Annual Shareholder Meeting 2018

Basel, 12 April 2018

Thomas Meier, CEO

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THEIR FUTURE - OUR FOCUS

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Our mission

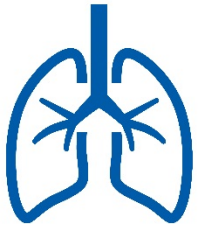
We are focusing on the development of treatments for neuro-ophthalmological, neuromuscular and pulmonary diseases that have a high unmet medical need

Focus on rare diseases

Neuro-ophthalmological

Neuromuscular

Pulmonary



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Our product pipeline

Three different drug candidates covering three therapeutic areas:

- Neuro-ophthalmological diseases
- Neuromuscular diseases
- Pulmonary diseases

Santhera Pipeline	Drug	Preclin.	Phase 1	Phase 2	Phase 3	Filing	Market
Neuro-ophthalmological Diseases							
Leber's Hereditary Optic Neuropathy	Idebenone*						*Raxone®*
Neuromuscular Diseases							
Duchenne Muscular Dystrophy (GC non- users)	Idebenone*						
Duchenne Muscular Dystrophy (GC users)	Idebenone*						
Congenital Muscular Dystrophy	Omigapil						
Pulmonary Diseases							
Cystic Fibrosis	POL6014						
Alpha-1 Antitrypsin Deficiency	POL6014		To be explored				
Non-Cystic Fibrosis Bronchiectasis	POL6014						
Primary Ciliary Dyskinesia	POL6014						

*Raxone® (Santhera Pharmaceuticals) is the tradename for idebenone. Raxone (150 mg idebenone) is currently approved for the treatment of visual impairment in adolescent and adult patients with LHON
GC: glucocorticoid

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Raxone® in Leber's Hereditary Optic Neuropathy (LHON)

Neuro-ophthalmological Diseases

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Raxone® is the first and only approved treatment for LHON

- LHON, a rare mitochondrial disease resulting in progressive and severe vision loss
- Most common in males with a disease onset between 15 – 35 years of age
- Within 1 year > 90% of patients experience vision loss in both eyes

Raxone® can lead to **stabilization** or **recovery** of vision

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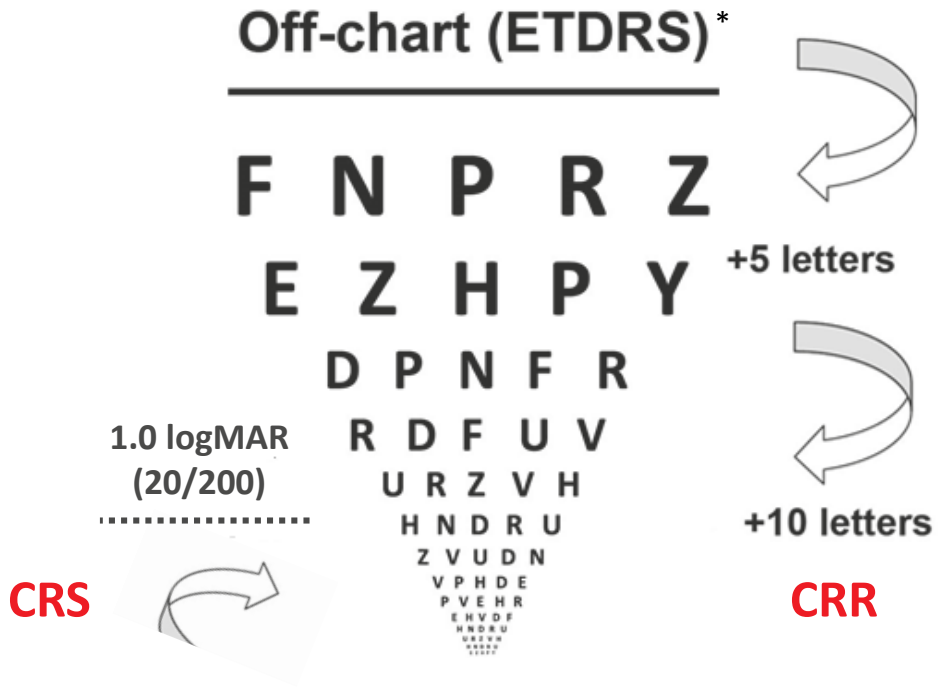
Raxone® improves vision in patients with LHON

Prevention of further vision loss by **clinically relevant stabilization** (CRS) and improvement of visual acuity by a **clinically relevant recovery** (CRR) are important and meaningful outcomes for patients with LHON

Clinical data have shown:

1 in 2 patients who received idebenone experienced a CRS, with vision remaining below logMAR 1.0**

1 in 3 patients who have lived with LHON for up to 5 years before treatment achieved a CRR after 6 month idebenone treatment



