Pioneering development in novel antibiotics and immuno-oncology
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Investment Highlights

1. Polyphor: Innovative biopharmaceutical company with two late-stage clinical products entering final stage of development and with clear path to market

2. Pioneering the development of “OMPTA¹”, potentially the first new class of antibiotics against gram negative bacteria in ~50 years²

3. Murepavadin: First OMPTA, in Phase III development for nosocomial pneumonia from Pseudomonas aeruginosa infections, potentially addressing an overall market opportunity estimated in a US$2-3 billion range

4. Balixafortide: Upside in immuno-oncology, proof of concept demonstrated and potential rapid route to market agreed with the FDA in HER2-negative metastatic breast cancer³

5. Further upside potential from innovative pipeline—inhaled formulation of Murepavadin (pre-clinical for CF⁴, NCFB⁵), POL6014 (Phase Ib in CF⁴) and new OMPTAs

6. Experienced management team with strong support from leading investor base

Notes:
1. Outer Membrane Protein Targeting Antibiotic
2. University of Minnesota; Centre for Infectious Disease Research and Policy (August 2017)
3. In combination with eribulin
4. Cystic Fibrosis
5. Non Cystic Fibrosis Bronchiectasis
Polyphor Vision

Become a leading biopharma company focused on antibiotics and specialty diseases

**Evolution**

- **Focus on antibiotics / specialty pharma**
- From unique technologies to innovative drugs
- Innovation in drug discovery macrocycles
- Foundation

**Today**

**Rationale**

**Focus on antibiotics**

- Supportive regulatory, financing and pricing environment
- Potentially the only company with a new class / mechanism of action
- Potentially the only company with pathogen specific precision medicine
- Focused on high unmet medical need, value and price indications

**Upside in immuno-oncology**

- Novel CXCR4 antagonist for combination treatment
- Clinical proof of concept demonstrated and rapid regulatory path agreed with the FDA
Experienced management team supported by Board of Directors

**Management Team**

- **Giacomo Di Nepi**
  - CEO
  - Former Executive VP and General Manager of Europe at InterMune
  - Senior leadership positions at Takeda, Novartis and McKinsey&Co

- **Debra Barker**
  - Chief Medical & Development Officer
  - Formerly held positions at Novartis including program lead Oncology
  - Former Development Head of Infectious Diseases at Novartis

- **Daniel Obrecht**
  - Chief Scientific Officer
  - Co-founder of Polyphor
  - Former Head of Combinatorial Chemistry Group at Roche

- **Kalina Scott**
  - CFO
  - Former Managing Director Corporate Finance at Bank am Bellevue
  - Experience in investment banking and corporate finance

**Board of Directors**

- **Argeris (Jerry) N. Karabelas**, Chairman
  - Former Executive Committee member of Novartis
  - Multiple senior executive positions at SmithKline Beecham

- **Kuno Sommer**, Vice-Chairman
  - Former Head of Contract Research at Harlan Laboratories
  - Former CEO of Berna Biotech
  - Former EC member at Roche Flavours and Fragrance Div. (Givaudan)

- **Jean-Pierre Obrecht**
  - Co-founder and former CEO of Polyphor
  - Former Head of Logistics Chemicals at Roche Pharma

- **Bernard Bollag**
  - Former Group Treasurer at Syngenta
  - Founder and Managing Director at Beaufort Capital
  - Former CFO of HomeSun, Aktiva Group

- **Frank Weber**
  - Chief Medical Officer of Probiodrug and heads the market access of Santhera (both part time assignments)
  - Former Senior VP, EU Medical and Global medical Advisor at Intermune and Chief Medical Officer at Merck and Merck-Serono

- **Silvio Inderbitzin**
  - Previous CEO of Spirig Pharma until its trade sale in 2013
  - Active investor in small to mid-sized Swiss life sciences companies

- **Andreas Wallnöfer**
  - Various senior leadership positions
  - Head of Clinical Research & Exploratory Dev., Head of pRED at Roche
  - Partner in BioMedInvest III fund
Antimicrobial resistance: Driving a major healthcare crisis requiring the development of new antibiotics with novel mechanism of action, especially against gram-negative pathogens

### Rapidly growing healthcare crisis
- Over 10m deaths expected from antimicrobial resistance by 2050
- Significant loss of economic output and GDP\(^1\)
- 4 out of 6 priority ESKAPE\(^2\) pathogens are gram-negative

