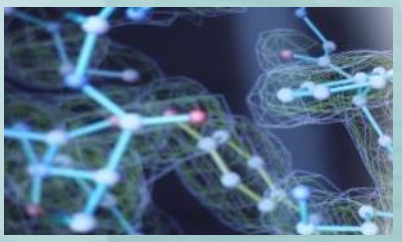

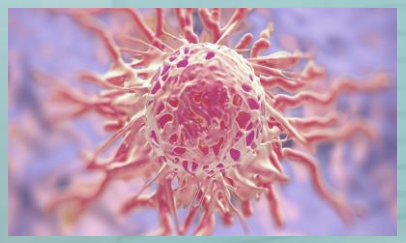

POLYPHOR

Pioneering development in novel antibiotics and immuno-oncology

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Investment Highlights

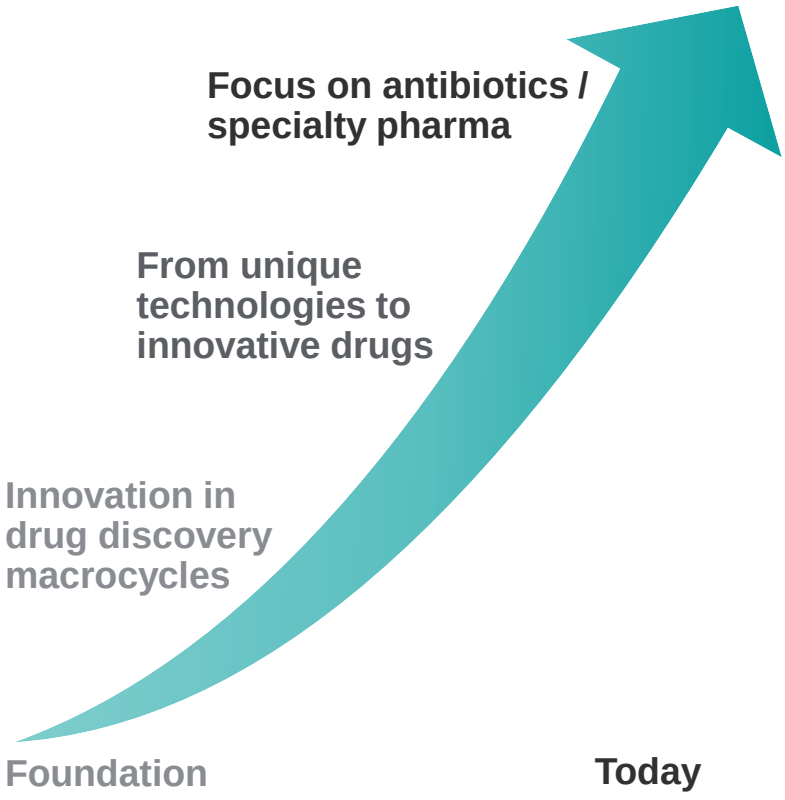
1. Polyphor: Innovative biopharmaceutical company with two late-stage clinical products entering final stage of development and with clear path to market
2. Pioneering the development of “OMPTA[1]”, potentially the first new class of antibiotics against gram negative bacteria in ~50 years[2]
3. Murepavadin: 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 cancer[3]
5. Further upside potential from innovative pipeline—inhaled formulation of Murepavadin (pre-clinical for CF[4], NCFB[5]), POL6014 (Phase Ib in CF[4]) 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



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

MUREPAVADIN

Antimicrobial resistance: Driving a major healthcare crisis requiring the development of new antibiotics with novel mechanism of action, especially against gram-negative pathogens

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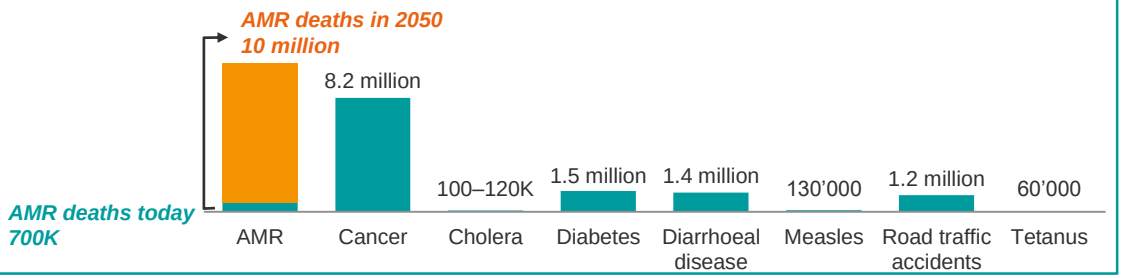
Rapidly growing healthcare crisis

- 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

Global deaths per year (2014)



Increasing public concern, changing the landscape

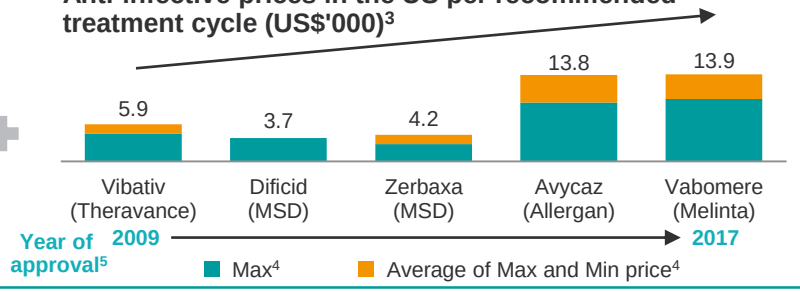
- Increasing regulatory support to reduce time to market and costs
- Support of funding agencies
- Improving pricing

FDA

"Combating antibiotic resistance – A Public Health issue – New Guidance to Industry"

BARDA

Anti-infective prices in the US per recommended treatment cycle (US$'000)[3]



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

Broad Spectrum → **Precision Antibiotics**

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. Enterococcus faecium, Staphylococcus aureus* are gram positive

3 Shows Wholesale Acquisition Cost (WAC) - the manufacturer's catalog or list price for a drug product to wholesalers; Price does not include any rebates / discounts

4 Max price indicates product of WAC and longest indicated treatment regimen as per the product label; Min and max prices indicate the cost of the drug for the minimum and maximum treatment course duration as mentioned on the labels of each drug

5 Year of approval: Vibativ (2009), Dificid (2011), Zerbaxa (2014), AvyCaz (2015) and Vabomere (2017)

Polyphor: Pioneering the development of "OMPTA", potentially the first new class of antibiotics to be introduced against gram negative bacteria in ~50 years

POLYPHOR

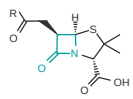
New Mechanism of Action—
targets specifically outer-membrane proteins of gram-negative pathogens.