* ETDRS: early treatment diabetic retinopathy study;
** logMAR: logarithm of the minimum angle of resolution

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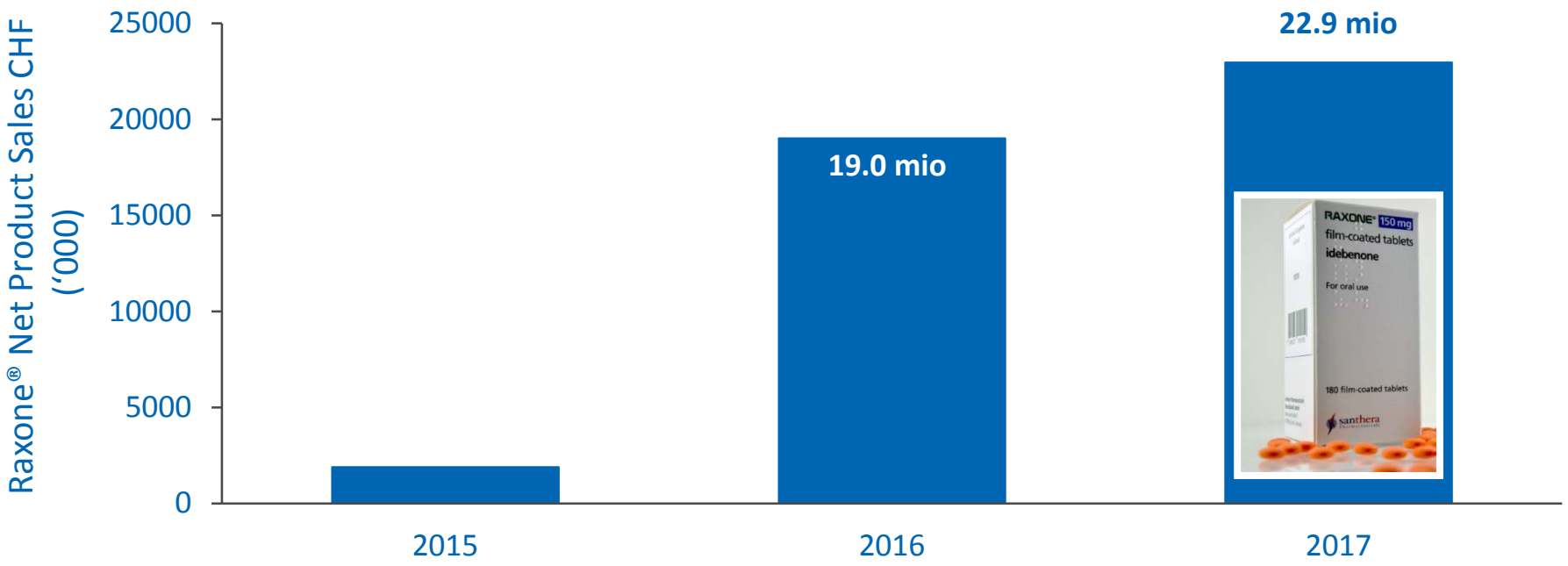
Raxone® sales in LHON since marketing authorization



- Raxone® is fully reimbursed in 8 European countries
- In an additional 12 European countries, Raxone® is currently available by special reimbursement schemes
- In 2017, Israel was granted first approval of Raxone® outside the EU
- **Sales guidance for 2018: CHF 28-30 million**

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Ongoing post approval studies in LHON

Post Approval Measures (PAM)	2016	2017	2018	2019	2020
Open Label Study	«LEROS»				
Nat. History Data Collection	«Case Record Survey»				
Expanded Access Program	«EAP»				
Product Registry	«PAROS» (post approval safety study, PASS)				

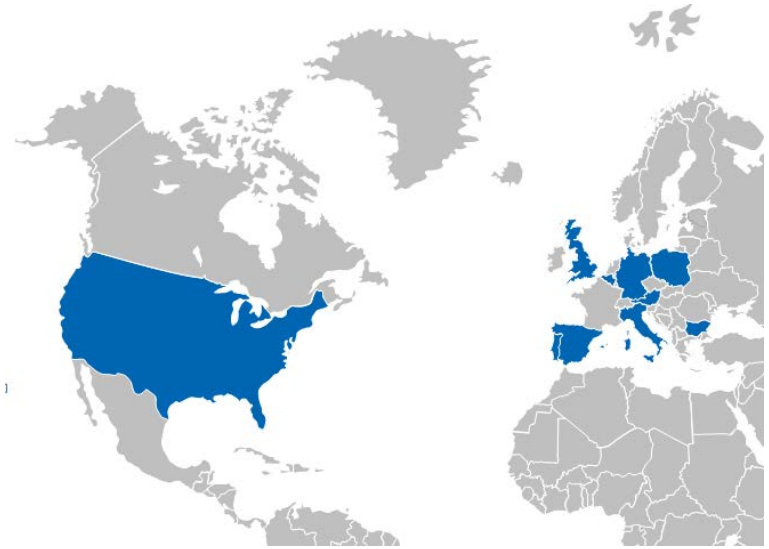
LEROS: An open-label, interventional Phase 4 study to assess the long-term efficacy and safety of Raxone® in LHON

