



RedHill Biopharma Ltd.

("RDHL")

Corporate Presentation
April 2022

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All forward-looking statements included in this presentation are made only as of the date of this presentation. We assume no obligation to update any written or oral forward-looking statement made by us or on our behalf as a result of new information, future events or other factors.

Corporate Highlights

An emerging U.S. specialty biopharmaceutical company (Nasdaq: RDHL), primarily focused on U.S. commercialization and development of drugs for gastrointestinal (GI) diseases and infectious diseases

Strong U.S. Commercial Footprint and Robust Development Pipeline with Multiple Near-Term Milestones

\$85m

Net revenues
12 mo. ended
9/30/21

~200

Employees

~120

Sales professionals

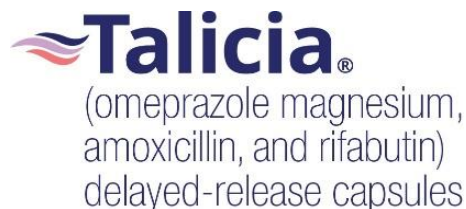
3

FDA-approved
drugs

6

Clinical late-stage assets

Completed multiple
Phase 3
studies with several
near-term catalysts



Emerging U.S. Specialty Pharma: Select Programsⁱ

Commercial Productsⁱⁱ



Talicia® (omeprazole magnesium, amoxicillin and rifabutin) - *H. pylori* infection in adults



Movantik® (naloxegol) - Opioid induced constipation (OIC) in adults with chronic non-cancer painⁱⁱⁱ

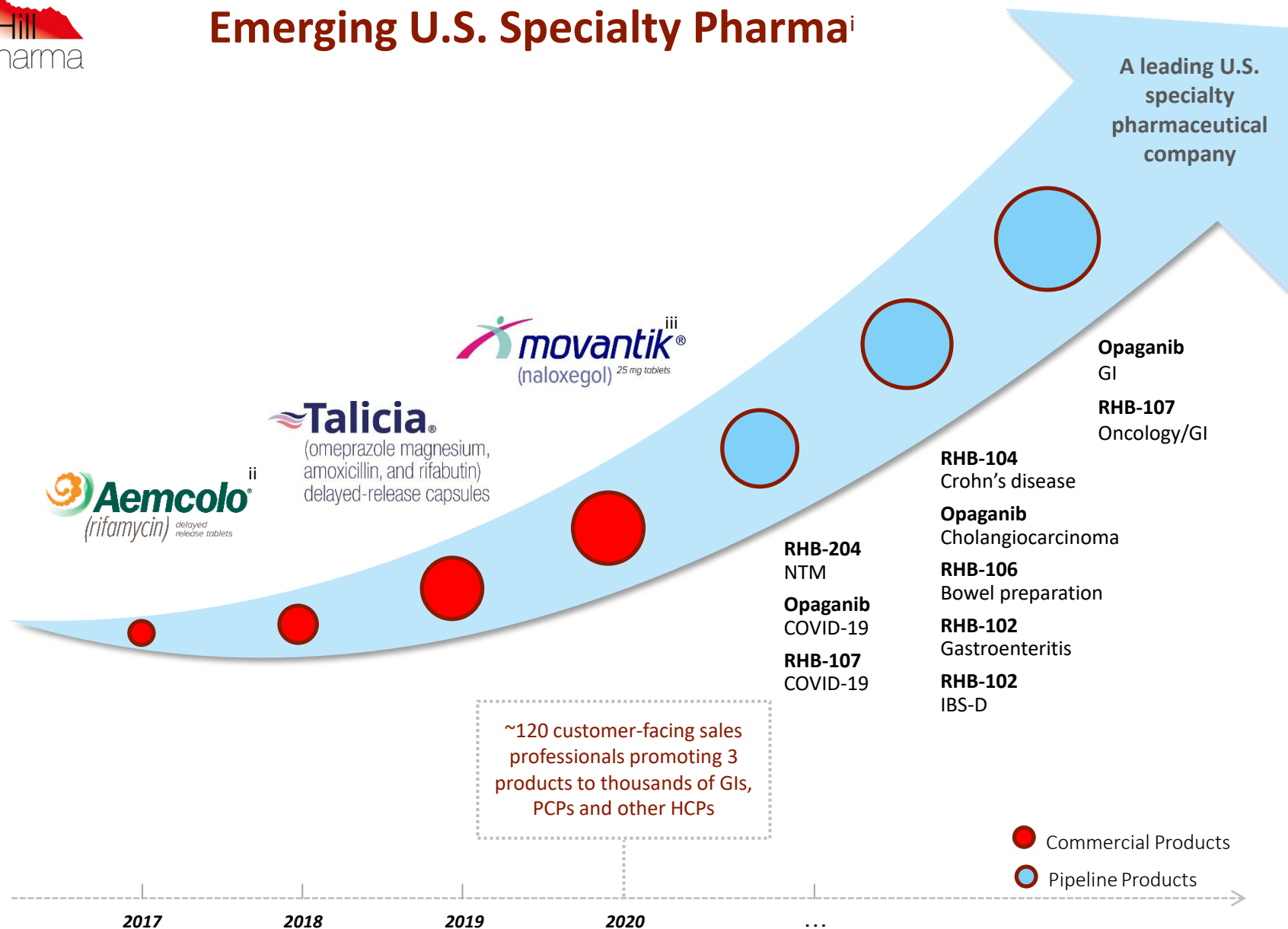


Aemcolo® (rifamycin) - Travelers' diarrhea caused by noninvasive strains of *E. coli* in adults

Development Pipeline ^{iv}		Pre-Clinical	Phase 1/2	Phase 3	NDA
RHB-204	NTM disease	Phase 3 U.S. study ongoing			
RHB-104	Crohn's disease	Positive results from Phase 3 MAP US study			
RHB-102	Gastroenteritis	Positive results from Phase 3 U.S. study			
	IBS-D	Positive results from Phase 2 U.S. study			
RHB-106	Bowel cleanser	Phase 2/3 studies planned			
Opaganib	Oncology Indications + COVID-19	Phase 2/3 COVID-19 & Phase 2 oncology program			
RHB-107 (upamostat)	Oncology/GI + COVID-19	Ongoing Phase 2/3 COVID-19, GI & oncology indications			

ⁱ Estimated timeline/indication in the pipeline is subject to changes in development plans and regulatory requirements/clarifications, including complementary/additional studies; ⁱⁱ For full prescribing information see: Aemcolo®: www.Aemcolo.com; Talicia®: www.talicia.com; Movantik®: www.movantik.com; ⁱⁱⁱ Movantik® is a registered trademark of AstraZeneca; ^{iv} Bekinda® (RHB-102) and Yeliva® (opaganib) are proposed tradenames which are subject to FDA review and approval at the time of NDA filing;

Emerging U.S. Specialty Pharma



ⁱ Presented events are forward looking statements and estimates and are subject to uncertainties including, among others, clinical and regulatory outcomes, marketing approvals, financial resources and commercial viability; This slide and strategic plan is made for illustrative purposes only. Please see "Disclaimer and Forward-Looking Statements".

ⁱⁱ Planned discussions with Cosmo regarding the License Agreement; ⁱⁱⁱ Movantik[®] is a registered trademark of AstraZeneca.

Financial Highlightsⁱ

RedHill Biopharma Ltd. Nasdaq: RDHL

Market Cap (approx.)	\$132 million
American Depositary Shares (ADSs)	52.8 million (Representing 528 million ordinary shares outstanding)
Cash Balance as of December 31, 2021 ⁱⁱ	Approx. \$54.2 million
2021 Net Revenues	\$85.8 million
2021 Gross Margin	42%
Q4/2021 Net Revenues	\$22.1 million

ⁱ Financial information as of April 1, 2022, unless otherwise noted ⁱⁱ cash, cash equivalents, short-term investments (bank deposits and financial assets at fair value) and restricted cash.

Highly Experienced Senior Leadership

Dror Ben-Asher, Chief Executive Officer

P.C.M.I. Ltd.

Adi Frish, Chief Corporate & Business Development Officer

Y. Ben-Dror, MediGus

Micha Ben Chorin, Chief Financial Officer

GVT, Pyramid Analytics, Starhome B.V.

Reza Fathi, PhD, Senior VP R&D

XTL, PharmaGenics, Harvard Inst. of Chem. & Cell Biology

David Wasserman, Senior VP Alliance & Project Management

Salix, Watson Pharmaceuticals, Glaxo PLC

Rob Jackson, Senior VP Sales & Marketing

Salix, Vicuron, Merck & Co.

Patricia Anderson, Senior VP Regulatory Affairs

MAPI Group, OptumInsight, Bayer, Novopharm

Steven Thomasian, VP Supply Chain

Salix, Kala Pharmaceuticals, Cemptra Pharmaceuticals

Shani Maurice, VP BD & Communications

Prime Minister's Office

Aida Bibliowicz, VP Clinical Affairs Europe

MSc Technion, MBA TAU, Cato Research Israel

Todd Krzyzaniak, VP Finance US Operations

Salix Pharmaceuticals, BioDelivery Sciences International

Gilead Raday, Chief Operating Officer

MSc Neurology, MBE Cambridge, Sepal Pharma

Guy Goldberg, Chief Business Officer

Eagle Pharma, ProQuest, McKinsey

Rick D. Scruggs, Chief Commercial Officer, Head of US Operations

Salix, Watson, Oclassen

June S. Almenoff, MD, PhD, Chief Medical Officer

Furiex, GSK, Tigenix

Mark L. Levitt, MD, PhD, Chief Scientific Officer

Teva, Sheba Medical Center, NIH

Benjamin Sloan, VP Market Access

Salix, Pear Therapeutics, Theratechnologies

Reginald Williams, VP Quality

Salix, Amgen, Eli Lilly and Merck & Co

Danielle Abramson, PhD, Senior VP Global Head of IP

Brown University, Greenberg Traurig

Michelle Snelling, VP Human Resources

Salix Pharmaceuticals, INC Research

Ben Martie, VP Legal Affairs

ViiV Healthcare (GSK), Chimex Inc.

Board of Directors and Advisory Board

Board of Directors

Dror Ben-Asher, CEO

P.C.M.I. Ltd.

Eric Swenden

Alterphama nv, Lifeline Scientific

Kenneth Reed, MD

Dermatologist; Director Minerva Biotechnologies

Shmuel Cabilly, PhD

Scientist, Director in several life-science companies

Rick D. Scruggs

Salix, Watson, Oclassen

Ofer Tsimchi

Danbar, Polysack, Director in several companies

Alla Felder

Neuroderm, PwC

Advisory Board

Prof. Thomas Borody, MD

Founder Centre for Digestive
Diseases

Werner Tschollar, MD

Past SVP for Worldwide R&D,
Novartis

Scott Harris, MD

Lyric, Avaxia, Ocera, Napo

Prof. Ran Oren, MD

Digestive and Liver expert,
Hadassah

Prof. Chezy Barenholz, PhD

Prof., Hebrew University of
Jerusalem, Co-inventor of Doxil®

Abe Schwartz

Covalon Tech., CEO Cedara
Software

Prof. Colin Blakemore, PhD

Oxford, Past CEO - UK Medical
Research Council

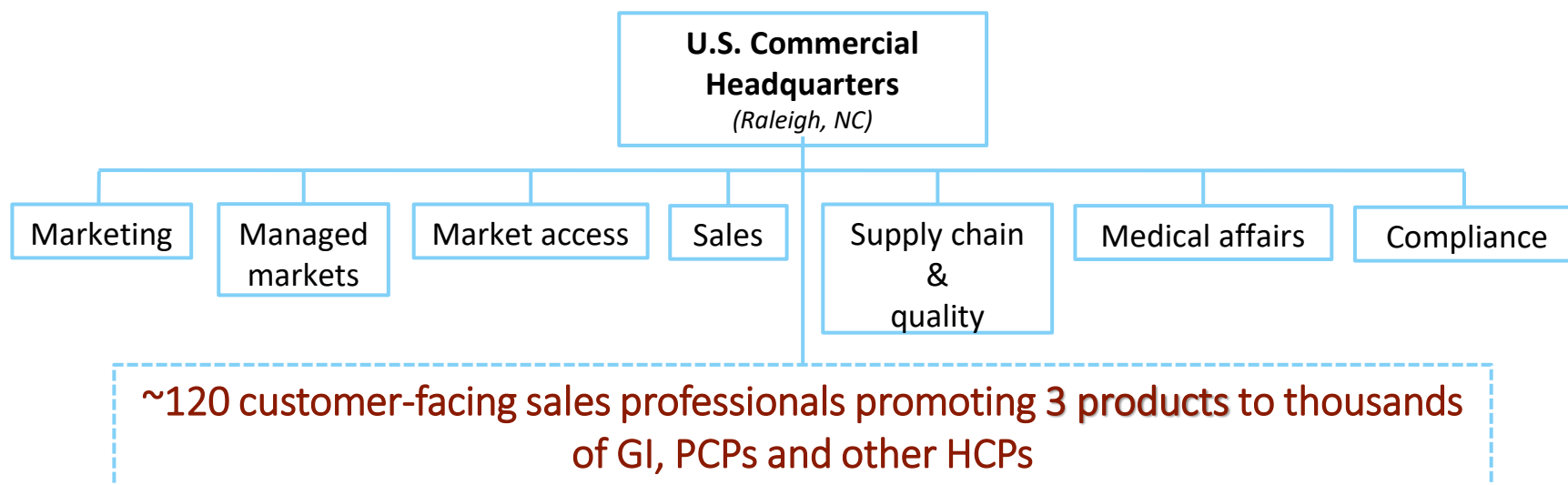
Ira Kalfus, MD

Lev pharma, Aetna/US
Healthcare

Jerry Rosenblatt, PhD

Foster Rosenblatt Consulting, IMS Health

Commercial Operations - Strong U.S. Presence



Promoting Three FDA-Approved Drugs:



Opioid-induced
constipation (OIC)



Helicobacter pylori (*H. pylori*)
infection



Travelers' diarrhea
caused by noninvasive *E. coli*

Promoting Movantik[®] since April 2020, launched Talicia[®] in Q1/20 and Aemcolo[®] in Q4/2019



Indicated for the treatment of opioid-induced constipation (OIC) in adults with chronic non-cancer pain

MOVANTIK® (naloxegol)

