Roche Diagnostics
Integrated Core Lab and new technologies
Dr. Thomas Schinecker, Global Head of Centralised and POC Solutions
20 November 2018
Our environment

*Increasing pressure on healthcare systems*

- Aging population
- Quality standards
- Chronic disease
- Workforce shortage
- Declining reimbursement

Health systems are facing pressure to do more with less
Hospitals are facing growing challenges

Our environment

Hospitals are **EXPECTED TO**

- Manage an increasingly high number of samples
- Deliver **results faster**
- Improve **outcomes**

While they have to **DEAL WITH**

- **Limited time, limited space**
- **Budget constraints**
- **Increased complexity** of diseases and treatments
Healthcare trends
As a result three major trends are shaping our industry

Centralisation
- Centralisation of samples and integration of adjacent disciplines into the core lab

Coagulation
Hematology
Mass Spec

Decentralisation (PoC)
- Decentralisation of urgent samples and out-patient care to address healthcare cost pressure

Digitalization
- Drive shift towards evidence-based, efficient, prevention-focused (clinical) decision making

Data integration
Lab Decision Support
Clinical Decision Support
Clinical Algorithms
Digital Biomarkers
PoC Amb.
PoC Hosp.
PoC ER/ICU
Standalone small Lab
PoC Home
Our Strategic Roadmap
From physical to virtual connectivity

Yesterday
Pioneers in Serum Work Area

We shaped the market by connecting clinical chemistry and immunoassays to create Serum Work Area

Today
Pioneers in Integrated Core Laboratory

Integrating further disciplines including molecular diagnostics, hematology, coagulation and third parties

2022
+ Integrated diagnostic information anywhere, anytime

Making diagnostic information from core & satellite labs, Point of Care and patients available where and when it is needed.
Roche solutions to address the trends
**POC & digital add to central lab**

**Setup**

- 8 hospitals with 7 labs and 1,250 beds
- Decentralized testing, limited IT

**Results**

- >115,000 cases per year
- 2.5 million lab tests per year

*Real customer case from Germany*
Roche solutions to address the trends
**POC & digital add to central lab**

**Setup**
- Original setup*: mainly Centralised
  - # beds
  - 8 hospitals with 7 labs and 1,250 beds
  - Decentralized testing, limited IT

- Optimized setup*: CS, PoC & Digital
  - % tests
  - 1 central lab, 5 PoC sites, 2 sites with limited test menu
  - Digitally connected results

**Results**
- >115,000 cases per year
- 2.5 million lab tests per year
- Increased test volumes: sales +22%
- Decreased Costs -18%

*Real customer case from Germany

**Centralised Solutions**
- Allows processing of high volume of tests through automation and integration of disciplines

**Roche PoC solutions**
- Enables decentralization of testing where appropriate & increases operational efficiency of the network

**Roche Digital solutions**
- Enables centralization of lab result data & use of PoC
Two strategic objectives
*Increase testing efficiency and deliver medical value*

**Testing efficiency**
- Improve laboratories operations and efficiency of IVD testing

**Medical value**
- Support clinical decisions through IVD tests that change clinical practice
Integrated Core Lab
Expanding with new disciplines and digital solutions

*cobas® pro, cobas® pure, cobas® Mass Spec have not been launched, yet.
Pioneer in IVD
Roche has played a key role in shaping lab diagnostics
Position of strength

Among the largest world-wide SWA installed base in the industry

>70,000 active analytical units – technology you can trust
Leveraging the power of Big Data
Consolidating information to optimize R&D, improve product performance and gain disease insights

**ROCHE GENERATED INSIGHTS**

- **19 billion** data points per year…
- **52 million** data points per day…
- **2 million** data points per hour…
- **600** data points per seconds…

**CPS cobas Cube**

- **6 billion** records of customer data – growing by 20 million per week
- Consolidate data from globally installed customer systems (Modular Analytics, cobas® 4000, cobas® 6000 and cobas® 8000)
- Provide insights into product performance, quality, as well as supply planning and service activities
- Led by a CPS interdisciplinary team of biostatisticians and software engineers

Testing efficiency
The broadest menu on one integrated platform

Consolidate up to 98% of SWA testing

Number of assays

<table>
<thead>
<tr>
<th>System</th>
<th>Roche: Clinical chemistry</th>
<th>Roche: Immunochemistry</th>
<th>Other vendors: Clinical chemistry</th>
<th>Other vendors: Immunochemistry</th>
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<tbody>
<tr>
<td>cobas 4000/6000/8000</td>
<td>111</td>
<td>90</td>
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<tr>
<td>Competitor</td>
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<td>Competitor</td>
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<td>Competitor</td>
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</table>