<table>
<thead>
<tr>
<th>AMR deaths today</th>
<th>AMR deaths in 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>700K</td>
<td>8.2 million</td>
</tr>
<tr>
<td>100–120K</td>
<td>1.5 million</td>
</tr>
<tr>
<td>1.4 million</td>
<td>130’000</td>
</tr>
<tr>
<td>1.2 million</td>
<td>60’000</td>
</tr>
</tbody>
</table>

### Increasing public concern, changing the landscape
- Increasing regulatory support to reduce time to market and costs
- Support of funding agencies
- Improving pricing

### Antibiotic stewardship changing the treatment paradigm
- Challenges inappropriate use of antibiotics and encourages precision medicine
  - Encourages appropriateness of antibiotic regimens
  - Implements interventions that target patients with specific infectious diseases
  - Implements interventions reducing the use of antibiotics associated with inducing resistance and or are associated with a high risk of *Clostridium difficile* complications

### Global deaths per year (2014)

<table>
<thead>
<tr>
<th>Cause</th>
<th>Deaths 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR</td>
<td>10 million</td>
</tr>
<tr>
<td>Cancer</td>
<td>8.2 million</td>
</tr>
<tr>
<td>Cholera</td>
<td>1.5 million</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.4 million</td>
</tr>
<tr>
<td>Diarrhoeal disease</td>
<td>130’000</td>
</tr>
<tr>
<td>Measles</td>
<td>1.2 million</td>
</tr>
<tr>
<td>Road traffic accidents</td>
<td></td>
</tr>
<tr>
<td>Tetanus</td>
<td></td>
</tr>
</tbody>
</table>

### Anti-infective prices in the US per recommended treatment cycle (US$’000)\(^3\)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Year of approval</th>
<th>Max(^4)</th>
<th>Average of Max and Min price(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibativ</td>
<td>2009</td>
<td>5.9</td>
<td>13.8</td>
</tr>
<tr>
<td>Dificid</td>
<td>2011</td>
<td>3.7</td>
<td>13.9</td>
</tr>
<tr>
<td>Zerbaxa</td>
<td>2014</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Avycaz</td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vabomere</td>
<td>2017</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Study by leading pharmaceutical pricing and strategy consultancy firm commissioned by the Company (2018), The Review on Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations (2014), WHO and NCBI

Notes:
1. Studies by RAND Europe and KPMG estimate that 300 million people are expected to die prematurely because of drug resistance over the next 35 years and the world’s GDP will be 2 to 3.5% lower than it otherwise would be in 2050.
2. ESKAPE pathogens: *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter spp.*
3. *Clostridium difficile* complications
Polyphor: Pioneering the development of "OMPTA", potentially the first new class of antibiotics to be introduced against gram negative bacteria in ~50 years

New Mechanism of Action—targets specifically outer-membrane proteins of gram-negative pathogens.

Antibiotics class active against gram-negative pathogens by year of discovery

<table>
<thead>
<tr>
<th>Year</th>
<th>Key:</th>
<th>Commonly act as bacteriostatic agents, restricting growth and reproduction</th>
<th>Commonly act as bactericidal agents, causing bacterial cell death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td><strong>β-Lactams</strong>&lt;br&gt;Most widely used antibiotics in the NHS&lt;br&gt;Examples: Penicillins (shown), such as amoxicillin and flucloxacillin; Cephalosporins such as cefalexin&lt;br&gt;Mode of action: Inhibit bacteria cell wall biosynthesis</td>
<td>&lt;br&gt;&lt;br&gt;1940</td>
<td>&lt;br&gt;&lt;br&gt;1950</td>
</tr>
<tr>
<td></td>
<td><strong>Aminoglycosides</strong>&lt;br&gt;Family of over 20 antibiotics&lt;br&gt;Examples: Streptomycin (shown), neomycin, kanamycin, paromomycin&lt;br&gt;Mode of action: Inhibit the synthesis of proteins by bacteria, leading to cell death</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>OMPTA</strong>&lt;br&gt;Targets critical gram negative pathogens</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Tetracyclines</strong>&lt;br&gt;Most widely used antibiotics in the NHS&lt;br&gt;Examples: Tetracycline (shown), doxycycline, lymecycline, oxytetracycline&lt;br&gt;Mode of action: Inhibit synthesis of proteins by bacteria, preventing growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Macrolides</strong>&lt;br&gt;Second most prescribed antibiotics in the NHS&lt;br&gt;Examples: Erythromycin (shown), clarithromycin, azithromycin&lt;br&gt;Mode of action: Inhibit protein synthesis by bacteria, occasionally leading to cell death</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Quinolones</strong>&lt;br&gt;Resistance evolves rapidly&lt;br&gt;Examples: Ciprofloxacin (shown), levofloxacin, trovafloxacin&lt;br&gt;Mode of action: Interfere with bacteria DNA replication and transcription</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compund Interest (2014)
Murepavadin addresses a significant unmet need