Important Safety Information

IMPORTANT SAFETY INFORMATION

- **MOVANTIK may cause serious side effects, including:**
 - Opioid withdrawal. You may have symptoms of opioid withdrawal during treatment with MOVANTIK, including sweating, chills, diarrhea, stomach pain, anxiety, irritability, and yawning. Patients taking methadone to treat their pain may be more likely to experience stomach pain and diarrhea. Tell your doctor if you have any of these symptoms
 - Severe Stomach Pain and/or Diarrhea. This can happen within a few days of starting MOVANTIK and can lead to hospitalization. If either of these side effects occurs, stop taking MOVANTIK and call your doctor immediately
 - Tear in your stomach or intestinal wall (perforation). Stomach pain that is severe can be a sign of a serious medical condition. If you get stomach pain that gets worse or does not go away, stop taking MOVANTIK and get emergency medical help right away
- **Do not take MOVANTIK if you:**
 - Have a bowel blockage (intestinal obstruction) or have a history of bowel blockage
 - Are allergic to MOVANTIK or any of the ingredients in MOVANTIK
- MOVANTIK can interact with other medicines and cause side effects, including opioid withdrawal symptoms (see symptoms above). Tell your doctor or pharmacist before you start or stop any medicines during treatment with MOVANTIK
- **Before you take MOVANTIK, tell your doctor about all of your medical conditions, including if you:**
 - Have any stomach, bowel (intestines) problems, including inflammation in parts of the large intestine (diverticulitis), or inflammation and injury of the intestines caused by reduced blood flow (ischemic colitis)
 - Have had recent surgery on the stomach or intestines
 - Have any kidney, or liver problems
 - Are pregnant or plan to become pregnant. Taking MOVANTIK during pregnancy may cause opioid withdrawal symptoms in you or your unborn baby. Tell your healthcare provider right away if you become pregnant during treatment with MOVANTIK
 - Are breastfeeding or plan to breastfeed. It is not known if MOVANTIK passes into your breast milk. Taking MOVANTIK while you are breastfeeding may cause opioid withdrawal in your baby. You and your healthcare provider should decide if you will take MOVANTIK or breastfeed. You should not breastfeed if you take MOVANTIK
- **Tell your doctor about all of the medicines you take**, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Other medicines may affect the way MOVANTIK works
- **If you stop taking your opioid pain medicine, stop taking MOVANTIK and tell your doctor**
- Avoid eating grapefruit or drinking grapefruit juice during treatment with MOVANTIK
- **The most common side effects of MOVANTIK include:** Stomach (abdomen) pain, diarrhea, nausea, gas, vomiting, headache, and excessive sweating

APPROVED USE FOR MOVANTIK

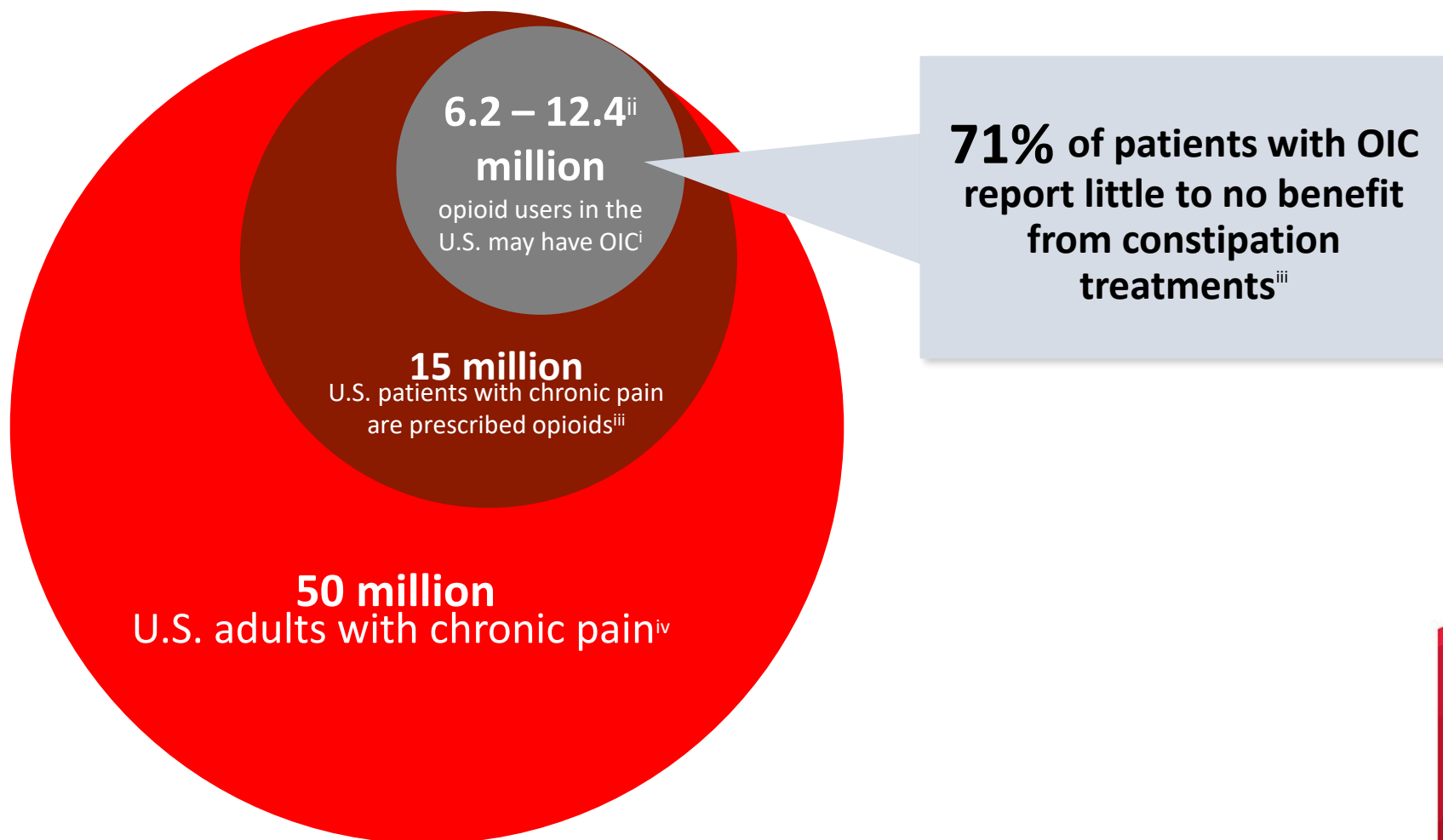
MOVANTIK is a prescription medicine used to treat constipation that is caused by prescription pain medicines called opioids, in adults with long-lasting (chronic) pain that is not caused by active cancer.

See full prescribing information for Movantik®: www.movantik.com

Movantik® - FDA-Approved for Treatment of Opioid-Induced Constipation

Approved Indication	Treatment of opioid-induced constipation (OIC) in adults with chronic non-cancer pain
Drug	Oral naloxegol tablets available in 12.5mg and 25mg dosage strengths
Approved	Approved in the U.S. in 2014 - launched in 2015 by AstraZeneca and Daiichi Sankyo
Key Attributes	✓ Specifically designed for opioid-induced constipation ✓ Favorable tolerability and safety profile ✓ Available in two doses ✓ Strong reimbursement coverage
Market Exclusivity	Patent protection extending until at least 2028

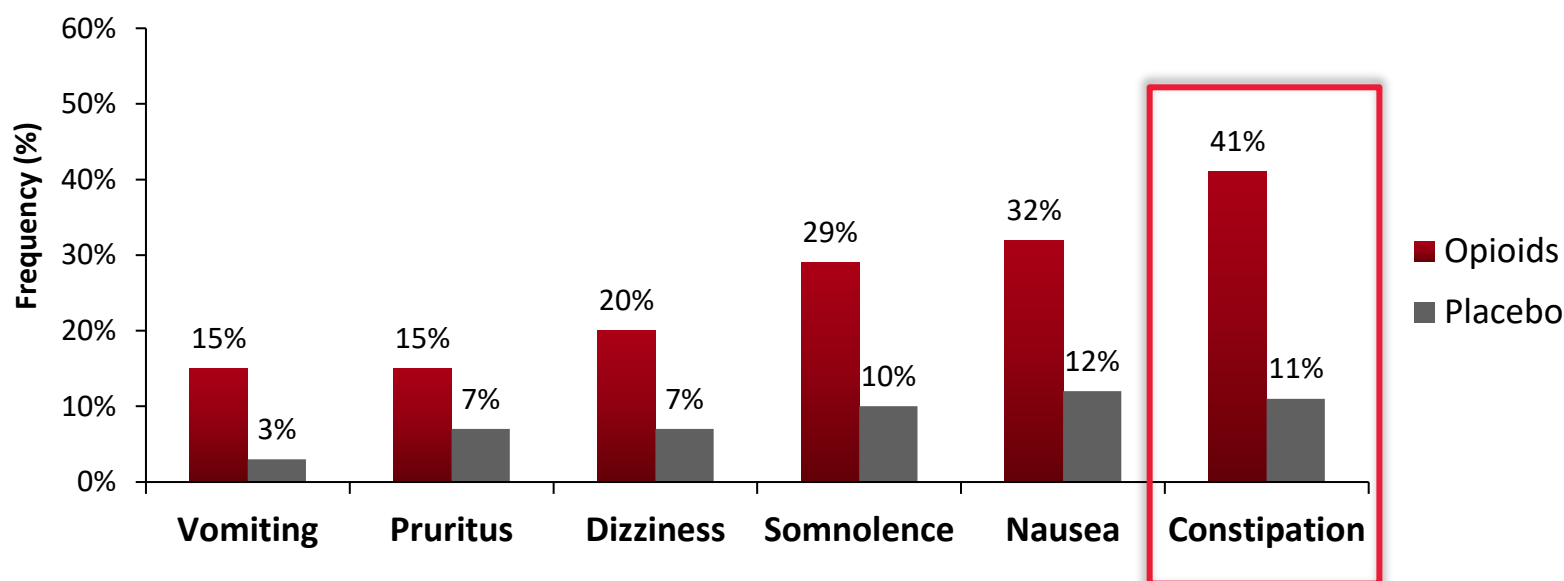
OIC is a Large and Underserved Marketⁱ



ⁱ Bell TJ et al. *Pain Med.* 2009;10(1):35-42. Dahlhamer J, Lucas J, Zelaya C et al. Prevalence of Chronic Pain and High-Impact Chronic Pain Among Adults – United States, 2016. *MMWR Morb Mortal Wkly Rep.* 2018;67:1001-1006. Accessed September 29, 2020. <https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6736a2-H.pdf>. ⁱⁱ 30.7% of patients with chronic noncancer pain are prescribed opioids. Prevalence of OIC is estimated at between 40% to 81% in patients with chronic noncancer pain. Mathieson S et al. *J Int Med.* 2020;287:458-474. ⁱⁱⁱ Constipation treatments included OTC laxatives (stool softeners, osmotics, stimulants, salines, and rectal options), prescription laxatives, and behavioral therapies (fiber supplements, increased fluids and exercise, and dietary changes). Coyne KS et al. *Clinicoecon Outcomes Res.* 2014;6:269-281. ^{iv} Vegia AR et al. *Pain Res Treat.* 2018. doi: 10.1155/2018/5704627 5. Coyne KS et al. *Clinicoecon Outcomes Res.* 2014;6:269-281.

Constipation is One of the Most Common Side Effects of Opioid Therapyⁱ

Results from a meta-analysis that included randomized controlled trials of opioid therapy in patients with chronic non-cancer pain:ⁱⁱ

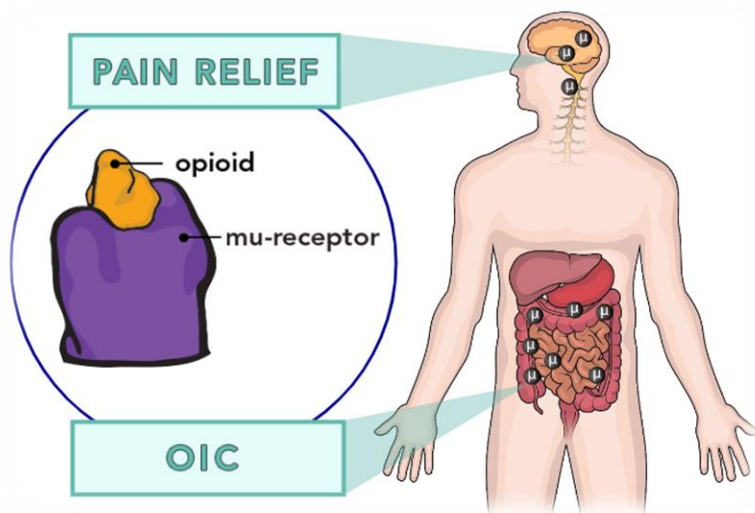


OIC Can Occur with Initiation of Opioid Therapy and May Persist for the Duration of Treatment^j

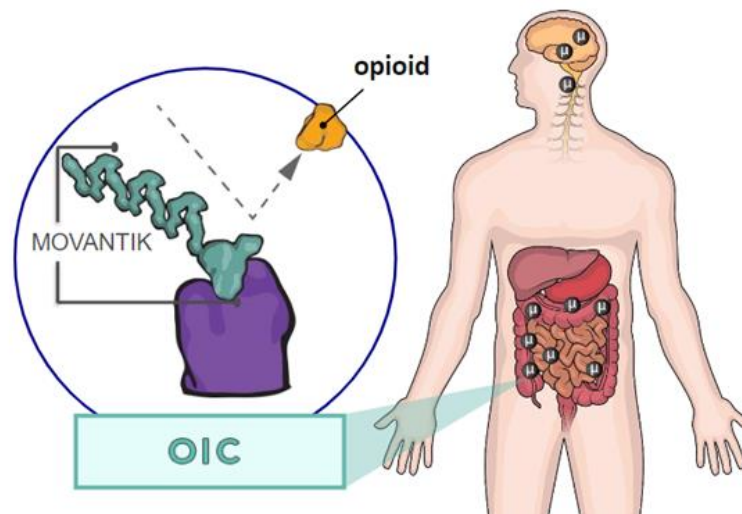
Movantik® is a Once-Daily Oral Therapy Specifically Designed to Treat OIC

Movantik functions as a peripherally acting mu-opioid receptor antagonist (PAMORA) in tissues such as the bowel, thereby decreasing the constipating effect of opioids while limiting the potential for interference with centrally mediated opioid analgesia.