Status as of May 1 2018
Source: Internal Roche data
Integration beyond the lab

Consistent results across all settings of care

Central laboratory
- cobas® 8000 modular analyzer series
- cobas® 6000 analyzer series

Satellite laboratory
- cobas® 6000 analyzer series
- cobas® 4000 analyzer series

Emergency laboratory
- cobas c 111 analyzer

Health clinic
- cobas® 4000 analyzer series
- cobas c 111 analyzer

Same reagents
Same detection technology
Same reference ranges
Simple training
Flexible staff allocation

Streamline the workflows across networks
cobas® pro
Continuous lab evolution and seamless integration into lab automation

- Shared reagents
- Consistent operation
- Same technologies
- Same assay menu

Fully-integrated lab from a single supplier
POC portfolio
Quality and control at the point of care

Accelerating time-critical decisions
- Coagulation: CoaguChek® Pro II
  - Cardiac: cobas h 232
- Hospital blood glucose monitoring: Accu-Chek Inform II
- BG/E: cobas b 221 and cobas b 123
- Infectious diseases: cobas® Liat

Supporting improved clinical outcomes
- HbA1c and lipid monitoring: cobas b 101
- Infectious diseases: cobas® Liat
- Urinalysis: Urisys® 1100

Empowering patients
- CoaguChek INRange/Vantus
The value of in-vitro diagnostics data

The driver of effective medical decision making

IVD accounts for

~2% of worldwide healthcare spending

IVD influences

~70% of clinical decision-making

1 in 7 of ALL clinical decisions based on Roche Diagnostics insights*


*Assumes ~20% market share
A global leader in medical innovation
World-class antibody development capabilities

<table>
<thead>
<tr>
<th>Disease Area</th>
<th>Cardiovascular</th>
<th>Women’s health</th>
<th>Critical care</th>
<th>Neurology</th>
<th>Oncology</th>
<th>Infectious diseases</th>
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<tbody>
<tr>
<td><strong>Major achievements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cardiovascular</td>
<td>High sensitive trop T</td>
<td>NICE recommendation-</td>
<td>FDA cleared Roche</td>
<td>FDA Breakthrough</td>
<td>FDA-cleared</td>
<td>First of a kind</td>
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<tr>
<td></td>
<td>and NT-proBNP</td>
<td>dation &amp; FDA Breakthrough for</td>
<td>PCT to aid in decision</td>
<td>for pTau/Abeta42</td>
<td>digital ROMA</td>
<td>Antigen-Antibody</td>
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<td>global gold standard</td>
<td>sFit-1/PIGF in</td>
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<td>in CSF for Alzheimer’s</td>
<td>algorithm in Ovarian cancer</td>
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<td>markers in Cardiology</td>
<td>Preeclampsia</td>
<td>therapy and</td>
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<td>(HE4 &amp; CA-125)</td>
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<td>Exclusive new markers</td>
<td>Novel markers for</td>
<td>Novel markers (e.g.</td>
<td>Blood-based</td>
<td>Work towards</td>
<td>Novel vector</td>
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<td>Endometriosis &amp;</td>
<td>stREM-1) &amp; digitally</td>
<td>markers for</td>
<td>GALAD score/algo</td>
<td>borne menu –</td>
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<td>Alzheimer’s</td>
<td>in Liver cancer</td>
<td>Zika, Dengue,</td>
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<td></td>
<td></td>
<td></td>
<td>for Sepsis</td>
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<td></td>
<td>Chikungunya</td>
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</table>

Other disease areas covered by CPS: Anemia, Bone, Coagulation, DAT, Endocrinology, Hematology, Hepatology, Inflammation, Renal, TDM, Urine
Indication programs: new way to invest
Our master plan to make a disease less burdensome

Indication programs

• Selected areas with unmet medical need

• Long term plan from marker discovery to assay development and clinical and health economics studies

• Algorithm and digital tools to enhance our solutions

Top investment areas

Atrial Fibrillation

Heart Failure

Coronary Artery Disease

Sepsis

Hepatitis

Sexually Transmitted Diseases

Tropical Diseases
Summary
Committed to continue our innovation journey inside and outside the lab

Proven track record of pioneering lab solutions

Increased focus on Point of Care

Delivering greater medical value
Doing now what patients need next