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

Key: Commonly act as bacteriostatic agents, restricting growth and reproduction Commonly act as bactericidal agents, causing bacterial cell death

β-Lactams

Most widely used antibiotics in the NHS



All contain a beta-lactam ring

Examples

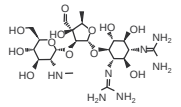
Penicillins (shown) such as amoxicillin and flucloxacillin; *Cephalosporins* such as cefalexin

Mode of action

Inhibit bacteria cell wall biosynthesis

Aminoglycosides

Family of over 20 antibiotics



All contain aminosugar substructures

Examples

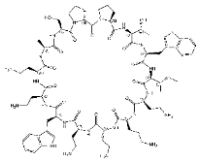
Streptomycin (shown), neomycin, kanamycin, paromomycin

Mode of action

Inhibit the synthesis of proteins by bacteria, leading to cell death

OMPTA

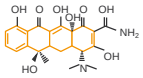
Targets critical gram negative pathogens



Discovery 1930 1940 1950 1960 1970 1980 2010

Tetracyclines

Becoming less popular due to development of resistance



All contain 4 adjacent cyclic hydrocarbon rings

Examples

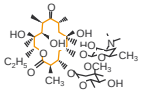
Tetracycline (shown), doxycycline, limecycline, oxytetracycline

Mode of action

Inhibit synthesis of proteins by bacteria, preventing growth

Macrolides

Second most prescribed antibiotics in the NHS



All contain a 14-, 15-, or 16-membered macrolide ring

Examples

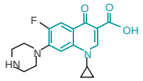
Erythromycin (shown), clarithromycin, azithromycin.

Mode of action

Inhibit protein synthesis by bacteria, occasionally leading to cell death

Quinolones

Resistance evolves rapidly



All contain fused aromatic rings with a carboxylic acid group attached

Examples

Ciprofloxacin (shown), levofloxacin, trovafloxacin

Mode of action

Interfere with bacteria DNA replication and transcription

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 WHO[1]

Responsible for 10% of all hospital acquired infections[2]

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)

USA:	76 – 82
EU-15[5]:	214 – 228
Total:	290 – 310

Notes:

1 WHO publishes a list of bacteria for which new antibiotics are urgently needed (February 2017)

2 Antimicrobial Agents and Chemotherapy; Multidrug-Resistant *Pseudomonas aeruginosa*: Risk Factors and Clinical Impact (2006) Valerie Aloush, Shiri Navon-Venezia, Yardena Seigman-Igra et al.

3 As per research published in Chest. 2006;129;1210-1218 Kollef (2006), Critical Care (2015) 19:219 Micek (2015), Intensive Care Med (2013) 39:682–692 Tumbarello (2013), American Journal of Respiratory and Critical Care Medicine. 2013;188(1);69-76. Planquette (2013) and Crit Care Med 2007 Vol. 35, No. 8: 1888-1895 Garnacho-Montero (2007)

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

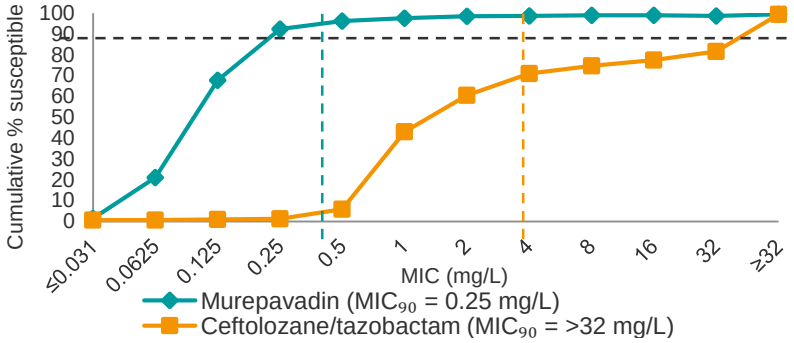
Murepavadin: First OMPTA already in late-stage development for *Pseudomonas aeruginosa* infections

POLYPHOR

- 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

Highly potent and superior coverage

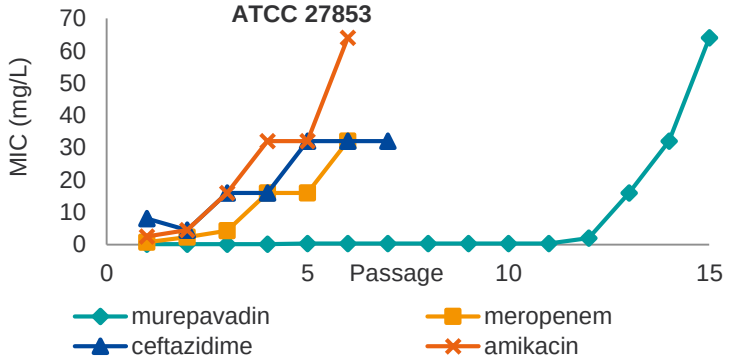
Cumulative susceptibility on 785 XDR isolates



EUCAST breakpoints	▪ Murepavadin target MIC = 0.5mg / L ▪ Ceftolozane / tazobactam > 4mg / L

2-3x slower development of resistance

Resistance development: serial passage



EUCAST breakpoints	▪ meropenem >8 mg/L ▪ ceftazidime >8 mg/L ▪ amikacin > 16 mg/L