OIC is caused by opioid binding to mu-receptors in the GI tract



*Movantik antagonizes opioid binding at the mu-receptor**



Movantik is a PEGylated derivative of naloxone, limiting central effectⁱ

Movantik - the #1 Prescribed Oral PAMORAⁱ



Movantik is the **market leader** in the PAMORA class – holding 73% market shareⁱ



The **#1 prescribed** oral PAMORA specifically designed to treat OIC, with over ~3 million prescriptions written since its launch in 2015ⁱ



The American Gastroenterological Association recommends the use of Movantik as one of the prescription options for management of OICⁱⁱ



Movantik is the preferred and unrestricted brand on a major National Medicare Part D formulary serving over 10 million Americansⁱⁱⁱ

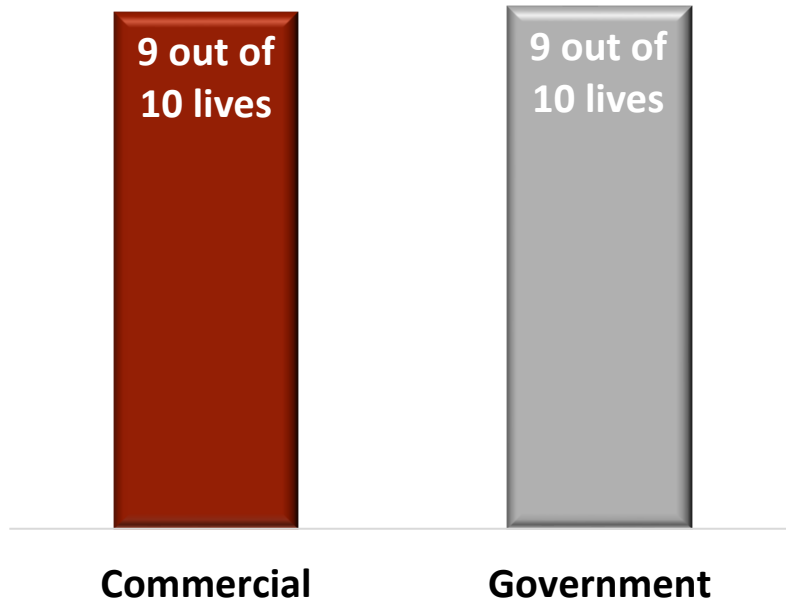
Movantik Acquisition - A Transformative Event for RedHill

RedHill acquired the global rights to Movantikⁱ (excluding Europe and Canada) from AstraZeneca in April 2020

- RedHill benefits from the large investment made by AstraZeneca to make Movantik a brand leader
 - First oral PAMORA approved in the U.S. for the treatment of OIC
- **RedHill is enhancing focus to grow Movantik**
 - Movantik prescription (TRx) growth led by RedHill promotion, reversing the trend of prescription decline prior to RedHill acquisition
 - Marketing investments to grow the PAMORA market
 - Best in class payer coverage
 - Focused RedHill execution in Pain segment

Continued Best Coverage in PAMORA Class

Movantik Lives Covered



- ✓ Best coverage without restrictions in the PAMORA class for both Commercial and Government segments
- ✓ 9 out of 10 commercially insured patients can access Movantik
- ✓ Improved both Commercial and Medicare Part D coverage YoY since acquiring Movantik
- ✓ Continue to identify opportunities to increase or enhance coverage

Talicia®

(omeprazole magnesium,
amoxicillin, and rifabutin)
delayed-release capsules

Indicated for the treatment of *Helicobacter pylori* infection in adults

***Approved for Marketing by U.S. FDA Following Two Positive Phase 3 Studies
Launched in the U.S.***



Talicia® (omeprazole magnesium, amoxicillin and rifabutin)

Important Safety Information

Talicia contains omeprazole, a proton pump inhibitor (PPI), amoxicillin, a penicillin-class antibacterial, and rifabutin, a rifamycin antibacterial. It is contraindicated in patients with known hypersensitivity to any of these medications, any other components of the formulation, any other beta-lactams or any other rifamycins.

Talicia is contraindicated in patients receiving delavirdine, voriconazole or rilpivirine-containing products.

Serious and occasionally fatal hypersensitivity reactions have been reported with omeprazole, amoxicillin and rifabutin.

Acute Tubulointerstitial Nephritis has been observed in patients taking PPIs and penicillins.

Clostridioides difficile-associated diarrhea has been reported with use of nearly all antibacterial agents and may range from mild diarrhea to fatal colitis.

Talicia may cause fetal harm and is not recommended for use in pregnancy. It may also reduce the efficacy of hormonal contraceptives. An additional non-hormonal method of contraception is recommended when taking Talicia.

Talicia should not be used in patients with hepatic impairment or severe renal impairment.

Cutaneous lupus erythematosus and systemic lupus erythematosus have been reported in patients taking PPIs. These events have occurred as both new onset and exacerbation of existing autoimmune disease.

The most common adverse reactions ($\geq 1\%$) were diarrhea, headache, nausea, abdominal pain, chromaturia, rash, dyspepsia, oropharyngeal pain, vomiting, and vulvovaginal candidiasis.

Talicia® - Approved by U.S. FDA for Treatment of *H. pylori* Infection in Adults

Approved Indication	Treatment of <i>H. pylori</i> infection in adults
Drug	Omeprazole magnesium, amoxicillin and rifabutin 10 mg ⁱ / 250 mg/ 12.5 mg delayed-release capsules ⁱ
Approved	NDA approved by U.S. FDA in November 2019 - launched in March 2020
Key Attributes	✓ Addresses concerns of resistance to clarithromycin and metronidazole ✓ Favorable tolerability and safety profile ✓ Aims to become the new first-line standard-of-care with broader indication ✓ All-in-one capsule: supports ease of adherence and compliance, with a single co-pay
Market Exclusivity	– Eligible for extended market exclusivity for total of 8 years under QIDP designation – Patent protection extending until at least 2034
Market Size	– Affects over 50% of the world population, with ~2 million U.S. patients treated annually – 2018 U.S. and global markets estimated at up to \$1.4 billion and \$4.8 billion respectivelyⁱⁱ – Rapid expansion of the prescriber base with record quarterly nTRx volume in Q4/21 – High levels of commercial (8/10 lives) and Government (6/10 lives) coverage

ⁱEach delayed-release capsule contains omeprazole 10 mg (equivalent to 10.3 mg omeprazole magnesium), amoxicillin 250 mg, and rifabutin 12.5 mg ⁱⁱFoster Rosenblatt market analysis, October 2018

Talicia Field Promotion Initiated July 2020

RedHill's U.S. sales force promoting Talicia® to approx. 25,000 gastroenterologists, primary care physicians and other healthcare providers

Rapid expansion in managed care coverage since launch

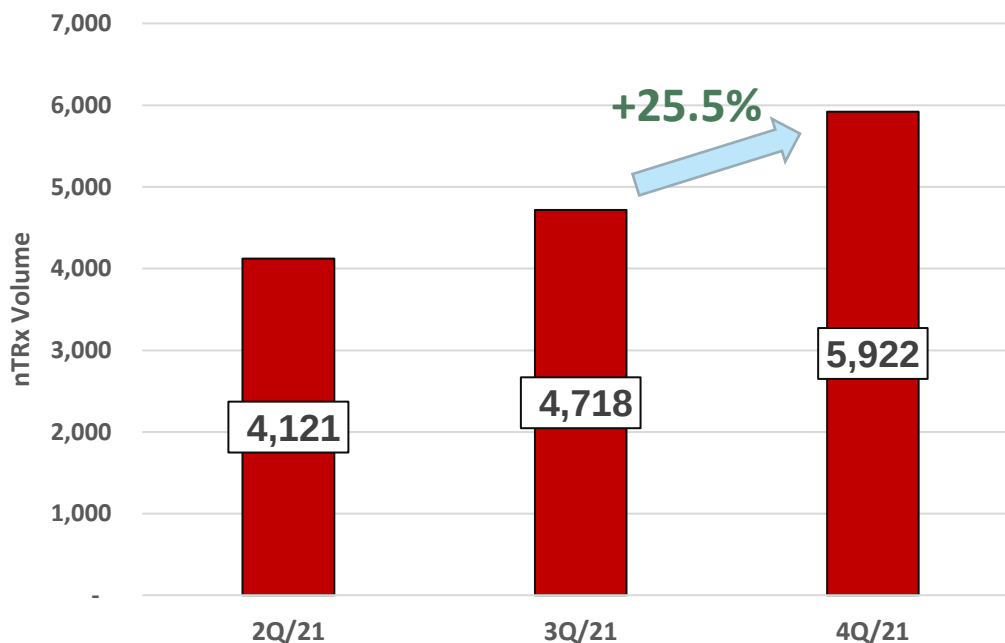
Talicia is the #1 Prescribed Branded *H. pylori* Therapy in the U.S.ⁱ

The screenshot displays the Talicia website. At the top left is the Talicia logo, which includes a stylized red and blue wave icon followed by the word "Talicia" in blue. Below the logo, the text reads: "(omeprazole magnesium, amoxicillin, and rifabutin) delayed-release capsules". To the right of the logo are two buttons: "Full Prescribing Information" in a dark blue box and "Important Safety Information" in a red box with a right-pointing arrow. Below these buttons is a small text box stating: "Talicia contains omeprazole, a proton pump inhibitor (PPI), amoxicillin a penicillin-class antibacterial and rifabutin, a". A navigation bar below the logo contains links: "Home", "The Challenge of *H. pylori*", "Efficacy", "Safety", "Dosing & Administration", "Information for Patients", and "Savings Program". The main content area features a dark background with the text "For the treatment of *Helicobacter pylori* infection in adults" in red. Below this is the headline "Outsmart Resistance. Eradicate *H. pylori*." in white. To the left of the headline is an image of a Talicia product box and a bottle. The box is white and blue, labeled "Talicia (omeprazole magnesium, amoxicillin, and rifabutin) delayed-release capsules 10 mg/250 mg/12.5 mg" and "2 BOTTLES x 34 CAPSULES". The bottle is white with a blue cap, labeled "Talicia" and "34 CAPSULES". To the right of the headline is a large graphic of a black bomb with orange sparks and a red, tentacle-like organism emerging from it. The tentacles are red and have many thin, hair-like appendages.

RedHill Delivered **25.5%** nTRx Q/Q Talicia Growth in Q4/21

Talicia Growth Initiatives:

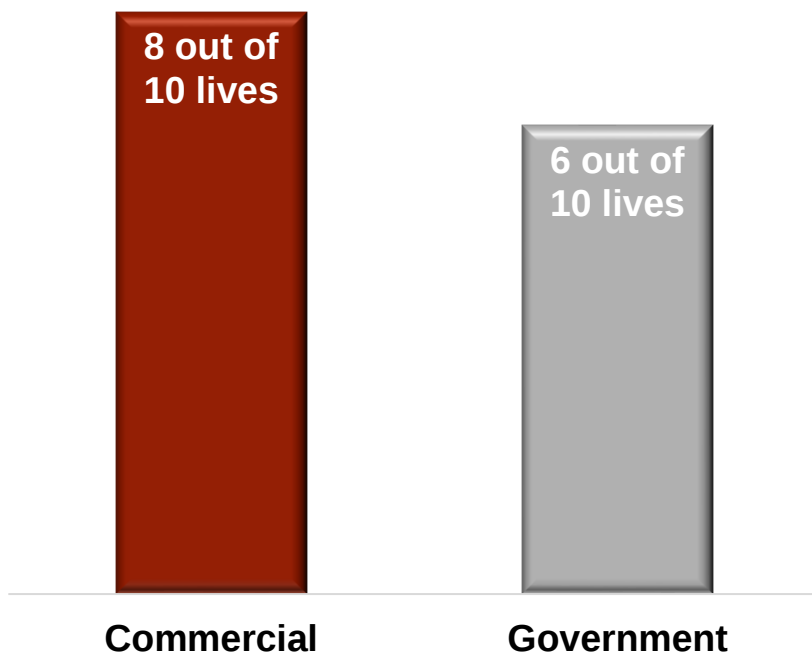
- ✓ Focus on field execution
- ✓ Expanding payor coverage
- ✓ Increase office access



Continued Quarter-over-Quarter Growth Despite Pandemic Conditions

Talicia Coverage Continues to Expand

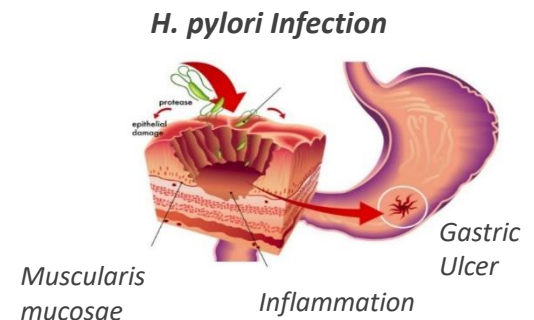
Talicia Lives Covered



- ✓ 14 million Medicaid lives in California now follow the contract drug list, expanding preferred, unrestricted coverage for Talicia
- ✓ The addition of Talicia to MediCal Rx will increase unrestricted Medicaid coverage by 12% starting Q1/22
- ✓ Efforts are underway to expand Medicaid coverage in select states
- ✓ We continue to execute on our overall coverage strategy for Talicia

H. pylori infection → Progressive gastro-duodenal damage

- *H. pylori* - a Group I carcinogen and the strongest risk factor for gastric cancerⁱ and peptic ulcer disease; Also associated with iron deficiency, B12 deficiency and drug malabsorption
 - Gastric cancer - a leading cause of cancer mortality worldwide, accounting for ~700K deaths annually
 - Eradication of *H. pylori* infection reduces gastric cancer riskⁱⁱ by about 75%
- U.S. *H. pylori* prevalence estimated at approx. 35% of the population - over 100 million peopleⁱⁱⁱ, with an estimated 2 million patients treated annually^{iv}
- SoC fails in approximately 25-40% of patients due to growing resistance to clarithromycin and metronidazole - antibiotics commonly used in standard combination therapies^v
- **American College of Gastroenterology (ACG) guidelines generally exclude the majority of U.S. population from treatment with SoC** - recommending against clarithromycin-based triple SoC therapies in cases of prior macrolide exposure (most of the U.S. population), in regions with unknown clarithromycin resistance (most U.S. regions) or regions with $\geq 15\%$ clarithromycin resistance^{vi}
 - Failed antibiotic treatments create newly-resistant bacteria^{vii}



ⁱLamb A et al. Role of the *Helicobacter pylori*-induced inflammatory response in the development of gastric cancer. *J Cell Biochem* 2013 Mar;114(3):491-7; ⁱⁱKumar S et al. Risk Factors and Incidence of Gastric Cancer After Detection of *Helicobacter pylori* Infection: A Large Cohort Study, *Gastroenterology* 2019. ⁱⁱⁱHooi JKY et al. Global Prevalence of *Helicobacter pylori* Infection: Systematic Review and Meta-Analysis. *Gastroenterology* 2017;153:420-429; ^{iv}IQVIA Custom Study for RedHill Biopharma, 2019; ^vMalfertheiner P. et al. Management of *Helicobacter pylori* infection - the Maastricht IV/ Florence Consensus Report, *Gut* 2012;61:646-664; O'Connor A. et al. Treatment of *Helicobacter pylori* Infection 2015, *Helicobacter* 20 (S1) 54-61; Venerito M. et al. Meta-analysis of bismuth quadruple therapy versus clarithromycin triple therapy for empiric primary treatment of *Helicobacter pylori* infection. *Digestion* 2013;88(1):33-4; ^{vi}Chey, WD et al. *Am. J. Gastroenterol* 2017; 112: 212-38. ^{vii}Nishizawa T et al. Enhancement of Amoxicillin Resistance after Unsuccessful *Helicobacter pylori* Eradication. *Antimicrob. Agents Chemother.* 2011, p. 3012-3014.

