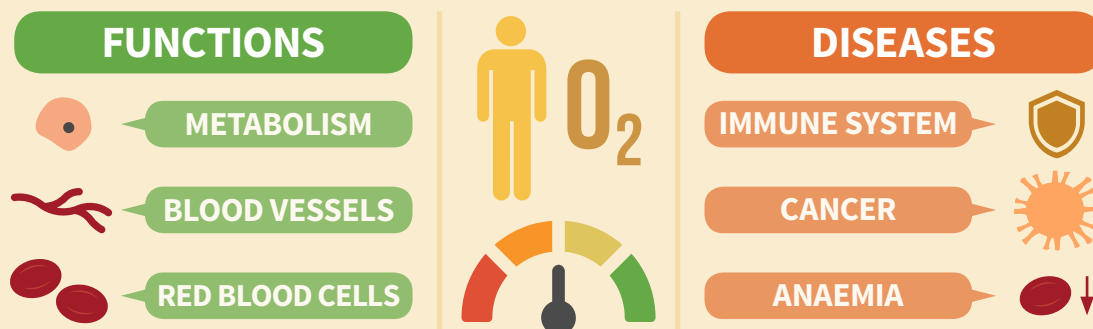


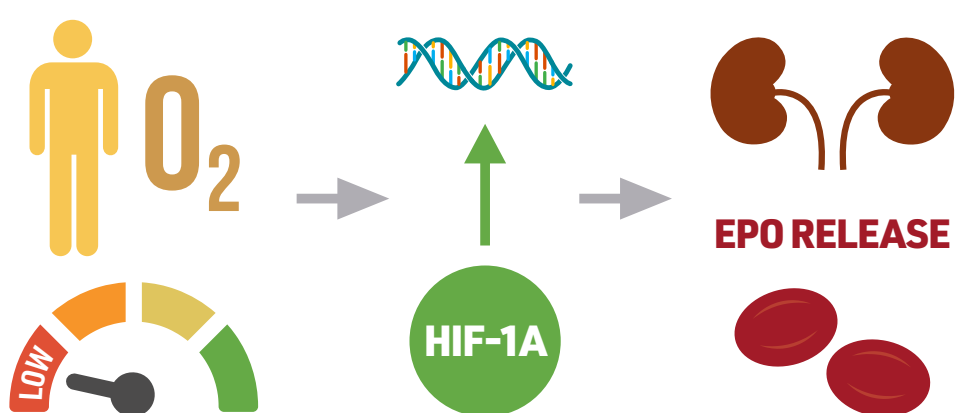
2019 NOBEL PRIZE IN PHYSIOLOGY/MEDICINE



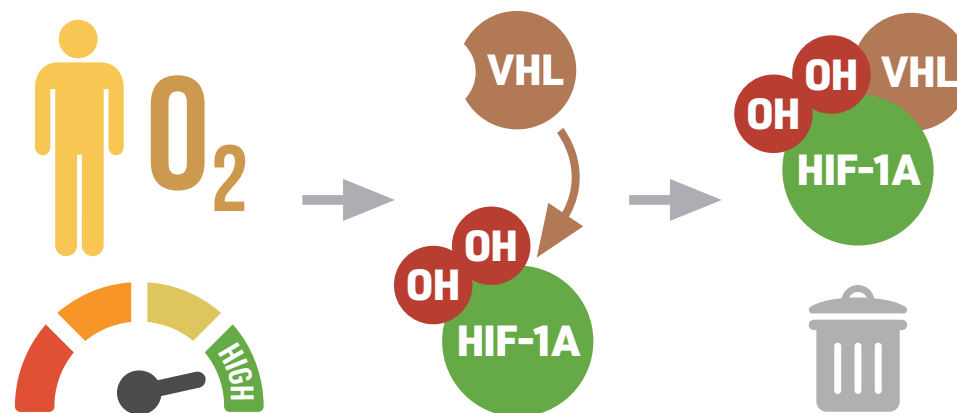
The Nobel Prize in Physiology or Medicine 2019 was awarded to **William G. Kaelin Jr.**, **Sir Peter J. Ratcliffe** and **Gregg L. Semenza** for their work on how cells sense and adapt to oxygen availability.



Oxygen sensing plays important roles in our bodies' cells. It allows adaptation of their metabolisms and production of red blood cells and new blood vessels. It is also important for our immune system, and plays roles in diseases such as anaemia and cancer.



When oxygen levels in our bodies' cells are low (hypoxia), levels of the hormone erythropoietin (EPO) increase to promote production of red blood cells. This is triggered by a protein complex, HIF-1A, which builds up in low-oxygen conditions and binds to DNA to trigger EPO production.



Under normal oxygen conditions, HIF-1A is rapidly broken down. The addition of hydroxyl (OH) groups to HIF-1A allows the VHL protein to recognise and bind to it. The VHL protein labels HIF-1A for degradation by cellular machinery, preventing it from binding to DNA in our cells.

WHY DOES THIS RESEARCH MATTER?

This research helps us understand how oxygen levels affect cell reactions. Drugs that can activate or block these oxygen-sensing mechanisms may be of use in treating cancer and other diseases.

Nobel Prize in Physiology or Medicine Press release: <https://www.nobelprize.org/uploads/2019/10/press-medicine2019.pdf>