



Press Release

RedHill Biopharma Announces EnteraGam® Poster Presentation at the ISPOR 20th Annual European Congress

TEL-AVIV, Israel / RALEIGH, NC, November 6, 2017 RedHill Biopharma Ltd. (NASDAQ: RDHL) (Tel-Aviv Stock Exchange: RDHL) (“RedHill” or the “Company”), a specialty biopharmaceutical company primarily focused on late clinical-stage development and commercialization of proprietary drugs for gastrointestinal and inflammatory diseases and cancer, today announced a planned poster presentation relating to EnteraGam® (serum-derived bovine immunoglobulin/protein isolate, SBI)¹, one of RedHill’s commercial products, at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual European Congress, on Tuesday, November 7, 2017, from 09:45 AM – 1:30 PM (GMT), at the Scottish Event Campus in Glasgow, Scotland.

EnteraGam® is a medical food intended for the dietary management of chronic diarrhea and loose stools, which must be administered under medical supervision. EnteraGam® is one of three gastrointestinal products promoted by RedHill’s sales force in the U.S., together with Donnatal® (Phenobarbital, Hyoscyamine Sulfate, Atropine Sulfate, Scopolamine Hydrobromide)² and Esomeprazole Strontium Delayed-Release (DR) Capsules 49.3 mg³. RedHill licensed the exclusive U.S. rights to EnteraGam® from Entera Health Inc. (“Entera Health”).

¹ EnteraGam® (serum-derived bovine immunoglobulin/protein isolate, SBI) is a commercially-available medical food, intended for the dietary management of chronic diarrhea and loose stools due to specific intestinal disorders, which must be administered under medical supervision.

² Donnatal® (Phenobarbital, Hyoscyamine Sulfate, Atropine Sulfate, Scopolamine Hydrobromide) is a prescription drug, classified as possibly effective as an adjunctive therapy in the treatment of irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis. For more information, please see the prescribing information: <http://www.donnatal.com/wp-content/uploads/2015/02/2015-02-18-Risk-Benefit-information-DTC-REV.-SE.pdf>.

³ Esomeprazole Strontium Delayed-Release (DR) Capsules 49.3 mg is an FDA-approved, proprietary, prescription proton pump inhibitor, indicated for adults for the treatment of gastroesophageal reflux disease (GERD) and other gastrointestinal (GI) conditions. For more information, please see the prescribing information: <https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?setid=53240ab5-98e7-4050-b640-e09c1271899a&type=display>

The poster⁴, entitled “Economic and Clinical Impact of Serum-Derived Bovine Immunoglobulin / Protein Isolate (SBI) in the Management of Chronic Diarrhea in Inflammatory Bowel Disease (IBD)”, presents data from a pharmacoeconomic study conducted by Entera Health. The aim of the study was to evaluate the real-world economic and clinical impact of EnteraGam[®] (SBI) use in patients suffering from IBD. The authors conclude that inclusion of EnteraGam[®] for the management of chronic diarrhea in IBD can offer clinical benefits of overall disease management, while also lowering the overall cost to the healthcare system and patients, resulting in net savings primarily due to a reduction in utilization of high-cost prescription medications.

Numerous publications of clinical studies and retrospective chart reviews support the use of SBI in the dietary management of chronic diarrhea and loose stools⁵. The combined effect of SBI is intended to fulfill a distinctive nutritional requirement associated with various gastrointestinal conditions, where chronic diarrhea or loose stools are present and normal dietary proteins alone are insufficient. SBI has been shown in clinical studies to reduce loose stools and improve stool consistency as well as other symptoms, such as abdominal pain, bloating and urgency in patients with chronic diarrhea and loose stools⁶. Several studies in patients suffering from IBD, such as ulcerative colitis and Crohn’s disease, where SBI was given due to uncontrolled chronic diarrhea and loose stools, suggest that SBI improves management of chronic diarrhea and loose stools in patients who are refractory or partially responding to traditional therapies⁷. SBI has also been studied in patients with fecal incontinence with chronic diarrhea, in patients with celiac and non-celiac gluten sensitivity with chronic diarrhea and in additional gastrointestinal conditions⁸.