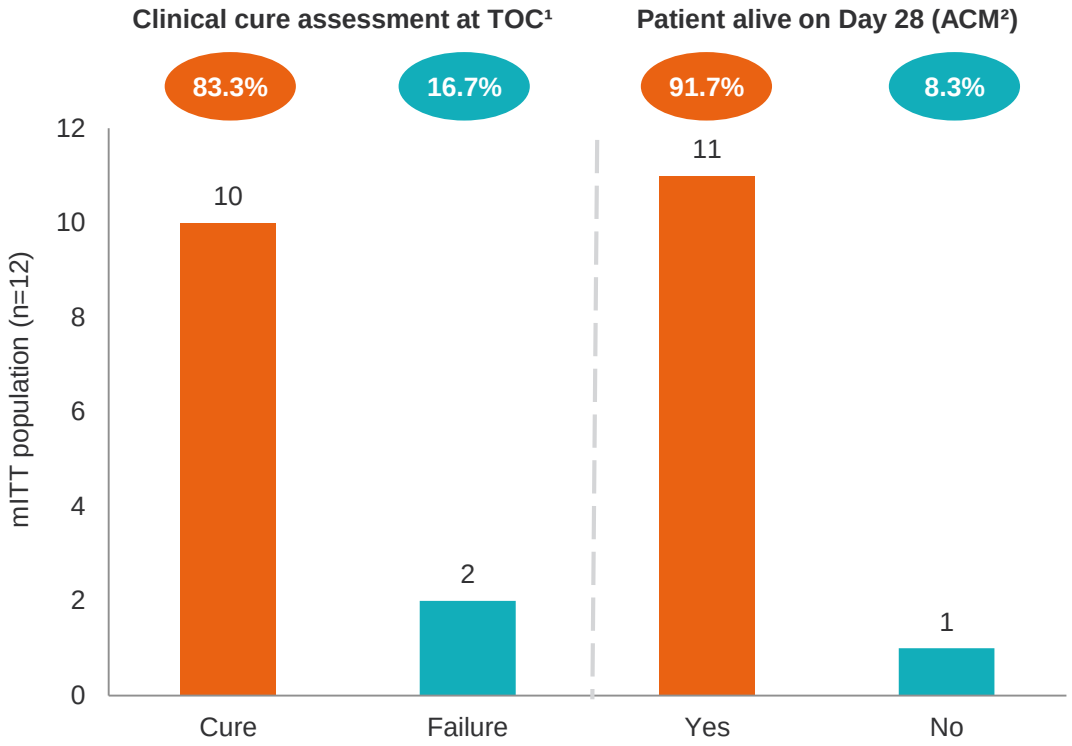
Notes:

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



Other findings

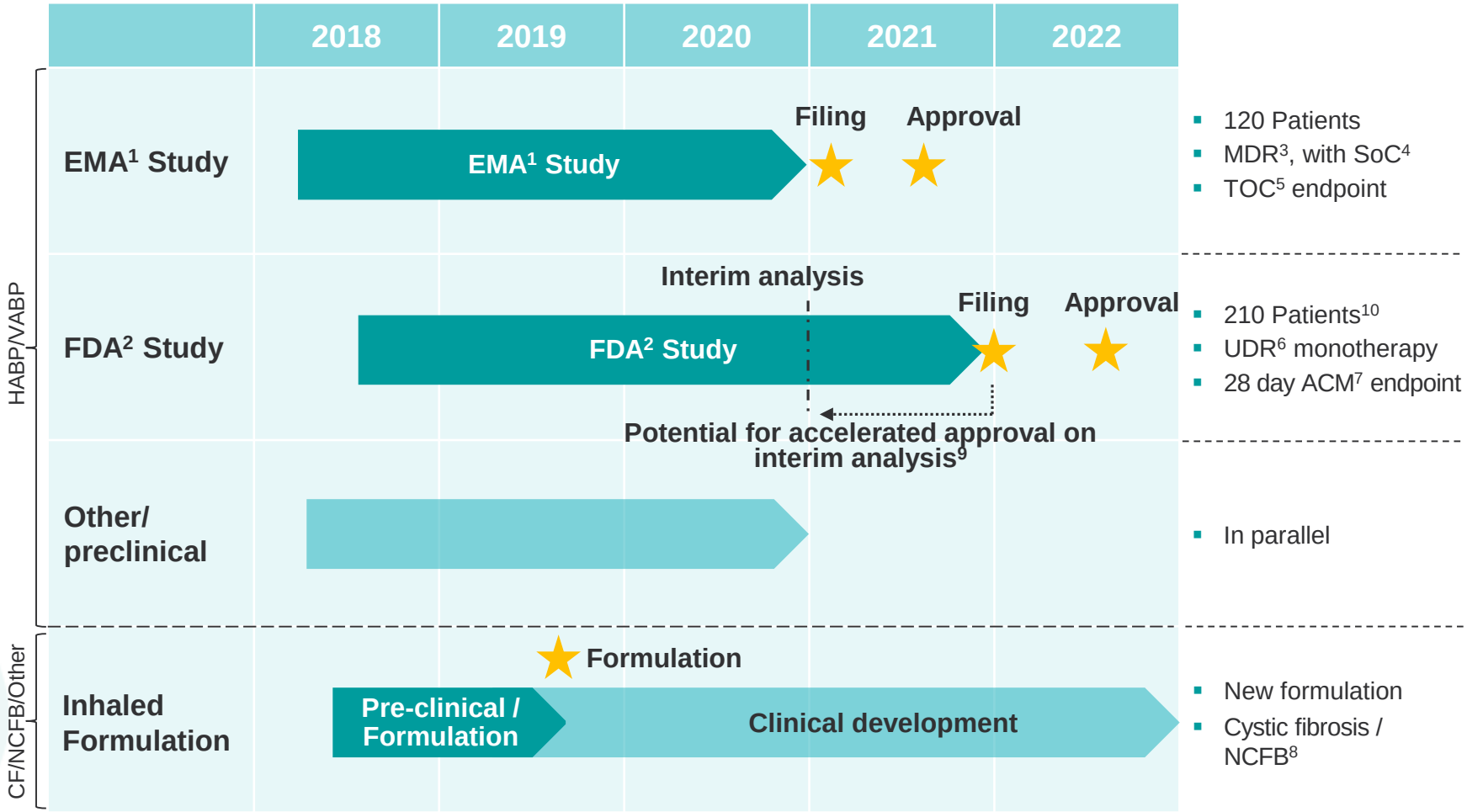
- Median SOFA[3] score 4.5 → 3.0
- Median CPIS[4] score 10.0 → 5.0
- Median PaO2/FiO2[5] 3 days
- No resistance observed
- Well tolerated in the study[6]

