Innovation and value creation

Daniel O’Day, CEO Roche Pharmaceuticals

J.P. Morgan Healthcare Conference
San Francisco, January, 2017
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Performance update

Strategy

Growth drivers

Summary
Q3 2016: Sales growth for fifth consecutive year

All growth rates at Constant Exchange Rates (CER)
HY 2016: Strong core operating profit & margin

CER=Constant Exchange Rates
2016: Building the base for future growth

New Molecular Entities: Launches and key read-outs

**Launches**
- Tecentriq in 2/3 line bladder & lung (US)
- Alecensa in 2/3 line ALK+ lung (US)
- Cotellic in BRAF+ melanoma (US)
- Gazyva in R/R iNHL (US)
- Venetoclax in 17p del CLL (US)

**Positive key read-outs**
- Gazyva in 1L iNHL: GALLIUM (at interim)
- Emicizumab (ACE910) in inhibitor patients: HAVEN1
- Actemra in Giant Cell Arteritis: GiACTA

**Diagnostics**
- Launch of Cobas e801
Performance update

Strategy

Growth drivers

Summary
Clear strategy to maintain leadership position

Data analytics to drive innovation & efficiency

**Pipeline & commercial delivery**
- Differentiated molecules
- Competitive fitness

**Data & analytics**
- Smart, more efficient R&D
- Access & personalised patient care

**Increased efficiency & productivity**
- Innovative ways of working
- Prioritisation and focus

Outstanding talent that drives innovation & execution
Roche strategy

*Focused on medically differentiated therapies*

- uniquely positioned to benefit all stakeholders
- personalized medicines for patients & health care professionals
- optimised benefit / risk ratio for regulators
- optimised benefit / cost ratio for payors
Innovation through rigorous prioritization

Focus on differentiated medicines

We select at late stage entry

...to increase sales potential

Illustrative

Medical need

low

high

Clinical differentiation

low

high

Threshold

Continued

Disqualified

Greater differentiation

Sales

Time
Recognition for innovation

*Leading by Breakthrough Therapy Designations (BTDs)*

**Total number of BTDs received**

<table>
<thead>
<tr>
<th>Company</th>
<th>BTDs</th>
</tr>
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<tbody>
<tr>
<td>Roche</td>
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</tr>
<tr>
<td>Novartis</td>
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<tr>
<td>BMS</td>
<td>10</td>
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<tr>
<td>Merck</td>
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</tr>
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<td>Pfizer</td>
<td>7</td>
</tr>
<tr>
<td>Abbvie</td>
<td>7</td>
</tr>
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</table>

**BTDs halve development time**

<table>
<thead>
<tr>
<th>Development Type</th>
<th>Years from Phase 1 to Filing</th>
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<tbody>
<tr>
<td>No designation</td>
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</tr>
<tr>
<td>Fast track</td>
<td>5.8</td>
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<td>Accelerated review</td>
<td>3.8</td>
</tr>
<tr>
<td>BTD</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Years from Phase 1 to Filing

-52% reduction

Source: [http://www.focr.org/breakthrough-therapies](http://www.focr.org/breakthrough-therapies) as of October 2016; PPMS=Primary Progressive Multiple Sclerosis; CLL=Chronic Lymphocytic Leukemia; NSCLC=Non-Small Cell Lung Cancer; IPF=Idiopathic Pulmonary Fibrosis
Launches of new medicines at a record high
Biosimilars impact

*Complex market drivers; clear divide in uptake vs Generics*

**Market share**

<table>
<thead>
<tr>
<th>Product</th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
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<tbody>
<tr>
<td>Remicade</td>
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<td>Somatropin(^1)</td>
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<tr>
<td>EPO(^1)</td>
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<tr>
<td>Filgrastim(^1)</td>
<td></td>
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<tr>
<td>Zyprexa (Eli Lilly)(^2)</td>
<td></td>
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<tr>
<td>Diovan (Novartis)(^2)</td>
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</tr>
</tbody>
</table>