H. pylori Resistance - An Important Public Health Concern

WHO: *H. pylori* ranked as pathogen with “high priority” need for new treatments

- February 2017 - WHO publishes global priority pathogen list
- Intended to identify the most important resistant bacteria at a global level for which there is an urgent need for new treatments

- H. pylori* (clarithromycin-resistant) categorized as a pathogen for which there is a High Priority need to develop new treatments**

- H. pylori* added as a known human carcinogen to the 2021 HHS Report on Carcinogensⁱ

Enterococcus faecium,
vancomycin-resistant

Staphylococcus aureus,
methicillin-resistant,
vancomycin intermediate
and resistant

***Helicobacter pylori*,**
clarithromycin-resistant

Campylobacter,
fluoroquinolone-resistant

Salmonella spp.,
fluoroquinolone-resistant

Neisseria gonorrhoeae,
3rd generation
cephalosporin-resistant,
fluoroquinolone-resistant

FDA: *H. pylori* identified under the GAIN Act as pathogen posing serious threat to public health

- Talicia® received FDA QIDP designation under the GAIN Act for serious or life-threatening infections
- Priority Review
- Extended market exclusivity for a total of 8 years

The three new qualifying
pathogens are:

Coccidioides species

Cryptococcus species

Helicobacter pylori

All 18 of the original draft
pathogens remain on the
list

Positive Pivotal Phase 3 Study

Randomized, Double-Blind, Active Comparator, Two-Arm, Pivotal Phase 3 Study (ERADICATE Hp2), Comparing Talicia® Against a Regimen of Amoxicillin and Omeprazole Alone in the Treatment of Confirmed *H. pylori* Infection in Dyspepsia Patients, Regardless of Ulcer Status

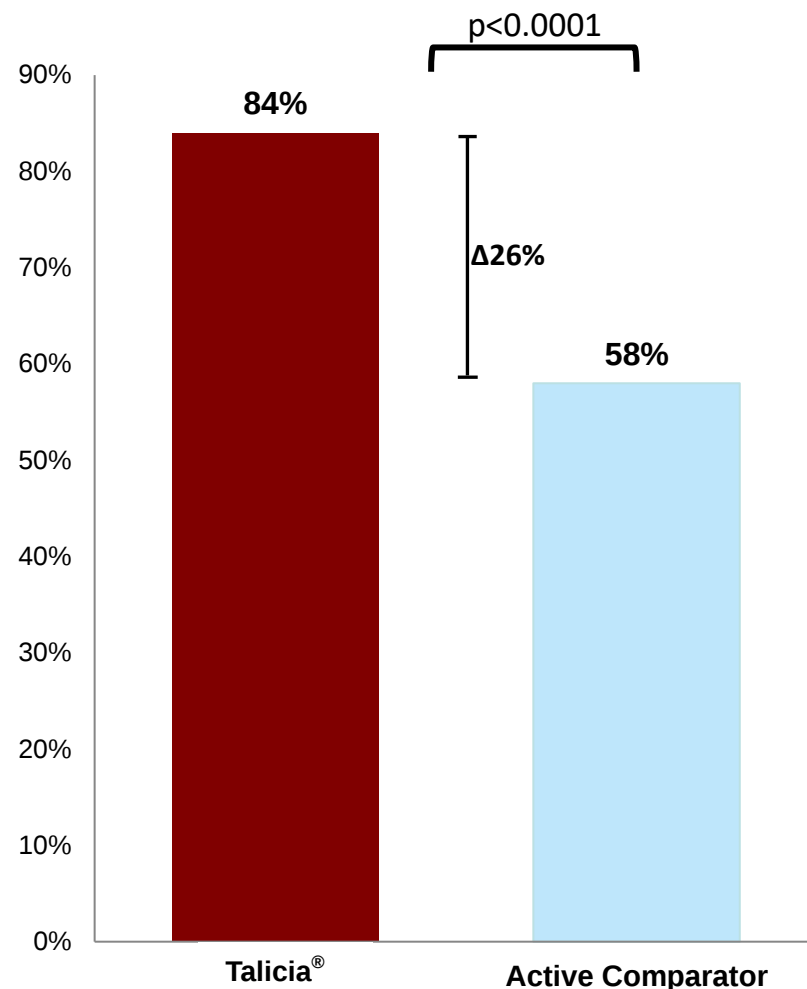
Number of subjects	455 in the U.S.
Duration of Study Treatment	14 days
Primary Endpoint	- The occurrence of <i>H. pylori</i> eradication in the Talicia® group compared to the active comparator group as confirmed via ¹³ C Urea Breath Test (UBT) testing 43-71 days after initiation of treatment

Positive Pivotal Phase 3 Study

The ERADICATE Hp2 study met its primary endpoint with a high degree of statistical significance ($p < 0.0001$)

- Top-line results demonstrated 84% eradication of *H. pylori* with Talicia® vs. 58% in the active comparator arm ($p < 0.0001$) (ITT)
- **90% eradication** based on adherence analysis (protocol defined subpopulation with evidence of drug exposure: designated as PK population)
- No serious safety issues were reported in the study; Talicia® found to be well-tolerated

Analysis*	Phase 3 Results - Talicia vs. Active Comparator	p-value
ITT Population	84% vs. 58%	$p < 0.0001$
mITT Population	84% vs. 58%	$p < 0.0001$
PK population (evidence of drug exposure)	90% vs. 65%	$P < 0.0001$



ⁱ ITT population included all randomized patients who received at least one dose of study drug; PK population included those subjects in the ITT population who had demonstrated presence of any component of investigational drug at Visit 3 (approx. day 13) or had undetected levels drawn >250 hours after the last dose.

Resistance Patterns in Pivotal Study Demonstrate Zero to Negligible Resistance For Component Antibiotics in Talicia®

H. pylori Resistance to Standard-of-Care

- H. pylori* culture results from patients across 20 U.S. states supported the high resistance of *H. pylori* to the antibiotics most commonly used for treatment -

Antibiotic	<i>H. pylori</i> Resistance Rate
Metronidazole	44%
Clarithromycin	17%
Amoxicillin	6%
Rifabutin	0%

- Consistent with the literatureⁱ describing the diminished efficacy of standard-of-care therapies, open-label part of the study showed 53% eradication of *H. pylori* with standard-of-careⁱⁱ
- Consistent 21-29% treatment benefit of Talicia® vs. the active comparator across all *H. pylori* culture susceptibility and resistance subgroups

ⁱ Fallone CA et al. The Toronto Consensus for the Treatment of Helicobacter pylori Infection in Adults. Gastroenterology 2016;151:51–69.

ⁱⁱ N=90; therapy in open-label part with patients who failed eradication was determined by the treating physician

Positive First Phase 3 Study

A Randomized Placebo-Controlled Phase 3 Study (ERADICATE Hp) to Assess the Safety and Efficacy of Talicia® in the Treatment of Confirmed *H. pylori* Infection in Dyspepsia Patients, Regardless of Ulcer Status

Number of Subjects	118 in the U.S.
Treatment Duration	14 days
Primary Endpoints	- The occurrence of <i>H. pylori</i> eradication as confirmed via 13C UBT testing 28-35 days after completion of treatment - Superiority in eradication of <i>H. pylori</i> infection over historical standard of care efficacy levels of 70% effectiveness
Positive Phase 3 Results	- Study met protocol-defined primary endpoint - demonstrating 89.4% efficacy in eradicating <i>H. pylori</i> infection ($p < 0.001$) - 63% eradication rate demonstrated in open-label treatment of treatment naïve placebo-arm patients with physician choice therapy (mostly standard of care (SoC)) for persistent <i>H. pylori</i> infection – supporting the potential superior efficacy of Talicia - No serious adverse events related to the drug were noted in the study

Strong Protection from Competition and Substitution

- FDA QIDP designation providing eligibility for a total of **8 years of market exclusivity**
- Talicia is covered by U.S. patents covering the unique 'all-in-one' capsule formulation and distinct PK profile, **extending until at least 2034**, with additional pending patents and applications in various territories worldwide
- Clear dosing differentiation versus available commercial options; rifabutin dosing (50mg tid) not commercially available and cannot be replicated by prescribers
- Acute use with low sensitivity for price differences → low incentive for substitution
- Indication allowing unique labeling, marketing and promotional opportunity
- 'All-in-one' easy to use regimen with single co-pay preferred over more cumbersome regimens

Talicia® - Clear Clinical Differentiation Provides Large Potential for Market Opportunity in the U.S. and WW

High Prevalence of *H. pylori*

Over 27M treatments
annually WWⁱ:
U.S.: 2M
5EU: up to 3.2M
Japan: up to 1.4M
China: up to 4.1M

Diminished Efficacy of Standard-of-Care - Approx. 60%

Growing *H. pylori*
resistance has led to
diminished efficacy of
current standard-of-care

Current Brand Medications Lack Clinical Differentiation

Current brands provide
only modest convenience
improvement vs. generics

\$4.8B Global Market

Annual U.S. market for
H. pylori therapies
estimated at \$1.4Bⁱ

Talicia® - Potential First-Line Therapy Targeting up to \$1.4B U.S. Market

- **Efficacy** - demonstrated clinical activity with high statistical significance in eradicating *H. pylori* in U.S. pivotal Phase 3 study
- **Addresses concerns of resistance** to clarithromycin and metronidazole
- **Attractive tolerability profile**
- **Potential to become preferred first-line treatment**
- **First all-in-one fixed-dose** - simple regimen potentially improves compliance and efficacy; Additional protection against generic substitution; Single co-pay



Indicated for the treatment of travelers' diarrhea caused by noninvasive strains of *E. coli* in adults

***Approved for Marketing by U.S. FDA
Launched in the U.S. by RedHill - December 2019***



Aemcolo® (rifamycin) - Important Safety Information

INDICATION AND IMPORTANT SAFETY INFORMATION

Aemcolo® is indicated for the treatment of travelers' diarrhea caused by noninvasive strains of *Escherichia coli* (*E. coli*) in adults.

Limitations of Use

Aemcolo® is not indicated in patients with diarrhea complicated by fever or bloody stool or due to pathogens other than noninvasive strains of *E. coli*.

To reduce the development of drug-resistant bacteria and maintain the effectiveness of Aemcolo® and other antibacterial drugs, Aemcolo® should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible bacteria.

CONTRAINDICATION

Aemcolo® is contraindicated in patients with a known hypersensitivity to rifamycin, any of the other rifamycin class antimicrobial agents, or any of the components in Aemcolo®.

WARNINGS AND PRECAUTIONS

Risk of Persistent or Worsening Diarrhea Complicated by Fever and/or Bloody Stool

Aemcolo® was not shown to be effective in patients with diarrhea complicated by fever and/or bloody stool or diarrhea caused by pathogens other than *E. coli* and is not recommended for use in such patients.

Discontinue Aemcolo® if diarrhea gets worse or persists more than 48 hours and consider alternative antibacterial therapy.

Clostridium difficile-Associated Diarrhea (CDAD)

CDAD has been reported with use of nearly all antibacterial agents and may range in severity from mild diarrhea to fatal colitis.

Consider CDAD in all patients who present with diarrhea following antibacterial drug use. Careful medical history is necessary since CDAD has been reported to occur over two months after the administration of antibacterial agents.

Development of Drug-Resistant Bacteria

Prescribing Aemcolo® in the absence of a proven or strongly suspected bacterial infection or a prophylactic indication is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

ADVERSE REACTIONS

Discontinuation of Aemcolo® due to adverse reactions occurred in 1% of patients. The most frequent adverse reactions were abdominal pain (0.5%) and pyrexia (0.3%).

Adverse reactions that occurred in at least 2% of Aemcolo®-treated patients and with a higher incidence than in the placebo or ciprofloxacin groups were constipation 3.5% and headache 3.3%, respectively.

USE IN SPECIFIC POPULATIONS

Pregnancy

There are no available data on AEMCOLO use in pregnant women to inform any drug associated risks for major birth defects, miscarriage, or adverse maternal or fetal outcomes.

Lactation

There is no information regarding the presence of AEMCOLO in human milk, the effects on the breastfed infant, or the effects on milk production.

Pediatric Use

The safety and effectiveness of AEMCOLO has not been established in pediatric patients <18 years of age.

See Full prescribing information for Aemcolo® is available at www.aemcolo.com

Launched by RedHill in the U.S. - December 2019

- A rifamycin antibacterial approved by U.S. FDA in Nov. 2018 for the treatment of travelers' diarrhea caused by noninvasive strains of *E. coli* in adults
- In-licensed U.S. rights from Cosmo Pharmaceuticals N.V. in Oct. 2019
- Robust U.S. patent portfolio and FDA QIDP designation, with U.S. marketing exclusivity through 2028
 - ✓ Minimally absorbed
 - ✓ Targeted delivery system
 - ✓ Proven efficacy against *E. coli*
 - ✓ Reliable safety and tolerability
 - ✓ Simple BID dosing



High Travel Spending Per Person in the U.S. Points to Significant Commercial Opportunity

Travelers' diarrhea is a significant market:

- Approximately **93 million** Americans travel abroad in 2018, of which **60 million** traveled to medium to high risk regionsⁱ
- Travelers' diarrhea may affect up to **70%** of travelers depending on destination and season of travelⁱⁱ
- **> 1/3** of those travelers are seeking health advice prior to leavingⁱⁱⁱ
- **52%** of travelers travel with OTC meds for gastro ailments and **28%** travel with a prescription antibiotic^{iv}
- The International Society of Travel Medicine (ISTM) recommends **traveling with an antibiotic for self-treatment** when visiting developing regionsⁱⁱⁱ

ⁱ <https://travel.trade.gov/view/m-2018-O-001/index.html>; ⁱⁱ CDC Yellow Book; ⁱⁱⁱ "Travel Health, Knowledge, Attitudes and Practices among United States Travelers." J Travel Med 2004; 11:23–26; ^{iv} Aemcolo survey market research, Aries Sep. 2019;

Late-Stage Development Pipeline



Opaganib – Phase 2/3

- Severe COVID-19 pneumonia
- Cholangiocarcinoma (bile duct cancer)
- Prostate cancer



RHB-107 – Phase 2/3

- Non-hospitalized symptomatic COVID-19
- Oncology



RHB-204 – Phase 3

- Pulmonary nontuberculous Mycobacteria (NTM) disease



RHB-104 – Phase 3

- Crohn's disease
- Multiple Sclerosis



RHB-102 – Phase 3

- Acute gastroenteritis & gastritis
- IBS-D



RHB-106 – Phase 2

- Bowel preparation



Opaganib (ABC294640)ⁱ

Investigational new drug

*First-in-class, orally-administered sphingosine kinase-2 (SK2) inhibitor
targeting COVID-19 and multiple oncology, inflammatory and GI
indications*

***Data reported from global Phase 2/3 study for COVID-19 - regulatory
discussions in progress***

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Positive top-line data from U.S. Phase 2 study for COVID-19

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Phase 2 studies in cholangiocarcinoma and prostate cancer ongoing

ⁱ Yeliva® is the proposed tradename for the drug product containing opaganib, which is subject to review by the FDA at the time of NDA filing

Opaganib - SK2 Inhibitor for COVID-19 and Oncology, Gastrointestinal and Inflammatory Diseases

