH1/2-1 |
| HCV Q | Bacteria | Bacteria-1 | Acute encephalitis | IDH1/2-2 |
| HCV GT | Gastrointestinal | Bacteria-2 | Encephalitis virus-1 | Leukemia |
| Transplantations | Virus | CoV typing | Encephalitis virus-2 | Hema-1 |
| HSV/VZV | Parasites | Flu A typing | Essential screening | Hema-2 |
| AdV/B19 | Bacteria-1 | CoV /bacteria | Colorectal cancer | Hema-3 |
| BK/JC Q | HPV | RV7 | KRAS-1 | Hema-4 |
| CMV/EBV/HHV6 Q | HR | STI | KRAS-2 | JAK2 |
| Tropical fever | HR & LR | Genital ulcer | KRAS-3 | BCR/ABL |
| Zika/Dengue/Chik | Drug Resistance | Candidiasis | Hepatocellular, etc. | Breast cancer, etc. |
| Dengue typing | GBS-R | Bacterial vaginosis | PIK3CA | AKT1 |
| Malaria | H.pylori Cla-DR | Vaginitis | NRAS-1 | BRCA |
| TB/NTM | MP DR | BV reflex | NRAS-2 | Genetics |
| TB/MDR | MG DR | BV/Vaginitis screening | Thyroid cancer, etc. | Thrombosis |
| TB/XDR | MRSA | Streptococcus screening | BRAF | APOE genotyping |
| TB/NTM | MDRO | Carbapenamase | Lung cancer | CYP2C19 |
| TB/MAC | ESBL | HBV Lamivudine | EGFR-1 | HLA typing |
| NTM typing 1 | AmpC | HBV Adefovir | EGFR-2 | Avellino |
| NTM typing 2 | One Platform | HBV Ente/T | EGFR-3 | PCDH15-1 |
| NTM typing 3 | | | | PCDH15-2 |
| Tick-borne disease | | | | PCDH15-3 |
| Lyme disease | | | | |
| Non-Lyme tick borne | | | | |



3. 2017 Initiatives

- Product portfolio expansion: Project 100

Infectious disease & Personalized medicine

| Gastrointestinal disease | Respiratory disease | Oncology | Genetics |
|---|--|--|--|
| GI bacteria-1, 2, parasite, Norovirus I, II | NTM typing, TB MDR, AdV, PIV 1/3, 2/4 | Comprehensive cancer panel, BRCA 1, 2 | F II, V, MTHFR 677, MTHFR 1298, ApoE |
| Noro, Rota, Astro, AV, Rota, Astro, AV | Flu/RSV/Flu A subtyping, Flu A/B/RSVAB | Colorectal cancer panel, N-RAS, iK-RAS | Factor II, Factor V, PAI-1, AAT, F II, V |
| EPEC eaeA/bfpA, EIEC, EAEC, C.diff A, B | Coronavirus typing, HRV, RSV A/B, MPV | Endometrial cancer panel, K-RAS, B-RAF | MDR 1, PVL, Warfarin, MTHFR, Collagen |
| EHEC VT1, VT2, ETEC LT, ST, Noro, C.diff | Respiratory panel (20), Entrovirus, CV | Melanoma cancer panel, DEK-CAN, PCA 3 | MTHFR, TYMS, DPY, r-Calctonin, CETP |
| Noro I, II, Rota, Astro, Sapo, AV, EIEC | Respiratory panel (17), EV, BP, BPP, BH | Breast cancer HR panel, FIP1L1-PDGFR | r-Estrogen, r-Vitamin D3, HLA A typing |
| EHEC stx1, stx2, ipaH, EIEC, Salmonella | Respiratory panel (14), HCoV, AV, CP, MP | Breast/Ovarian panel, Wilms tumor, AFP | HLA DRB 1, 3, 4, 5 typing, HLA A, B, C |
| Noro, C.diff, Rotavirus, Salmonella spp | Flu H1N1, H3NX, H5NX, H7NX, BP, BPP | Prostate cancer panel, TEL-AML1, EGFR | HLA DRB, DQA, DQB, DPA, DPB, CYP2D6 |
| Campylobacter spp, C. jejuni, C. coli, EV | AV, hMPV A, B, HBoV, Flu H1N1, H3N2 | Methylated Septin 9, Lung cancer panel | HLA B57:01 identification, GST-M1, T1 |

| STI | Blood infection | Drug resistance | Transplantation, etc. |
|---------------------------------------|------------------------------------|--|---------------------------------------|
| HPV (33), HPV HR (14), CT, NG, UU, MG | Tropical fever core (7), RVE virus | Entecavir-resistance, HBV, ancomycin-resistant | HSV 1/HSV-2, VZV, BK, CMV/EBV/HH6 (Q) |