Driven by price and patient offering
Efficacy visible only long(er) term

Payer driven
Efficacy visible immediately
High turnover of patients

Small molecule
Virtually disappear

Sources: IMS Health, IMS & Roche analysis, \(^1\) Volume market share based on EU5 average, \(^2\) Data based on % remaining sales in EU
Clear strategy to maintain leadership position

Data analytics to drive innovation & efficiency

Pipeline & commercial delivery

- Differentiated molecules
- Competitive fitness

Data & analytics

- Smart, more efficient R&D
- Access & personalised patient care

Increased efficiency & productivity

- Innovative ways of working
- Prioritisation and focus

Outstanding talent that drives innovation & execution
Increasing productivity  
**Selected examples**

### Commercial

- Resource shift to support launches
- Commercial productivity program

![Graph showing resource shift from 2016 to 2017]

- Recent launches & pipeline
- In-market & established

### Product Development

- Decision making: Putting all projects into portfolio context
- Above median NPV and POL
- Below NPV and POL

### Production

- Shift from small to large molecule capacity
- Small molecule capacity
- Biologics capacity

Shared service centres: Kuala Lumpur, Budapest
Clear strategy to maintain leadership position

Data analytics to drive innovation & efficiency

Pipeline & commercial delivery

- Differentiated molecules
- Competitive fitness

Data & analytics

- Smart, more efficient R&D
- Access & personalised patient care

Increased efficiency & productivity

- Innovative ways of working
- Prioritisation and focus

Outstanding talent that drives innovation & execution
Roche: Towards individualization of treatment

*Uniquely positioned to change treatment paradigm*

<table>
<thead>
<tr>
<th></th>
<th>Past</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Symptomatic</td>
<td>Single biomarkers (tissue-based)</td>
<td>Comprehensive diagnostics, (genomics, tissue &amp; blood)</td>
</tr>
<tr>
<td><strong>Treatment decision</strong></td>
<td>Empirical</td>
<td>Biomarker-guided</td>
<td>Comprehensive Dx and data-driven decision support</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Broad spectrum medicines</td>
<td>Targeted medicines</td>
<td>Individualized treatments</td>
</tr>
</tbody>
</table>
Strong focus on data analytics

Leveraging Pharma & Dia expertise and collaborations

Access meaningful data

- Clinical Trial Data
  - 4%
- Real World Data
  - 96%

Create insights

- Infrastructure & novel technologies to analyse integrated data

Realise value from insights

- Smarter, more efficient R&D
- Improved access & personalised patient care

Data analytics to accelerate R&D productivity & personalised patient care
Performance update

Strategy

Growth drivers

Summary
Outcome studies are event-driven: timelines may change. Standard approval timelines of 1 year assumed.
### 2016 onwards: Key data read-outs

<table>
<thead>
<tr>
<th>Year</th>
<th>NMEs</th>
<th>Line Extensions</th>
<th>FDA Breakthrough Therapy Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Gazyva R/R iNHL (GADOLIN)</td>
<td>Venclexta R/R CLL with 17p del</td>
<td>Olesoxime</td>
</tr>
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<td></td>
<td>Cotelic + Zelboraf BRAFmut melanoma</td>
<td>Tecentriq 2L+ bladder cancer</td>
<td>Crenezumab, Gantenerumab</td>
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<tr>
<td></td>
<td>Alecensa 2L ALK+ NSCLC</td>
<td>Ocrevus RMS/ PPMS</td>
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<td></td>
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<td>Tecentriq 2L+ all-comers NSCLC</td>
<td>Crenezumab, Gantenerumab</td>
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<tr>
<td></td>
<td>Tecentriq</td>
<td>Ocriplasmy</td>
<td>Idasanutlin, Taselisib, Etrolizumab</td>
</tr>
<tr>
<td>2017</td>
<td>Gazyva 1L iNHL (GALLIUM)</td>
<td>Tecentriq + Avastin + chemo 1L NSCLC</td>
<td>Tecentriq program</td>
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<tr>
<td></td>
<td>Perjeta + Herceptin eBC HER2+ (APHINITY)</td>
<td>Tecentriq + Avastin 1L RCC</td>
<td>CRC, SCLC, TNBC, Melanoma</td>
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<tr>
<td></td>
<td>Tecentriq</td>
<td>Lampalizumab Geographic atrophy</td>
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<tr>
<td></td>
<td>Alecensa 1L ALK+ NSCLC</td>
<td>Emicizumab Hemophilia A inhibitors</td>
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<td>Lampalizumab Geographic atrophy</td>
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<td></td>
</tr>
</tbody>
</table>