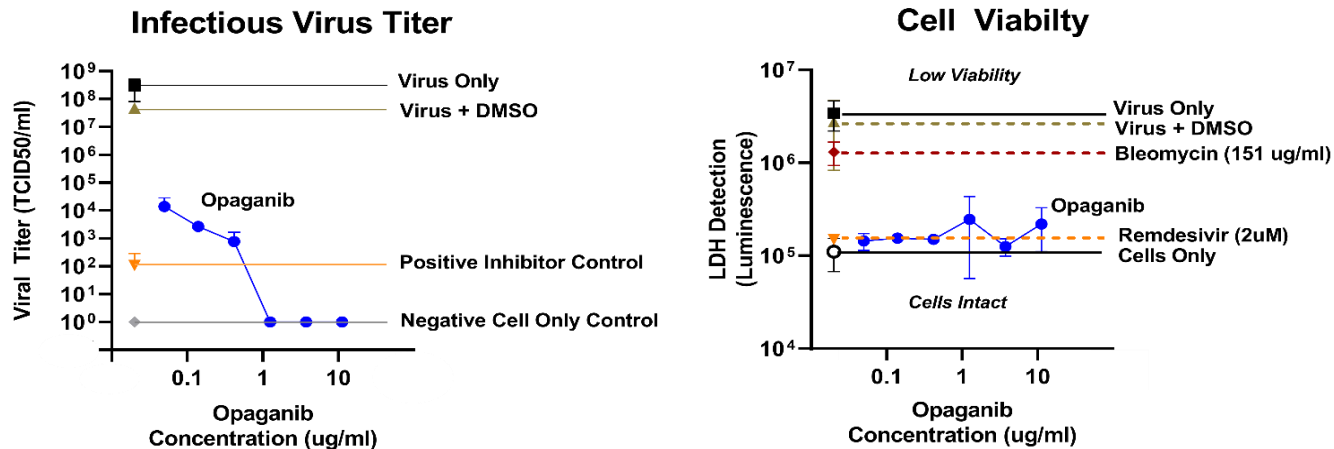
The Product	- Potential first-in-class, orally-administered sphingosine kinase-2 (SK2) inhibitor - Anti-cancer, anti-inflammatory activities, targeting multiple oncology, inflammatory and GI indications - Potent anti-viral activity, targeting a critical host factor - minimizing potential development of resistance due to viral mutations
Development Status	- Extensive pre-clinical studies in viral infection models, oncology, GI-Inflammation and radioprotection models, as well as toxicology studies - Food effect study in healthy volunteers
	- Phase 1 study in cancer patients with advanced solid tumors
	- Phase 2a study for treatment of cholangiocarcinoma ongoing - Phase 2 study analysis expected in Q2/2022 - Orphan Drug Designation for the treatment of cholangiocarcinoma
	- Investigator-sponsored Phase 2 study in prostate cancer - 40 patient Phase 2a COVID-19 study in moderate-severe patients showed signals of efficacy - Global Phase 2/3 COVID-19 study results announced - viral clearance endpoint was met; significant reduction in mortality in prespecified subgroup of patients receiving best available SoC; post hoc analysis showed reduction in mortality and other clinical endpoints in moderately severe patient subgroup

Opaganib COVID-19 Program: Overview

- ✓ **Novel oral drug candidate showing improved viral RNA clearance in patients with severe COVID-19 pneumonia**
- ✓ **Significant 70% mortality benefit when given on top of best SoC, as well as improved time to clinical recovery in a prespecified analysis of a Phase 2/3 study**
- ✓ **Demonstrated a 62% mortality reduction in a large subgroup of moderately severe hospitalized COVID-19 patients in a global Phase 2/3 post hoc analysis**
- ✓ Successful preclinical model in human lung bronchial tissue showing complete inhibition of SARS-CoV-2 viral replication as measured after three days incubation
- ✓ Successful U.S. Phase 2 study (n=40) completed in hospitalized COVID-19 patients with promising safety and efficacy signals
- ✓ Over 460 subjects treated to date with a consistently favorable safety and tolerability profile
- ✓ Targets a host cell component, Sphingosine Kinase 2 (SK2), important for RNA virus replication, **irrespective of viral mutations** in the Spike protein
- ✓ Independent anti-inflammatory activity
- ✓ Regulatory data submissions initiated in Q4/2021 in U.S., Europe, UK and additional countries; Discussions ongoing and initial guidance on confirmatory study and potential path to approval received; Company plans potential emergency and marketing authorization applications in certain countries in H1/2022

Opaganib Demonstrated Potent Antiviral Activity Against SARS-CoV-2 Variants

- Opaganib was evaluated in *in vitro* model of human lung bronchial tissue (EpiAirway™), including positive control of remdesivir:
 - Opaganib inhibited infectious virus production of SARS-CoV-2 (WA1/2020) in a dose-dependent manner at pharmacologically relevant concentrations, **with complete inhibition seen starting at 1 µg/ml**, without cytotoxicity
 - Dose-dependent inhibition of virus production shown without compromising cell membrane integrity



- Opaganib further demonstrated potent inhibition of *Delta*, *Beta* and *Gamma* SARS-CoV-2 variants in a preclinical study at non-cytotoxic doses
- New data further showed potent inhibition of *Omicron* with opaganib while maintaining host cell viability in an *ex vivo* human respiratory explant model

Opaganib Global Phase 2/3 Study in Severe COVID-19

Global Phase 2/3 study in patients hospitalized with severe COVID-19 pneumonia

- Randomized, double-blind, parallel-arm, placebo-controlled global Phase 2/3 study
- 475 Patients randomized 1:1 to receive opaganib or placebo on top of standard-of-care
- Primary endpoint: proportion of patients reaching room air by Day 14

Top-line data demonstrated positive trends:

- Despite not meeting primary endpoint, analysis of the study efficacy endpoints showed trends in favor of the opaganib arm vs. placebo across multiple endpoints, including the primary endpoint, despite not achieving statistical significance

Post hoc analysis demonstrated statistically significant benefit to moderately severe patients, supporting potential use in earlier stages of disease:

- Analysis of 251 hospitalized, moderately severe COVID-19 patients requiring a Fraction of inspired Oxygen (FiO₂) up to 60% (54% of study participants):
 - ✓ 62% statistically significant reduction in mortality (7/117 in opaganib arm vs. 21/134 for placebo; nominal p-value=0.019, Relative Risk 2.6)
 - ✓ 21% statistically significant efficacy benefit in reaching room air by day 14 (77% of opaganib patients vs. 63.5% for placebo; nominal p-value=0.033)
 - ✓ 4-day earlier hospital discharge (10 days for opaganib vs. 14 for placebo) resulting in a total saving of 524 cumulative hospitalization days across the group by Day 42 (nominal p-value=0.0195)
 - ✓ Overall adverse events balanced between the groups, suggesting good safety

Opaganib Global Phase 2/3 Study in Severe COVID-19 - Significant Improvement in Viral Clearance

- ✓ In a prespecified analysis of all Phase 2/3 study patients with positive PCR at screening, opaganib improved median time to viral RNA clearance by at least 4 days
 - Median of 10 days for viral clearance in the opaganib arm vs. clearance median not reached by end of 14-day treatment in placebo arm (Hazard Ratio 1.34; nominal p-value=0.043, n=437/463)
- ✓ **Opaganib is a novel oral drug candidate showing improved viral RNA clearance in patients with severe COVID-19 pneumonia**
- ✓ Provides clinical evidence supporting opaganib's potential antiviral activity
- ✓ Results achieved in a severely ill hospitalized patient population with a median of 11-days from onset of symptoms - a patient population much further advanced than mild-moderate outpatients with less than 5 days from symptom onset, for which oral anti-viral medications have recently been approved

Opaganib Global Phase 2/3 Study in Severe COVID-19 - 70% Mortality Benefit in Opaganib + SoC Subgroup

- ✓ A prespecified analysis of Phase 2/3 data in severe COVID-19 patients showed a **significant 70.2% mortality benefit** with opaganib by Day 42 when given on top of the best available SoC, remdesivir and corticosteroids
 - Mortality rate of 6.98% for the opaganib + SoC arm (n=3/43) vs. 23.4% for placebo + SoC arm (n=11/47) (nominal p-value=0.034)
- ✓ A second prespecified analysis showed opaganib delivered a **significant 34% benefit in time to recovery**, defined as achieving a score of 1 or less on the WHO Ordinal Scale by Day 14
 - 37.4% of opaganib +SoC arm (n=86/230) reached this event vs. 27.9% of placebo + SoC arm (n=65/233) (nominal p-value=0.013, Hazard Ratio 1.49)

Results achieved in a severely ill hospitalized patient population with a median of 11-days from symptom onset

Opaganib Phase 2 COVID-19 Study - Positive Data

U.S. Phase 2 study of opaganib in patients hospitalized with COVID-19 pneumonia:

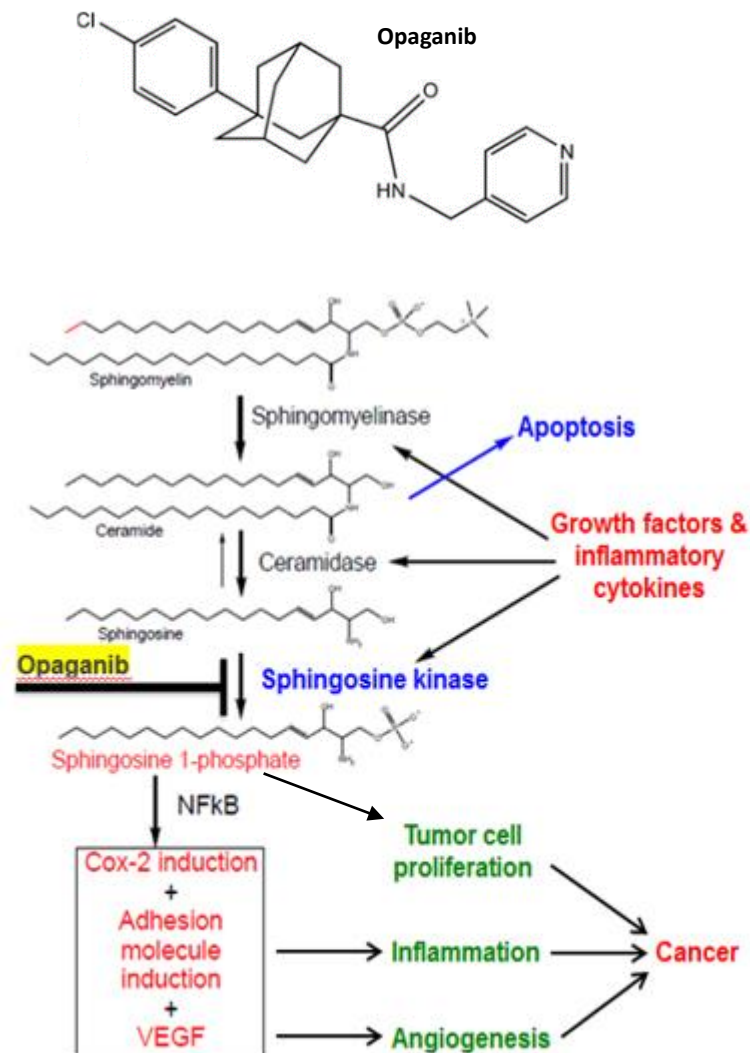
Non-powered study of 40 patients, randomized 1:1 to receive opaganib or placebo on top of standard-of-care. Follow up for up to 42 days post treatment initiation

Results demonstrated positive safety and efficacy signals:

- Opaganib found to be safe, with no material safety differences between the arms. Overall, fewer patients suffered from SAEs in the opaganib arm vs. placebo
- Opaganib arm demonstrated consistent trend of greater improvement in reducing oxygen requirement by end of treatment on Day 14 across key primary and secondary efficacy outcomes:
 - ✓ 50% of opaganib treated patients reached room air by Day 14 vs. 22% in the placebo group – benefit maintained regardless of whether patients received dexamethasone and/or remdesivir
 - ✓ 86.4% of opaganib treated patients were discharged from hospital by Day 14 vs. 55.6% of patients treated with placebo
 - ✓ Median time to discharge was 6 days for opaganib compared to 7.5 days for placebo
 - ✓ 81.8% of opaganib patients achieved a 2-point improvement in the WHO Ordinal Scale vs. 55.6% of patients in the placebo group – achieved in a median time of 6 days vs. 7.5 days, respectively
 - ✓ Greater reduction from baseline of the median total oxygen requirement (AUC) over 14 days (62% vs. 47%)

Opaganib, a Novel SK2 Selective Inhibitor

- Proprietary, first-in-class, **orally-administered, stable small molecule sphingosine kinase-2 (SK2) inhibitor**
- Opaganib is **the first clinical compound to selectively inhibit SK2**, a lipid kinase with multiple cellular functions – potentially inhibiting tumor growth, pathological inflammation, and viral replication
- SK2 inhibition differs from SK1 inhibition as **the effects are more localized intracellularly rather than dependent on the extracellular actions of Sphingosine-1-phosphate (S1P) mediated by receptors**
- SK2 impacts tumor growth and proliferation, pathological inflammation and cytokine production, including TNF α and IL-6
- SK2 is a critical component of the replication-transcription complex of several viruses. Blocking it may play a role in inhibiting viral replication



SK2 as a Specific Target for Anti-cancer Drugs

Why SK2 for Anticancer Therapy?

- SK2 is an innovative molecular target for anticancer therapy because of its critical role in catalyzing the formation of intracellular S1P, known to regulate cell proliferation and activation of inflammatory pathways
- SK2, unlike SK1, contains a pro-apoptotic BH3 binding domain which may promote apoptosis under certain conditions. Down-regulation of the kinase function of SK2 inhibits the proliferation of tumor cells
- SK2 also possesses a Pleckstrin Homology Domain allowing it to attach to membranes

Oncology Development Status

- ✓ Completed numerous successful pre-clinical studies in various oncology indications
- ✓ Phase 1 study in cancer patients with advanced solid tumors successfully met primary and secondary endpoints
- ✓ Phase 2a study for treatment of cholangiocarcinoma ongoing
- ✓ Investigator-sponsored Phase 2 study in prostate cancer - Enrollment ongoing in study arm evaluating combination with abiraterone; arm evaluating opaganib in combination with enzalutamide showed activity but did not meet primary endpoint

Opaganib - Positive Phase 1 Study

Phase 1 Clinical study of opaganib in Cancer Patients with Advanced Solid Tumors

Study Design	- Open-label, dose-escalation, PK and PD, first-in-human Phase I study with opaganib
Site	- Medical University of South Carolina
Subjects	- 21 patients with advanced solid tumors, the majority of which were GI cancer patients
Endpoints	- Primary endpoints: to identify the maximum tolerated dose (MTD) and the dose limiting toxicities (DLTs) and to evaluate the safety of opaganib - Secondary endpoints: to determine the PK and PD properties and to assess antitumor activity - The study included the first-ever longitudinal analyses of plasma S1P levels as a potential PD biomarker for activity of a sphingolipid-targeted drug
Positive Phase 1 Results (June 2016)	- The study met its primary and secondary endpoints - Opaganib was found to be safe and well tolerated as well as safely administered to cancer patients over a prolonged period at doses that provide circulating drug levels that are predicted to have therapeutic activity - Administration of opaganib resulted in a rapid and pronounced decrease in S1P levels - One patient had a prolonged partial remission and several patients had prolonged stabilization of disease - Of the three patients with cholangiocarcinoma, one had a partial response and the other two stable disease, one which lasted for over a year

Opaganib - Phase 2a Study for Cholangiocarcinoma Ongoing

Single-arm Phase 2a clinical study evaluating opaganib in patients with advanced, unresectable, intra-hepatic, perihilar and extra-hepatic cholangiocarcinoma

Sites	Mayo Clinic, MD Anderson, Huntsman Cancer Institute, Emory University
Initiated	December 2017
Lead Investigator	Dr. Mitesh J. Borad, MD, Associate Professor of Medicine and Director of Phase I Drug Development at the Mayo Clinic Cancer Center in Arizona
Development status	- Enrollment completed for stand-alone arm (39 subjects) - preliminary data indicates efficacy signal in a number of subjects; data to be submitted for presentation - Second arm evaluating opaganib in combination with hydroxychloroquine, an anti-autophagy agent - Granted Orphan Drug designation for the treatment of cholangiocarcinoma - Compassionate use for cholangiocarcinoma under Expanded Access Program - Phase 2 study analysis expected in Q2/2022
Primary endpoint	- Response Rate - defined as CR+PR+SD of at least 4 months duration
Market Size	- Approximately 8,000 people are diagnosed with intrahepatic and extrahepatic bile duct cancers annually in the U.S.