*Pseudomonas aeruginosa* is one of the most dangerous pathogens

**World Health Organization**

Critical priority 1 pathogen by WHO¹

Responsibls for 10% of all hospital acquired infections²

The 2nd leading cause of Nosocomial pneumonia with mortality rates of 30 – 40%³

**HABP / VABP due to P.a.⁴**

Estimated cases per year in 2017 ('000)

<table>
<thead>
<tr>
<th>Region</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>76 – 82</td>
</tr>
<tr>
<td>EU-15</td>
<td>214 – 228</td>
</tr>
<tr>
<td>Total</td>
<td>290 – 310</td>
</tr>
</tbody>
</table>

Notes:

1. WHO publishes a list of bacteria for which new antibiotics are urgently needed (February 2017)
4. Estimates as per leading management consulting firm commissioned by the company and calculated using US Census Bureau International Database and OECD; Includes confirmed and unconfirmed cases of nosocomial Pneumonia due to *Pseudomonas* infections; Patient split based on 26.3% and 73.7% in US and EU15 respectively (refer to slide 17)
5. EU-15 consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and the UK
Murepavadin: First OMPTA already in late-stage development for *Pseudomonas aeruginosa* infections

- New MoA / New class (OMPTA)\(^1\)
- Pathogen specific
- Bactericidal
- Highly potent including MDR\(^2\) / XDR\(^3\)
- High lung penetration
- Low resistance potential
- QIDP\(^4\) (add. 5 year exclusivity) and fast track status
- Targeted at nosocomial pneumonia

Notes:
1. Outer Membrane Protein Targeting Antibiotic
2. Multidrug-Resistant
3. Extensively Drug-Resistant
4. Qualified Infectious Disease Product and fast track designation granted for treatment of VABP due to *Pseudomonas aeruginosa*; 5 years of additional exclusivity
Murepavadin: Very promising Phase II study results (in MDR/XDR population)

Positive risk–benefit profile

Phase II Study – VABP
Murepavadin + Standard of Care (SoC) in MDR centers

Clinical cure assessment at TOC¹

<table>
<thead>
<tr>
<th></th>
<th>Cure</th>
<th>Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

Patient alive on Day 28 (ACM²)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

- Clinical cure assessment: 83.3% cured, 16.7% failed
- Patient alive on Day 28: 91.7% alive, 8.3% dead

Other findings

- Median SOFA³ score: 4.5 → 3.0
- Median CPIS⁴ score: 10.0 → 5.0
- Median PaO2/FiO2⁵: 3 days
- No resistance observed
- Well tolerated in the study⁶

Source: Company information

Notes:
1 Test Of Cure
2 All-Cause Mortality
3 Sepsis-related organ failure assessment
4 Clinical Pulmonary Infection
5 Partial pressure arterial Oxygen and Fraction of inspired Oxygen
6 Possible treatment related serious adverse events included one case of acute renal failure which resolved without sequelae following discontinuation of Murepavadin
Murepavadin: Streamlined development pathway agreed with regulators

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMA¹ Study</td>
<td></td>
<td></td>
<td>Filing</td>
<td>Approval</td>
<td></td>
</tr>
<tr>
<td>FDA² Study</td>
<td></td>
<td></td>
<td>Interim analysis</td>
<td>Filing</td>
<td>Approval</td>
</tr>
<tr>
<td>Other/ preclinical</td>
<td></td>
<td></td>
<td>Potential for accelerated approval on interim analysis(^9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhaled Formulation</td>
<td>Pre-clinical / Formulation</td>
<td>Clinical development</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Target timeline**
- 120 Patients
- MDR\(^3\), with SoC\(^4\)
- TOC\(^5\) endpoint
- 210 Patients\(^1\)
- UDR\(^6\) monotherapy
- 28 day ACM\(^7\) endpoint
- In parallel
- New formulation
- Cystic fibrosis / NCFB\(^8\)

**Note:**
1. European Medicines Agency
2. Food and Drug Administration
3. Multi-Drug Resistant
4. Standard of Care
5. Test of Cure
6. Usual Drug Resistance
7. All-Cause Mortality
8. Non-Cystic Fibrosis bronchiectasis; FDA considering conditional approval on compelling data similar to Oncology compound
9. Assuming positive outcome for interim results, filing and approval can be accelerated
10. Micro ITT population
**Unique profile vs. other antibiotics / companies**