27th ECCMID Vienna, Austria 22 – 25 April 2017

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



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

POLYPHOR

Antibiotics - Recent Launches / Late Stage Pipeline

		HABP / VABP from *Pseudomonas aeruginosa*						Other infections		
	POLYPHOR	Allergan	MERCK	Melinta THERAPEUTICS	MERCK	SHIONOGI	basilea PHARMACEUTICA	TETRAPHASE	ACHAOGEN	nabriva
Product	**Murepavadin**	AvyCaz	Ceftazolane-tazobactam *(Zerbaxa)*	Meropenem-Vaborbactam (*Vabomere*)	Cilastin-imipenem-relebactam	Cefiderocol	Ceftobiprole[1] *(Zevtera)*	Eravacycline	Plazomicin	Lefamulin
Class / MoA	✓ ▪ **New–OMPTAs**	✗	✗	✗	✗	✗	✗	✗	✗	✓ (Gram-positive)
Spectrum	▪ **Targeted**	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad
Indications[2]	▪ **HABP / VABP**	▪ cUTI ▪ cIAI ▪ HABP / VABP	▪ cUTI ▪ cIAI ▪ HABP / VABP	▪ cUTI ▪ HABP / VABP	▪ HABP / VABP ▪ cUTI ▪ cIAI	▪ cUTI ▪ CRE ▪ AP ▪ HABP / VABP	▪ HABP ▪ CABP	▪ cIAI ★	▪ cUTI ★ ▪ CRE ▪ AP	▪ CABP

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

Source: Other company information, Other company websites

Approved ★ Filed

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

Murepavadin: Unique market opportunity

Potential for high price and rapid uptake

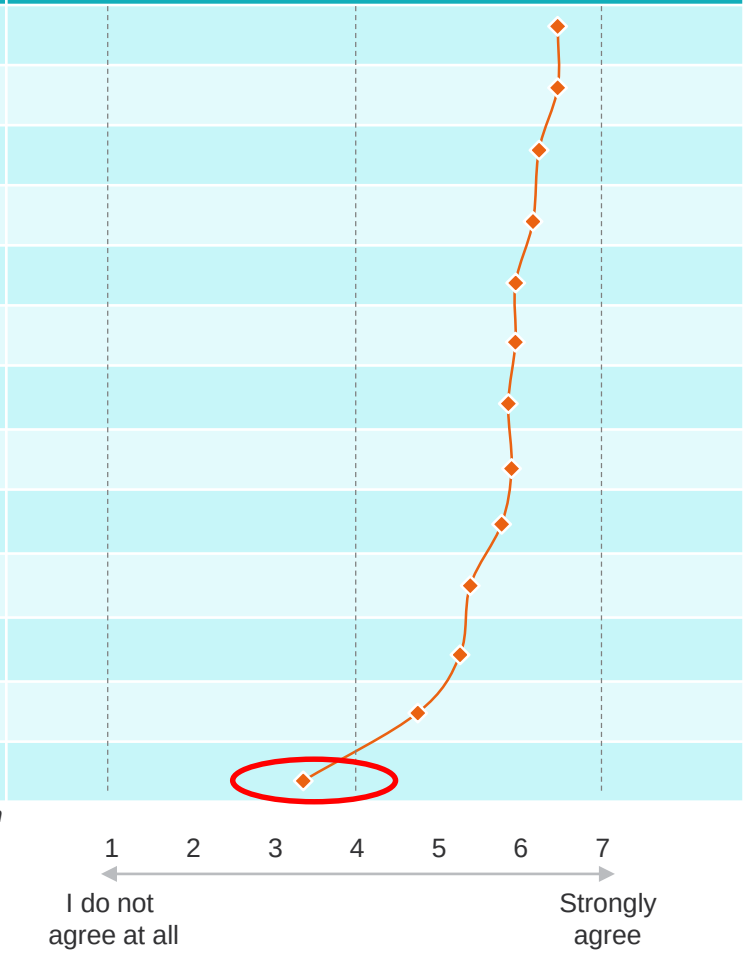
POLYPHOR

Distinctive features	Premium Pricing	Rapid market uptake
	Potential for premium pricing:	***No incentive to spare:***
▪ **First member of a new class**	▪ Novel agent with new mechanism of action	▪ New class with low resistance potential
▪ **Targeted therapy**	▪ Low possibility of misuse	▪ No impact on other pathogens and microbiome ▪ Narrow spectrum, consistency with guidelines
▪ **Focus on HABP/VABP (high mortality)**	▪ First indication with high unmet need ▪ ICU setting – highest doses and prices	▪ 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)

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



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)

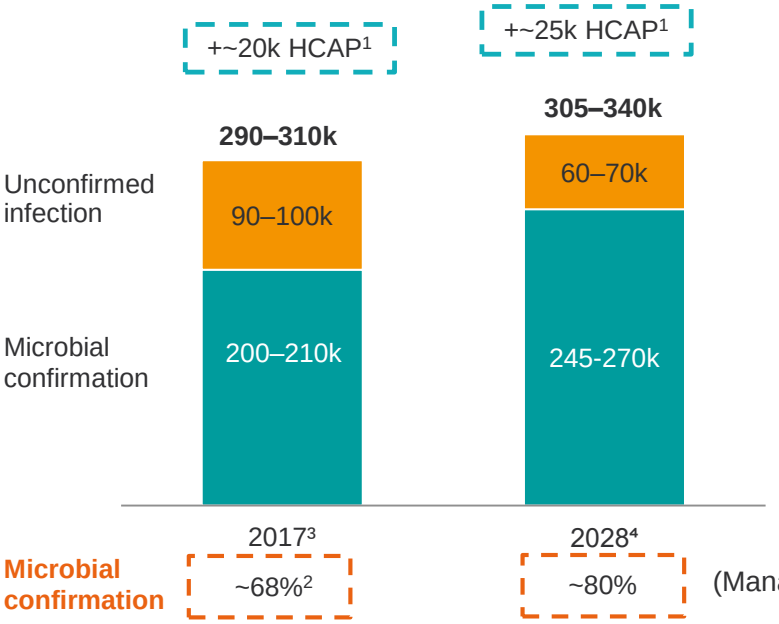
Note:

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[2]

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

HABP + VABP patient population in US + EU15*



(Management assumption)

Key drivers of increase in microbial confirmation[5]