RHB-107 (upamostat)

Investigational new drug

Late-stage, first-in-class, orally-administered small molecule targeting COVID-19, oncology, inflammatory lung diseases and GI indications

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Ongoing Phase 2/3 study for COVID-19 in non-hospitalized patients in the U.S. and South Africa – Positive Phase 2 (Part A) data reported

RHB-107 - S1 Serine Protease Inhibitor with Ongoing Phase 2/3 COVID-19 Study in Non-Hospitalized Patients

The Drug	First-in-class, orally-administered inhibitor of S1 family of trypsin-like serine proteases with potential for use in the treatment of cancer, inflammatory lung diseases, irritable bowel syndrome, inflammatory bowel disease and pancreatitis
	RHB-107 is a specific and potent inhibitor of human trypsin-3 ($K_i \sim 20\text{nM}$), trypsin-2 ($K_i \sim 75\text{nM}$), trypsin-6 ($\sim 100\text{nM}$), trypsin-1 ($K_i \sim 190\text{nM}$) and matriptase-1 ($\sim 200\text{nM}$)
	RHB-107 also inhibits a specific inhibitor of a number of members of the type II transmembrane serine proteases (TTSPs), some of which are important factors in the spread of infectious disease, including, matriptase, TMPRSS11, HAT-like 5 (HATL5), HAT, TMPRSS2 and hepsin
	Licensed worldwide rights from Heidelberg Pharma (formerly Wilex), excluding China, Taiwan, Macao and Hong Kong
Development Status	– Phase 2/3 study in non-hospitalized patients with symptomatic COVID-19 ongoing in U.S. and South Africa; Phase 2 (Part A) of the study met its primary endpoint showing good safety and tolerability – In addition, highly promising efficacy results were noted
	– Demonstrated clinical safety profile from approx. 240 patients across 11 clinical studies, including Phase 2 studies in locally advanced pancreatic cancer and metastatic breast cancer
	– FDA Orphan Drug Designation awarded for treatment of pancreatic cancer
	– RHB-107 planned to be evaluated in combination with opaganib in oncology
	– Regulatory discussions are expected during Q2/2022

RHB-107 - Ongoing Phase 2/3 COVID-19 Study

**Ongoing Phase 2/3 study with RHB-107 in non-hospitalized patients with symptomatic COVID-19 not requiring supplemental oxygen
(Phase 2, Part A completed)**

- ✓ **Study design:** 2-part, multicenter, randomized, double-blind, placebo-controlled, parallel-group Phase 2/3 study
- ✓ **Innovative use of home-based monitoring technologies** with home nursing support allowing patients participate from home
- ✓ **Clinical endpoints:** Hospitalization, mortality, time to sustained recovery
- ✓ Patients will be tested for specific viral strain
- ✓ Conducted in U.S. and South Africa

We expect that RHB-107 will be effective against emerging viral variants with mutations in the spike protein

- ✓ Once-daily orally-administered treatment early in course of disease, with demonstrated clinical safety
- ✓ Targets serine proteases - human cell factors involved in viral entry - expected to be insensitive to mutations in spike protein, including the emerging Omicron variant
- ✓ Demonstrated potent inhibition of SARS-CoV-2 viral replication in pre-clinical model of human bronchial tissue

RHB-107 – Positive Phase 2 COVID-19 Study

Phase 2 (Part A) study in non-hospitalized COVID-19:

- ✓ The study was designed to evaluate safety for dose selection and provide preliminary assessment of parameters to be used for efficacy evaluation (Part B)
- ✓ 61 patients were enrolled and randomizedⁱ on a 1:1:1 basis to receive one of two dose levels of RHB-107 or placebo



The primary endpoint was met, demonstrating good safety, tolerability, and promising efficacy signals:

- ✓ 100% reduction in hospitalization due to COVID-19 – with zero patients (0/41) on the RHB-107 arms vs. 15% (3/20) hospitalized on the placebo-controlled arm
- ✓ 87.8% reduction in severe new COVID-19 symptoms after treatment initiation – with only one patient in the RHB-107 treated group 2.4%, (1/41) vs. 20% (4/20) of patients in the placebo-controlled arm
- ✓ The most common variant was Delta

ⁱ Study arms were well balanced with respect to baseline disease severity, risk factors and vaccination status.



RHB-204

Investigational new drug

Targeting pulmonary nontuberculous Mycobacteria (NTM) disease - with Orphan Drug designation, QIDP designation, including Fast-Track development status

U.S. Phase 3 Study Ongoing

RHB-204 - Targeting First-Line Pulmonary NTM Disease

Planned Indication	- Pulmonary nontuberculous mycobacteria (NTM) disease caused by Mycobacterium avium Complex (MAC)
The Product	- Patent-protected, fixed-dose, all-in-one combination of three antibiotic drugs: clarithromycin, clofazimine and rifabutin – each known to be active against NTM disease caused by MACⁱ
Key Attributes	- Targeting first-line treatment - potential new standard-of-care for a disease with no FDA-approved first-line therapy - Convenient stand-alone oral therapy for a chronic disease requiring extended treatment - Unique dosing combination - optimizing exposure for safety and efficacy
Market Size	- U.S. market potential estimated at approx. \$660M in 2022ⁱⁱ
Development Status	- Phase 3 study ongoing - QIDP and Fast-Track Designation granted, providing eligibility for rolling NDA review, Priority Review and accelerated approval - Orphan Drug designation extends potential U.S. market exclusivity to a total of 12 years post-approval

RHB-204 for Pulmonary NTM - Background and Epidemiology

- **Difficult to treat infection with no FDA-approved first-line standard-of-care**
- NTM are a ubiquitous bacteria, mostly non-pathogenic but can cause human diseaseⁱ
 - Pulmonary manifestations account for 80-90% of NTM associated diseaseⁱ
 - Approximately 80% of pulmonary NTM infections in the U.S. are associated with MACⁱⁱ
- Pulmonary NTM disease symptoms can include fever, weight loss, chronic or recurring cough, chest pain, blood in sputum and fatigueⁱⁱⁱ
- NTM have high levels of drug resistance and require long term dosing with three or more antibiotics^{iv}
- An orphan disease - with an estimated 109,000 pulmonary NTM patients in the U.S. in 2022^v



ⁱWassilew et al. (2016). Pulmonary Disease Caused by Non-Tuberculous Mycobacteria. *Respiration*, 91(5), 386–402. ⁱⁱAdjemian et al. (2012). Prevalence of Nontuberculous Mycobacterial Lung Disease in U.S. Medicare Beneficiaries. *American Journal of Respiratory and Critical Care Medicine*, 185(8), 881–886. ⁱⁱⁱGriffith et al. (2007). An Official ATS/IDSA Statement: Diagnosis, Treatment, and Prevention of Nontuberculous Mycobacterial Diseases. *American Journal of Respiratory and Critical Care Medicine*, 175(4), 367–416. ^{iv}Griffith et al. (2007). An Official ATS/IDSA Statement: Diagnosis, Treatment, and Prevention of Nontuberculous Mycobacterial Diseases. *American Journal of Respiratory and Critical Care Medicine*, 175(4), 367–416. ^vFoster Rosenblatt/Company estimates

RHB-204 - CleaR-MAC Phase 3 Study Ongoing

A Phase 3 study intended to assess the efficacy and safety of RHB-204 as a first-line, stand-alone treatment for pulmonary NTM infections caused by MAC

Study Design	- Multi-center, randomized, double-blind, two-part, placebo-controlled, parallel-group Phase 3 study; 3:2 randomization - Up to 40 U.S. clinical sites; potential expansion to UK, Japan and additional territories - Two-part study: • Part one: placebo-controlled, subjects evaluated for primary endpoints at Month 6 • Part two: Open-label treatment with RHB-204 for 10 months, with follow-up 3 months post-treatment
Patient Population	- 125 subjects with symptomatic pulmonary MAC disease with nodular bronchiectasis - An interim sample size re-estimate is planned at approx. 50% enrolment
Endpoints	- Co-primary efficacy endpoints for Part one: - Sputum culture conversion (SCC) after 6 months of treatment (consecutive negative sputum cultures at Months 4,5,6) - Quality of Life questionnaire – Bronchiectasis (QoL-B) respiratory symptoms domain score from Baseline to Month 6 vs. placebo



RHB-104

Investigational new drug

Combination therapy targeting MAP bacteria for treatment of Crohn's disease and potentially other autoimmune diseases

***Positive First Phase 3 Study in Crohn's Disease -
Study Successfully Met Its Primary Endpoint and Key Secondary Endpoints***

Potential MAPⁱ Diagnostic Progress May Enable Accelerated Clinical Development

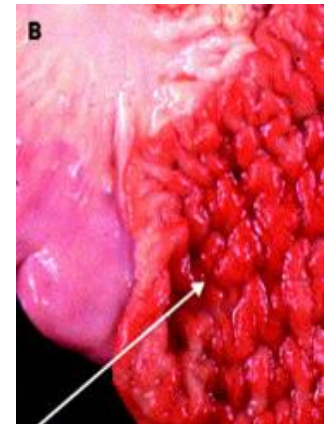
The Link between Crohn's Disease and MAP

Growing evidence that intracellular mycobacteria play a crucial role in Crohn's disease

- MAP (*Mycobacterium avium subsp. paratuberculosis*) is the causative agent of Johne's disease, an infectious disease in cattle, clinically and pathologically similar to Crohn's disease
 - An intracellular pathogen that proliferates in monocytes/macrophages
 - Extremely slow growing and widely pervasive in the environment
- Advances in diagnostic technology have led to increasingly higher identification of MAP in Crohn's diseases patients
 - 92% (34/37 Crohn's disease patients by PCR) - Bull, J Clin Microbiol, 2003
 - 86% (52/60 Crohn's disease patients) - Shafran, Dig Dis Sci, 2002
- Crohn's disease is a multifactorial disease
 - Defective innate immunity to intracellular bacteria
 - Mutations in the NOD2 gene are strongly associated with Crohn's disease
- Mycobacterial infections in humans are difficult to treat; Effective anti-mycobacterial agents require intracellular activity
 - ATS/IDSAⁱ and WHO advise triple antibiotic therapy for non-tuberculosis mycobacterial disease



Crohn's disease



Johne's disease

RHB-104 for Crohn's - Product and Market Overview

Planned Indication	Treatment of Crohn's disease in adult patients
The product	Patent-protected combination of 3 antibiotics (clarithromycin, clofazimine and rifabutin) in a single oral capsule with potent intracellular, antimycobacterial and anti-inflammatory properties
Market Size	Worldwide market estimated to exceed \$12.8 billion in 2022 ⁱ
Positive First Phase 3 Top-Line Results	Positive results from the MAP US first Phase 3 study with RHB-104 in Crohn's disease - study successfully met its primary endpoint and key secondary endpoints
Key Attributes	✓ Unique MoAs, including targeting the potential underlying cause of Crohn's ✓ Improved efficacy on top of standard-of-care ✓ Safety and tolerability enabling combining RHB-104 with standard-of-care ✓ Oral all-in-one capsule

ⁱ GlobalData Crohn's Disease Global Forecast , September 2017

RHB-104 Positive First Phase 3 Study in Crohn's - Met Primary Endpoint and Key Secondary Endpoints

Multi-center, randomized, double-blind, placebo-controlled, parallel group study (MAP US study) to assess efficacy and safety of orally-administered, fixed-dose combination RHB-104 in subjects with moderately to severely active Crohn's disease, on-top of baseline background SoC medications

Number of Subjects	331
Sites	Over 100 in the U.S., Canada, Europe, Australia, New Zealand and Israel
Primary Endpoint	State of remission at week 26
Previous Studies	- Several PK, Phase 1, 2 and 3 clinical studies conducted
Phase 3 MAP US Development Status	- Positive Phase 3 results - study met its primary endpoint and key secondary endpoints - Ongoing discussions with KOLs; FDA meeting planned to discuss design of confirmatory Phase 3 study and path to potential approval; Planned utilization of MAP Dx methods based on new literature for CD positive patients, subject to validation

RHB-104 Crohn's Disease Phase 3 - Positive Results

The MAP US Phase 3 study met its primary and key secondary endpoints, demonstrating meaningful, consistent and statistically significant clinical activity of orally-administered RHB-104 as an add-on to standard-of-care treatments

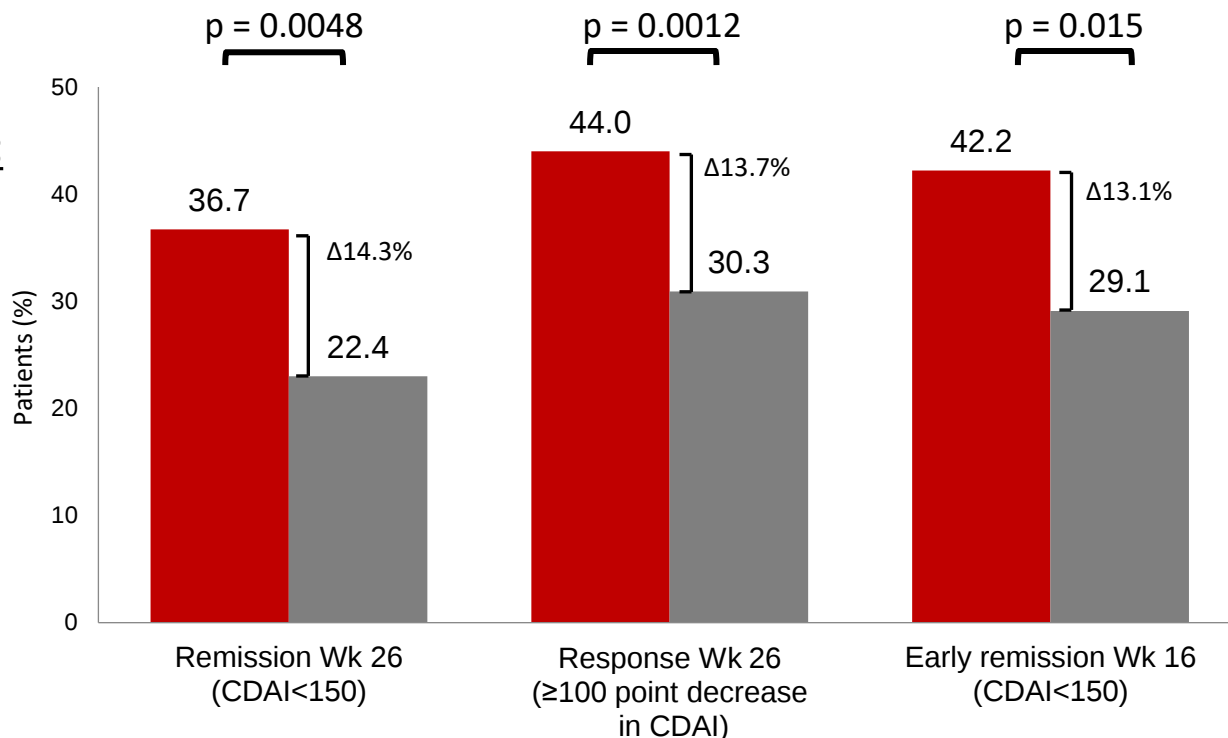
■ RHB-104 (n= 166) ■ Placebo (n=165)

