

Researchers solve mystery behind baby's first breath

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(Medical Xpress)—Queen's University researchers have discovered how a key artery in a newborn baby's heart constricts and eventually closes when the baby takes its first breath and adjusts to the shock of being born. The discovery will give doctors new treatment options for problems such as blue babies.

"Before birth, every human has a ductus arteriosus artery. When the ductus fails to constrict, it's bad," says [cardiologist](#) Stephen Archer, who was recently appointed head of the Department of Medicine at Queen's.

When a baby is born, the artery senses the high level of oxygen from the first breath and immediately constricts, allowing babies to breath oxygen through their lungs rather than receiving oxygen from their mother's placenta.

Dr. Archer and his team discovered the muscular layer of the ductus arteriosus is responsible for the constriction. Mitochondria – a part of a cell that produces energy – creates a signaling molecule that interacts with [ion channels](#) and enzymes to make the ductus constrict.

"That first breath is like turning on a metabolic furnace," says Dr. Archer.

The study also discovered that a drug called MDIVI-1 can stop the constriction – which could have clinical benefits because sometimes it is necessary to keep the ductus open in infants awaiting complicated heart

surgeries.

Dr. Archer has been working for the past 15 years trying to discover how the oxygen is sensed and how the constriction process in the ductus arteriosus artery works.

The study, conducted with collaborators from the University of Chicago and the University of Nebraska, has been published in the academic journal [Circulation Research](#).

More information: www.ncbi.nlm.nih.gov/pubmed/23334860

Provided by Queen's University

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