“... just the beginning”

Why innovation efficiency matters
Information set forth in this presentation contains forward-looking statements, which involve a number of risks and uncertainties. We caution investors that forward-looking statements contained herein are based upon management’s expectations and assumptions as of the date of this presentation. Such forward-looking statements are neither promises nor guarantees, but are subject to a variety of risks and uncertainties, many of which are beyond our control, and which could cause actual results to differ materially from those contemplated in these forward-looking statements. We expressly disclaim any obligation or undertaking to release publicly any updates or revisions to any such statements to reflect any change in our expectations or any change in events, conditions or circumstances on which any such statement is based.
Agenda

A little intro to Evotec

The Megatrend

What is changing
# Leading external drug discovery & development

## Company snapshot

<table>
<thead>
<tr>
<th>100+</th>
<th>€ 400 m+</th>
<th>€ 100 m+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-owned pipeline programmes with significant milestone &amp; royalty potential</td>
<td>Revenues(^1)</td>
<td>Adjusted Group EBITDA(^1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10+</th>
<th>3,000+</th>
<th>200+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-owned companies &amp; corporate ventures</td>
<td>Top-class employees(^1)</td>
<td>Long-term partnerships</td>
</tr>
</tbody>
</table>

\(^1\) In 2019 (e)
Our sites underline the outsourcing trend

Global centres of excellence

- Princeton, Seattle, Branford, Watertown ~250
- Lyon, Toulouse ~600 employees
- Verona, ~660 employees
- Abingdon, Alderley Park ~700 employees
- Hamburg, Göttingen, Munich, Cologne ~700 employees

1) 1st J.POD under construction; planned to be operational in 2020
Product candidates still have a long way to go

Our core competencies
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What is changing
„Just the beginning …“ for the best medicine ever

Trends towards „convergence“ and more personalised medicine

Combination therapies

Wearables

Optimised diagnostics

3D Printing – customised treatment

DNA sequencing for personalisation

AI & robotics

Source: https://www.nationalgeographic.com/magazine/2019/01/12-innovations-technology-revolutionize-future-medicine/
Image sources: Ohio State University; Wexner Medical Center; Chonghe Wang and Sheng Xu; Kyoung Chae; James Hayden; Bruna Bortolato; Erik Benson; Björn Högberg; Marcel van den Bergh
Medicine of the future comes with radical change

Technologies & mega trends

Next wave of technologies

Next gen sequencing
More precise & early diagnostics
iPSC & CRISPR gene editing
RNAi technologies, CAR-T
Checkpoint inhibitors
Artificial intelligence, big data
3D printing, blockchain, wearables, sensors
Real-world data, …

Healthcare mega trends

Patient-centric medicine
Digital health
Predictive & preventive medicine
Value-based care

Partnered discovery & development

evotec & Partners
Patient-centric approaches will give us better drugs
Genetics, biomarkers, and better technologies improving success

Human genetics supported targets\(^1\)

<table>
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<tr>
<th>% success</th>
</tr>
</thead>
<tbody>
<tr>
<td>All programmes</td>
</tr>
<tr>
<td>Genetically supported</td>
</tr>
</tbody>
</table>

\(-2\times\)\n
Biomarker-based patient stratification\(^2\)

<table>
<thead>
<tr>
<th>% success</th>
</tr>
</thead>
<tbody>
<tr>
<td>No biomarker</td>
</tr>
<tr>
<td>Selection biomarker</td>
</tr>
</tbody>
</table>

\(-3\times\)\n
\(^{1}\text{Source: Nelson et. al., Nat. Genet. 2015}\)
\(^{2}\text{Source: Bio: Clinical Development Success Rates 2006-2015}\)
Productivity challenge is accelerating dramatically

Development costs vs. average peak sales

**Development Cost, $ m**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost, $ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1,188</td>
</tr>
<tr>
<td>2017</td>
<td>1,992</td>
</tr>
</tbody>
</table>

Cost per asset increased ~2/3rd since 2010

**Sales, $ m**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales, $ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>816</td>
</tr>
<tr>
<td>2017</td>
<td>465</td>
</tr>
</tbody>
</table>

Average peak sales almost halved since 2010

Source: Deloitte’s Centre for Health Solutions: A new future for R&D? Measuring the return from pharmaceutical innovation 2017
No more “exclusivity” to Pharma

Complete fragmentation of the value chain

Academia

- Target ID/Validation
- Hit-Identification
- Lead Optimisation
- Pre-clinical

Phase I

Phase II

Phase III

Approval

Market

Duration

Pre-clinical Phase

> 14 years

Clinical Phase

# of Players

Ca 5000 R&D

Ca. 1000 IND

Ca. 500 POC

Ca. 50 Market

Cost

Approx. $1–3 bn

Evotec's core competencies

IP = Intellectual Property
IND = Investigational New Drug
... just the beginning of a megatrend