- Guidelines' implementation
- Increased acceptance of antibiotic stewardship
- Rapid diagnostic tests diffusion
- Availability of pathogen–specific drugs

Peak market potential of HABP/VABP + MDR HCAP[1] cases due to confirmed *Pseudomonas aeruginosa* — Year 2028

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

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

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); 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

2 Based on average of confirmation rates as per Study by leading management consulting firm commissioned by the Company (2018) citing Esperatti (2010), Cardoso (2015), Russell (2015), Webber (2007), Herkel (2016) and Hugonnet (2007)

3 Estimates as per leading management consulting firm commissioned by the Company (2018) citing US Census bureau and OECD hospital discharge rates;

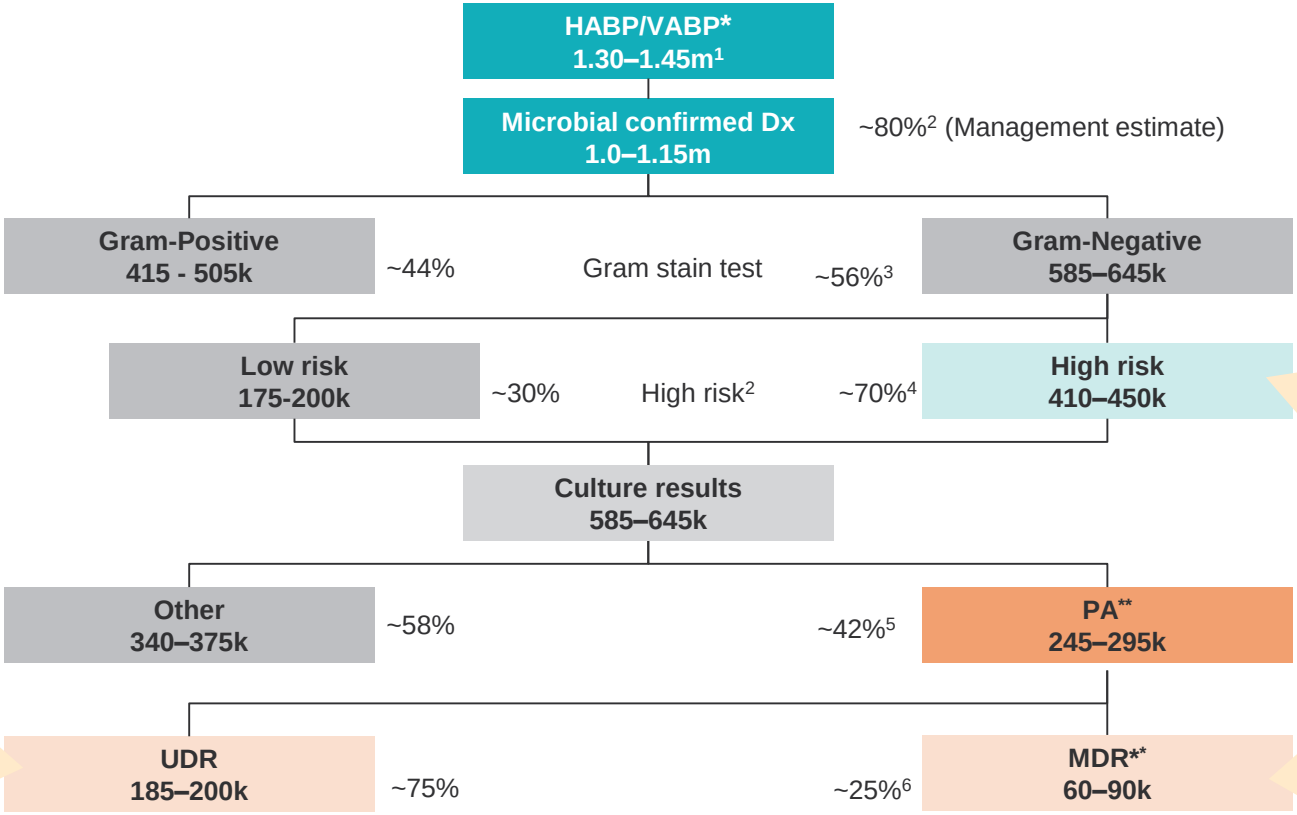
4 Estimates as per leading management consulting firm commissioned by the Company (2018) using increased microbial confirmation (management assumption), OECD hospital discharge rates and population data (US Census Bureau and OECD); Patient population CAGR calculated at 0.3% for EU15 (2001 – 2015) and 0.8% for US (1995 – 2010) through 2028;

5 Based on management view

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

POLYPHOR

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



*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

3 Based on proportion of HAP/VAP cases as per Study by leading management consulting firm commissioned by the Company (2018) citing Esperatti (2010), Russell (2015), Quartin (2013), Rotstein (2008), Richards (1999), and Webber (2007)

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 Herkel (2016), Gastmeier (2009), Pasquale (2013) and Weber (2007) as well as Gram-negative VAP/HAP patients receiving antibiotics within 90 days prior to onset (%) 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)

5 Based on VAP/HAP patients with confirmed *P. aeruginosa* as per study by leading management consulting firm commissioned by the Company (2018) citing Esperatti (2014), Herkel (2016), Torres (2015), Kalanuria (2014), Rello (1998), Hunter (2012), Masterson (2008), NHSN report (2014), Richards (1999), Park (2005), Quartin (2013), Webber (2007), Kollef (2005) and Sievert (2013)

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 NHSN report (2014)