External natural history controlled, open-label intervention study to assess the efficacy and safety of long-term treatment with idebenone in LHON

250 LHON patients → **Idebenone 300mg orally, 3 times daily**

Population	Males and females with LHON ≥ 12 years of age Onset of symptoms ≤ 5 years at baseline
Study design	Open-label, interventional Phase 4
Treatment	Single group assignment of idebenone 300mg orally, 3 times daily
Treatment duration	24 months
Key endpoint	Clinically relevant recovery (CRR) of visual acuity
Status	Recruiting

Centers and locations



Countries:
Austria
Belgium
Germany
Italy
Portugal
Spain
UK
Poland
Bulgaria
U.S.

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Outlook Neuro-ophthalmology business

- Raxone® approved in Europe for LHON
- Projected sales for 2018 reach profitability for neuro-ophthalmology business (including post approval studies)
- Anticipated peak sales potential for Europe: CHF ~50 million p.a.
- Protection through Orphan Drug Status in Europe until 4Q 2025
- Expansion of marketing authorizations to countries outside Europe

Neuro-ophthalmology

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Our product pipeline

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- **Neuromuscular diseases**
- Pulmonary diseases

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Raxone® in Duchenne Muscular Dystrophy

Neuromuscular Diseases

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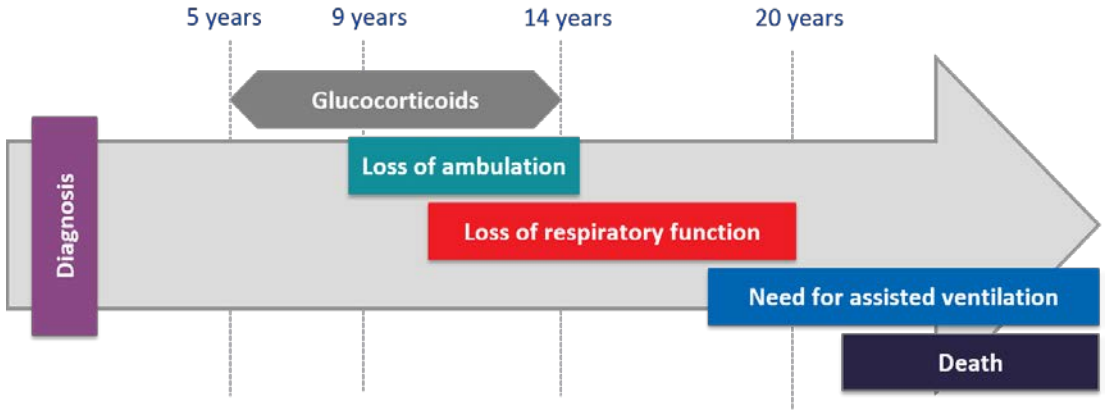
Urgent medical need for new therapies in DMD

- Increasing respiratory muscle weakness in DMD leads to:
  - Decreased lung volumes and flow rates
  - Decreased ability to cough effectively and clear airways from mucus
  - Increased risk of airway infections
- There are no approved pharmacological therapies for treating respiratory decline
- ~35,000 patients combined in US and Europe

As respiratory function declines, assisted ventilation is required to alleviate symptoms



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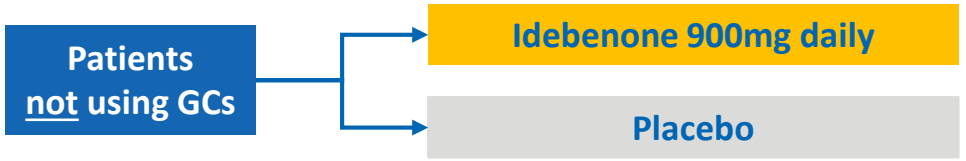
Santhera studies in DMD – Patient eligibility

Patients with DMD not using glucocorticoids

40% of patients 10 years and older are not using glucocorticoids and were eligible for the DELOS study:

The DELOS study (Phase 3)



- **Treatment duration: 52 weeks**
- **Completed**

Patients with DMD using glucocorticoids

Patients who are currently using glucocorticoids are eligible to enter the SIDEROS study:

The SIDEROS study (Phase 3)

