Harpoon Therapeutics Doses First Patient with a Mesothelin-Targeting T cell Engager (HPN536) in Phase 1/2a Clinical Trial for Ovarian and Other Solid Tumor Cancers

- HPN536 is the second TriTAC T cell engager to enter clinical development from the Harpoon pipeline

- Trial initiated at Sarah Cannon Research Institute in Nashville, Tenn. - a leading drug development organization

SOUTH SAN FRANCISCO, Calif., April 18, 2019 - Harpoon Therapeutics, Inc. (NASDAQ: HARP), a clinical-stage immunotherapy company developing a novel class of T cell engagers, announced today that the first patient has been dosed with HPN536 in a Phase 1/2a clinical trial initially focused on ovarian cancer. HPN536 targets mesothelin, which is expressed on malignant cells of ovarian and pancreatic carcinoma, mesothelioma, non-small cell lung cancer and breast cancer. HPN536 is Harpoon's second product candidate to enter the clinic and is based on Harpoon's proprietary Tri-specific T cell Activating Construct (TriTAC™) platform that has been designed to recruit a patient's own immune cells to destroy tumors.

"We are pleased with the rapid progress of our clinical programs, based on our proprietary TriTAC platform, with patient dosing now underway for our second product candidate, HPN536, that targets mesothelin," said Natalie Sacks, M.D., Chief Medical Officer of Harpoon Therapeutics. "The dose escalation portion of the trial will focus on patients with ovarian cancer, where mesothelin is over expressed in a high percentage of patients. HPN536 is a targeted, off the shelf immunotherapy that has been optimized for delivery to solid tumors and designed to provide a novel way to engage a patient's own immune cells to fight cancer for patients who have limited treatment options."

"We are excited to participate in this trial of such a promising agent that will hopefully benefit patients with ovarian cancer and other mesothelin-expressing solid tumors such as pancreatic and lung cancers," said Howard A. Burris, M.D., President and Chief Medical Officer for Sarah Cannon. Sarah Cannon Research Institute at Tennessee Oncology in Nashville, Tenn., is a participating site in the trial.

"Harpoon's unique approach to T cell engagement may offer appealing advantages over other T cell therapies and, in addition, provide meaningful efficacy with improved patient management based on the convenience of once weekly intravenous dosing," said Gerald McMahon, Ph.D., President and CEO of Harpoon. "We look forward to exploring this target, where CAR (chimeric antigen receptor) expressing T cells targeting mesothelin have shown early evidence of clinical benefit in data presented at the American Association of Cancer Research Annual Meeting in Atlanta earlier this month."

About the Phase 1/2a Trial for HPN536

HPN536 is a 50-kD single polypeptide that contains three binding domains - to human mesothelin, human serum albumin and human CD3.The Phase 1/2a trial is a multicenter, open-label study designed to evaluate the safety, tolerability, pharmacokinetics and activity of HPN536 in up to 80 patients with mesothelin-expressing cancers. The Phase 1 portion of the trial is a dose escalation phase, with the goal of determining a dose for additional clinical investigations. This first phase is expected to enroll up to 20 patients, initially focusing on patients suffering from ovarian cancer. HPN536 will be administered to

patients once weekly by intravenous infusion. The primary outcome measure will be an assessment of safety and tolerability, and determination of a dose for the Phase 2 portion of the trial. Following dose escalation, the study will further evaluate the safety and activity of HPN536 in up to three additional parallel cohorts of 20 patients each with ovarian, pancreatic and mesothelioma cancer. For additional information about the trial, please visit clinicaltrials.gov using the identifier NCT03872206.

About Harpoon Therapeutics

Harpoon Therapeutics is a clinical-stage immunotherapy company developing a novel class of T cell engagers that harness the power of the body's immune system to treat patients suffering from cancer and other diseases. T cell engagers are engineered proteins that direct a patient's own T cells to kill target cells that express specific proteins, or antigens, carried by the target cells. Using its proprietary Tri-specific T cell Activating Construct™ (TriTAC) platform, Harpoon is developing a pipeline of novel T cell engagers, or TriTACs, initially focused on the treatment of solid tumors and hematologic malignancies. For additional information about Harpoon Therapeutics, please visit www.harpoontx.com.

Cautionary Note on Forward-looking Statements

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as "may," "will," "expect," "plan," "anticipate," "target," "estimate," "intend" and similar expressions (as well as other words or expressions referencing future events, conditions or circumstances) are intended to identify forward-looking statements. These forward-looking statements are based on Harpoon Therapeutics' expectations and assumptions as of the date of this press release. Each of these forward-looking statements involves risks and uncertainties that could cause Harpoon Therapeutics' clinical development programs, future results or performance to differ significantly from those expressed or implied by the forward-looking statements. Forward-looking statements contained in this press release include, but are not limited to, statements about the anticipated safety, efficacy and patient management benefits of HPN536 for the treatment of patients with ovarian and other cancers, anticipated advantages the TriTAC platform may have over other therapies, the progress, timing, scope and results of clinical trials, the association of data with treatment outcomes and the timing and likelihood of development milestones for product candidates. Many factors may cause differences between current expectations and actual results, including unexpected safety or efficacy data observed during clinical studies, clinical trial site activation or enrollment rates that are lower than expected, changes in expected or existing competition, changes in the regulatory environment, the uncertainties and timing of the regulatory approval process, and unexpected litigation or other disputes. Other factors that may cause Harpoon Therapeutics' actual results to differ from those expressed or implied in the forward-looking statements in this press release are discussed in Harpoon Therapeutics' filings with the U.S. Securities and Exchange Commission, including the "Risk Factors" sections contained therein. Except as required by law, Harpoon Therapeutics assumes no obligation to update any forward-looking statements contained herein to reflect any change in expectations, even as new information becomes available.

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