

Researchers pave the way for new treatment for heart failure

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(Medical Xpress) -- Scientists at the University of Glasgow, working with international colleagues, have discovered a new method of potentially reversing the effects of congestive heart failure.

The team from the Institute of Neurosciences & Psychology led by Dr George Baillie, have identified an enzyme that could be targeted with drugs to treat the condition.

[Congestive heart failure](#) (CHF) is a condition where the [heart](#) does not pump sufficient amounts of oxygen and nutrients around the body, resulting in symptoms such as shortness of breath, coughing, exercise intolerance and a build-up of fluid in the body.

It is one of the world's leading health problems and is linked to smoking and obesity, amongst other things.

The team from Glasgow, working as part of an international collaboration headed by Professor Emilio Hirsch at the University of Torino, used the latest technology to discover a way of controlling the enzyme PI-3 kinase, which plays a major role in CHF.

Dr Baillie said: "When we exercise, the increase in oxygen required by our muscles is facilitated by increased blood flow that results from an increased heart rate.

"Heart rate is controlled by the stress hormone adrenaline which binds to

receptors on the surface of the heart cells, making the heart beat faster and stronger.

“However, failing hearts can’t contract properly so they won’t pump enough blood through your body to keep you fit and well.”

The reason failing hearts do not contract properly is due to a reduction in the amount of receptors on the heart cell caused by the over-expression of the enzyme PI-3 kinase.

By inhibiting the expression of PI-3 kinase in mice, the researchers found the adrenalin receptors remained at a normal level thus enabling normal heart function. The discovery offers a new way of potentially treating the condition through the development of new and existing drugs.

Dr Baillie said: “Drugs aimed at this specific enzyme have already been developed but they have not been used for this condition, so this research paves the way for new or existing drugs to be developed for CHF in the next five to 10 years.”

The project took advantage of Glasgow University’s world-leading expertise in peptide array technology, which enables scientists to examine the molecular nature of protein-protein interactions.

The interactions of proteins are very important to the way cells communicate with each other. Cells react to stress by signalling to adjacent cells in order to co-ordinate a timely and unified response.

Peptide Array technology allows scientists to map out the binding sites of proteins to find peptides – short sequences of amino acids – that have the potential to inhibit binding and act as inhibitors to prevent disease.

The research is the cover story in the latest edition of the journal *Molecular Cell* and was funded by the Fondation Leducq, the European Union Sixth Framework Program EuGeneHeart, Telethon, Regione Piemonte, University of Torino, National Institute of Health and the Medical Research Council UK.

Provided by University of Glasgow

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