*Murepavadin compares favourably against its peers*

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### Antibiotics - Recent Launches / Late Stage Pipeline

<table>
<thead>
<tr>
<th>Product</th>
<th>Murepavadin</th>
<th>AvyCaz</th>
<th>Ceftazolane-tazobactam <em>(Zerbaxa)</em></th>
<th>Meropenem-Vaborbactam <em>(Vabomere)</em></th>
<th>Cilastin-imipenem-relebactam</th>
<th>Cefiderocol</th>
<th>Ceftobiprole¹ <em>(Zevtera)</em></th>
<th>Eravacycline</th>
<th>Plazomicin</th>
<th>Lefamulin</th>
</tr>
</thead>
</table>

#### Class / MoA

- New—OMPTAs

#### Spectrum

- Targeted

#### Indications²

- HABP / VABP
  - cUTI
  - cIAI
  - HABP / VABP
  - HABP / VABP

- Other infections
  - HABP / VABP
  - cUTI
  - cIAI
  - CRE
  - AP
  - HABP / VABP
  - CABP

---

**Source:** Other company information, Other company websites

**Notes:**

1. Approved in EU; Only for HABP (excluding VABP)
2. CABP = Community Acquired Bacterial Infection, cIAI = complicated Intra-Abdominal infection, cUTI = complicated Urinary Tract Infection, CRE= Carbapenem-Resistant *Enterobacteriaceae*, AP = Acute Pyelonephritis

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- New class — OMPTAs
- Targeted spectrum (Murepavadin)
- HABP / VABP — 40% mortality

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**Approved**

**Filed**

---

12
Murepavadin: Unique market opportunity

Potential for high price and rapid uptake

**Distinctive features**

- First member of a new class
- Targeted therapy
- Focus on HABP/VABP (high mortality)

**Premium Pricing**

*Potential for premium pricing:*

- Novel agent with new mechanism of action
- Low possibility of misuse
- First indication with high unmet need
- ICU setting – highest doses and prices

**Rapid market uptake**

*No incentive to spare:*

- New class with low resistance potential
- No impact on other pathogens and microbiome
- Narrow spectrum, consistency with guidelines
- High mortality / life threatening indication with strong urge to treat
### Strong response in a blinded survey of healthcare practitioners

Assessment of product X statements / weighted mean scores per total sample (n=76)\(^1\) (based on “top to bottom” scores)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Mean scores (Scale from 1 to 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique new class of antibiotics</td>
<td></td>
</tr>
<tr>
<td>Novel mechanism of action</td>
<td></td>
</tr>
<tr>
<td>New hope to address multi drug resistance</td>
<td></td>
</tr>
<tr>
<td>Allows de-escalation of broad-spectrum antibiotics</td>
<td></td>
</tr>
<tr>
<td>Limits the use of current last resort treatment</td>
<td></td>
</tr>
<tr>
<td>Makes most sense in combination with rapid diagnostic testing</td>
<td></td>
</tr>
<tr>
<td>Low propensity to induce MDR in comparison to broad-spectrum antibiotics</td>
<td></td>
</tr>
<tr>
<td>Allow to reduce the use of beta-lactam agents</td>
<td></td>
</tr>
<tr>
<td>Low ability for complications due to the colonization of Clostridium difficile (CDAD)</td>
<td></td>
</tr>
<tr>
<td>Safety profile allows use both in induction-and precision treatment</td>
<td></td>
</tr>
<tr>
<td>The logical add-on as soon as <em>Pseudomonas aeruginosa</em> is confirmed or suspected</td>
<td></td>
</tr>
<tr>
<td>Only to be used in patient with limited options</td>
<td></td>
</tr>
<tr>
<td>Only to be used as last resort treatment</td>
<td></td>
</tr>
</tbody>
</table>

Could you please assess the following statements on Product X on a scale from 1–7, where 1= I do not agree at all to 7=I fully agree?