Outcome studies are event-driven: timelines may change. Standard approval timelines of 1 year assumed.
## Our Cancer Immunotherapy Strategy

*Tecentriq as a foundation*

### Going deep in diseases where we have strong scientific rationale

<table>
<thead>
<tr>
<th>Pivotal</th>
<th>Lung</th>
<th>Bladder</th>
<th>Kidney</th>
<th>Breast</th>
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<tr>
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<td>1L, 2L,</td>
<td>1L, 2L,</td>
<td>1L, combo with Avastin</td>
<td>1L combo with chemo</td>
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<tr>
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<td>adjuvant</td>
<td>adjuvant</td>
<td></td>
<td></td>
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<tr>
<td>Important future development areas</td>
<td>Colorectal</td>
<td>Melanoma</td>
<td>Ovarian</td>
<td>Hematology</td>
</tr>
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</table>

All studies with extensive biomarker program and PDL1 diagnostic

Bladder 1L: IMvigor210
PDUFA date: April 30th
Tecentriq in 2L+ non-small cell lung cancer

Survival benefit regardless of PD-L1 status

Barlesi et al, ESMO 2016; a Stratified HR; HR=hazard ratio; ITT=intention-to-treat

No. at Risk
Atezolizumab 425 407 382 363 342 326 305 279 260 248 234 223 218 205 198 188 175 163 157 141 116 74 54 41 28 15 4 1
Docetaxel 425 390 365 336 311 286 263 236 219 195 179 168 151 140 132 123 116 104 98 90 70 51 37 28 16 6 3

Median 9.6 mo (95% CI, 8.6, 11.2)
Median 13.8 mo (95% CI, 11.8, 15.7)

ITT patient population

HR, 0.73\textsuperscript{a}
(95% CI, 0.62, 0.87)
P = 0.0003

Minimum follow up = 19 months
**Immunotherapy in addition to targeted medicines**

*Multifold approaches across different tumour phenotypes*

---

### Marked targets

- **Several targeted medicines** (e.g., Tarceva, Herceptin)
- **Chemo**

### Clinical phases

- **Ph1b**
  - aCD40
  - aCEA-IL2v FP
  - aFAP-IL2v FP
  - aOX40

- **IND (2017)**
  - TBA

### Marked targets

- **MEKi** (e.g., Cotellic)
- **aVEGF** (Avastin)
- **aAng2/VEGF**
- **aPDL1** (Tecentriq)

### INFLAMED

- **Kill Cancer Cells**
  - aCD20/CD3 TCB 2
  - aCD20/CD3 TCB 1
  - aCEA/CD3 TCB
  - aCSF1R
  - aTIGIT
  - aOX40

---

1. Dual roles in T eff activation and T reg inhibition suggest OX40 activity in both desert and inflamed phenotypes; IND=new investigational drug application; TBA=to be announced
Cancer immunotherapy: 10 NMEs with near-term monotherapy and combo read-outs