IMMUNO-ONCOLOGY
Balixafortide highlights

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

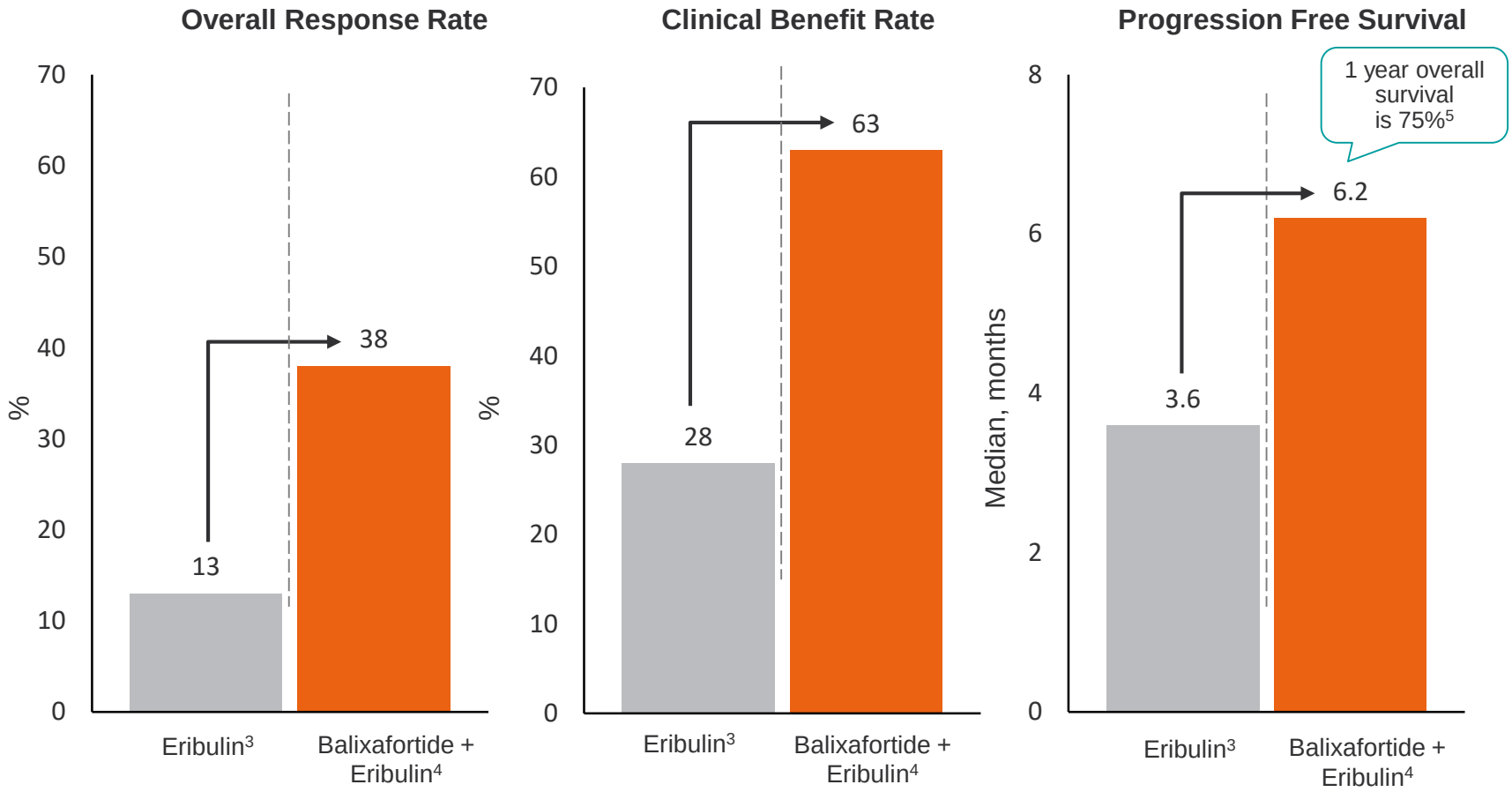
- **Most advanced CXCR4 antagonist[1]**
  - Potent and selective CXCR4 antagonist
  - Disruption of CXCR4 and SDF-1 axis renders cancer cells more susceptible to chemotherapy and increases immune cell infiltration into the tumour
  - Potential to enhance the activity of a range of chemo and immunotherapies
  - 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)



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

THE LANCET Oncology

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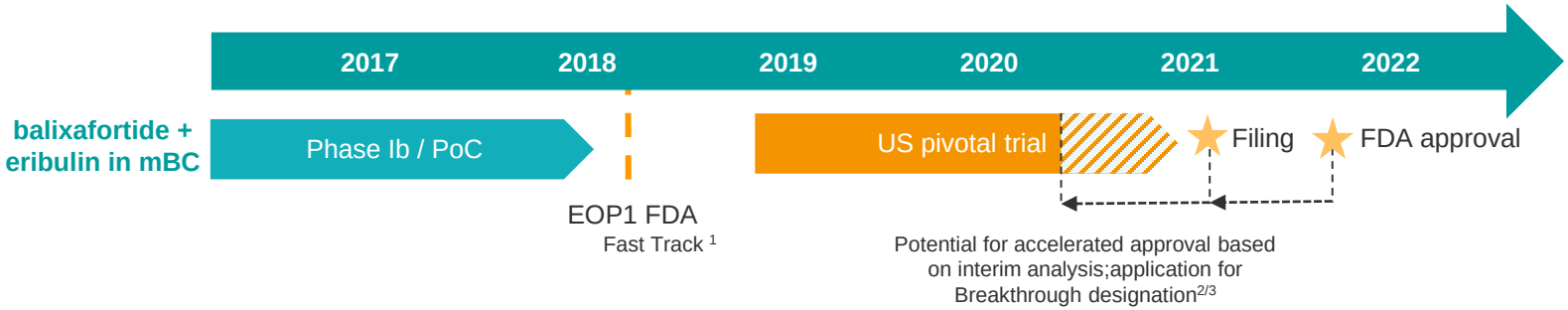
Balixafortide: Strong development path with accelerated approval potential