Primary Endpoint Met:

- ✓ Remission at week 26

Secondary Endpoints Met:

- ✓ Response at week 26
- ✓ Early remission at week 16



ⁱ Calculated with Cochran-Mantel-Haenszel (CMH) chi-square test with stratification according to anti-TNF agents use (yes/no)

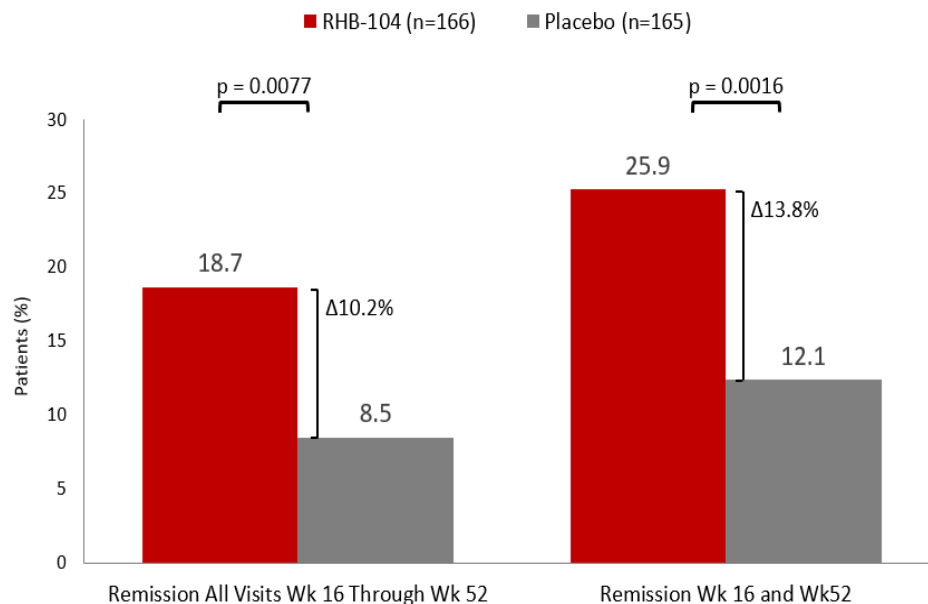
RHB-104 Crohn's Disease Phase 3 - Positive Results

Additional Endpoints Met:

- ✓ **Durable remission weeks 16-52:** statistically significant benefit in durable remission on all visits, weeks 16-52, demonstrating an improvement of 100% over placebo
- ✓ **Maintenance of remission:** analysis of maintenance of remission at week 52 in subjects noted to be in remission at week 16 demonstrated statistically significant benefit with RHB-104 over placebo

Safety:

- ✓ **RHB-104 was demonstrated to be generally safe and well-tolerated** similar TAEs, SAEs and AEs leading to study drug discontinuation between treatment groups
- ✓ ECG monitoring report demonstrated evidence of progressive prolongation of the QTcF interval across visits; None of these QT abnormalities resulted in adverse cardiac events

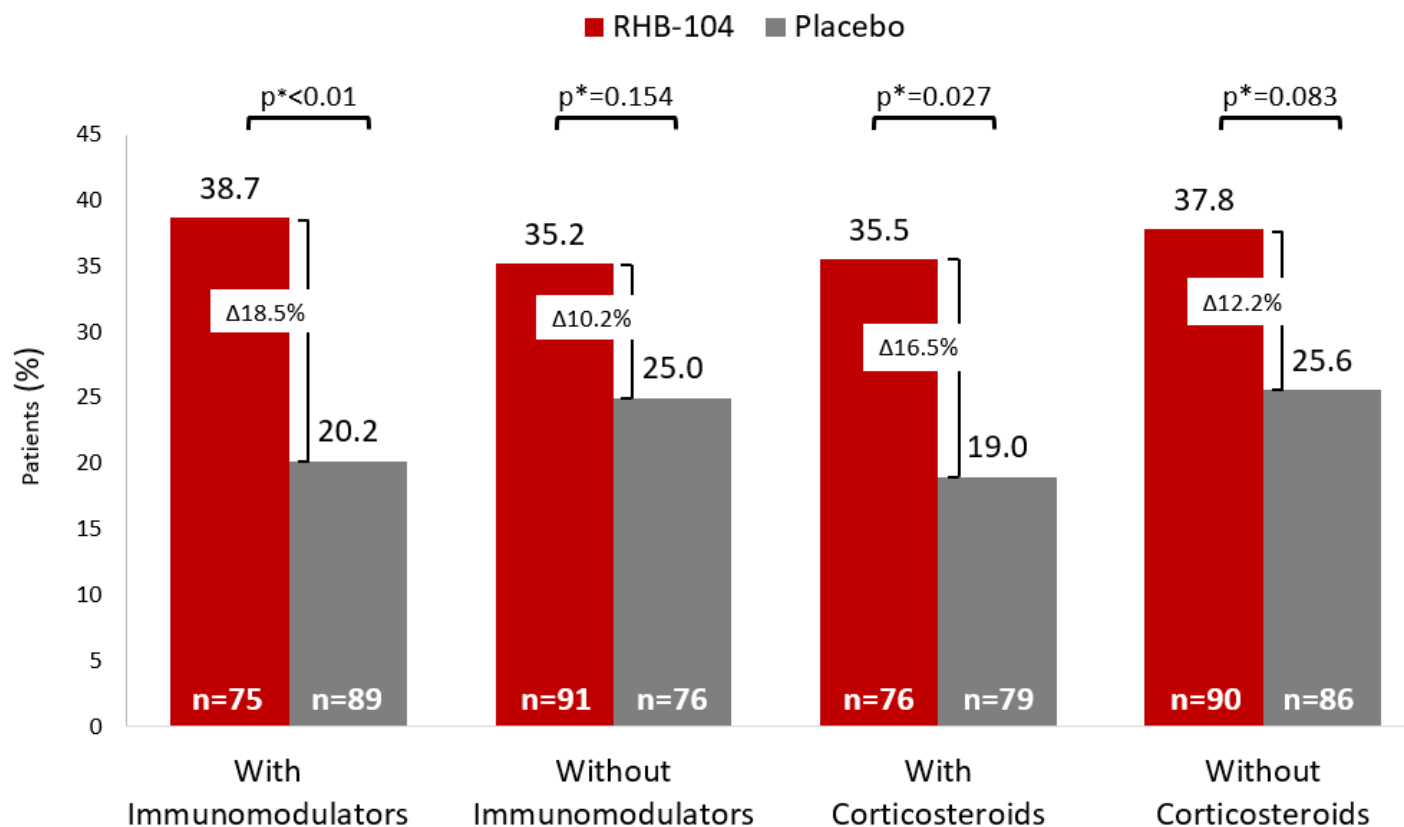


ⁱ Calculated with Cochran-Mantel-Haenszel (CMH) chi-square test with stratification according to anti-TNF agents use (yes/no); ^o Number of subjects reflects those subjects who have completed week 52 assessments and are no longer receiving blinded therapy

RHB-104 Crohn's Disease Phase 3 - Positive Results

Effects of concomitant immunomodulators and corticosteroids: Remission at week 26 concomitant meds subgroup analyses demonstrated the impact of RHB-104 as an add-on therapy to a variety of standard-of-care agents despite not being prospectively powered

- ✓ Meaningful and statistically significant treatment effects were observed in patients using concomitant immunomodulators (38.7% vs. 20.2%, $p < 0.01$) and corticosteroids (35.5% vs. 19.0%, $p = 0.027$) throughout the trial

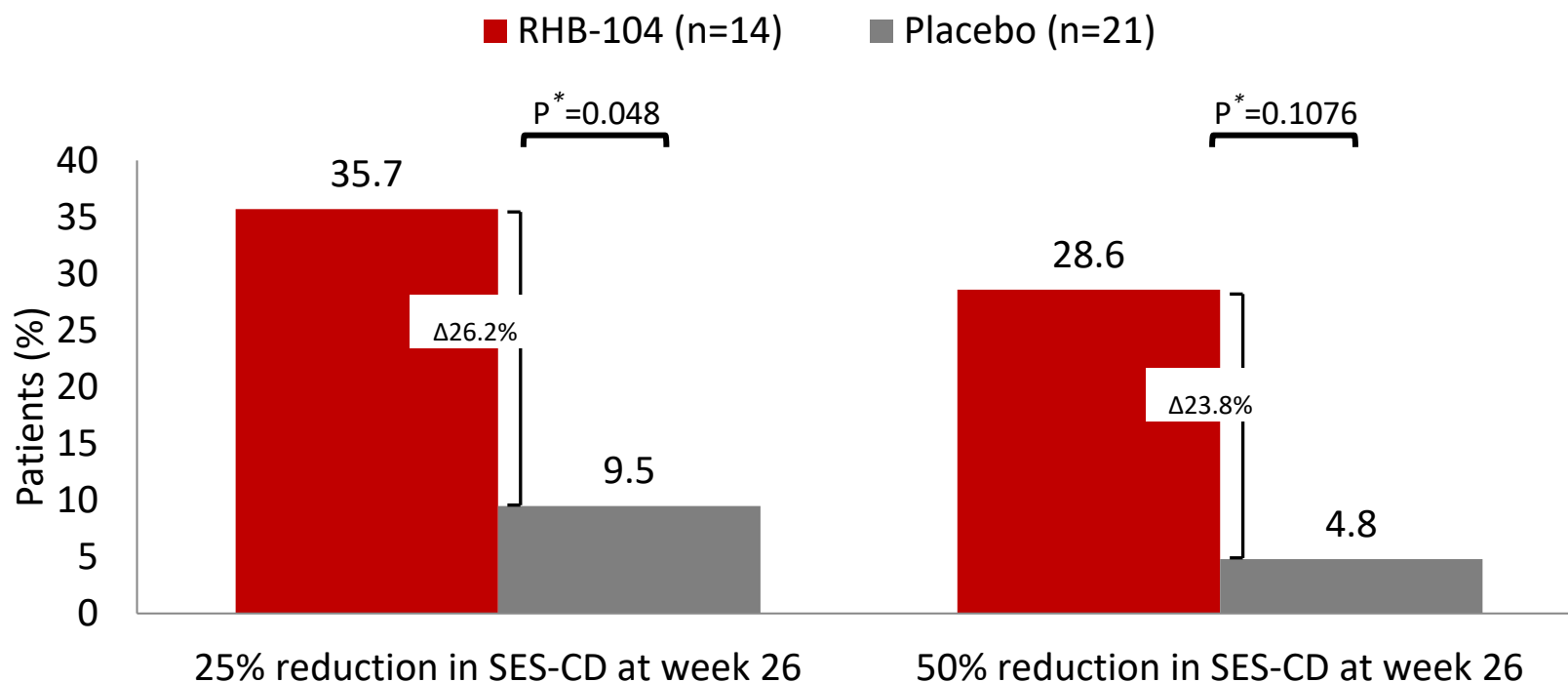


ⁱ Calculated with Cochran-Mantel-Haenszel (MH) chi-square test with stratification according to anti-TNF agent use (yes/no); ^o Calculated with Mantel-Haenszel (MH) chi-square test

RHB-104 Crohn's Disease Phase 3 - Positive Results

Endoscopic response:

- ✓ Endoscopy was voluntary in the study
- ✓ In a small subset of patients (n=35) in whom endoscopy was performed, results showed meaningful improvement in endoscopic healing (Simple Endoscopic Score for Crohn's Disease (SES-CD)) at week 26 (statistically significant at 25% decrease with similar trend at 50% decrease)

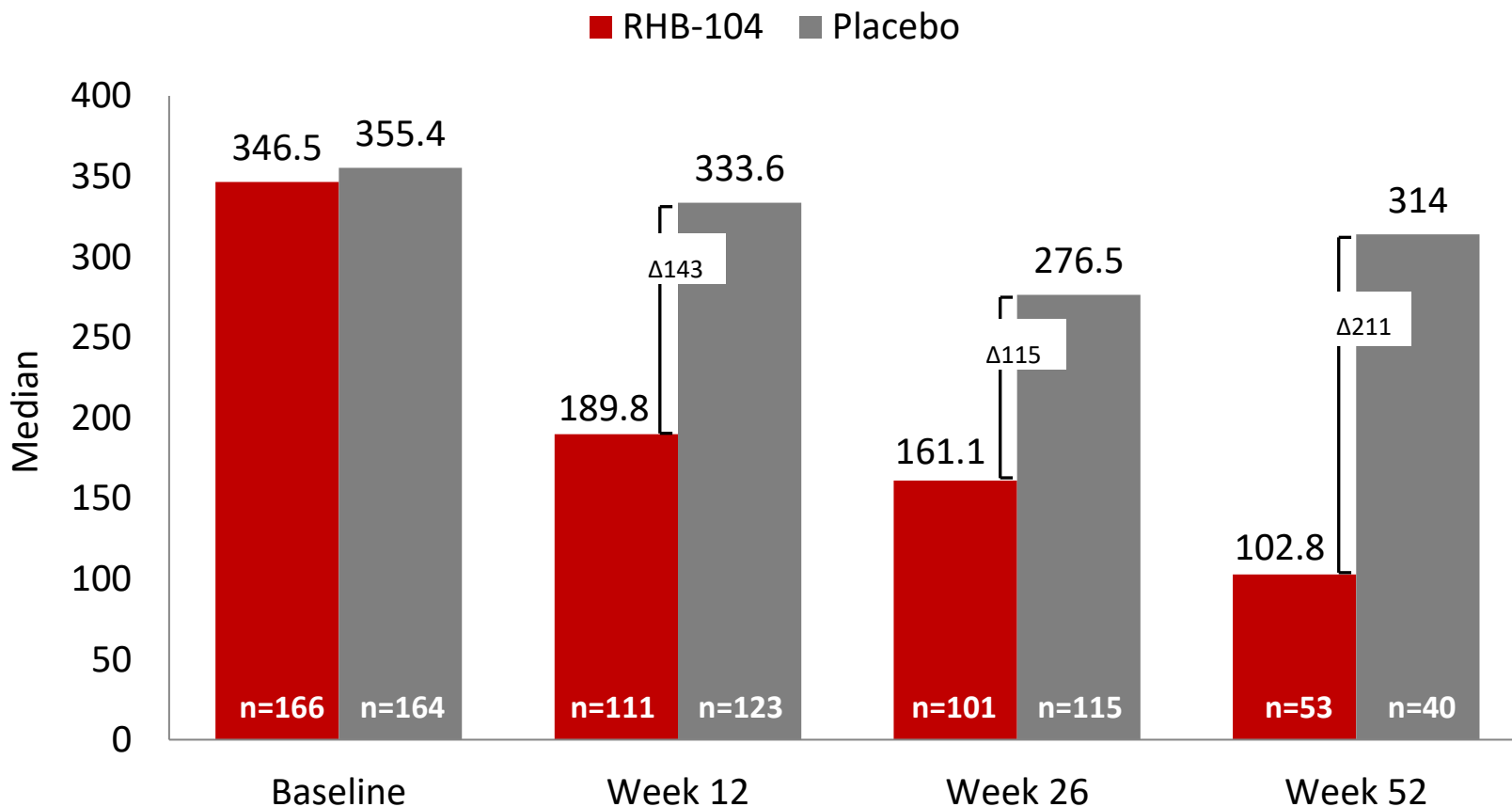


ⁱ Calculated with Cochran-Mantel-Haenszel (CMH) chi-square test with stratification according to anti-TNF agents use (yes/no)