<table>
<thead>
<tr>
<th>NME / Combinations</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>aCEA/CD3 TCB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aCEA/CD3 TCB + Tecentriq</td>
<td></td>
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</tr>
<tr>
<td>aOX40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aOX40 + Tecentriq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>emactuzumab + Tecentriq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aCD40 + Tecentriq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aCEA-IL2v FP + Tecentriq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vanucizumab + Tecentriq</td>
<td></td>
<td></td>
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<tr>
<td>aFAP-IL2v FP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDOi + Tecentriq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aCD40 + vanucizumab</td>
<td></td>
<td></td>
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<tr>
<td>aCD40 + emactuzumab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aCD20/CD3 TCB 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIGIT + Tecentriq</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NME = new molecular entity; 1. NMEs: aCD40; aOX40; aFAP-IL2v FP; aCEA-IL2v FP; vanucizumab (aAng2/VEGF); aCEA/CD3 TCB; aCD20/CD3 TCB 1; emactuzumab (aCSF-1R); IDOi (NewLink); aTIGIT; Note: Outcome studies are event driven, timelines may change
2016 onwards: Key data read-outs

**2015**
- **Tecentriq**
  - 2L+ bladder cancer
- **Venclexta**
  - R/R CLL with 17p del
- **Cotellic + Zelboraf**
  - BRAFmut melanoma
- **Alecensa**
  - 2L ALK+ NSCLC
- **Gazyva**
  - R/R iNHL (GADOLIN)

**2016**
- **Tecentriq**
  - 2L+ all-comers NSCLC
- **Venclexta**
  - R/R CLL with 17p del
- **Cotellic + Zelboraf**
  - BRAFmut melanoma
- **Alecensa**
  - 2L ALK+ NSCLC
- **Gazyva**
  - 1L iNHL (GALLIUM)

**2017**
- **Tecentriq + Avastin + chemo**
  - 1L NSCLC
- **Perjeta + Herceptin**
  - eBC HER2+(APHINITY)
- **Tecentriq + Avastin**
  - 1L RCC
- **Alecensa**
  - 1L ALK+ NSCLC

**Post 2017**
- **Tecentriq program**
  - CRC
  - SCLC
  - TNBC
  - Melanoma
- **Olesoxime**
- **Crenezumab**
- **Gantenerumab**
- **Idasanutlin**
- **Taselisib**
- **Etrolizumab**
- **Lampalizumab**
- **Emicizumab**
- **Hemophilia A inhibitors**
- **Tecentriq**
- **program**
  - CRC
  - SCLC
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- **Idasanutlin**
- **Taselisib**
- **Etrolizumab**
- **Lampalizumab**
- **Emicizumab**
- **Hemophilia A inhibitors**

Outcome studies are event-driven: timelines may change. Standard approval timelines of 1 year assumed.
OCREVUS: First drug active in both RMS & PPMS
Strong share of voice at ECTRIMS

- New endpoint analysis focusing on disease progression as treatment goal
- Regulatory review by FDA/EMA for both RMS and PPMS on-going; PDUFA date: March 28th

RMS=relapsing forms of multiple sclerosis (MS) which includes patients with RRMS and SPMS with superimposed relapses; RRMS=relapsing-remitting MS; SPMS=secondary progressive MS; PPMS=primary progressive MS; Giovannoni G. et al, presented at ECTRIMS 2016; Montalban X. et al, presented at ECTRIMS 2016
2016 onwards: Key data read-outs

Outcome studies are event-driven: timelines may change. Standard approval timelines of 1 year assumed.
Hemophilia A: Emicizumab in inhibitor patients

HAVEN 1 meeting all endpoints

By-passing agent market (USD 2.1bn)

<table>
<thead>
<tr>
<th>Year</th>
<th>FEIBA VH</th>
<th>NovoSeven</th>
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<td>2.1</td>
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<tr>
<td>2012</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>2018</td>
<td>2.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

HAVEN 1

Primary endpoint
- Significant reduction in the number of bleeds

Secondary endpoints
- Significant reduction in the number of bleeds in an intra-patient comparison in people who had received prior bypassing agent prophylaxis

Safety Profile and Sub-cut Administration
- Future trials will explore less frequent dosing
- Most common adverse events were injection site reactions, consistent with prior studies

Emicizumab development program
- Seeking to overcome current clinical challenges, such as multiple frequent IV infusions, high burden of treatment, and the short-lasting effects of existing treatments

1. EvaluatePharma consensus analyst estimates; 2. The study showed a statistically significant reduction in the number of bleeds over time in people treated with emicizumab prophylaxis compared to those receiving no prophylactic treatment.

