MyoKardia Presents Additional Positive Data from Phase 2 PIONEER-HCM Study of Mavacamten (Formerly MYK-461) at the Heart Failure Society of America's 21st Annual Scientific Meeting

New Positive Data on Secondary and Exploratory Endpoints Consistent with Previously Reported Topline Results

SOUTH SAN FRANCISCO, Calif., September 18, 2017 – MyoKardia, Inc. (Nasdaq: MYOK) ("MyoKardia" or the "Company"), a clinical stage biopharmaceutical company pioneering a precision medicine approach for the treatment of heritable cardiovascular diseases, today announced that additional positive data from the first patient cohort of its Phase 2 PIONEER-HCM study of mavacamten in symptomatic, obstructive hypertrophic cardiomyopathy (oHCM) patients were presented at the Heart Failure Society of America (HFSA)'s 21st Annual Scientific Meeting in Dallas, TX.

In an oral presentation as part of the "Big Trials of the Last Year" session at HFSA, Stephen Heitner, M.D., director of the HCM Clinic at Oregon Health and Science University's Knight Cardiovascular Institute, and the lead investigator in the PIONEER-HCM study, presented new time-series plots of individual patient data on the primary endpoint, post-exercise peak left ventricular outflow tract (LVOT) gradient, and time-series plots of mean data on several additional measures, including resting LVOT gradient and resting left ventricular ejection fraction (LVEF) from baseline to week 12. Additional measures of exercise capacity, functional capacity and symptoms were also presented, as well as data on the safety profile of mavacamten.

MyoKardia initially reported positive topline results from this first patient cohort on August 7, 2017, which met the primary endpoint of change in post-exercise peak LVOT gradient from baseline to week 12 as well as key secondary endpoints, including peak oxygen consumption (peak VO_2).

The additional results presented today by Dr. Heitner indicated that mavacamten treatment led to a meaningful reduction, in the first few weeks of treatment, in resting LVOT gradient with a less pronounced reduction in resting LVEF. The rapid reduction in LVOT gradient, observed in 9 out of 10 patients by week 2, supported the addition of a second, low-dose cohort in the PIONEER-HCM trial.

Furthermore, data following the washout period (from week 12 to week 16) were presented for the following measures: post-exercise peak LVOT gradient, resting LVOT gradient, resting LVEF, dyspnea score, NYHA Functional Class and NT-proBNP. For all of these measures, reversion towards baseline values was observed, on average across the cohort, after mavacamten therapy was discontinued.

"These data strengthen the case, initially seen with the release of the topline results, that mavacamten, by targeting the underlying biomechanical defect of the disease, can affect multiple clinically meaningful metrics that characterize the oHCM disease burden," said Dr. Stephen

Heitner. “On behalf of the investigators, I am pleased to present these additional data showing the concordant and positive effects of mavacamten, with patients feeling better and displaying improvements in exercise capacity.”

“Hypertrophic cardiomyopathy continues to be an area of serious unmet need and patients living with this disease have limited options,” said Marc Semigran, M.D., chief medical officer of MyoKardia. “These data increase our confidence in the mavacamten program and we look forward to advancing this program over the remainder of 2017, including the completion of study visits in our second, low-dose cohort in PIONEER-HCM, an End-of-Phase 2 meeting with the FDA and the initiation of our EXPLORER-HCM trial.”

Patient Baseline Characteristics

- In this first patient cohort of PIONEER-HCM, 11 symptomatic, oHCM patients enrolled and 10 completed the study. Patients were treated with a 10 mg or 15 mg starting daily dose of mavacamten for 12 weeks, followed by a four-week washout phase. In this first cohort, patients were required to discontinue background therapy including beta blockers.

