ARCA BIOPHARMA ANNOUNCES SECOND QUARTER 2018 FINANCIAL RESULTS AND PROVIDES CORPORATE UPDATE

End-of-Phase 2 Meeting with the U.S. FDA on Gencaro Atrial Fibrillation Development Plan Completed; Single Additional Phase 3 Trial Planned to Support NDA Submission

Westminster, CO, August 9, 2018 – ARCA biopharma, Inc. (Nasdaq: ABIO), a biopharmaceutical company applying a precision medicine approach to developing genetically-targeted therapies for cardiovascular diseases, today reported financial results for the quarter ended June 30, 2018.

"The second quarter of this year saw an important milestone for the Gencaro development program with the completion of an End-of-Phase 2 FDA meeting that provided important guidance for the next steps in our development of Gencaro as potentially the first genetically-targeted treatment for atrial fibrillation," commented Dr. Michael Bristow, ARCA's President and Chief Executive Officer. "With work underway on completing the Gencaro Phase 3 trial protocol and continued progress with IND enabling activities for AB171 in PAD and HF, we believe ARCA is advancing our pipeline of genetically-targeted therapeutics to address the unmet medical needs of patients with cardiovascular disease."

Pipeline Update

Gencaro (bucindolol hydrochloride) - a pharmacologically unique beta-blocker and mild vasodilator being developed for the potential treatment of patients with atrial fibrillation (AF) and chronic heart failure with reduced left ventricular ejection fraction (HFrEF).

- In April 2018, Medtronic, Inc. and ARCA agreed to extend their current U.S., Canadian and European Clinical Trial Collaboration Agreement for one additional year.

- In May 2018, results from ARCA's GENETIC-AF Phase 2B clinical trial were presented in a "Late Breaking Clinical Trials" oral presentation at the European Society of Cardiology (ESC) Heart Failure 2018 World Congress.

- In June 2018, ARCA held an End-of-Phase 2 meeting with the U.S. Food and Drug Administration (FDA) to review the GENETIC-AF data and potential future Gencaro development plans.

    - FDA concurrence to proceed into Phase 3 was reached. ARCA anticipates submitting a Special Protocol Assessment (SPA) application for the proposed Gencaro Phase 3 clinical trial in the third quarter of 2018. Progress to Phase 3 is

dependent on the Company receiving additional funding.

AB171 – a thiol-substituted isosorbide mononitrate being developed as a potential genetically-targeted treatment for heart failure (HF) and peripheral arterial disease (PAD).

- Chemistry, manufacturing and controls (CMC) activities were continued in the second quarter.

- IND-enabling non-clinical studies are anticipated to begin in the first half of 2019.

Second Quarter 2018 Summary Financial Results

Cash, cash equivalents and marketable securities totaled $9.6 million as of June 30, 2018, compared to $11.8 million as of December 31, 2017. 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 the first quarter of 2019.

Research and development (R&D) expenses for the quarter ended June 30, 2018 totaled $1.2 million compared to $4.5 million for the corresponding period of 2017. The $3.3 million decrease in research and development expenses in the second quarter of 2018 as compared to the second quarter 2017 was primarily due to decreased clinical expenses following the completion of the GENETIC-AF clinical trial. The Company expects R&D expenses in 2018 to be lower than 2017 as the GENETIC-AF clinical trial has been completed.

General and administrative (G&A) expenses for the quarter ended June 30, 2018 were $1.0 million, relatively unchanged compared to the $1.1 million in the second quarter of 2017. ARCA expects G&A expenses in 2018 to be consistent with those in 2017 as it maintains administrative activities to support ongoing operations.

Total operating expenses for the quarter ended June 30, 2018 were $2.2 million compared to $5.6 million for the second quarter of 2017. The decrease in total operating expenses for the second quarter of 2018 was primarily due to the decrease in R&D expense due to the completion of the GENETIC-AF clinical trial.

Net loss was $2.1 million, or $0.15 per share, for the second quarter of 2018 compared to $5.5 million, or $0.59 per share, for the second quarter of 2017.

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 (AF) and chronic heart failure with reduced left ventricular ejection fraction (HFrEF)

which recently completed a Phase 2B clinical trial. 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. 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 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 the first quarter of 2019, 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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(Tables follow)

ARCA BIOPHARMA, INC.

BALANCE SHEET DATA
(in thousands)
(unaudited)

	June 30, 2018	December 31, 2017
Cash, cash equivalents & marketable securities	$9,635	$11,752
Working capital	$8,950	$10,229
Total assets	$10,067	$12,365
Total stockholders' equity	$8,998	$10,275

ARCA BIOPHARMA, INC.

STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(in thousands, except share and per share amounts)			
Costs and expenses:				
Research and development	$ 1,154	$ 4,508	$ 2,874	$ 7,754
General and administrative	1,002	1,051	2,055	2,186
Total costs and expenses	2,156	5,559	4,929	9,940
Loss from operations	(2,156)	(5,559)	(4,929)	(9,940)
Interest and other income	43	39	84	84
Interest expense	(3)	(2)	(6)	(4)
Net loss	$ (2,116)	$ (5,522)	$ (4,851)	$ (9,860)
Change in unrealized loss on marketable securities	—	4	2	14
Comprehensive loss	$ (2,116)	$ (5,518)	$ (4,849)	$ (9,846)
Net loss per share:				
Basic and diluted	$ (0.15)	$ (0.59)	$ (0.35)	$ (1.07)
Weighted average shares outstanding:				
Basic and diluted	13,923,512	9,324,822	13,772,947	9,210,186