GENETIC-AF PHASE 2B CLINICAL TRIAL ATRIAL FIBRILLATION BURDEN (AFB) RESULTS PRESENTED AT AMERICAN HEART ASSOCIATION 2018 SCIENTIFIC SESSIONS

- *AF detection by implanted Medtronic devices*
- *Similar trends for benefit in favor of Gencaro compared to active comparator for AF risk reduction observed by continuous monitoring with implanted devices compared to intermittent ECG-based monitoring.*

Westminster, CO, November 12, 2018 – ARCA biopharma, Inc. (Nasdaq: ABIO), a biopharmaceutical company applying a precision medicine approach to developing genetically-targeted therapies for cardiovascular diseases, today announced that data from the Atrial Fibrillation Burden (AFB) substudy of the Phase 2B GENETIC-AF clinical trial were presented November 11, 2018 in a poster session at the American Heart Association 2018 Scientific Sessions in Chicago. Jonathan Piccini, MD, MHS, FACC, FAHA, Associate Professor of Medicine and Director of the Duke Center for Atrial Fibrillation, Duke University Medical Center, presented the data.

GENETIC-AF was a Phase 2B, double-blind, superiority clinical trial evaluating Gencaro™ (bucindolol hydrochloride) as a genetically-targeted treatment for atrial fibrillation (AF) in patients with heart failure and reduced left ventricular ejection fraction (HFrEF). Safety data indicated that Gencaro was generally safe and well-tolerated in the AF/HFrEF population investigated with a safety profile similar to the active comparator metoprolol succinate (TOPROL-XL).

The primary endpoint results for the trial were determined by intermittent, clinic-based heart rhythm monitoring. However, a subset of patients (N=69) also underwent continuous heart rhythm monitoring with Medtronic implanted devices to determine AF recurrence based on AFB, a method that can identify AF with more certainty than intermittent clinic-based monitoring. A prespecified time-to-first event analysis was conducted using a total AFB of at least 6 hours per day to define an event of AF recurrence, as this criterion has been previously shown to be associated with an increased rate of HF hospitalizations.

In this substudy, Gencaro demonstrated similar trends for benefit compared to TOPROL-XL for the endpoint of time to AF recurrence when measured by continuous monitoring with implanted devices and by intermittent ECG-based monitoring (69 patients; hazard ratio = 0.73; 95% confidence interval: 0.34, 1.58) for both methods). Event rates were slightly higher for device-based monitoring and the device-based endpoint occurred a median of 6.5 days prior to ECG-based detection ($p < 0.0001$). Analyses were also presented for a cohort that exclude patients with long-standing (i.e., ≥12 years) and heavily pretreated HF and/or AF. In these analyses, a trend for benefit in favor of Gencaro over TOPROL-XL was observed in the overall population (230 patients; hazard ratio = 0.68; 95% confidence interval: 0.45, 1.02) and in the AFB substudy population

using device-based detection (60 patients; hazard ratio = 0.61; 95% confidence interval: 0.25, 1.44) and ECG-based detection (60 patients; hazard ratio = 0.60; 95% confidence interval: 0.25, 1.43).

About GENETIC-AF

A **Gen**otype-Directed Comparative **E**ffectiveness **T**rial of Bucindolol and Toprol-XL for Prevention of Symptomatic **A**trial **F**ibrillation/Atrial Flutter in Patients with Heart Failure

GENETIC-AF was a Phase 2B multi-center, randomized, double-blind, clinical superiority trial comparing the safety and efficacy of Gencaro™ against an active comparator, the beta-blocker Toprol XL (metoprolol succinate) for the treatment and prevention of recurrent atrial fibrillation or flutter (AF/AFL) in heart failure patients with reduced left ventricular ejection fraction (LVEF). Eligible patients had LVEF < 50%, a history of paroxysmal AF (episodes lasting 7 days or less) or persistent AF (episodes lasting more than 7 days and less than 1 year) in the past 6 months, and the beta-1 389 arginine homozygous genotype that ARCA believes responds most favorably to Gencaro™. A subset of patients in the trial also underwent continuous heart rhythm monitoring to assess AF burden, which was defined as a patient experiencing at least six hours of AF in a day. Topline results of GENETIC-AF were reported on February 26, 2018.

About ARCA biopharma

ARCA biopharma is dedicated to developing genetically-targeted therapies for cardiovascular diseases through a precision medicine approach to drug development. ARCA's lead product candidate, Gencaro™ (bucindolol hydrochloride), is an investigational, pharmacologically unique beta-blocker and mild vasodilator being developed for the potential treatment of heart failure (HF) patients at risk for atrial fibrillation (AF). ARCA has identified common genetic variations that it believes predict individual patient response to Gencaro, giving it the potential to be the first genetically-targeted AF prevention treatment. The Gencaro development program has been granted Fast Track designation by FDA. ARCA is also developing AB171, a thiol-substituted isosorbide mononitrate, as a potential genetically-targeted treatment for peripheral arterial disease (PAD) and for heart failure (HF). For more information, please visit www.arcabio.com.

Safe Harbor Statement

This press release contains "forward-looking statements" for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. These statements include, but are not limited to, statements regarding the ability of ARCA's financial resources to support its operations through the end of 2018, potential future development plans for Gencaro, the expected features and characteristics of Gencaro or AB171, including the potential for genetic variations to predict individual patient response to Gencaro, Gencaro's potential to treat AF, AB171's potential to treat HF, future treatment options for patients with AF, and the potential for Gencaro to be the first genetically-targeted AF prevention treatment. Such statements are based on management's current expectations and involve risks and uncertainties. Actual results and performance could differ materially from those projected in the forward-looking statements as a result of many factors, including, without limitation, the risks and uncertainties associated with: ARCA's financial resources and whether they will be sufficient to meet its business objectives and operational

requirements; ARCA may not be able to raise sufficient capital on acceptable terms, or at all, to continue development of Gencaro or to otherwise continue operations in the future; results of earlier clinical trials may not be confirmed in future trials; the protection and market exclusivity provided by ARCA's intellectual property; risks related to the drug discovery and the regulatory approval process; and, the impact of competitive products and technological changes. These and other factors are identified and described in more detail in ARCA's filings with the Securities and Exchange Commission, including without limitation ARCA's annual report on Form 10-K for the year ended December 31, 2017, and subsequent filings. ARCA disclaims any intent or obligation to update these forward-looking statements.

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