- The following table summarizes the baseline characteristics of the 11 patients enrolled in the first cohort of PIONEER-HCM:

Age, years; mean (min-max)	56 (22-70)
Sex, % male	64
NYHA Functional Class	64% Class II; 36% Class III
History of Paroxysmal Atrial Fibrillation	1
History of Septal Myectomy	1
Previous Background Beta Blocker Therapy, Discontinued Prior to Study Start per Protocol	9
Resting LVEF, %; mean ± SD	70 ± 7.0
Exercise LVEF, %; mean ± SD	76 ± 7.8
Resting LVOT Gradient, mmHg; mean ± SD	68 ± 34.4
Post-Exercise Peak LVOT Gradient, mmHg; mean ± SD	125 ± 60.0
Peak VO_2, mL/kg/min; mean ± SD	20.7 ± 7.44

Impact of Mavacamten on Additional Secondary and Exploratory Endpoints

- Time-series of mean resting LVOT gradient and mean LVEF were reported today for the first time, showing concordance with data previously reported. Resting LVOT gradient was reduced to 14 ± 24.6 mmHg (mean ± SD) at week 12 from a baseline value of 68 ± 34.4 mmHg. Resting LVEF was reduced to 55 ± 13.1% at week 12 from a baseline value of 70 ± 7.0%.

- A mean time-series plot of dyspnea numerical rating scale (NRS), a common measure of patient symptoms, was also reported. At week 12, patients achieved an average dyspnea NRS of 1.7 ± 1.8 compared to a baseline of 4.9 ± 1.6 (p=0.002).

- Furthermore, additional CPET measures of exercise capacity, including VE/VCO_2 and circulatory power, also showed similar trends as previously reported data.

Safety Overview

- Mavacamten was generally well-tolerated in this first patient cohort of PIONEER-HCM. As previously reported, one patient experienced a serious adverse event due to a recurrence of atrial fibrillation and elected to stop study drug at week 4.

- All other adverse events (AEs) were mild to moderate. A majority of AEs were deemed unrelated to study drug. Of these non-serious AEs, the most common observations (defined as three or more events) in this cohort were: headache (4), reduction in ejection fraction (3) and nausea (3). None of these patients with an adverse event report of reduction in ejection fraction had symptoms of decompensated heart failure.

- Finally, a time-series plot of mean NT-proBNP, a biomarker commonly used to track severity of heart failure, was presented, providing additional support for the favorable safety profile observed.

MyoKardia intends to discuss the mavacamten clinical development plan in an End-of-Phase 2 meeting with the FDA and seek feedback on the potential for EXPLORER-HCM, its next study of mavacamten in symptomatic oHCM, to be a pivotal study with peak VO_2 as the primary endpoint. The key inclusion and exclusion criteria for EXPLORER-HCM are anticipated to be similar to those for PIONEER-HCM.

PIONEER-HCM Study Design

PIONEER-HCM is a Phase 2 open-label study to assess the efficacy, safety, pharmacokinetics, pharmacodynamics, and tolerability of mavacamten in patients with symptomatic oHCM. oHCM patients with left ventricular ejection fraction (LVEF) ≥ 55%, LVOT gradient (resting gradient ≥ 30 mmHg, post-exercise peak LVOT gradient ≥ 50 mmHg) and New York Heart Association (NYHA) Functional Class ≥ II were treated with mavacamten for 12 weeks, followed by a four-week washout phase. The primary endpoint of PIONEER-HCM is the change in post-exercise peak LVOT gradient from baseline to week 12. Additional endpoints include change from baseline to week 12 in peak VO_2, VE/VCO_2, NYHA Functional Class, NT-proBNP, rest and exercise LVEF, and dyspnea score. Safety endpoints include treatment-related AEs and serious AEs, and changes from baseline in laboratory test results, vital signs, and electrocardiograms. PIONEER-HCM consists of two dosing cohorts: the first cohort, in which subjects received an initial 10 mg or 15 mg daily dose and were required to discontinue background therapy including

beta blockers, and the second cohort, in which subjects will receive a lower daily dose and are not required to discontinue beta blocker therapy.