Market dynamics in R&D outsourcing

Key growth drivers

1. Increasing comfort with high end “western” or “low cost” eastern outsourcing – Access to Capacity

2. Higher R&D capital efficiency through switch from fixed costs to variable business models – Capital Elasticity

3. Ability to adjust investments proportional to portfolio needs – Capital Intensity

Early R&D outsourcing is a macro trend
Market overview – Revenues, in $ bn

Source: Visiongain – Drug Discovery Outsourcing Market Forecast 2015-2025, Evotec’s estimates
R&D holds great potential for further outsourcing

R&D outsourcing & External Innovation

in € bn

Source: Visiongain – Drug Discovery Outsourcing Market Forecast 2015-2025 and Evotec’s estimates
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What is changing
Disease-relevant profiles to deliver better drugs

Patient-centric and holistic approach

Translational Models

Define relevance
- Medical records
- Patient iPS cell lines
- Patient tissue samples

Gain PanOmic insight
- Transcriptomic, proteomics, metabolomics, genomics data integration
- PanHunter data interpretation

Holistic Profiles

Superior Knowledge

Convert data into drugs
- Hypothesis building
- Defining health and disease
- Efficacy/Safety profiles building
Dramatically decreasing costs open new routes

DNA sequencing: from global challenge to commodity

Costs per genome – Faster than Moore’s Law

Source: National Human Genome Research Institute
Image Source: https://erenow.net/common/the-emperor-of-all-maladies/8.php
Where innovation gets lost in translation …

Lack of predictive pre-clinical models leads to high clinical failure rates

Current CNS drug discovery based on

- Animal models
- Recombinant cell lines
- Primary human cells

- Limited understanding of disease mechanisms
- Limited disease relevance of \textit{in vivo} models
- Limited stratification of patient populations

Animal models (\textit{in vitro} and \textit{in vivo})

Primary human cells

Limited disease relevance

Limited access / availability
“IPS cells can become a powerful tool to develop new drugs to cure intractable diseases because they can be made from patients’ somatic cells.”

Shinya Yamanaka, Nobel prize laureate

Disease-specific drugs

Screening

Patient

Disease in a dish

Patient-specific iPSCs

Disease-affected cell types, i.e. neurons, ...

IPS = Induced pluripotent stem cells

iPSC = Induced pluripotent stem cells
Game AND players are changing at rapid pace

Artificial Intelligence (AI) in drug discovery – Human AND Machine

2016 alphaGo
Lee Se-dol loses to alphaGo

AI driven drug-design is surpassing conventional endeavor
AI a new and important partner

Opportunities through cooperation with artificial intelligence

Error rates of breast cancer diagnoses (in %)

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<tbody>
<tr>
<td>Pathologist</td>
<td>3.5</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
<td>2.9</td>
</tr>
<tr>
<td>AI &amp; Pathologist</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Cooperation of man & machine

- 99.5% accuracy
- 30 times faster

Sources: D. Wang et al. (2016): Deep Learning for Identifying Metastatic Breast Cancer (pre-print); https://www.pwc.de/de/gesundheitswesen-und-pharma/wie-kuenstliche-intelligenz-das-gesundheitssystem-revolutioniert.html
Innovation ecosystem transforming into true network

New roles & rules for Biotechinnovation
Towards a “sharing economy“ in R&D

Just the beginning of a mega trend
# The new normal

Selected paradigm shifts in early R&D – Innovation efficiency

<table>
<thead>
<tr>
<th>Old Paradigm</th>
<th>New Paradigm</th>
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<tbody>
<tr>
<td>Defined therapeutic areas</td>
<td>Combinations and personalised medicine</td>
</tr>
<tr>
<td>Fix cost infrastructures and integrated value chain</td>
<td>Variable networks along disaggregated value chain</td>
</tr>
<tr>
<td>Biologics or small molecules or vaccines or … XYZ</td>
<td>Multimodality</td>
</tr>
<tr>
<td>Late validation via P&amp;L and inefficient Venture Capital “hand over games”</td>
<td>Partnership models that bring down cost of capital in R&amp;D</td>
</tr>
</tbody>
</table>
Selected trends for European biotech

Translating paradigm changes into innovation efficiency

1. Holistic ways of treating patients rather than diseases

2. Digital health and artificial intelligence to use patient data and customise treatment options

3. Increasing interest in efficient academic translation for efficient drug development and company formations
QUESTIONS AND ANSWERS
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