- **Treatment duration: 78 weeks**
- **Ongoing**

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Regulatory strategy

Santhera Pipeline	Drug	Preclin.	Phase 1	Phase 2	Phase 3	Filing
Neuromuscular Diseases						
Duchenne Muscular Dystrophy (GC non- users)	Idebenone*					
Duchenne Muscular Dystrophy (GC users)	Idebenone*				SIDEROS	

Patients with DMD not using glucocorticoids	Patients with DMD using glucocorticoids
• Successful Phase 3 DELOS trial as basis for regulatory dossier • Additional natural history data to establish clinical relevance of treatment effect • Additional open-label data with idebenone • Best approval pathway in EU and US under consideration	• Positive SIDEROS Study allows expansion of label to all patients irrespective of GC use status • Top-line data available 2H 2020

GC: Glucocorticoid

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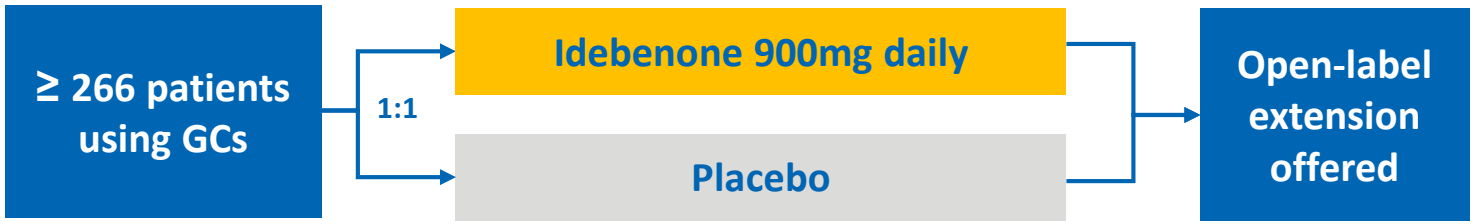
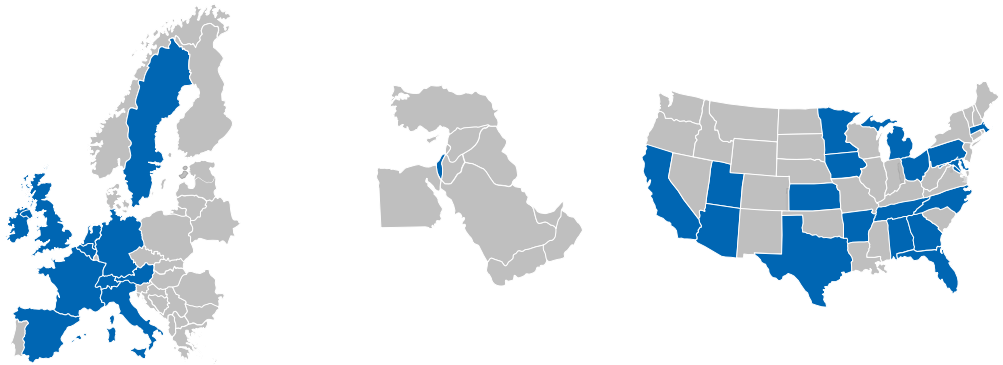
SIDEROS www.SIDEROSdmd.com

A Phase 3 double-blind study with idebenone in patients with DMD taking glucocorticoid steroids (SIDEROS)



Population	Patients ≥ 10 y in respiratory function decline
Study design	Interventional, placebo controlled, Phase 3, RCT
Treatments	Parallel group assignment to idebenone 300mg orally 3 time daily, or placebo
Treatment duration	18 months
Key endpoint	Change from baseline in forced vital capacity percent predicted (FVC %p) at 18 months
Status	Recruiting

>60 sites across the EU, U.S. and Israel



10 EU countries | **1 non-EU country** | **18 states across US**

Status: March 2018

FVC: forced vital capacity; GC: glucocorticoid; RCT: randomized controlled trial

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US Expanded Access Program: *BreatheDMD*

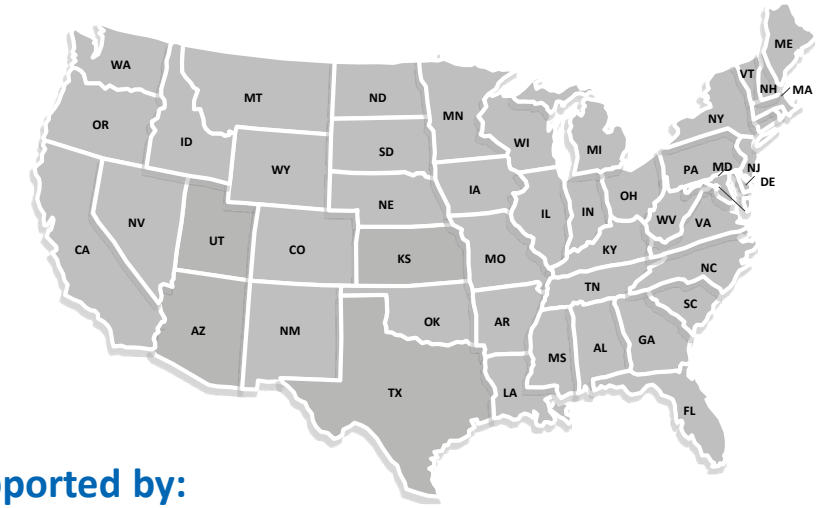
A US Expanded Access Program (EAP) in patients with DMD

