

'Wonder gene' found to affect blood pressure

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(PhysOrg.com) -- Scientists have identified an important gene that regulates the function of the muscle cells in arteries and thereby helps determine blood pressure.

Dr Paolo Tammaro and his team at the University of Manchester hope their work on the gene - already known to be involved in a lot of different processes in the body such as regulating how the heart beats and how brain cells function - will help the pharmaceutical industry to design novel blood-pressure lowering drugs.

<u>High blood pressure</u> is the most common cause of diseases of the heart and arteries, including heart attacks and strokes. In the UK alone, highblood pressure affects more than 16 million people.

Dr Tammaro, whose findings are published in the *Journal of Physiology* today (1st July 2010), explained: "Blood pressure is regulated by the diameter of the arteries. Muscle cells in the wall of these blood vessels regulate the diameter: muscle contraction narrows the artery and increases blood pressure while muscle relaxation has the opposite effect. We knew that specialized proteins in the muscle <u>cell membrane</u> known as CaCC <u>ion channels</u> are fundamental in controlling this contraction. However, the gene coding for these proteins has been unknown. Now we have identified it as TMEM16A.

"Our findings will help us to understand if, and how, mutations in this gene can cause vascular disease in man. Hopefully they will lead to the discovery of new drugs to help people predisposed to high or low blood



pressure."

He added: "<u>Lifestyle factors</u> such as diet and stress are critical and have a big effect in determining whether or not you will have blood pressure problems; but our genes are also very important.

"This particular gene encodes a protein that is important in the muscle cells' response to hormones such as vasopressin and adrenaline. These hormones are released during stress and bind to the <u>muscle cells</u>, triggering a series of reactions that cause a rise in <u>blood pressure</u>. By identifying the gene, we can understand how the body may better cope with and redress any problems in this delicate process."

Dr Tammaro, based at Manchester's Faculty of Life Sciences, said: "We became excited when the gene for CaCC channels was cloned simultaneously by three separate teams and reported in 2008 in the journals Science, Nature and Cell. We decided to investigate whether this gene had a role in the vascular system. For many years, the CaCC channels were known to be involved in a lot of different processes in the body such as controlling the secretion of fluids in the lungs, perception of odours and regulating how the heart beats and how <u>brain cells</u> function. We now know that this gene is also present and operates in human <u>arteries</u>."

The team, whose work is supported by the BBSRC, the Wellcome Trust and the Royal Society, now plan to approach pharmaceutical companies with their findings in the hope they will be able to use this new target to design novel drugs.

More information: The paper 'TMEM16A/Anoctamin1 protein mediates calcium-activated chloride currents in pulmonary arterial smooth muscle cells' is published in the *Journal of Physiology*.



Provided by University of Manchester

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