Project 100
 "All Real-time Diagnostics on One Platform"

3. 2017 Initiatives

- **Market expansion: United States**

Plans for Successful U.S. Expansion



2017

Collaboration on instrument
Kick-off of clinical trials

2018

Submission of products to FDA for approval
Launch of FDA products

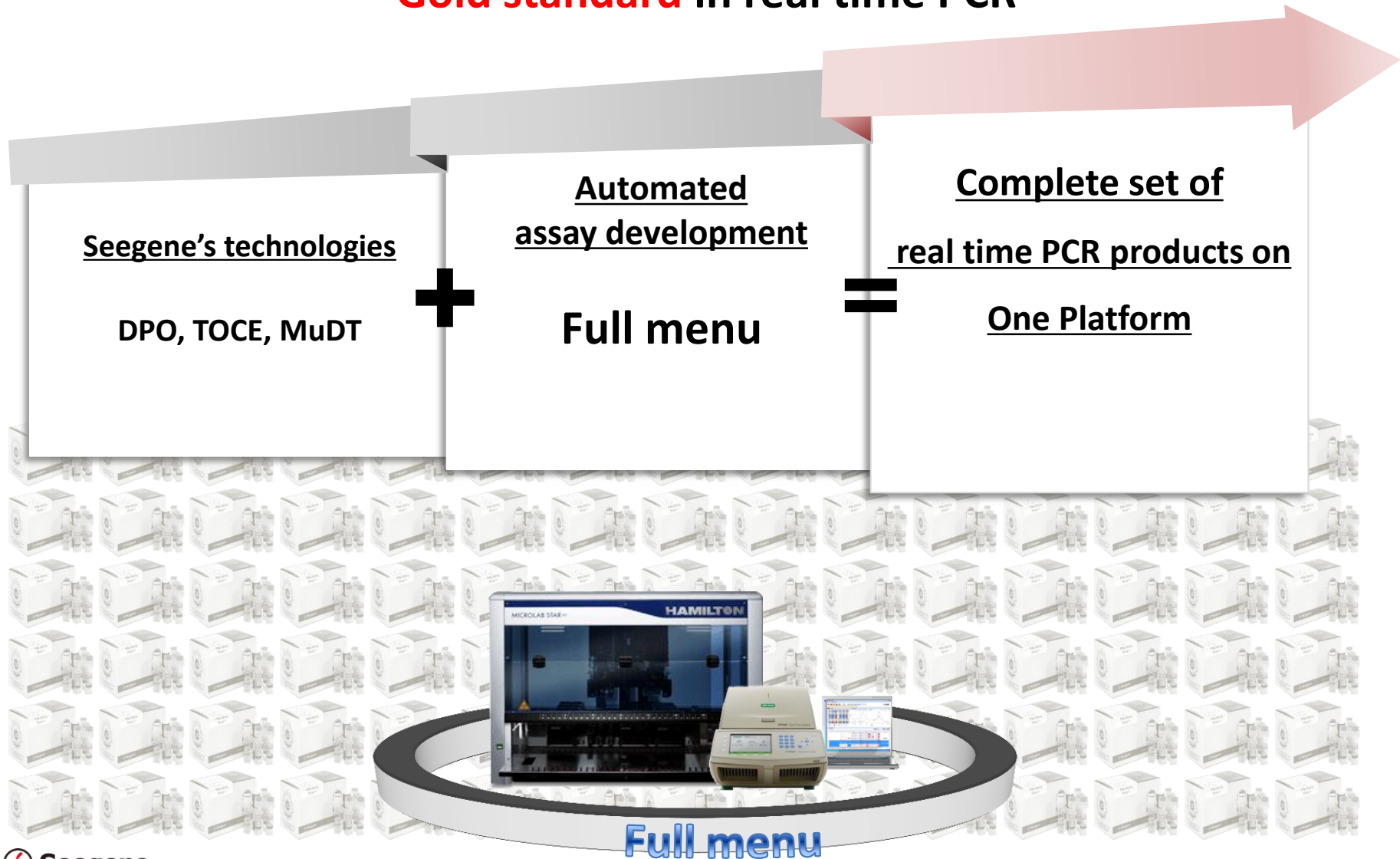
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2020

Continued introduction of FDA approved products

4. Looking into the Future

Gold standard in real time PCR



Thank You!

