ARCA BIOPHARMA ANNOUNCES ISSUANCE OF EUROPEAN PATENT FOR TREATING CARDIOVASCULAR DISEASES AND CONDITIONS WITH A NEW CHEMICAL ENTITY UTILIZING GENETIC TARGETING

ARCA Plans Genetically-Targeted Development of a New Chemical Entity (AB171) for Peripheral Arterial Disease and Heart Failure

Westminster, CO, November 16, 2017 – ARCA biopharma, Inc. (Nasdaq: ABIO), a biopharmaceutical company applying a precision medicine approach to developing genetically-targeted therapies for cardiovascular diseases, today announced the European Patent Office's issuance of a patent (EPO # 2515899) on methods of treating cardiovascular disease and conditions with a thiol-substituted isosorbide mononitrate based on genetic targeting. The European patent, entitled "Methods and Compositions for Cardiovascular Diseases and Conditions," provides protection for this novel approach to treating patients with cardiovascular disease and conditions. The European patent has been validated in ten countries: Denmark, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland and the United Kingdom. ARCA has related patent applications pending in the United States Patent Office and Canadian Intellectual Property Office.

ARCA has discovered what it believes to be a pharmacogenetic target for AB171 that is the basis for the patents and which the company believes may enable genetically-targeted cardiovascular development programs. ARCA plans to advance development of AB171, a potential New Chemical Entity (NCE), for the treatment of two cardiovascular indications: peripheral arterial disease (PAD) and chronic heart failure (HF). The compound, formerly known as LA-419, was previously under development at Lacer, S.A., where multiple Phase 1 studies were conducted to assess pharmacokinetics and clinical tolerability. ARCA has collaborated with Elucida Research in the preclinical development of AB171. The Company anticipates initiating chemistry, manufacturing and controls (CMC) activities in the first half of 2018, followed by nonclinical studies with AB171 to support submission of an Investigational New Drug Application (IND).

"ARCA was founded on the belief that a precision medicine approach to drug development, tailoring medical treatment to functionally important genetic variants in drug targets that also serve as biomarkers, can enable more effective therapies, improve patient outcomes and reduce healthcare costs. The addition of AB171 to our genetically-targeted development pipeline, including the Gencaro atrial fibrillation-heart failure program, is consistent with that mission," commented Dr. Michael Bristow, ARCA's President and CEO. "We believe our experience with GENETIC-AF has established the feasibility of in-house design and execution of pharmacogenetic clinical trials, and has provided invaluable insights into this type of drug development. We are eagerly anticipating the top line results of the Phase 2B GENETIC-AF trial, expected in the latter part of the first quarter of 2018, which following discussions with FDA, may inform further

development of Gencaro. ARCA's current levels of staffing and expertise allow for the simultaneous activation of the AB171 program and organization of the potential next steps for Gencaro."

ARCA believes that its current cash, cash equivalents and marketable securities will be sufficient to fund its operations, at its projected cost structure, through the end of second quarter of 2018.

About AB171

AB171 is a thiol-containing derivative of isosorbide mononitrate. Pre-clinical data indicate that AB171 has significant anti-oxidant properties and is favorably differentiated from other nitrates for prevention of myocardial remodeling, anti-atherosclerotic effects and the development of tolerance. ARCA believes the unique pharmacology of AB171, coupled with targeting to genetically-identified enhanced response subpopulations, has the potential to translate to better long-term responses than treatment with traditional pharmacotherapy.

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 patients with atrial fibrillation and HF with reduced ejection fraction. 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 atrial fibrillation prevention treatment. ARCA has a collaboration with Medtronic, Inc. for support of the GENETIC-AF trial. The Gencaro development program has been granted Fast Track designation by the U.S. Food and Drug Administration (FDA). ARCA plans to develop AB171, a thiol-substituted isosorbide mononitrate, as a potential genetically-targeted treatment for PAD and for 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 anticipated characteristics of AB171 as a potential genetically-targeted treatment for PAD and for HF, the potential timeline for development of AB171, including any IND submission related thereto, the potential for genetic variations to predict individual patient response to Gencaro or AB171, Gencaro's potential to treat 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; 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, 2016, and subsequent filings. ARCA disclaims any intent or obligation to update these forward-looking statements.

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