About Mavacamten (Formerly MYK-461)

Mavacamten is a novel, oral, allosteric modulator of cardiac myosin that reduced hypercontractility in a Phase 1 clinical study of HCM patients. MyoKardia has evaluated mavacamten in multiple Phase 1 clinical studies, primarily designed to evaluate safety and tolerability of oral doses of mavacamten, and provide pharmacokinetic and pharmacodynamic data. In April 2016, the U.S. FDA granted Orphan Drug Designation for mavacamten for the treatment of symptomatic oHCM, a subset of HCM. MyoKardia is currently studying mavacamten in the Phase 2 PIONEER-HCM study.

About MyoKardia

MyoKardia is a clinical stage biopharmaceutical company pioneering a precision medicine approach to discover, develop and commercialize targeted therapies for the treatment of serious and rare cardiovascular diseases. MyoKardia's initial focus is on the treatment of heritable cardiomyopathies, a group of rare, genetically-driven forms of heart failure that result from biomechanical defects in cardiac muscle contraction. MyoKardia has used its precision medicine platform to generate a pipeline of therapeutic programs for the chronic treatment of the two most prevalent forms of heritable cardiomyopathy—hypertrophic cardiomyopathy (HCM), and dilated cardiomyopathy (DCM). MyoKardia's most advanced product candidate is mavacamten (formerly MYK-461). Mavacamten is a novel, oral, allosteric modulator of cardiac myosin that reduced hypercontractility in Phase 1 clinical studies of HCM patients. In April 2016, the FDA granted Orphan Drug Designation for mavacamten for the treatment of symptomatic oHCM, a subset of HCM. MyoKardia is currently studying mavacamten in PIONEER-HCM. MYK-491, MyoKardia's second product candidate, is designed to increase the overall extent of the heart's contraction in DCM patients by increasing cardiac contractility. MyoKardia is currently evaluating MYK-491 in a Phase 1 study in healthy volunteers. A cornerstone of the MyoKardia platform is the Sarcomeric Human Cardiomyopathy Registry (SHaRe), a multi-center, international repository of clinical and laboratory data on individuals and families with genetic heart disease, which MyoKardia helped form in 2014. MyoKardia's mission is to change the world for patients with serious cardiovascular disease through bold and innovative science.

Forward-Looking Statements

Statements we make in this press release may include statements which are not historical facts and are considered forward-looking within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, which are usually identified by the use of words such as "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "seeks," "should," "will," and variations of such words or similar expressions. We intend these forward-looking statements to be covered by the

safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act and Section 21E of the Securities Exchange Act and are making this statement for purposes of complying with those safe harbor provisions. These forward-looking statements, including statements regarding the clinical and therapeutic potential of mavacamten (formerly MYK-461), the Company's expectations with respect to its ability to continue to advance mavacamten in the PIONEER-HCM study, the timing of the completion of study visits in its second patient cohort in PIONEER-HCM, its anticipated End-of-Phase 2 meeting with the FDA, its ability to initiate its EXPLORER-HCM trial in symptomatic oHCM and the timing of such initiation, the potential for EXPLORER-HCM to be a pivotal study with peak VO2 as the primary endpoint, the key inclusion and exclusion criteria for EXPLORER-HCM, the number of patients expected to be enrolled in EXPLORER-HCM, as well as the requirements for registration of the Company's product candidates, reflect our current views about our plans, intentions, expectations, strategies and prospects, which are based on the information currently available to us and on assumptions we have made. Although we believe that our plans, intentions, expectations, strategies and prospects as reflected in or suggested by those forward-looking statements are reasonable, we can give no assurance that the plans, intentions, expectations or strategies will be attained or achieved. Furthermore, actual results may differ materially from those described in the forward-looking statements and will be affected by a variety of risks and factors that are beyond our control including, without limitation, risks associated with the development and regulation of our product candidates, as well as those set forth in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2017, and our other filings with the SEC. Except as required by law, we assume no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

Investor Contact:
Beth DelGiacco
Stern Investor Relations, Inc.
212-362-1200
beth@sternir.com

Media Contact:
Steven Cooper
Edelman
415-486-3264
steven.cooper@edelman.com

###