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

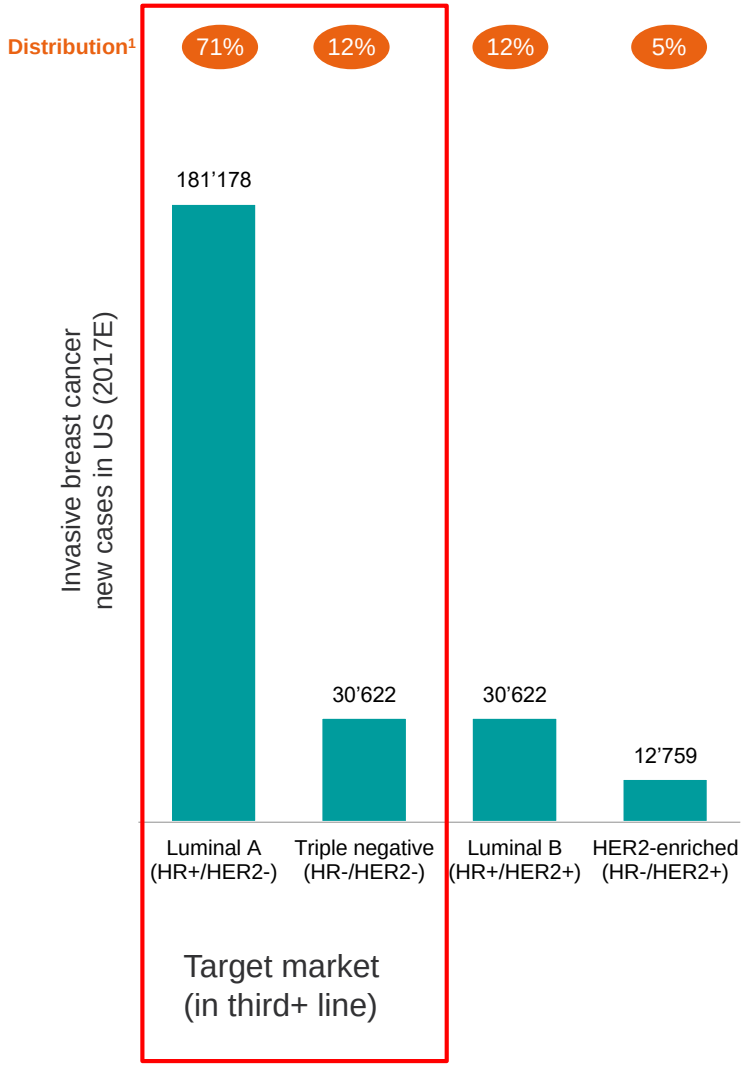
Large addressable market in mBCa with upside from other indications

POLYPHOR

Select breast cancer products[2]

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

Four main molecular subtypes and their distribution (US)



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

POLYPHOR

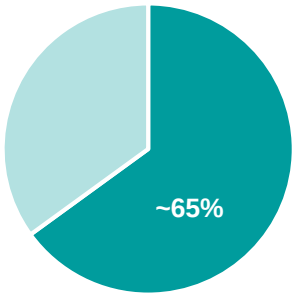
Product / main indications	Development	Key trial results	Comments
Murepavadin *POL7080* *(inhaled)* CF / NCFB[5]	Pre-clinical	▪ Highly potent at low doses	▪ Orphan indication ▪ Chronic usage
OMPTA[1] Gram-negative ESKAPE[2] pathogens	Pre-clinical	▪ Highly effective vs MDR / XDR[3] ESKAPE pathogens ▪ 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
POL6014[4] Cystic Fibrosis (CF)	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, AATD[5] ▪ CHF6.5M Upfront + 121M in Milestones and up to double digit royalties

Source: Company information
Notes:
1 OMPTA = Outer Membrane Protein Targeting Antibiotic
2 Enterpcoccus faecium, Staphylococcus aureus, Klebisella 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

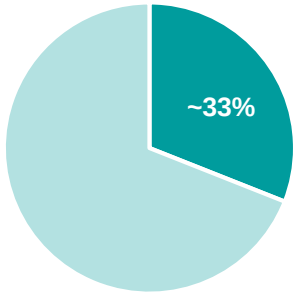
Further significant potential from the Murepavadin inhaled formulation

Pseudomonas aeruginosa colonization

CF[1] patients

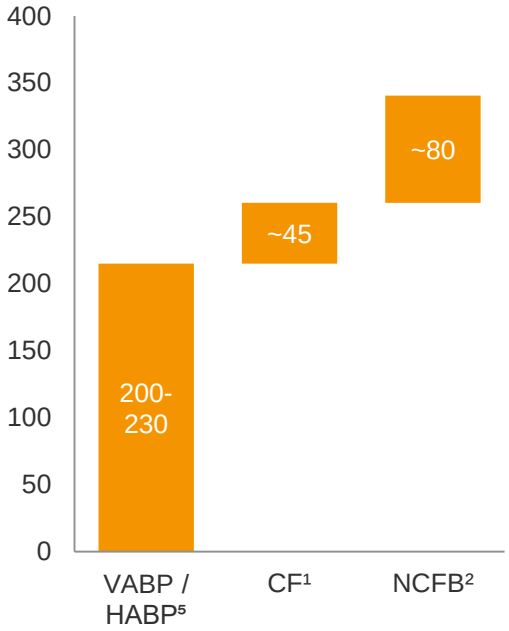


NCFB[2] patients

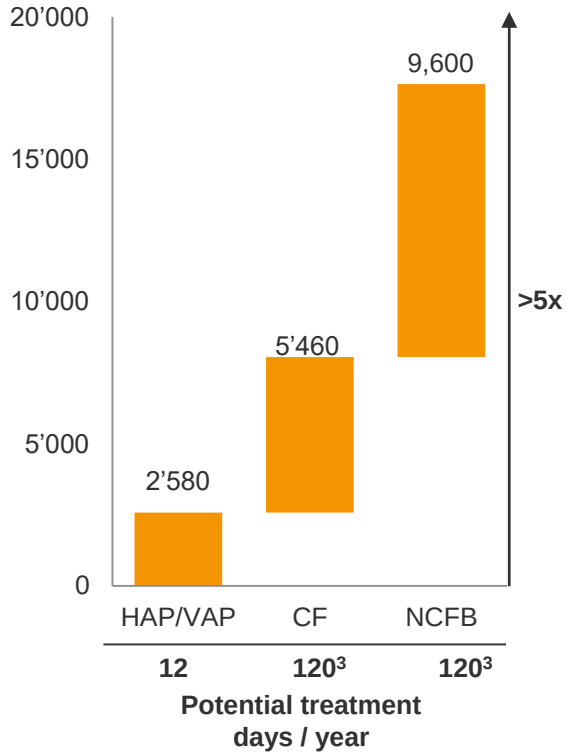


PA colonization Other

Patient Population w/ *Pa* ('000), 2017



Potential Tx Days / Yr [4]



Notes:

1 CF Foundation Patient Registry Annual Report 2016; Change in *Pseudomonas aeruginosa* prevalence in cystic fibrosis adults over time (2016) Mathew R. Crull, Kathleen J. Ramos, Ellen Caldwell, Nicole Mayer-Hamblett, Moira L. Aitken and Christopher H. Goss

