Press Release

RedHill Biopharma Announces Initiation of Phase II Study with YELIVA™ in Hepatocellular Carcinoma at the Medical University of South Carolina

- **The Phase II clinical study is intended to evaluate the efficacy and safety of YELIVA™ (ABC294640) in patients with advanced hepatocellular carcinoma (HCC), the most common primary malignant cancer of the liver with a worldwide mortality rate of 95%**

- **The Phase II study is being conducted at the Hollings Cancer Center at the Medical University of South Carolina (MUSC) and is supported by a grant from the U.S. National Cancer Institute (NCI), awarded to MUSC, with additional support from RedHill; enrollment is expected to commence shortly, pending final regulatory clearance**

- **HCC is the second most frequent cause of cancer-related deaths worldwide; worldwide and U.S. markets for the treatment of HCC are estimated to reach approximately $895 million and $471 million in 2017, respectively**

- **YELIVA™ is a proprietary, first-in-class, orally-administered sphingosine kinase-2 (SK2) selective inhibitor, with anti-cancer and anti-inflammatory activities**

- **RedHill is pursuing, in parallel, several U.S. clinical studies with YELIVA™, targeting multiple inflammatory and oncology indications**

- **Final positive results from a Phase I study with YELIVA™ in cancer patients with advanced solid tumors confirmed that the study successfully met its primary and secondary endpoints and that the drug can be safely administered to patients at doses that are predicted to have therapeutic activity**

TEL-AVIV, Israel, October 5, 2016 RedHill Biopharma Ltd. (NASDAQ: RDHL) (TASE: RDHL) ("RedHill" or the "Company"), a biopharmaceutical company primarily focused on development and commercialization of late clinical-stage, proprietary, orally-administered, small molecule drugs for gastrointestinal and inflammatory diseases and cancer, today announced that a Phase II clinical study evaluating YELIVA™ (ABC294640) in patients with advanced hepatocellular carcinoma (HCC) has been initiated, with enrollment expected to commence shortly, pending final regulatory clearance.

YELIVA™ is a proprietary, first-in-class, orally-administered, sphingosine kinase-2 (SK2) selective inhibitor with anti-cancer and anti-inflammatory activities. By inhibiting the SK2 enzyme, YELIVA™ blocks the synthesis of sphingosine 1-phosphate (S1P), a lipid signaling molecule that promotes cancer growth and pathological inflammation.

RedHill is pursuing and evaluating with YELIVA™ multiple clinical programs in oncology, inflammatory and gastrointestinal indications, as well as potential collaboration opportunities with larger pharmaceutical companies to evaluate YELIVA™ as an add-on therapy to their existing oncology treatments.

The HCC Phase II study will be conducted at the Medical University of South Carolina Hollings Cancer Center (MUSC) and additional clinical centers in the U.S. It is supported by a $1.8 million grant from the National Cancer Institute (NCI) awarded to MUSC, intended to fund a broad range of studies on the feasibility of targeting sphingolipid metabolism for the treatment of a variety of solid tumor cancers, including the Phase II study with YELIVA™ for the treatment of HCC. The Phase II HCC study will be supported by additional funding from RedHill.

The Phase II study will evaluate YELIVA™ as a second-line monotherapy in up to 39 patients with advanced HCC who have experienced tumor progression following treatment with first-line single-agent sorafenib (Nexavar®). Carolyn D. Britten, MD, Chief of the Division of Hematology/Oncology in the Department of Medicine at MUSC and Associate Director for Clinical Investigations at the MUSC Hollings Cancer Center, is the Principal Investigator for the Phase II study.

Dr. Carolyn D. Britten, MD, said: "We are looking forward to testing YELIVA™ in advanced hepatocellular cancer, a devastating disease with no approved systemic therapy beyond sorafenib."

HCC is the most common primary malignant cancer of the liver, accounting for approximately 85% of liver cancer cases[1]. It is the fifth and ninth most prevalent cancer worldwide in men and women, respectively, and the second most frequent cause of cancer-related deaths worldwide[2]. Annual worldwide incidence of liver cancer was estimated to have

[1] GlobalData – Hepatocellular Carcinoma – Opportunity Analysis and Forecasts to 2024.

[2] Ferlay J, Bray F, Steliarova-Foucher E, Forman D (2014) Cancer Incidence in Five Continents, CI5plus.

reached 782,000 cases in 2012, with a mortality rate of 95%; the corresponding U.S. numbers are 30,000 and 80%, respectively[3]. Most patients with HCC suffer from liver cirrhosis, which develops following long periods of chronic liver disease. The majority of HCC cases are associated with hepatitis B and hepatitis C virus infections. Few treatment options exist for patients diagnosed at an advanced stage, representing the majority of HCC patients. Sorafenib (Nexavar®) is a targeted drug approved for the treatment of HCC in patients who are not candidates for surgery and do not have severe cirrhosis. The worldwide and U.S. markets for the treatment of HCC are estimated to reach approximately $895 million and $471 million in 2017, respectively[4].

Results from a Phase I study with YELIVA™ in patients with advanced solid tumors confirmed that the study, also conducted at MUSC, successfully met its primary and secondary endpoints, demonstrating that the drug is well-tolerated and can be safely administered to cancer patients at doses that provide circulating drug levels that are predicted to have therapeutic activity.

Among the 16 subjects that were assessable for response by RECIST 1.1 criteria (Response Evaluation Criteria in Solid Tumors), one subject had a partial response with a progression-free survival of 16.9 months, and six subjects had stable disease with a progression-free survival of between 3.5 and 17.6 months. Of the three patients with cholangiocarcinoma, one had a partial response and the other two had stable disease, one of which had stable disease for over a year. YELIVA™ was well-tolerated over a prolonged period at doses inducing the expected pharmacodynamic effects.

