Bicarbonate

- Acts as a buffer to maintain the body's acid-base balance (pH).
- Plays a role in transporting carbon dioxide in the blood.

Bicarbonate (HCO3(-)) plays a crucial role in human physiology, serving as a byproduct of mitochondrial energy production and functioning as a pH buffer throughout the body. Due to its inability to permeate cellular membranes, bicarbonate transport proteins are essential for regulating bicarbonate concentrations across these membranes. In humans, there are 14 bicarbonate transport proteins belonging to the SLC4 and SLC26 families, which operate through various transport mechanisms. Additionally, certain anion channels and ZIP metal transporters assist in the movement of bicarbonate across membranes. Impaired bicarbonate transport can result in various health issues, including systemic acidosis, neurological disorders, kidney stones, and hypertension. Furthermore, changes in the expression levels of bicarbonate transporters in individuals with breast, colon, and lung cancer indicate a significant role for these transporters in cancer progression.[1]

References

1. Alka K, Casey JR. Bicarbonate transport in health and disease. IUBMB Life. 2014 Sep;66(9):596-615. doi: 10.1002/iub.1315. Epub 2014 Oct 1.