2 European Respiratory Journal 2012 40: P3983 and Respiratory Medicine 117 (2016) 179e189

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

POLYPHOR

Targeting the most resistant gram-negative ESKAPE[1] pathogens

Gram-negative infections with limited treatment options

repair impact fund
novo holdings

MICs (µg/ml) against resistant isolates

	Acinetobacter baumannii					*Enterobacter cloacae*					*Escherichia coli*					*Klebsiella pneumoniae*					*Pseudomonas aeruginosa*				
	1061150	863866	872842	924711	A461	1018083	867213	878393	885517	950265	1038407	926415	959670	ESBL 401259	ESBL 706543	403575	501326	853420	946897	ESBL 2130474	33570	401190	500546 (IHMA)	UU 6419	UU 8352
OMPTA	1	4	4	2	1	4	8	2	4	1	1	0.5	1	0.5	0.5	2	0.5	2	4	0.5	2	2	8	4	1
OMPTA 1	0.06	0.125	0.06	0.03	0.06	0.125	0.125	0.06	0.06	0.06	0.125	0.125	0.06	0.03	0.03	0.125	0.06	0.25	0.25	0.06	0.125	0.125	0.125	0.25	0.125
Colistin	0.25	>64	>8	8	8	>64	>64	>64	>64	8	8	8	4	0.25	0.125	4	0.125	16	16	0.125	0.5	0.5	0.5	0.5	0.25
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
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	16	>64	>64	32	64	32	>64	16	8
Ceftazidime	>64	>64	>8	32	16	32	>64	64	0.5	64	>64	>8	64	0.25	64	>64	32	>64	>64	>64	64	>64	16	>64	>64
Ceftriaxone	>64	>64	>8	>64	32	32	>64	64	0.5	>64	64	>8	>64	0.25	>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

Sensitive Resistant

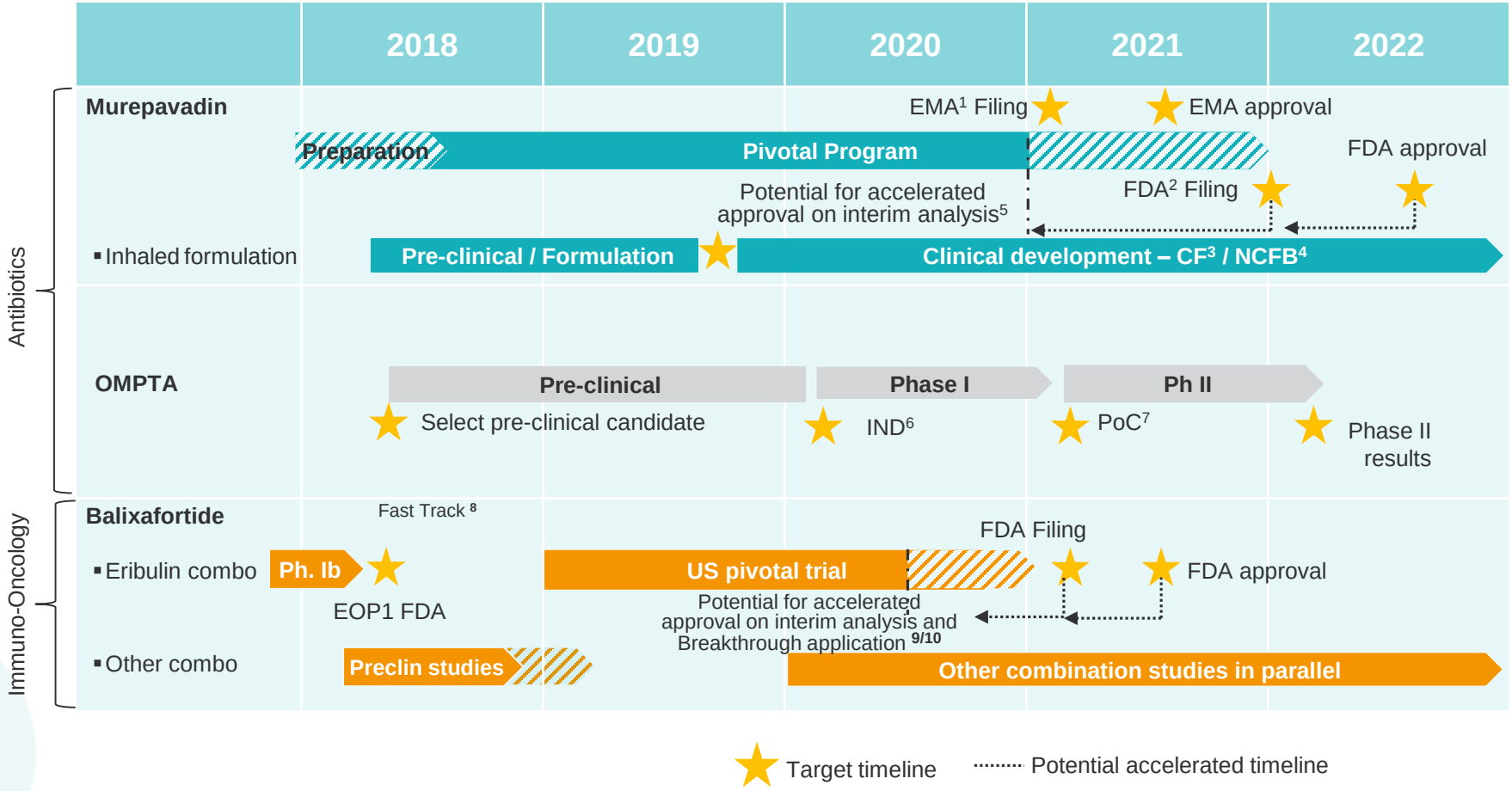
Notes:
1 ESKAPE pathogens: Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, *Pseudomonas aeruginosa* and Enterobacter spp.

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



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

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 "OMPTA[1]", potentially the first new class of antibiotics against gram negative bacteria in ~50 years[2]

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 cancer[3]

5. Further upside potential from innovative pipeline—inhaled formulation of Murepavadin (pre-clinical for CF[4], NCFB[5]), POL6014 (Phase Ib in CF[4]) and new OMPTAs

6. 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

POLYPHOR

Thank you