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**TWO GENCARO™ ATRIAL FIBRILLATION ABSTRACTS ACCEPTED FOR
PRESENTATION AT THE AMERICAN HEART ASSOCIATION SCIENTIFIC
SESSIONS 2011**

**Gencaro Potentially the First Genetically-Targeted Treatment for Prevention of Atrial
Fibrillation**

Broomfield, CO, August 10, 2011 – ARCA biopharma, Inc. (Nasdaq: ABIO), a biopharmaceutical company developing genetically-targeted therapies for atrial fibrillation and other cardiovascular diseases, announced today that two Gencaro (bucindolol hydrochloride) abstracts have been selected for oral presentation at the American Heart Association’s Scientific Sessions 2011, being held November 12-16, 2011 in Orlando, Florida. The abstracts present atrial fibrillation data from the pivotal Phase 3 BEST trial of Gencaro.

Dr. Ryan Aleong, Assistant Professor of Medicine, Cardiology, Director of Implanted Cardiac Device Clinic, University of Colorado Hospital, and Interim Director of Arrhythmia Services at Denver Health Medical Center, is scheduled to present both abstracts:

- “Prevention of Atrial Fibrillation by Bucindolol is Completely Dependent on the Beta-1 389 Arg/Gly Adrenergic Receptor Polymorphism.” (Expanded Panel Discussion – EPD.400.03 – Atrial Fibrillation: Novel Insights into Mechanisms; Wednesday, November 16, 2011, from 9:00 a.m. to 11:45 a.m. Eastern).
- “Is New Onset Atrial Fibrillation a Surrogate Marker for Heart Failure Progression?” (Abstract Oral Session – AOS.516.01 – Ventricular Function/Hemodynamics and Biomarkers; Wednesday, November 16, 2011, from 2:00 p.m. to 5:10 p.m. Eastern).

Atrial Fibrillation

Atrial fibrillation is a disorder in which the normally regular and coordinated contraction pattern of the heart’s two small upper chambers (the atria) becomes irregular and uncoordinated. The irregular contraction pattern associated with atrial fibrillation causes blood to pool in the atria, predisposing the formation of clots. These clots may travel from the heart and become lodged in the arteries leading to the brain and other organs, thereby blocking necessary blood flow and potentially resulting in stroke. In addition, in patients with heart failure with reduced left ventricular ejection fraction (HFREF), new onset atrial fibrillation may also contribute to

worsening heart failure and increased risk of death.

Studies estimate atrial fibrillation affected between 2 and 3 million Americans in 2005. Those same studies estimate the prevalence of atrial fibrillation will likely increase to between 3.8 million and 4.8 million by 2025. Industry estimates expect the atrial fibrillation drug market in developed countries to increase more than eight-fold, from \$843 million in 2009 to \$6.8 billion in 2019. The Company believes there is an unmet medical need for new atrial fibrillation treatments that have fewer side effects than currently available therapies and are more effective, particularly in patients with HFREF, where most of the approved atrial fibrillation drugs are contra-indicated or have warnings in their prescribing information.

Gencaro Phase 3 Atrial Fibrillation Clinical Trial

The Company plans to conduct a Phase 3, multi-center, randomized, double-blind clinical trial of Gencaro in approximately 300-400 new onset atrial fibrillation patients with HFREF. The Company believes the planned study will provide important clinical data on the safety and efficacy of Gencaro in this patient population and additional information on the pharmacogenetic selectivity of Gencaro. The primary endpoint of the trial will be time to recurrent symptomatic atrial fibrillation after electrical cardioversion.

The Company is planning for the atrial fibrillation trial to compare Gencaro to the beta-blocker metoprolol CR/XL in patients with the genotype (homozygous arginine position of the beta₁389 adrenergic receptor) in which Gencaro appears to demonstrate therapeutic enhancement. Metoprolol CR/XL does not appear to have enhancement of efficacy in patients with this genotype. The Company believes the planned trial would take approximately two years from enrollment of the first patient to completion. Subject to obtaining additional financing, the Company anticipates initiating patient enrollment in the trial in the first half of 2012.

About ARCA biopharma

ARCA biopharma is dedicated to developing genetically-targeted therapies for cardiovascular diseases. The Company's lead product candidate, GencaroTM (bucindolol hydrochloride), is an investigational, pharmacologically-unique beta-blocker and mild vasodilator being developed for the prevention of atrial fibrillation in patients with heart failure. ARCA has identified common genetic variations in the cardiovascular system that it believes interact with Gencaro's pharmacology and may predict individual patient response to Gencaro, giving it the potential to be the first genetically-targeted treatment for the prevention of atrial fibrillation. ARCA is collaborating with Laboratory Corporation of America to develop the companion genetic test for Gencaro. For more information please visit www.arcabiopharma.com.

Safe Harbor Statement

This press release and the anticipated presentations may contain "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 genetic variations to predict individual patient response to Gencaro; the potential for Gencaro to be the

first genetically-targeted heart failure and/or atrial fibrillation prevention treatment; the projected increase in prevalence of atrial fibrillation; the projected increase in the size of the atrial fibrillation drug market in developed countries; and, the potential for the planned atrial fibrillation clinical trial provide important data on the safety and efficacy of Gencaro in the trial population. 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: the Company's financial resources and whether they will be sufficient to meet the Company's business objectives and operational requirements; the protection and market exclusivity provided by the Company'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 SEC, including without limitation the Company's annual report on Form 10-K for the year ended December 31, 2010 and subsequent filings. The Company disclaims any intent or obligation to update these forward-looking statements.

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