Emicizumab and its uses are investigational and have not been approved by the US Food and Drug Administration. Efficacy and safety have not been established. The information presented should not be construed as a recommendation for use. The relevance of findings in preclinical studies to humans is currently being evaluated.
2016 onwards: Key data read-outs

### 2015
- **Tecentriq**: 2L+ bladder cancer
- **Venclexta**: R/R CLL with 17p del
- **Cotellic + Zelboraf**: BRAFmut melanoma
- **Alecensa**: 2L ALK+ NSCLC
- **Gazyva**: R/R iNHL (GADOLIN)

### 2016
- **Venclexta**: R/R CLL with 17p del
- **Ocrevus**: RMS/ PPMS
- **Emicizumab**: Hemophilia A inhibitors
- **Gazyva**: 1L iNHL (GALLIUM)
- **Actemra**: Giant cell arteritis
- **Tecentriq**: 2L+ all-comers NSCLC

### 2017
- **Tecentriq**: 2L+ all-comers NSCLC
- **Venclexta**: R/R CLL with 17p del
- **Emicizumab**: Hemophilia A
- **Lampalizumab**: Geographic atrophy
- **Gazyva**: 1L iNHL (GALLIUM)
- **Actemra**: Giant cell arteritis
- **Tecentriq**: 2L+ all-comers NSCLC

### Post 2017
- **Tecentriq program**: CRC, SCLC, TNBC, Melanoma
- **Tecentriq**: 2L+ all-comers NSCLC
- **Venclexta**: R/R CLL with 17p del
- **Emicizumab**: Hemophilia A
- **Lampalizumab**: Geographic atrophy

Outcome studies are event-driven: timelines may change. Standard approval timelines of 1 year assumed.
Geographic atrophy is an untreatable eye disease

*It causes irreversible retinal cell death*

![Disease Progression Diagram]

Today, over 5 million people suffer from GA worldwide
Lampalizumab: MAHALO Phase 2 study
First to show positive results

**All comers monthly**

- Least Squares Mean Change from Baseline in GA Area (mm²)
- $P < \text{pre-specified significance level of } 0.2$
- Reduction of 20% in GA area progression at M18 vs sham

**CFI + group monthly**

- Least Squares Mean Change from Baseline in GA Area (mm²)
- $P = <0.005$
- Reduction of 44% in GA area progression at M18 vs sham

Sham pooled CFI+

Lampalizumab monthly CFI+

Sham pooled monthly CFI+

Lampalizumab monthly CFI+
Performance update

Strategy

Growth drivers

Summary
Strong pipeline mitigates biosimilar impact

Growth driven by next generation medicines

NME launches
Venetoclax, Alectinib, Cotellic, Ocrelizumab, Atezolizumab, ACE910, Lampalizumab

Pipeline and recent launches

Biosimilars
MabThera, Herceptin, Avastin

Sales
2017 an important year for our pipeline

Key read-outs

- **APHINITY** (Perjeta aBC, Her2+)
- **IMpower 150** (Tecentriq 1L Lung)
- **CHROMA, SPECTRI** (Lampalizumab GA)
- **HAVEN 3** (Emicizumab non-inh.)
### 2016 outlook

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Group sales growth¹</td>
<td>Low to mid-single digit</td>
</tr>
<tr>
<td>Core EPS growth¹</td>
<td>Ahead of sales growth</td>
</tr>
<tr>
<td>Dividend outlook</td>
<td>Further increase dividend in Swiss francs</td>
</tr>
</tbody>
</table>

¹ At Constant Exchange Rates (CER)
Doing now what patients need next