About EnteraGam[®]:

EnteraGam[®] (serum-derived bovine immunoglobulin/protein isolate, SBI) is a medical food product intended for the dietary management of chronic diarrhea and loose stools. EnteraGam[®] must be administered under medical supervision. EnteraGam[®] binds

⁴ The poster was authored by Tyson C, AHRM Inc., Buffalo, NY, USA; Shafran I, Shafran Gastroenterology Center/University of Central Florida Medical School, Winter Park, FL, USA; Hilal R, Center for Advanced Gastroenterology/Assistant Professor, UCF-College of Medicine, Maitland, FL, USA; Chalasani R, Digestive and Liver Disease Consultants, Houston, TX, USA; Good L, South Nassau Communities Hospital, Lynbrook, NY, USA; Taxman T, Institute for Women's and Children's Health, Lyndhurst, OH, USA; Maheshwari S, Center for Digestive Disease, The Woodlands, TX, USA; Silver HS, Knoxville Gastroenterology Consultants, Knoxville, TN, USA; Glamour TS, Advanced Gastro & Liver Care, Pinellas Park, FL, USA; Wallis BJ, Advanced GI Associates, Crystal River, FL, USA; Bradshaw T, Entera Health, Cary, NC, USA; Shaw A, Entera Health, Cary, NC, USA; Dalfonso LL, AHRM Inc., Raleigh, NC, USA and Magar R, AHRM Inc., Raleigh, NC, USA.

⁵ See full list of publications at: http://enteragam.com/assets/lib/EnteraGam_Product_Information.pdf.

⁶ See full list of publications at: http://enteragam.com/assets/lib/EnteraGam_Product_Information.pdf.

⁷ Shafran, Ira, et al. "Management of inflammatory bowel disease with oral serum-derived bovine immunoglobulin." *Therapeutic advances in gastroenterology* 8.6 (2015): 331-339.

⁸ Good, Larry, and Bruce P Burnett. “Management of Loose, Frequent Stools and Fecal Incontinence in a Chronic Mesenteric Ischemia Patient with Oral Serum-Derived Bovine Immunoglobulin.” *Clinical Medicine Insights. Gastroenterology* 8 (2015): 7–11.

microbial components⁹, such as toxic substances released by bacteria that upset the intestinal environment. This helps prevent them from penetrating the lining of the intestine, which may contribute to chronic diarrhea and loose stools in people who have specific intestinal disorders¹⁰.

Safety Information about EnteraGam®:

EnteraGam® contains beef protein; therefore, patients who have an allergy to beef or any other component of EnteraGam® should not take this product. EnteraGam® has not been studied in pregnant women, in women during labor and delivery, or in nursing mothers. The choice to administer EnteraGam® during pregnancy, labor and delivery, or to nursing mothers is at the clinical discretion of the prescribing physician.

EnteraGam® does not contain any milk-derived ingredients such as lactose, casein or whey. EnteraGam® is gluten-free, dye-free and soy-free.

Please see full [Product Information](#).

To report suspected adverse reactions, contact Entera Health, Inc. at 1-855-4ENTERA (1-855-436-8372), or the FDA at 1-800-FDA-1088 (1-800-332-1088) or www.fda.gov/medwatch.

About Esomeprazole Strontium Delayed-Release Capsules 49.3 mg¹¹:

Esomeprazole Strontium Delayed-Release Capsules 49.3 mg is indicated for adults:

- for the short-term treatment (4-8 weeks) of heartburn and other symptoms associated with gastroesophageal reflux disease (GERD) and/or in healing and symptomatic resolution of erosive esophagitis (EE).
- to reduce the risk of stomach ulcers in some people taking non-steroidal anti-inflammatory drugs (NSAIDs) (controlled studies did not extend beyond 6 months).
- in combination with amoxicillin 1000 mg and clarithromycin 500 mg is indicated for the treatment of patients with a stomach infection (*Helicobacter pylori*) and duodenal ulcer disease.
- is indicated for the long-term treatment of pathological hypersecretory conditions, including Zollinger-Ellison Syndrome.