Up to 250 DMD patients → **Idebenone 300mg orally 3 times daily**

Population	DMD patients ≥ 10 years in respiratory decline
Objective	Provide access to treatment with idebenone for patients with DMD in the US
Treatment	Idebenone 300mg orally 3 times daily
Key endpoints	Safety, tolerability, effectiveness and QoL data
Status	Enrolling

Centers and locations

Up to 35 sites across the US



Supported by:

Cure Duchenne™ · Jett Foundation · MDA For Strength, Independence & Life · Parent Project Muscular Dystrophy — Join the Fight. End Duchenne.

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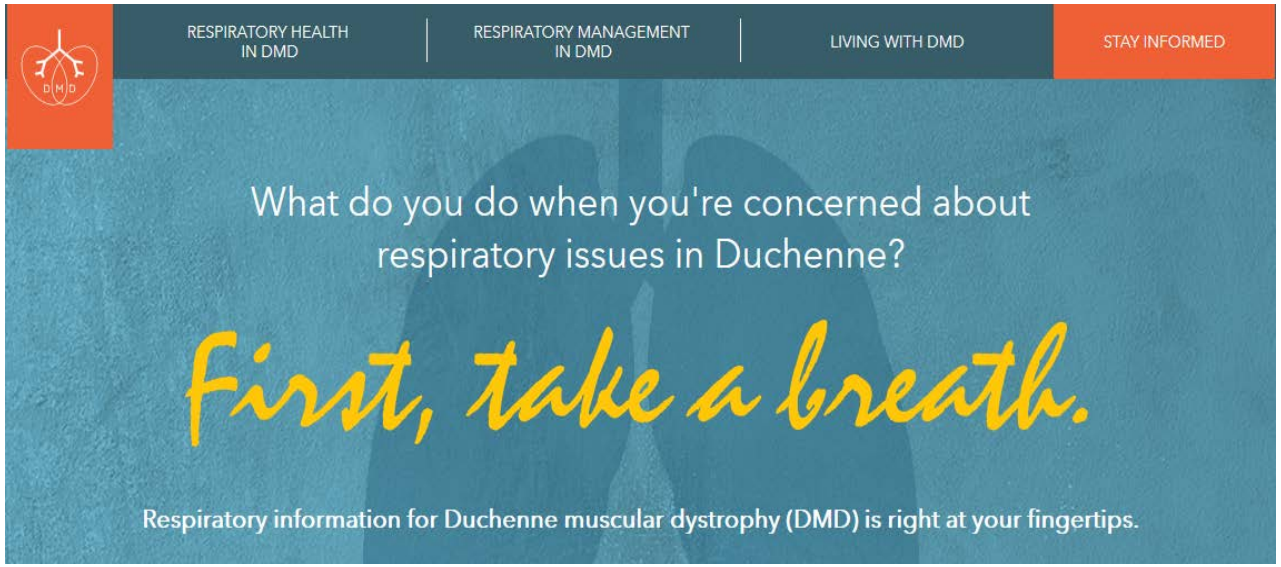
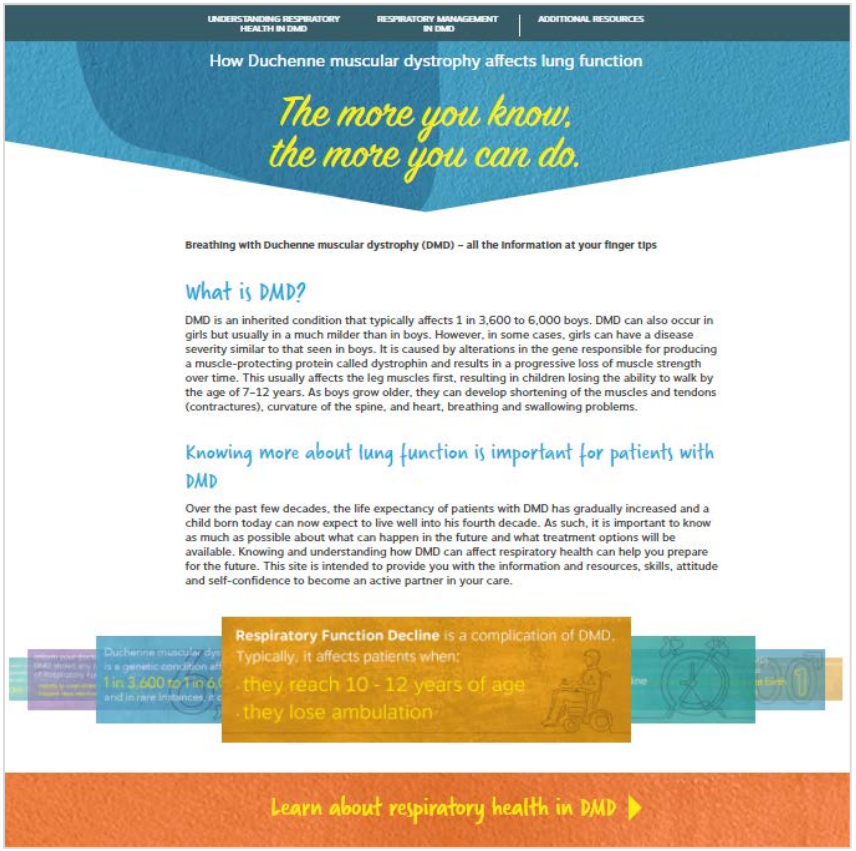
Santhera's disease awareness campaigns in DMD

