Cardio3 BioSciences C-Cath® Article Published in Circulation Cardiovascular Interventions

Study Demonstrates Enhanced Endomyocardial Therapeutics Retention through an Optimized Delivery System.

Mont-Saint-Guibert, Belgium, - Cardio3 BioSciences (C3BS) (NYSE Euronext Brussels and Paris: CARD), a leader in the discovery and development of regenerative, protective and reconstructive therapies for the treatment of cardiac diseases, today announces the advanced publication of C-Cath® (C-Cath™) study results in the on-line edition of the journal Circulation Cardiovascular Interventions (Circ Cardiovasc Interv.).

The publication reported

- a close to three-fold increase in retention of cells within the heart muscle when using C-Cath®, a nitinol curved needle catheter developed by Cardio3 BioSciences compared with a standard needle
- that the increase in retention when using C-Cath® has no negative effect on biocompatibility or safety

The publication concluded that a nitinol-based curved needle delivery system with side holes such as C-Cath® achieved enhanced myocardial stem cell retention.

Percutaneous catheter based methods are an established route for delivery of regenerative biologics to the heart. However the current devices and methodologies are associated with a significant loss of the delivered stem cell dose in the general circulation, creating a barrier to the efficiency of local delivery of therapeutic agents. This study provided an opportunity to conceptualize model and test a variety of needle designs for optimization of cell retention. It demonstrated that a curved needle design featuring small-to-large graded side holes resulted in a significant increase in cell retention in both healthy and infarcted hearts. More precisely, a curved needle design eliminated backflow of injectate and limited loss in the general circulation, and the use of a small-to-large graded side-hole design diminished interstitial pressure during delivery to improve diffusion and cell viability.

C-Cath®, with its nitinol-based curved needle and side holes, is the new generation of percutaneous injection catheter for myocardial delivery. This proprietary steerable percutaneous catheter has been designed and developed to elevate the standard of care to clinicians and patients by focusing on three key features: retention, safety, and ease of use.

With C-Cath®, Cardio3 BioSciences provides the clinician with a catheter biocompatible with injected agents which can be safely manoeuvred to reach targeted sites within the heart chamber. C-Cath® also permits stable contact with the beating myocardium without generating additional tissue trauma and diffuses the therapeutic agent over a bigger target area to obtain both a higher concentration and a wider tissue exposure.

**Dr Atta Behfar**, the lead author from the Division of Cardiovascular Diseases and Center for Regenerative Medicine at Mayo Clinic, commented: “Major advances in the understanding of stem cells as reparative biotherapeutics have been achieved during the past decade, yet regenerative procedures remain limited by the low retention rates after transplantation. Optimized delivery of stem cells is a priority to advance regenerative procedures. Having used the C-Cath® in preclinical evaluation and having examined the device to assess its physical properties, I consider it to be a superbly crafted catheter that has the potential to become a unique tool, for use with a wide array of biologics”.

**Dr Christian Homsy**, CEO of Cardio3 BioSciences, added: “While the key focus for Cardio3 BioSciences remains C-Cure®, our unique stem cell treatment for heart failure which is actually in a phase III clinical study in Europe, the publication of the C-Cath® study results in a journal as prestigious as Circulation Cardiovascular Interventions highlights Cardio3 BioSciences’ dedication and leadership in bringing regenerative therapies to patients. We believe that innovation needs to take into account all the elements related to therapy, beyond the cells themselves and including, for example, the delivery systems. With our dedication to solid science and innovation, we once again demonstrate that we are the cornerstone of the cardiac regenerative medicine industry”.

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About Cardio3 BioSciences

Cardio3 BioSciences is a Belgian leading biotechnology company focused on the discovery and development of regenerative and protective therapies for the treatment of cardiac diseases. The company was founded in 2007 and is based in the Walloon region of Belgium. Cardio3 BioSciences leverages close research collaborations in the US with Mayo Clinic and in Europe with the Cardiovascular Centre Aalst, Belgium.

The Company’s lead product candidate C3BS-CQR-1 is the most advanced autologous cellular therapy product for the treatment of heart failure, one of the world’s most pressing unmet medical needs. The product consists of patient’s own stem cells harvested from the bone marrow and engineered to become progenitors of new functional cardiac cells that behave identically to those lost to heart disease with a goal to rebuild the heart. This process of cardiac-lineage commitment is known as Cardiopoiesis. CQR-1 is currently the first product in a Phase III trial worldwide using organ specified cells for the treatment of ischemic heart failure.

Cardio3 BioSciences has also developed C-Cath®, the technologically most advanced intramyocardial injection catheter with superior performance for delivery of biotherapeutics into the myocardium. The proprietary steerable percutaneous catheter has been developed to elevate the standard of care to clinicians and patients. C-Cath® is CE marked and is now available for commercial use in the EU and many other countries where the CE mark allows commercialization.

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