

Researchers discover new enzyme function for anemia

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Researchers at St. Michael's Hospital have discovered a new function for an enzyme that may protect against organ injury and death from anemia.

"Identifying this mechanism may lead to new therapies and approaches to improving outcomes for anemic patients," said Dr. Greg Hare, a researcher at the Li Ka Shing Knowledge Institute of the hospital and one of the lead investigators of the study.

One in four people around the world and up to 50 per cent of patients coming for surgery are anemic. The condition has many different causes including infection (malaria, HIV, parasites), [nutritional deficiencies](#) (iron, folate, B12), [genetic mutations](#), pregnancy, trauma and surgical [blood loss](#).

Anemia occurs when blood has a lower than normal number of [red blood cells](#) or hemoglobin – an iron-rich protein that carries oxygen from the lungs and heart to the rest of the body. Cells need oxygen to survive and to produce energy for all bodily functions.

Dr. Hare and colleagues found that when people have anemia, neuronal nitric oxide synthase (nNOS) – an enzyme in nerve cells that produces nitric oxide, an important signaling molecule in the body – increases the body's ability to respond, adapt to low oxygen levels and makes the body more efficient in delivering oxygen to tissues.

The researchers found levels of nNOS in the brain increased in anemic

mice, and that the mice without this enzyme die earlier, and with higher [hemoglobin](#) levels.

The research appeared today's issue of *Proceeding of the National Academy of Sciences*.

"This research will help us identify when an anemic patient is at greatest risk for injury and death when undergoing surgery," said Dr. Hare.

"Research is underway to test these findings in humans."

Provided by St. Michael's Hospital

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