Dedicated website providing information on respiratory function care

- US website: www.takeabreathdmd.com
- European website: www.breatheduchenne.com





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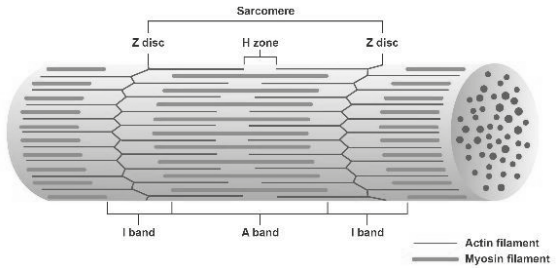
Omigapil in Congenital Muscular Dystrophy (CMD)

Neuromuscular Diseases

CMD is a group of inherited neuromuscular diseases

CMD is characterized by **progressive** and potentially life-threatening **muscle weakness**



Affected patients have **difficulties walking**, and experience **respiratory insufficiency**

Affects both boys and girls **equally**, with a disease onset frequently at **birth** or **early childhood**

Prevalence is estimated as ~**1 – 4 per 100,000**

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CALLISTO: Safety and pharmacokinetics of omigapil in CMD

Ascending, multiple dose cohort study evaluating the pharmacokinetic profile, safety and tolerability of oral omigapil in pediatric and adolescent patients with CMD

20 patients (5 groups) → **Omigapil, different doses**

Population	5 - 16 year-old males and females with a CMD (clinical picture: Ullrich CMD or MDC1A)
Study design	Phase 1, open-label, sequential group study
Treatment	5 groups with different omigapil doses
Treatment duration	12 weeks
Centers	Single center in the US (NINDS, NIH)
Key objectives	Establish the pharmacokinetic profile, safety and tolerability of omigapil in children and adolescents with CMD
Status	Complete

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Successful completion of CALLISTO Study

NEWS RELEASE

Santhera Announces Successful Completion of First Clinical Trial with Omigapil in Patients with Congenital Muscular Dystrophy

Pratteln, Switzerland, April 5, 2018 – Santhera Pharmaceuticals (SIX: SANN) reports the successful completion of the first clinical trial with omigapil in patients with two forms of congenital muscular dystrophy (CMD) conducted in the US at the National Institutes of Health (NIH). The ascending multiple dose cohort study (CALLISTO) met its primary objective to establish a favorable pharmacokinetic profile of omigapil and demonstrated that the study drug was safe and well tolerated in children and adolescents with CMD. Following further data analysis, the Company will discuss these results with clinical experts and regulatory authorities to prepare for a pivotal trial in patients with CMD.

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www.santhera.com

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The single-center interventional trial to establish the pharmacokinetic profile and to evaluate the safety and tolerability of omigapil in pediatric and adolescent patients with CMD was conducted at the NIH's clinical center in Bethesda, Maryland (USA), and led by Carsten Bönnemann, MD, and A. Reghan Foley, MD, of the NIH's National Institute of Neurological Disorders and Stroke. Ambulant and non-ambulant patients aged 5-16 years with either of two of the most common forms of CMD resulting from collagen VI-deficiency (COL6-related dystrophies or COL6-RDs) or laminin alpha2-deficiency (LAMA2-related dystrophy or LAMA-RD) were eligible to participate in the trial. A total of 20 patients were enrolled in this ascending multiple dose cohort study. Participants were randomized to one of five groups and received omigapil at a once-daily dose ranging from 0.02 mg/kg to 0.08 mg/kg body weight as a liquid oral formulation for a period of 3 months.