⁹ Horgan A, Maas K, Henderson A, Detzel C, Weaver E. Serum-derived bovine immunoglobulin/protein isolate binds to pathogen-associated molecular patterns. Poster presented at: Federation of American Societies for Experimental Biology; April 26-30, 2014; San Diego, CA.

¹⁰ Petschow BW, Burnett B, Shaw AL, Weaver EM, Klein GL. Serum-derived bovine immunoglobulin/protein isolate: postulated mechanism of action for management of enteropathy. *Clin Exp Gastroenterol.* 2014;7:181-190.

Gasbarrini A, Lauritano EC, Garcovich M, Sparano L, Gasbarrini G. New insights into the pathophysiology of IBS: intestinal microflora, gas production and gut motility. *Eur Rev Med Pharmacol Sci.* 2008;12 Suppl 1:111-117.

¹¹ Esomeprazole Strontium Delayed-Release Capsules is also available in a 24.65 mg dose. RedHill promotes the Esomeprazole Strontium Delayed-Release Capsules 49.3 mg formulation only.

Important Safety Information about Esomeprazole Strontium Delayed-Release Capsules 49.3 mg:

- Esomeprazole strontium is contraindicated in patients with known hypersensitivity to proton pump inhibitors. For information about contraindications of antibacterial agents (clarithromycin and amoxicillin) indicated in combination with esomeprazole strontium, refer to the contraindications section of their package inserts.
- Symptomatic response to therapy does not rule out the presence of gastric malignancy. Consider additional follow-up and diagnostic testing in adult patients who have a suboptimal response or an early symptomatic relapse after completing treatment with a proton pump inhibitor (PPI). In older patients, also consider an endoscopy.
- Acute interstitial nephritis has been observed in patients taking PPIs. Discontinue esomeprazole strontium if acute interstitial nephritis develop.
- PPI therapy may be associated with increased risk of *Clostridium difficile*-associated diarrhea. This diagnosis should be considered for diarrhea that does not improve.
- PPI therapy may be associated with an increased risk of osteoporosis-related fractures of the hip, wrist, or spine. The risk of fracture was increased in patients who received high-dose (multiple daily doses) and long-term (a year or longer) therapy.
- Cutaneous lupus erythematosus (CLE) and systemic lupus erythematosus (SLE) have been reported in patients taking PPIs, including esomeprazole. These events included both new onset and exacerbations. If signs or symptoms consistent with CLE or SLE are noted with esomeprazole strontium, discontinue and refer the patient to a specialist. Most patients improve with discontinuation of the PPI alone in 4 to 12 weeks.
- Avoid concomitant use of esomeprazole strontium with clopidogrel, due to a reduction in plasma concentrations of the active metabolite of clopidogrel. When using esomeprazole strontium consider alternative anti-platelet therapy.
- Daily treatment with any acid-suppressing medications over a long period of time (e.g., longer than 3 years) may lead to malabsorption of cyanocobalamin (vitamin B12). Rare reports of cyanocobalamin deficiency occurring with acid-suppressing therapy have been reported in the literature.
- Hypomagnesemia has been reported rarely with prolonged treatment with PPI therapy and may require discontinuing PPI therapy.
- Concomitant use of esomeprazole strontium and St. John's wort or rifampin can substantially decrease esomeprazole strontium concentrations. Avoid concomitant use.
- Literature suggests that concomitant use of PPIs with methotrexate (primarily at high dose; see methotrexate prescribing information) may elevate and prolong serum levels of methotrexate and/or its metabolite, possibly leading to methotrexate toxicities. In high-dose methotrexate administration, a temporary withdrawal of the PPI may be considered in some patients.
- Concomitant use of esomeprazole strontium and atazanavir or nelfinavir is not recommended. esomeprazole strontium is expected to increase the plasma levels of saquinavir. Consider dose reduction of saquinavir.
- Patients treated with PPIs and warfarin concomitantly may need to be monitored for increases in INR and prothrombin time. Esomeprazole may interfere with the absorption

of drugs for which gastric pH affects bioavailability (e.g., ketoconazole, iron salts, erlotinib, digoxin and mycophenolate mofetil).