Source: GFK Research commissioned by the Company (2017)

Note:

1 76 Intensive care unit specialist+Infectious disease specialist+Nurses+Pharmacists (US, Germany, Italy)
Murepavadin: Overall potential estimated total market size of US$2–3bn

No. of cases of Nosocomial Pneumonia due to *Pseudomonas* infections ('000)

HABP + VABP patient population in US + EU15

<table>
<thead>
<tr>
<th>Unconfirmed infection</th>
<th>Microbial confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>+~20k HCAP¹</td>
<td>290–310k</td>
</tr>
<tr>
<td>90–100k</td>
<td>200–210k</td>
</tr>
<tr>
<td>2017³ ~68%²</td>
<td>2028* ~80%</td>
</tr>
</tbody>
</table>

Key drivers of increase in microbial confirmation⁵
- Guidelines’ implementation
- Increased acceptance of antibiotic stewardship
- Rapid diagnostic tests diffusion
- Availability of pathogen–specific drugs

Peak market potential of HABP/ VABP + MDR HCAP¹ cases due to confirmed *Pseudomonas aeruginosa* — Year 2028

US + EU 15 combined: US$2-3bn

Notes:
1. HCAP = Healthcare Associated Pneumonia and only includes MDR patients; As per study by leading management consulting firm commissioned by the Company (2018) citing Kollef (2005) and Venditti (2009);
2. Estimated number of HCAP MDR patients in 2028 represent 25k, indicating US + EU5 for 2022 applied to 2028; 2017 estimates based on 2022 figures of the study
4. Estimates as per leading management consulting firm commissioned by the Company (2018) citing US Census bureau and OECD hospital discharge rates;
5. Estimates as per leading management consulting firm commissioned by the Company (2018) using increased microbial confirmation (management assumption), OECD hospital discharge rates and population data (US Census Bureau and OECD); Patient population CAGR calculated at 0.3% for EU15 (2001 – 2015) and 0.8% for US (1995 – 2010) through 2028;
6. Based on management view

² Range based on + / – 5% of estimates from the study by leading management consulting firm commissioned by the Company (2018)
Murepavadin: Potential for strong patient share of MDR patients plus use in centers with strong antibiotic stewardship and selective empiric treatment in high risk patients / centers

HABP + VABP patient population in US + EU15 (2028)

<table>
<thead>
<tr>
<th>Microbial confirmed Dx</th>
<th>Gram-Positive 415 - 505k</th>
<th>Gram-Negative 585–645k</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0–1.15m</td>
<td>~44%</td>
<td>~56%</td>
</tr>
<tr>
<td>~80%² (Management estimate)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Culture results</th>
<th>Other 340–375k</th>
<th>UDR 185–200k</th>
<th>PA** 245–295k</th>
<th>MDR** 60–90k</th>
</tr>
</thead>
<tbody>
<tr>
<td>585–645k</td>
<td>~58%</td>
<td>~75%</td>
<td>~42%⁵</td>
<td>~25%⁶</td>
</tr>
</tbody>
</table>

*Range based on + / – 5% of estimates from the study by leading management consulting firm commissioned by the Company (2018)

** Higher level in the range includes HCAP MDR patients (25K) for US and EU5 for 2022 applied to 2028. Hence is higher than the indicated proportion / tree sum

Notes:
1. Estimates as per leading management consulting firm commissioned by the company (2018) and calculated using US Census Bureau International Database and OECD; Incident patient population growth is assumed to be in line with hospital admissions representing 0.3% for EU15 (2001 – 2015) and 0.8% for US (1995 – 2010) through 2028 (patient numbers calculated using OECD hospital discharge rates)
2. Management estimate based on increased implementation of antibiotic stewardship programs, emergence of rapid diagnostic tests (including FISH technology vs current reliance on slow microbiological culturing) and availability of pathogen specific drugs such as Murepavadin
4. Based on Gram-negative VAP/HAP patients with duration of onset of >5 days(%) as per Study by leading management consulting firm commissioned by the Company (2018) citing Esperatti (2010), Celis (1998) and Pasquale (2013) (Europe averages also applied to US)
6. Based on MDR P. aeruginosa infections as per Study by leading management consulting firm commissioned by the Company (2018) citing Tumbarello et al. (2013), ECDC (2016), Micek et al. (2015) and NIHNS report (2014)
IMMUNO-ONCOLOGY
Balixafortide highlights

High potential immuno-oncology asset with potential rapid path to market

- Most advanced CXCR4 antagonist\(^1\)
  - Potent and selective CXCR4 antagonist
  - Disruption of CXCR4 and SDF-1 axis renders cancer cells more susceptible to chemotherapy and increases immune cell infiltration into the tumour
  - Potential to enhance the activity of a range of chemo and immunotherapies
  - Optimised to enable higher dosing

