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Nobel Prize in Physiology/ Medicine 2019

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

- The discovery by scientists aims to identify the **molecular machinery** that regulates the activity of genes in response to varying levels of oxygen and understand how underlying cells adapt to such variations in oxygen supply.
- **Gregg L. Semenza** was awarded the Prize for the discovery of **hypoxia-inducible factor 1 (HIF-1) protein**.
 - This protein is responsible for **switching genes on and off** in response to low oxygen levels in the cells.
- **Sir Peter J. Ratcliffe** (Professor at Oxford University), earned his share of the Prize for discovering a mechanism common to all cells of the human body.
 - When **oxygen levels are low** in the cells, this mechanism **signals the kidneys** to produce more red blood cells, which carry the vital molecule throughout the body.
- **William G. Kaelin** (Professor at Harvard University) received the Prize for his work investigating a **genetic syndrome** called **Von Hippel-Lindau’s (VHL) disease**.
 - He found that the gene behind VHL encodes for a protein that seems to prevent cancer, and was implicated in its response to low oxygen levels.
 - This discovery was eventually tied to HIF-1 and gave potential understanding to treat a range of conditions like cancer, diabetes, and coronary artery disease.
- The scientists focused on developing drugs that could treat diseases by either activating or blocking the body’s oxygen-sensing machinery.
 - For example, the oxygen response is confiscated by cancer cells which stimulates the formation of blood vessels to help themselves grow.
- This work by scientists has paved the way for new strategies to fight anemia, cancer, and other diseases.

Source: TH