A Phase Ib/II study with YELIVA™ for the treatment of refractory or relapsed multiple myeloma has recently been initiated at Duke University Medical Center. The study is supported by a $2 million grant from the National Cancer Institute (NCI) Small Business Innovation Research Program (SBIR) awarded to Apogee Biotechnology Corp. (Apogee), in conjunction with Duke University, with additional support from RedHill.

A Phase Ib study to evaluate YELIVA™ as a radioprotectant for prevention of mucositis in head and neck cancer patients undergoing therapeutic radiotherapy is planned to be initiated in the first quarter of 2017.

A Phase I/II clinical study evaluating YELIVA™ in patients with refractory/relapsed diffuse large B-cell lymphoma (DLBCL) was initiated at the Louisiana State University Health Sciences Center (LSUHSC) in New Orleans in June 2015 and is expected to resume in the coming weeks following administrative hold and pending a protocol amendment aimed at improving overall recruitment. The study is supported by a grant awarded to Apogee from the NCI, as well as additional support from RedHill.

IARC CancerBase No. 9, Section of Cancer Surveillance.

[3] World Health Organization International Agency for Research on Cancer, GLOBOCAN 2012: Estimated Cancer Incidence, Mortality and Prevalence Worldwide in 2012.

[4] Datamonitor - Hepatocellular cancer Forecast (2015).

The ongoing studies with YELIVA™ (ABC294640) are registered on www.ClinicalTrials.gov, a web-based service by the U.S. National Institute of Health, which provides public access to information on publicly and privately supported clinical studies.

About YELIVA™ (ABC294640):
YELIVA™ (ABC294640) is a Phase II-stage, proprietary, first-in-class, orally-administered, sphingosine kinase-2 (SK2) selective inhibitor with anti-cancer and anti-inflammatory activities. RedHill is pursuing with YELIVA™ multiple clinical programs in oncology, inflammatory and gastrointestinal indications. By inhibiting the SK2 enzyme, YELIVA™ blocks the synthesis of sphingosine 1-phosphate (S1P), a lipid signaling molecule that promotes cancer growth and pathological inflammation. SK2 is an innovative molecular target for anticancer therapy because of its critical role in catalyzing the formation of S1P, which is known to regulate cell proliferation and activation of inflammatory pathways. YELIVA™ was originally developed by U.S.-based Apogee Biotechnology Corp. and completed multiple successful pre-clinical studies in oncology, inflammation, GI and radioprotection models, as well as the ABC-101 Phase I clinical study in cancer patients with advanced solid tumors. The development of YELIVA™ was funded to date primarily by grants and contracts from U.S. federal and state government agencies awarded to Apogee Biotechnology Corp., including the U.S. National Cancer Institute, the U.S. Department of Health and Human Services' Biomedical Advanced Research and Development Authority (BARDA), the U.S. Department of Defense and the FDA Office of Orphan Products Development.

About Hollings Cancer Center:
The Hollings Cancer Center at the Medical University of South Carolina is a National Cancer Institute-designated cancer center and the largest academic-based cancer research program in South Carolina. The cancer center is comprised of more than 120 faculty cancer scientists with a research funding portfolio of $44 million and a dedication to reducing the cancer burden in South Carolina. Hollings offers state-of-the-art diagnostic capabilities, therapies and surgical techniques within multidisciplinary clinics that include surgeons, medical oncologists, radiation therapists, radiologists, pathologists, psychologists and other specialists equipped for the full range of cancer care, including more than 200 clinical trials. For more information, please visit www.hollingscancercenter.org.

About RedHill Biopharma Ltd.:
RedHill Biopharma Ltd. (NASDAQ/TASE: RDHL) is a biopharmaceutical company headquartered in Israel, 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's current pipeline of proprietary products includes: (i) **RHB-105 -** an oral combination therapy for the treatment of *Helicobacter pylori* infection with successful results from a first Phase III study; (ii) **RHB-104 -** an oral combination therapy for the treatment of Crohn's disease with an ongoing first Phase III study and an ongoing proof-of-concept Phase IIa study for multiple sclerosis; (iii) **BEKINDA® (RHB-102) -** a once-daily oral pill formulation of ondansetron with an ongoing

Phase III study for acute gastroenteritis and gastritis and an ongoing Phase II study for 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 uPA inhibitor, targeting gastrointestinal and other solid tumors; (vii) **RP101 -** currently subject to an option-to-acquire by RedHill, RP101 is a Phase II-stage first-in-class, orally-administered Hsp27 inhibitor, targeting pancreatic and other gastrointestinal cancers; (viii) **RIZAPORT® (RHB-103) -** an oral thin film formulation of rizatriptan for acute migraines, with a U.S. NDA currently under discussion with the FDA and marketing authorization received in Germany in October 2015; and (ix) **RHB-101 -** a once-daily oral pill formulation of the cardio drug carvedilol.

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 establish and maintain corporate collaborations; (vi) 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; (vii) 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; (viii) the implementation of the Company's business model, strategic plans for its business and therapeutic candidates; (ix) 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; (x) parties from whom the Company licenses its intellectual property defaulting in their obligations to the Company; (xi) estimates of the Company's expenses, future revenues capital requirements and the Company's needs for additional financing; (xii) competitive companies and technologies within the Company's industry; and (xiii) the impact of the political and security situation in Israel on the Company's business. 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 25, 2016. 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.

Company contact:
Adi Frish
Senior VP Business Development & Licensing
RedHill Biopharma
+972-54-6543-112
adi@redhillbio.com

IR contact (U.S.):
Marcy Nanus
Senior Vice President
The Trout Group
+1-646-378-2927
Mnanus@troutgroup.com