- Esomeprazole strontium may increase systemic exposure of cilostazol and one of its active metabolites. Consider dose reduction of cilostazol.
- In adults, adverse reactions (ARs) reported at a frequency of 1% or greater with esomeprazole strontium include headache, diarrhea, nausea, flatulence, abdominal pain, constipation, and dry mouth.
- Safety and effectiveness of esomeprazole strontium have not been established in pediatric patients. Not recommended for use in pediatric patients.
- Safety of esomeprazole strontium have not been studied in patients with severe renal impairment. Not recommended for use in patients with severe renal impairment.

Talk to your doctor or healthcare professional. Please see Prescribing information including Medication Guide for Esomeprazole Strontium Delayed-Release Capsules at <https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?setid=53240ab5-98e7-4050-b640-e09c1271899a&type=display>

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

About Donnatal®:

Donnatal® (Phenobarbital, Hyoscyamine Sulfate, Atropine Sulfate, Scopolamine Hydrobromide), a prescription drug, is classified as possibly effective as an adjunctive therapy in the treatment of irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis. Donnatal® slows the natural movements of the gut by relaxing the muscles in the stomach and intestines. Donnatal® comes in two formulations: immediate release Donnatal® Tablets and immediate release Donnatal® Elixir, a fast-acting liquid.

Important Safety Information about Donnatal®:

Donnatal® is contraindicated in patients who have glaucoma, obstructive uropathy, obstructive disease of the gastrointestinal tract, paralytic ileus, unstable cardiovascular status, severe ulcerative colitis, myasthenia gravis, hiatal hernia with reflux esophagitis, or known hypersensitivity to any of the ingredients. Patients who are pregnant or breastfeeding or who have autonomic neuropathy, hepatic or renal disease, hyperthyroidism, coronary heart disease, congestive heart failure, cardiac arrhythmias, tachycardia or hypertension should notify their doctor before taking Donnatal®. Side effects may include: dryness of the mouth, urinary retention, blurred vision, dilation of pupils, rapid heartbeat, loss of sense of taste, headache, nervousness, drowsiness, weakness, dizziness, insomnia, nausea, vomiting and allergic reactions which may be severe.

Further information, including prescribing information, can be found on www.donnatal.com.

Please see the following website for complete important safety information about Donnatal®: <http://www.donnatal.com/professionals/important-safety-information/>

To report suspected adverse reactions, contact Concordia Pharmaceuticals Inc. at 1-877-370-1142 or email: medicalinformation@concordiarx.com, or the FDA at 1-800-FDA-1088 (1-800-332-1088) or www.fda.gov/medwatch.

About RedHill Biopharma Ltd.:

RedHill Biopharma Ltd. (NASDAQ: RDHL) (Tel-Aviv Stock Exchange: RDHL) is a specialty biopharmaceutical company, primarily focused on the development and commercialization of late clinical-stage, proprietary, orally-administered, small molecule drugs for the treatment of gastrointestinal and inflammatory diseases and cancer. RedHill promotes three gastrointestinal products in the U.S. and its clinical stage pipeline includes treatments for gastrointestinal indications, pancreatic cancer and acute migraines: **Donnatal®** - a prescription oral adjunctive drug used in the treatment of IBS and acute enterocolitis; **Esomeprazole Strontium Delayed-Release Capsules 49.3 mg** - a prescription proton pump inhibitor indicated for adults for the treatment of gastroesophageal reflux disease (GERD) and other gastrointestinal conditions; and **EnteraGam®** - a medical food intended for the dietary management, under medical supervision, of chronic diarrhea and loose stools. RedHill's clinical-stage pipeline includes: (i) **TALICIA™ (RHB-105)** - an oral combination therapy for the treatment of *Helicobacter pylori* infection with successful results from a first Phase III study and an ongoing confirmatory Phase III study; (ii) **RHB-104** - an oral combination therapy for the treatment of Crohn's disease with an ongoing first Phase III study, a completed proof-of-concept Phase IIa study for multiple sclerosis, and a planned pivotal Phase III study for nontuberculous mycobacteria (NTM) infections; (iii) **BEKINDA® (RHB-102)** - a once-daily oral pill formulation of ondansetron with successful top-line results from a Phase III study in acute gastroenteritis and gastritis and successful top-line results from a Phase II study in IBS-D; (iv) **RHB-106** - an encapsulated bowel preparation licensed to Salix Pharmaceuticals, Ltd.; (v) **YELIVA® (ABC294640)** - a Phase II-stage, orally-administered, first-in-class SK2 selective inhibitor targeting multiple oncology, inflammatory and gastrointestinal indications; (vi) **MESUPRON** - a Phase II-stage first-in-class, orally-administered protease inhibitor, targeting pancreatic cancer and inflammatory gastrointestinal diseases and (vii) **RIZAPORT® (RHB-103)** - an oral thin-film formulation of rizatriptan for acute migraines, with a U.S. NDA resubmitted to the FDA and marketing authorization received in two EU member states under the European Decentralized Procedure (DCP).

This press release contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements may be preceded by the words “intends,” “may,” “will,” “plans,” “expects,” “anticipates,” “projects,” “predicts,” “estimates,” “aims,” “believes,” “hopes,” “potential” or similar words. Forward-looking statements are based on certain assumptions and are subject to various known and unknown risks and uncertainties, many of which are beyond the Company’s control, and cannot be predicted or quantified and consequently, actual results may differ materially from those expressed or implied by such forward-looking statements. Such risks and uncertainties include, without limitation, risks and uncertainties associated with (i) the initiation, timing, progress and results of the Company’s research, manufacturing, preclinical studies, clinical trials, and other therapeutic candidate development efforts; (ii) the Company’s ability to advance its therapeutic candidates into clinical trials or to successfully complete its

preclinical studies or clinical trials; (iii) the extent and number of additional studies that the Company may be required to conduct and the Company's receipt of regulatory approvals for its therapeutic candidates, and the timing of other regulatory filings, approvals and feedback; (iv) the manufacturing, clinical development, commercialization, and market acceptance of the Company's therapeutic candidates; (v) the Company's ability to successfully market Donnatal[®] and EnteraGam[®], (vi) the Company's ability to establish and maintain corporate collaborations; (vii) the Company's ability to acquire products approved for marketing in the U.S. that achieve commercial success and build its own marketing and commercialization capabilities; (viii) the interpretation of the properties and characteristics of the Company's therapeutic candidates and of the results obtained with its therapeutic candidates in research, preclinical studies or clinical trials; (ix) the implementation of the Company's business model, strategic plans for its business and therapeutic candidates; (x) the scope of protection the Company is able to establish and maintain for intellectual property rights covering its therapeutic candidates and its ability to operate its business without infringing the intellectual property rights of others; (xi) parties from whom the Company licenses its intellectual property defaulting in their obligations to the Company; and (xii) estimates of the Company's expenses, future revenues capital requirements and the Company's needs for additional financing; (xiii) the Company's Expanded Access Program, which allows patients with life-threatening diseases potential access, subject to regulatory and other approvals, to RedHill's investigational new drugs that have not yet received regulatory marketing approval, if a patient suffers an adverse experience using such investigative drug, potentially adversely affecting the clinical development program of that investigational product or the Company generally; (xiv) competitive companies and technologies within the Company's industry. More detailed information about the Company and the risk factors that may affect the realization of forward-looking statements is set forth in the Company's filings with the Securities and Exchange Commission (SEC), including the Company's Annual Report on Form 20-F filed with the SEC on February 23, 2017. All forward-looking statements included in this Press Release are made only as of the date of this Press Release. We assume no obligation to update any written or oral forward-looking statement unless required by law.

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