- Clinical proof of concept demonstrated Phase Ib / PoC\(^2\) study in combination with Eribulin
  - High tumor response rates in late stage and heavily pretreated metastatic breast cancer patients
  - Response rate compares favourably against published data of eribulin alone\(^3\)

- Development pathway defined
  - Single pivotal trial agreed with both FDA and EMA
  - Base design: eribulin +/- balixafortide in patients with advanced metastatic breast cancer
  - Fast Track designation received from FDA

- Targeted upcoming milestones
  - Protocol finalization
  - End of Phase II meeting with FDA (~year end)
  - Start pivotal study (Q1 2019); first patient in (Q2 2019)

Note:
1. In clinical development for solid tumours
2. PoC = Proof of Concept
3. Reflects an indirect comparison
Pharma pipeline: Balixafortide

Proof of Concept demonstrated

Balixafortide (Ph Ib / PoC) Proof of Concept\(^1\)—Improving treatment of advanced mBC\(^2\)
(Open label, n=24)

Overall Response Rate

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eribulin(^3)</td>
<td>13</td>
</tr>
<tr>
<td>Balixafortide + Eribulin(^4)</td>
<td>38</td>
</tr>
</tbody>
</table>

Clinical Benefit Rate

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eribulin(^3)</td>
<td>28</td>
</tr>
<tr>
<td>Balixafortide + Eribulin(^4)</td>
<td>63</td>
</tr>
</tbody>
</table>

Progression Free Survival

<table>
<thead>
<tr>
<th></th>
<th>Median, months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eribulin(^3)</td>
<td>3.6</td>
</tr>
<tr>
<td>Balixafortide + Eribulin(^4)</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Notes:
1. Reflects an indirect comparison
2. Metastatic Breast Cancer
3. “Embrace” Registration Trial for Eribulin
4. Polyphor trial – results from dose expansion cohort
5. Eribulin alone was 53% in EMBRACE pivotal trial and 64% in Capecitabine trial; Twelves et al., 2014; Cortes et al., 2011

1 year overall survival is 75%\(^5\)
Balixafortide: Strong development path with accelerated approval potential

*Development, regulatory and partnering strategy*

**Possible regulatory path for Balixafortide in mBC**

- Focused registration study to secure rapid initial registration agreed with FDA:
  - Randomised study comparing balixafortide + eribulin to eribulin alone in HER2-negative mBCa with PFS as primary endpoint (320 Patients)
  - Potential for accelerated approval based on interim analysis of ORR
  - CXCR4 expression to be assessed as an exploratory biomarker

- Potential exploratory studies as basis for further indications:
  - With other classes of drugs approved for HER2-negative breast cancer, including capecitabine (Xeloda), palbociclib (Ibrance) or paclitaxel (Abraxane)
  - In additional tumour types depending subject to pre-clinical data (e.g. colo-rectal and pancreatic cancer in combination with check-point inhibitors)
  - May be initiated in parallel to US pivotal trial

**Base Case Scenario – US approval**

Source: Company information

1 Fast track status granted
2 Conditional approval based on accelerated approval, timelines based on current estimates for recruitment
3 Being reviewed to take into account EMA advice
Balixafortide: Market opportunity

Large addressable market in mBCa with upside from other indications

Select breast cancer products

<table>
<thead>
<tr>
<th>Product</th>
<th>Company</th>
<th>Current status</th>
<th>MoA</th>
<th>Peak sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynparza</td>
<td>AstraZeneca / Merck</td>
<td>Approved (Jan-2018)</td>
<td>PARP inhibitor</td>
<td>US$0.7bn (2023)</td>
</tr>
<tr>
<td>Ibrance</td>
<td>Pfizer</td>
<td>Approved (Mar-2017)</td>
<td>CDK 4 &amp; 6 inhibitor</td>
<td>US$2.9bn (2023)</td>
</tr>
<tr>
<td>Abemaciclib</td>
<td>Eli Lilly</td>
<td>Approved (Sep-2017)</td>
<td>CDK 4 &amp; 6 inhibitor</td>
<td>US$0.5bn (2025)</td>
</tr>
<tr>
<td>Afinitor</td>
<td>Novartis</td>
<td>Approved (Jul-2012)</td>
<td>mTOR inhibitor</td>
<td>US$0.7bn (2015)</td>
</tr>
<tr>
<td>Ribociclib</td>
<td>Novartis</td>
<td>Approved (Mar-2017)</td>
<td>CDK 4 &amp; 6 inhibitor</td>
<td>US$1.5bn (2025)</td>
</tr>
</tbody>
</table>

Four main molecular subtypes and their distribution (US)