The trial met its primary objective and established that the pharmacokinetic profile of omigapil is suitable for further development in pediatric patients and demonstrated that omigapil was safe and well tolerated in this fragile population of CMD patients.

"We are grateful to participating patients and their families for enrolling in this first interventional trial with a drug candidate for CMD and to the clinical researchers at the NIH for their dedication to this milestone trial for these forms of CMD," said **Thomas Meier**, PhD, CEO of Santhera. "This is an important step towards profiling the therapeutic potential of omigapil for the LAMA2 and COL6 related forms of CMD for which there is currently no treatment available. We will now collaborate with international experts and seek advice from regulators to further advance the clinical development of omigapil towards a pivotal trial."

"This collaboration with Santhera and the patient community allowed us to test for the first time an investigational therapy in children with these more common types of CMD for which no other treatment options are currently available," said **Carsten Bönnemann**. "With the help of Ken Cheung, PhD at Columbia University, this clinical trial applied an innovative design by utilizing a novel adaptive dose-finding algorithm. Upon full analysis, we will share detailed data from the CALLISTO trial at upcoming scientific conferences and with the patient community. We look forward to continue working with Santhera, all stakeholders and regulators to define the fastest development path towards pivotal efficacy studies for this drug candidate."

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Outlook: Neuromuscular diseases pipeline

Neuromuscular

Idebenone in DMD

- Collect additional data to support results of pivotal DELOS trial
- Roll-out Expanded Access Program in US
- Prepare for EU and US regulatory filing for DMD patients not using GCs
- Continue SIDEROS study in GC users; expected high level readout 2H 2020

Omigapil in CMD

- Discuss new study design with clinical expert team
- Discuss development plan for 2 CMD subtypes with EMA and FDA

GCs: glucocorticoids

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Primary Ciliary Dyskinesia	POL6014						

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POL6014 in Cystic Fibrosis (CF)

Pulmonary Diseases

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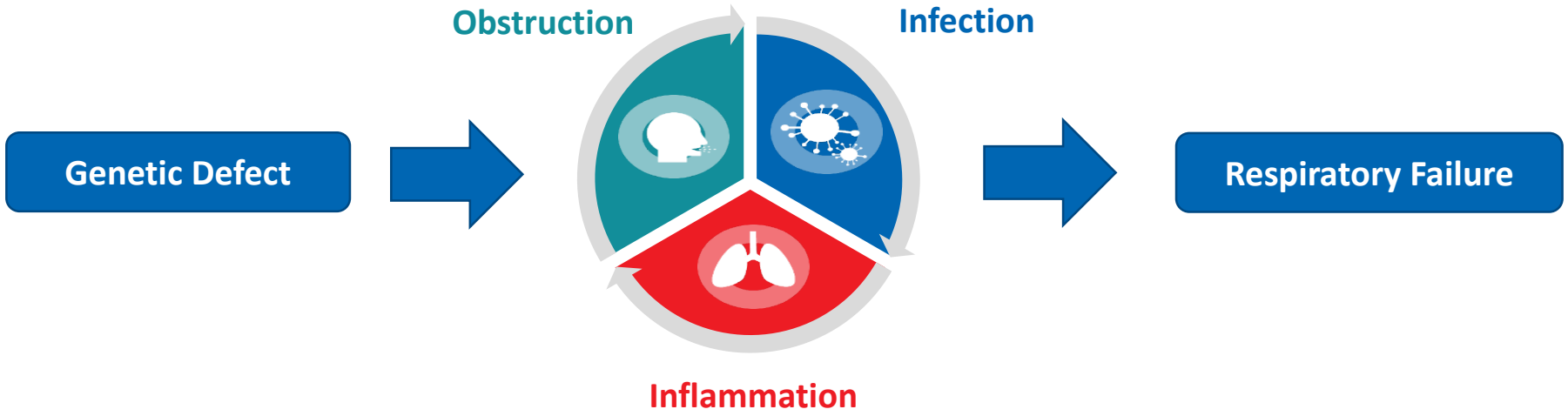
Cystic Fibrosis, a rare inherited lung disease

- CF is a progressive, genetic disease leading to thick mucus in the lung (airway obstruction)
- This results in persistent lung infections, chronic inflammation and loss of respiratory function



- The disease is diagnosed in young children, about 70,000 patients live in US & EU
- Current treatments do not specifically address the chronic, underlying inflammation