RHB-104 Crohn's Disease Phase 3 - Positive Results

Median Fecal Calprotectin

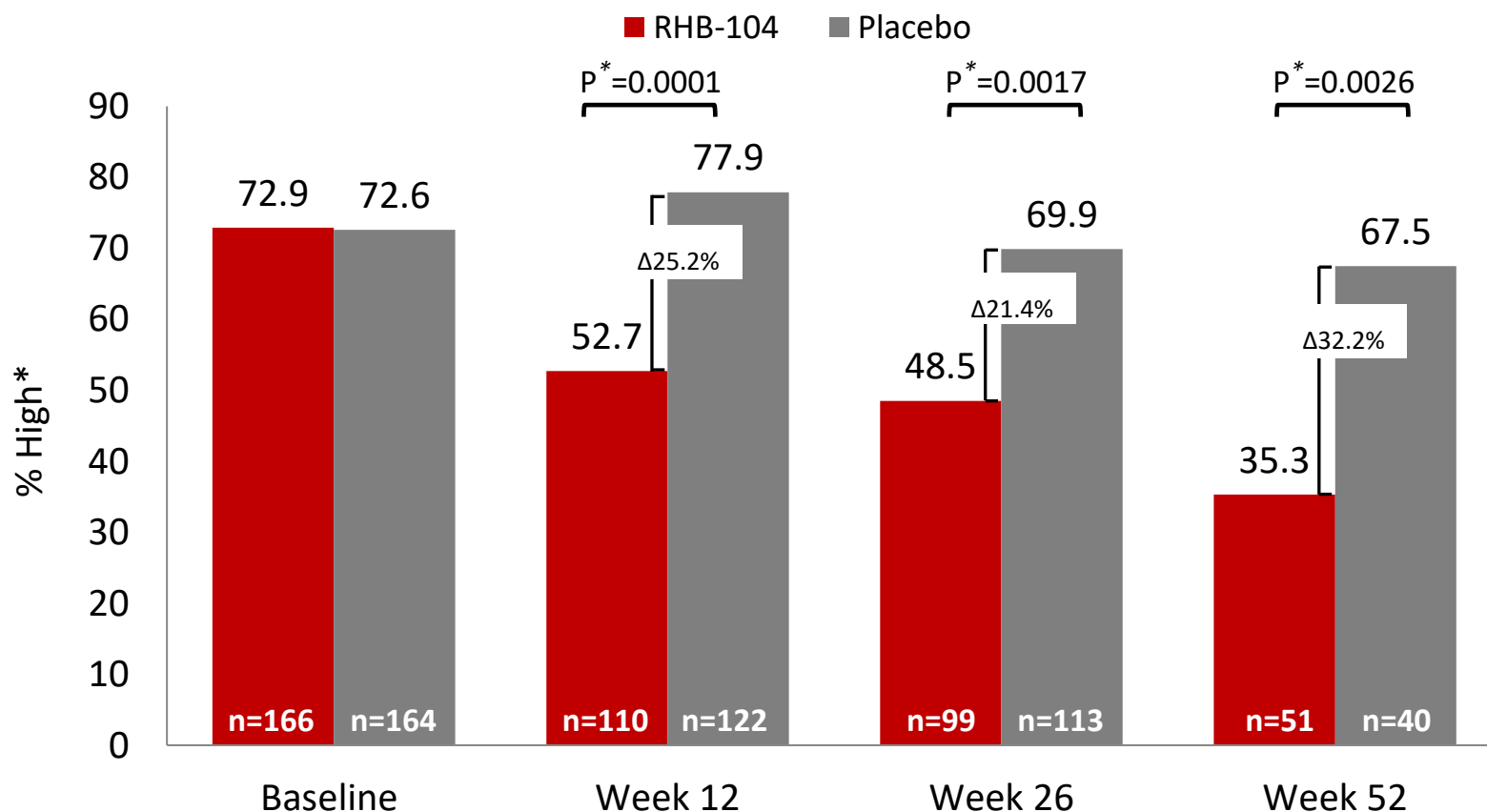
- ✓ Marked and continuous decline of calprotectin inflammatory marker in the RHB-104 active arm from baseline through week 52



RHB-104 Crohn's Disease Phase 3 - Positive Results

% High Fecal Calprotectin**

- ✓ Proportion of high calprotectin declined significantly in the RHB-104 active arm from baseline through week 52 (weeks 12, 26 and 52)



ⁱ Calculated with Cochran-Mantel-Haenszel (CMH) chi-square test with stratification according to anti-TNF agents use (yes/no); ** High defined as > 162.9

RHB-104 - Multiple Barriers to Entry

- Robust global patent portfolio covering RHB-104, with additional claims being pursued
- Potential 3 years exclusivity for treatment of Crohn's disease
- Limited availability of clofazimine (distributed by the World Health Organization (WHO) and Novartis) and generally requires name based individual import permit or Expanded Access Program (EAP) process for use
- Lower concentrations of the triple combination of RHB-104 active components provide excellent synergistic anti-MAP growth activity compared to individual or dual combinations of the drugsⁱ
- All-in-one capsule solution for patients and physicians (reduced co-pays, etc.)
- Potential PK synergies of APIs administered in the RHB-104 formulation that disappear when administered concomitantly
- APIs are not available in doses being used in RHB-104
- Physicians' potential liability exposure and complicated ramp-up period

ⁱ Alcedo KP, Thanigachalam S, Naser SA. RHB-104 triple antibiotics combination in culture is bactericidal and should be effective for treatment of Crohn's disease associated with *Mycobacterium paratuberculosis*, *Gut Pathogens*, 2016, 8:32.

RHB-104 - Our Plans

Possible progress in MAP diagnostic technology may enable advancement towards a confirmatory study in MAP positive moderate-severe Crohn's patients

Planned confirmatory trial design, pending regulatory input:

- Relatively small study in 100-150 MAP positive moderate-severe patients with active disease (inflammatory markers elevated)
- Randomized to active vs. placebo with primary endpoint to include mucosal healing
 - Potential correlation of the mucosal healing with MAP status (whether for eradication or suppression)



RHB-102ⁱ

Investigational new drug

A bi-modal extended release, once-daily, ondansetron

RHB-102 24 mg - Positive Results from a U.S. Phase 3 Study for Gastroenteritis/Gastritis - Met Primary Endpoint

RHB-102 12 mg - Positive Results from a U.S. Phase 2 Study for IBS-D Met Primary Endpoint

ⁱ Bekinda® is the proposed tradename for RHB-102, which is subject to review by the FDA at the time of NDA filing

RHB-102 24 mg: Gastroenteritis & Gastritis - Positive First Phase 3 Results

A Randomized, Double-Blind, Placebo Controlled, Parallel Group Phase 3 Study (GUARD study) to Assess the Safety and Efficacy of RHB-102ⁱ 24 mg for the Treatment of Acute Gastroenteritis & Gastritis

The Product	Patent-protected, once-daily extended-release oral tablet ondansetron 24 mg
Number of Subjects	321 adults and children over the age of 12
Sites	21 in the U.S.
Primary Endpoint	The absence of vomiting, without rescue medication and intravenous hydration, from 30 minutes post first dose of the study drug until 24 hours post dose
Potential Advantages	- If approved by FDA, RHB-102 could become the first 5-HT₃ antiemetic drug indicated for the treatment of acute gastroenteritis or gastritis in the U.S. - Long-lasting (24H) oral treatment with the potential to reduce dehydration and hospital visits and stays
Market Size	- Approximately 179 million cases of acute gastroenteritis annually in the U.S., leading to an estimated 470,000 hospitalizationsⁱⁱ - Worldwide potential market could exceed \$650 million annuallyⁱⁱⁱ
Development Status	- Positive Phase 3 study results announced June 2017 - the study met primary endpoint - RedHill designing a confirmatory Phase 3 study for acute gastroenteritis and gastritis

ⁱ Bekinda® is a proposed tradename for RHB-102, which is subject to FDA review and approval

ⁱⁱ Scallan E, Griffin PM, Angulo FJ, Tauxe RV, Hoekstra RM. Foodborne Illness Acquired in the United States - Unspecified Agents. *Emerg Infect Dis.* 2011;17(1):16-22

ⁱⁱⁱ Graves S. Nancy, Acute Gastroenteritis, *Prim Care Clin Office Pract* 40 (2013) 727-741 and Company analysis;

RHB-102 24 mg: Gastroenteritis & Gastritis Positive Phase 3 Results

A Randomized, Double-Blind, Placebo Controlled, Parallel Group Phase 3 Study (“GUARD”) to Assess Safety and Efficacy of RHB-102 24 mg for Treatment of Acute Gastroenteritis & Gastritis

Results

- **The Phase 3 GUARD study successfully met its primary endpoint in the Intent to Treat (ITT) population ($p = 0.04$)**
- **ITT:** RHB-102 24 mg improved the efficacy outcome by 21%; 65.6% of RHB-102 24 mg treated patients as compared to 54.3% of placebo patients ($p = 0.04$; $n=192$ in the RHB-102 group and $n=129$ in the placebo group)
- **PP:** In patients who met all protocol entry criteria and for which the diagnosis of gastroenteritis was confirmed ($n=177$ in the RHB-102 group and $n=122$ in the placebo group), RHB-102 24 mg improved the efficacy outcome by 27%; 69.5% of patients in the RHB-102 24 mg group vs. 54.9% in the placebo group, ($p = 0.01$)
- RHB-102 24 mg was demonstrated to be safe and well-tolerated; electrocardiogram results showed no adverse changes with treatment

RHB-102 12 mg: IBS-D

Positive Phase 2 Results

A Randomized, Double-Blind, Placebo-Controlled, 2-Arm Parallel Group Phase 2 Clinical Study Designed to Evaluate the Safety and Efficacy of RHB-102 12 mg in Patients Suffering from Diarrhea-Predominant Irritable Bowel Syndrome (IBS-D)

The Product	Patent-protected, once-daily extended release oral tablet ondansetron 12 mg
Number of Subjects	126 patients
Sites	16 in the U.S.
Primary Endpoint	Response in stool consistency compared to baseline, per FDA guidance definition
Market Size	- It is estimated that at least 30 million Americans may suffer from IBS, of which approximately 40% are of the IBS-D subtypeⁱ - 8.3 million diagnosed prevalent cases in 2018 in the U.S.ⁱⁱ - 2019 potential U.S. market for IBS-D treatments estimated to reach ~ \$980M
Development Status	- Positive top-line results announced Oct. 2017; Study successfully met primary endpoint - Positive End-of-Phase 2/Pre-Phase 3 FDA meeting announced Sep. 2018 - design of two pivotal Phase 3 studies with RHB-102 to be finalized and partnership discussions accelerated

ⁱ Lovell RM, Global prevalence of and risk factors for irritable bowel syndrome: a meta-analysis, *Clin Gastroenterol Hepatol* (2012), 10(7)712-721; Saito YA et al, The epidemiology of irritable bowel syndrome in North America: a systemic review, *Am J Gastroenterol* (2002), 97(8): 1910-5; ⁱⁱ GlobalData

RHB-102 12 mg: IBS-D

Positive Phase 2 Results

A Randomized, Double-Blind, Placebo-Controlled, 2-Arm Parallel Group Phase 2 Clinical Study Designed to Evaluate the Safety and Efficacy of RHB-102 12 mg in Patients Suffering from Diarrhea-Predominant Irritable Bowel Syndrome (IBS-D)

Results

- **Primary endpoint:** The Phase 2 study met its primary endpoint, improving the primary efficacy outcome of stool consistency response (per FDA guidance definition) by an absolute difference of 20.7% ($p=0.036$)
 - 56.0% responders of subjects treated with RHB-102 ($n=75$) vs. 35.3% responders of the placebo subjects ($n=51$)
- **Secondary endpoints:** While not powered for statistical significance of the secondary efficacy endpoints, the study suggested clinically meaningful improvement in both abdominal pain response and overall response (combined stool consistency and abdominal pain response)
- **Safety:** RHB-102 12 mg was demonstrated to be safe and well-tolerated



RHB-106

Investigational new drug

Proprietary Encapsulated Formulation for Bowel Preparation

RHB-106 - Encapsulated Bowel Preparation

Planned Indication	Preparation of the gastrointestinal tract prior to abdominal procedures/surgeries, such as colonoscopy
The Product	– Proprietary, flavorless, odorless, solid oral encapsulated formulation for bowel preparation – Caplet formulation composed of sodium picosulfate, magnesium oxide, ascorbic acid and simethicone, mannitol and other excipients
Potential Advantages	– Improved safety over existing encapsulated preparations – Convenient, easy, taste free, and odorless – Can be taken with water
Potential Market Size	– Approx. 19 million colonoscopies performed annually in the U.Sⁱ – 2019 U.S. sales of bowel preparations estimated at approximately \$580 millionⁱⁱ
Development Status	– Phase 2/3 studies planned – Phase 2a with a previous formulation of RHB-106 conducted in 62 patients in Australiaⁱⁱⁱ demonstrating significantly improved patient response and comparable bowel cleansing

ⁱ IDATA Research, August 2018; ⁱⁱ Foster-Rosenblatt, December 2019; ⁱⁱⁱ Ramrakha SR et al. Investigating the tolerability of four bowel preparations – the taste test, *J Gastroenterol Hepatol*, 2006; 21 (Suppl;4): A286-A299



Thank You!

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