- Luminal A (HR+/HER2-): 71%
- Triple negative (HR-/HER2-): 12%
- Luminal B (HR+/HER2+): 12%
- HER2-enriched (HR-/HER2+): 5%

Notes:
1. American Cancer Association, Breast Cancer Facts & Figures 2017-2018
2. GlobalData Her2-negative and TNBC Global drug forecast and market analysis to 2025
### OTHER ASSETS

**Further upside from innovative pipeline**

*Murepavadin (inhaled formulation), OMPTAs and POL6014 provide further upside*

<table>
<thead>
<tr>
<th>Product / main indications</th>
<th>Development</th>
<th>Key trial results</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Murepavadin POL7080 (inhaled) | Pre-clinical | ▪ Highly potent at low doses | ▪ Orphan indication  
▪ Chronic usage |
| CF / NCFB⁵ |  |  |  |

| OMPTA¹ | Pre-clinical | ▪ Highly effective vs MDR / XDR³ ESKAPE pathogens  
▪ In vitro and in vivo profile shows good safety | ▪ Hospital infections  
▪ Further compounds  
▪ Novo REPAIR Impact Fund financing of up to CHF11.5m  
  - Tranche 1 CHF6.8m at IPO price  
  - Tranche 2: CHF4.7m upon milestone |
| Gram-negative ESKAPE² pathogens |  |  |  |

| POL6014⁴ | Phase Ib (out-licensed to Santhera; 3M grant from CFF) | ▪ Full inhibition of elastase, even at lower dose  
▪ Well-tolerated | ▪ Orphan drug status  
▪ Additional potential indications, including NCFB, PCD, AATD⁵  
▪ CHF6.5M Upfront + 121M in Milestones and up to double digit royalties |
| Cystic Fibrosis (CF) |  |  |  |

Source: Company information

Notes:

1. OMPTA = Outer Membrane Protein Targeting Antibiotic
2. *Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter spp.*
3. MDR = Multi Drug-Resistant; XDR = Extensively Drug-Resistant
4. Out-licensed to Santhera as of 15 Feb-18
5. CF = Cystic Fibrosis; NCFB = Non-Cystic Fibrosis Bronchiectasis; PCD = Primary Ciliary Dyskinesia; AATD = Alpha-1 Antitrypsin Deficiency
Further significant potential from the Murepavadin inhaled formulation

*Pseudomonas aeruginosa* colonization

- **CF**¹ patients
  - ~65%
- **NCFB**² patients
  - ~33%

**Patient Population**

w/ *Pa* ('000), 2017

- **VABP / HABP**⁵
  - 200-230
- **CF**¹
  - ~45
- **NCFB**²
  - ~80

**Potential Tx Days / Yr** ⁴

- **HAP/VAP**
  - 2'580
- **CF**
  - 5'460
- **NCFB**
  - 9'600

Notes:

3. FDA.gov, Montserrat Vendrell - The Open Respiratory Medicine Journal. 2015; 9: 30–36, Emma Vázquez-Espinosa - Therapeutics and Clinical Risk Management - Journals. 2015; 11: 407–415, 120 days / year assuming a similar regimen as inhaled tobramycin; Recommended doses as per pack insert of repeated cycles of 28 days followed by 28 off days
4. Calculated by taking product of potential treatment days / year and the average number of patients (HAP/VAP: 270*12, CF: 35*120, NCFB: 80*120)
5. Estimates as per leading management consulting firm commissioned by the company (2018) and calculated using US Census Bureau International Database and OECD; Includes confirmed cases of nosocomial Pneumonia due to *Pseudomonas* infections only; upper end of range includes 20k HCAP patients
New OMPTAs – multiple candidates’ generation potential

Targeting the most resistant gram-negative ESKAPE\(^1\) pathogens

Gram-negative infections with limited treatment options

MICs (\(\mu\)g/ml) against resistant isolates

<table>
<thead>
<tr>
<th>Acinetobacter baumannii</th>
<th>Enterobacter cloacae</th>
<th>Escherichia coli</th>
<th>Klebsiella pneumoniae</th>
<th>Pseudomonas aeruginosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1061150</td>
<td>906396</td>
<td>872842</td>
<td>924711</td>
<td>A441</td>
</tr>
<tr>
<td>OMPTA</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>OMPTA 1</td>
<td>0.06</td>
<td>0.125</td>
<td>0.06</td>
<td>0.03</td>
</tr>
</tbody>
</table>

| Colistin | 0.25 | >64 | >8 | 8 | 8 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 |