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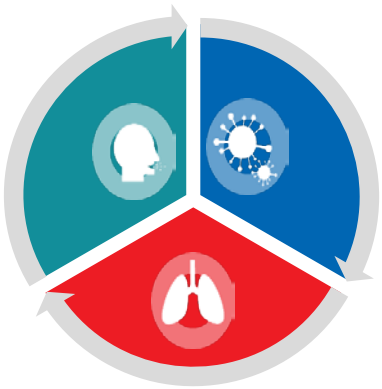
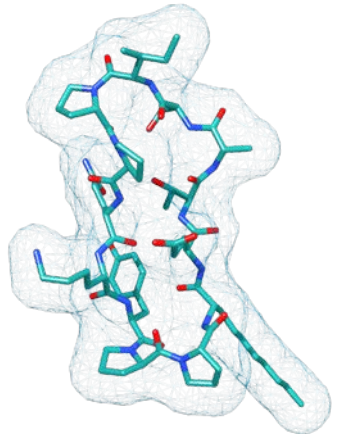
Targeting elastase for chronic lung inflammation

- Inflammation causes excessive production of human neutrophil elastase (hNE)
- Elevated hNE levels play a central role in lung tissue damage



Inflammation

- POL6014, a cyclic peptide, is a reversible, competitive and selective inhibitor of hNE
- The compound has been rationally designed for potency and selectivity
- The drug is administered via inhalation to achieve high concentrations in the lung



- Chronic inflammation is also present in other so-called neutrophilic lung diseases
- POL6014 presents an opportunity for a pipeline in a product

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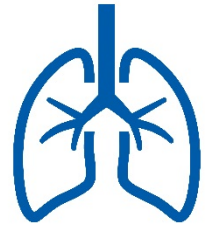
Outlook: POL6014 Development Plan

POL6014 in CF

- Start multiple ascending dose trial in CF patients (3Q 2018)
- Apply for Orphan Drug Designations for CF in EU and US (2H 2018)
- Prepare for Phase II efficacy trial (2019)

Pulmonary



Study	Phase 1	Phase 2
Single Ascending Dose in healthy volunteers	Completed	
Single Ascending Dose in CF patients	Completed	
Multiple Ascending Dose in CF patients	Start 3Q 2018	
Phase 2 Efficacy Study in CF patients		Start 2H 2019

POL6014 in other pulmonary diseases

- Explore opportunities in other pulmonary disease with clear rationale for elastase inhibition

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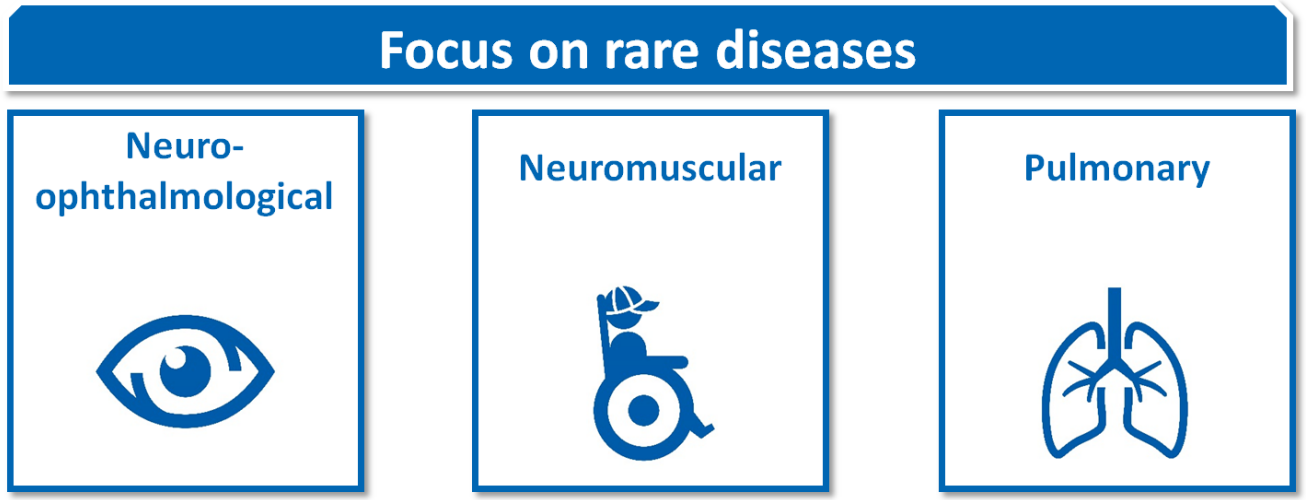
Summary

- Continued to establish Santhera as specialty pharma company with focus on orphan drugs
- Successfully expanded pipeline to three therapeutic focus areas of orphan diseases
- Balanced pipeline with clinical stage assets
- First product (Raxone®) successfully launched in rare neuro-ophthalmological disease (LHON)
- Positive data from Phase 3 trial as basis for regulatory filing strategy in subset of DMD patients



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