

New drug formulation could help people undergoing heart surgery

October 31 2018

Professor Raimondo Ascione, and Professor Saadeh Suleiman, from the Bristol Heart Institute, will explore whether treatment with two drugs, which are already used in other ways in people with heart conditions, could benefit patients undergoing open-heart surgery. They have been awarded a grant of nearly £300,000 by the British Heart Foundation (BHF) to carry out this work.

Open-[heart surgery](#) typically requires stopping the heart for one to two hours, while blood is pumped around the body using a heart-lung machine. Despite many advances, stopping the heart in this way still leads to significant injury, which is associated with complications after the surgery.

Previous studies carried out in Professors Suleiman and Halestrap's laboratories in rodents showed that consecutive use of two drugs, isoprenaline and adenosine, can activate protective pathways and limit heart damage following a [heart attack](#).

The team will now test this discovery in a pig model of heart attack and cardiac surgery at the University of Bristol's Translational Biomedical Research Centre (TBRC). The pig heart is very similar to the human heart in its size, anatomy and function.

In the first part of the [research project](#), the scientists will check the safety and feasibility of the surgery and isoprenaline/adenosine treatment and determine suitable doses.

In the second part of the study, the team will assess whether this treatment can limit damage caused to the injured pig heart when it is stopped during cardiac surgery and aim to establish the mechanisms underlying any protective effect.

Raimondo Ascione, Professor of Cardiac Surgery and Translational Research in the Bristol Medical School, and TBRC Director, who is leading the research, said: "This research could potentially benefit millions of [cardiac surgery patients](#) globally, and is aimed at paving the way for future first-in-man trials.

"This work, with its multidisciplinary and translational focus, could reduce the use of NHS resources and also benefit the scientific community."

Professors Ascione and Suleiman, who have been collaborating for years on this area of research, added: "This research project, because of the relevance of the model to human physiology, will also establish a method for testing new drugs or formulations in the UK, which could benefit people in the future."

Dr. Lucie Duluc, Research Advisor at the BHF, said: "Preventing heart injury after surgery would be of huge benefit to the thousands of patients in the UK who have these crucial operations every year.

"Professor Ascione and Professor Suleiman have already demonstrated the potential to trigger a protective response within the heart in rodents, and this research is the next step towards translating that potential into a treatment that can benefit patients.

"This research will improve our understanding of the ways in which the heart protects itself after loss and restoration of blood supply and may identify new targets to prevent subsequent heart injury.

"Funding for this research has only been made possible by the fantastic generosity of the public. We rely on their support to drive forward research programmes in our mission to beat heartbreak forever and ensure that we keep hearts beating and blood flowing."

The two-year research project titled 'Consecutive isoprenaline/adenosine to improve myocardial cardioplegic protection in a porcine model of ischemic heart failure with superimposed [cardiac surgery](#)' is funded by the BHF and will begin on 1 December 2018.

Provided by University of Bristol

Citation: New drug formulation could help people undergoing heart surgery (2018, October 31) retrieved 20 April 2024 from <https://medicalxpress.com/news/2018-10-drug-people-heart-surgery.html>

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