| Gentamicin | >64 | >64 | >8 | 64 | 1 | 0.25 | 8 | 0.25 | 64 | >64 | 1 | >8 | 64 | 1 | 1 | 2 | >64 | >64 | 2 | 64 | >64 | >64 | >64 | >64 | >64 | >64 |

| Tobramycin | >64 | 4 | 0.25 | 0.25 | 0.25 | 0.25 | 16 | 0.25 | 4 | >64 | 32 | >8 | 32 | 32 | 32 | 16 | >64 | 32 | 16 | 8 | >64 | >64 | 32 | >64 | 32 |

| Ciprofloxacin | >64 | 32 | >8 | >64 | >64 | ≤0.06 | 0.125 | ≤0.06 | 0.5 | 32 | 16 | >8 | 32 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 |

| Ceftazidime | >64 | >64 | >8 | 32 | 16 | 32 | >64 | 64 | 0.5 | >64 | >8 | 64 | 0.25 | 64 | >64 | 32 | >64 | >64 | >64 | >64 | >64 | >64 | 0.25 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 |

| Ceftriaxone | >64 | >64 | >8 | >64 | 32 | 32 | >64 | 64 | 0.5 | >64 | >8 | >64 | 0.25 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 | >64 |

| Meropenem | 16 | 32 | >8 | 16 | 8 | ≤0.06 | ≤0.06 | 0.125 | ≤0.06 | 0.125 | ≤0.06 | 0.03 | ≤0.06 | ≤0.06 | ≤0.06 | 64 | 8 | ≤0.06 | >64 | ≤0.06 | 4 | >64 | 8 | >64 | >64 | >64 | >64 | >64 | >64 |

Notes:
1 ESKAPE pathogens: Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa and Enterobacter spp.
Polyphor strategic focus

- **Murepavadin + OMPTA**
  - Phase III development
  - Further develop inhaled formulation
  - Develop OMPTA platform to clinic
  - Potential for own-commercialisation

- **Balixafortide**
  - Leverage rapid development path agreed with Regulatory Authorities
  - Co-develop/ Co-commercialize

- **POL6014**
  - Out-licensed to Santhera
## Strategic roadmap

**Clearly defined development plan and value inflection points**

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murepavadin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Inhaled formulation</td>
<td>Preparation</td>
<td>Pivotal Program</td>
<td>Clinical development – CF³ / NCFB⁴</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OMPTA</td>
<td>Pre-clinical</td>
<td>Phase I</td>
<td>Ph II</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select pre-clinical candidate</td>
<td>IND⁶</td>
<td>PoC⁷</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balixafortide</td>
<td>Fast Track ⁸</td>
<td>US pivotal trial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Eribulin combo</td>
<td>Ph. Ib</td>
<td>EOP1 FDA</td>
<td>FDA Filing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Other combo</td>
<td>Preclin studies</td>
<td>Other combination studies in parallel</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1. European Medicines Agency
2. Food and Drug Administration
3. Cystic Fibrosis
4. Non-Cystic Fibrosis bronchiectasis
5. Assuming positive outcome for interim results, filing and approval can be accelerated
6. IND = Investigational New Drug (also called CTA in Europe)
7. PoC = Proof of Concept
8. Fast track status granted
9. Conditional approval based on accelerated approval, timelines based on current estimates for recruitment
10. Being reviewed to take into account EMA advice
Polyphor: Innovative biopharmaceutical company with two late-stage clinical products entering final stage of development and with clear path to market

Pioneering the development of “OMPTA¹”, potentially the first new class of antibiotics against gram negative bacteria in ~50 years²

Murepavadin: First OMPTA, in Phase III development for nosocomial pneumonia from Pseudomonas aeruginosa infections, potentially addressing an overall market opportunity estimated in a US$2-3 billion range

Balixafortide: Upside in immuno-oncology, proof of concept demonstrated and potential rapid route to market agreed with the FDA in HER2-negative metastatic breast cancer³

Further upside potential from innovative pipeline—inhaled formulation of Murepavadin (pre-clinical for CF⁴, NCFB⁵), POL6014 (Phase Ib in CF⁴) and new OMPTAs

Experienced management team with strong support from leading Swiss investor base

Notes:
1 Outer Membrane Protein Targeting Antibiotic
2 University of Minnesota; Centre for Infectious Disease Research and Policy (August 2017)
3 In combination with eribulin
4 Cystic Fibrosis
5 Non Cystic Fibrosis Bronchiectasis
Thank you