



Dr. Peter Helli, Heart and Stroke Foundation of Canada/Pfizer research fellow.

BREATHING EASIER

High blood pressure – the number one risk factor for stroke and a major risk factor for heart disease – can lead to a number of complications.

In the lungs, high blood pressure can cause fluid to leak from blood vessels, resulting in pulmonary edema (fluid in the airways) and shortness of breath.

Common respiratory diseases such as asthma, cystic fibrosis, and chronic obstructive pulmonary disease deprive the body of oxygen, triggering a series of reactions that causes blood vessels in the lungs to constrict. This creates an enormous strain on the heart, to the point where it fails.

We do not fully understand how a decrease in oxygen level causes vessels to constrict. Dr. Peter Helli, from the University of Toronto's Heart & Stroke/Richard Lewar Centre of Excellence, is trying to unravel the process that regulates the constriction of arteries and airways to find out.

As an undergraduate student, Helli became intrigued by the fact that the body uses calcium as a start button to set off a sequence of events that eventually causes airway muscles to contract.

"Calcium is also found in the muscle of blood vessels," he explains, noting that coordinated contraction of two types of muscle is essential for the healthy operation of the lungs. "You have to match two processes – the constriction of the blood vessels and of airways – to get the right amount of oxygen in the blood."

Helli suggests that this common process could offer a unique insight into the difficulties associated with breathing and lead to the development of better medications.

Helli also continues to explore other aspects of calcium signalling, including the action of established medications on heart muscle cells with his supervisor Dr. Peter Backx.



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