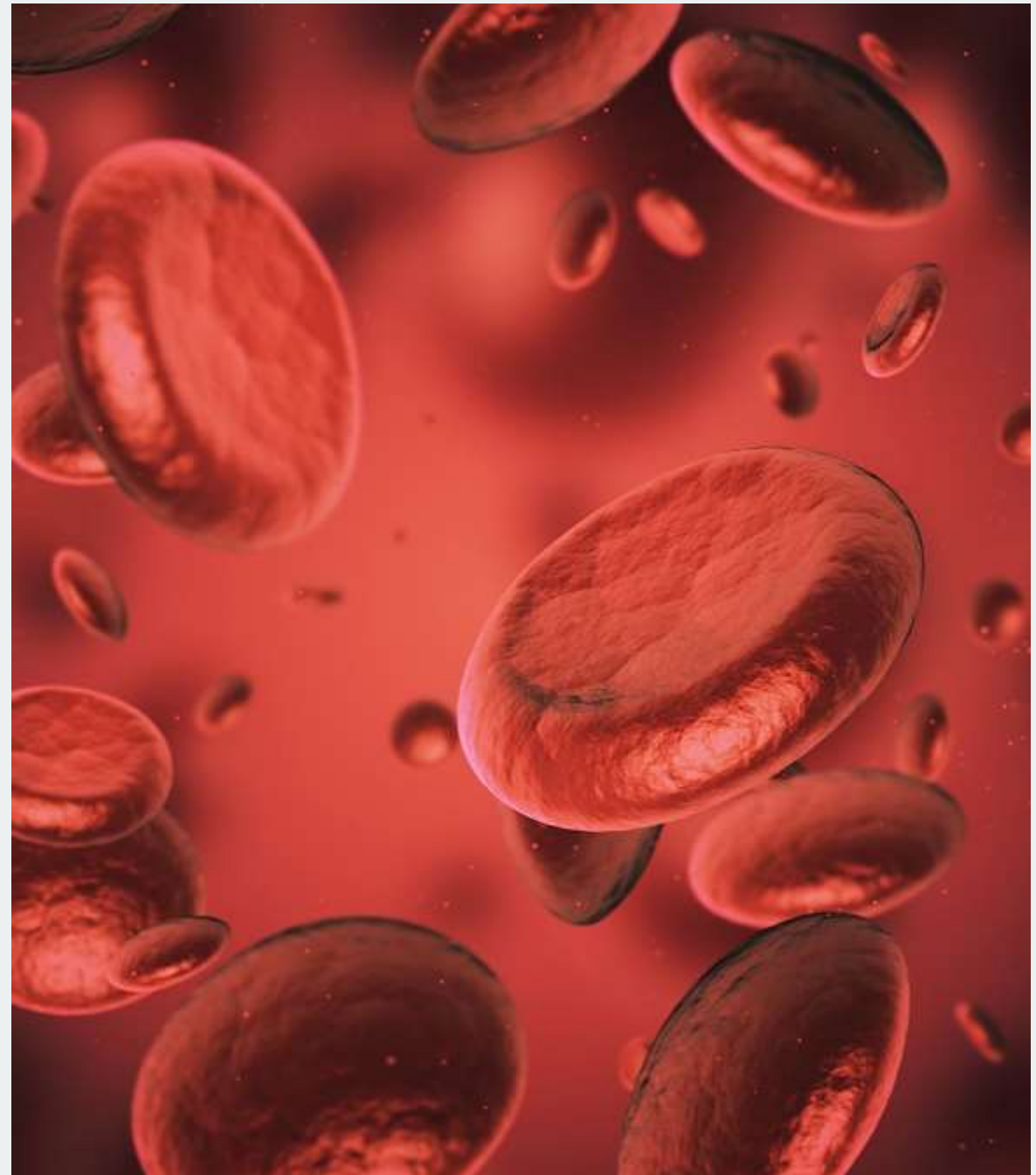




# BOHR EFFECT VS HALDANE EFFECT IN HEMOGLOBIN PHYSIOLOGY

UNDERSTANDING OXYGEN AND  
CARBON DIOXIDE TRANSPORT  
MECHANISMS



THE BOHR EFFECT:  
ENHANCING  
OXYGEN DELIVERY  
TO TISSUES



# MECHANISM AND PHYSIOLOGICAL SIGNIFICANCE OF THE BOHR EFFECT



## **Bohr Effect Mechanism**

CO<sub>2</sub> and H<sup>+</sup> concentrations reduce hemoglobin's oxygen affinity, promoting oxygen release in active tissues.

## **Molecular Changes in Hemoglobin**

Hydrogen ions bind hemoglobin, altering structure and facilitating oxygen unloading; CO<sub>2</sub> forms carbaminohemoglobin aiding release.

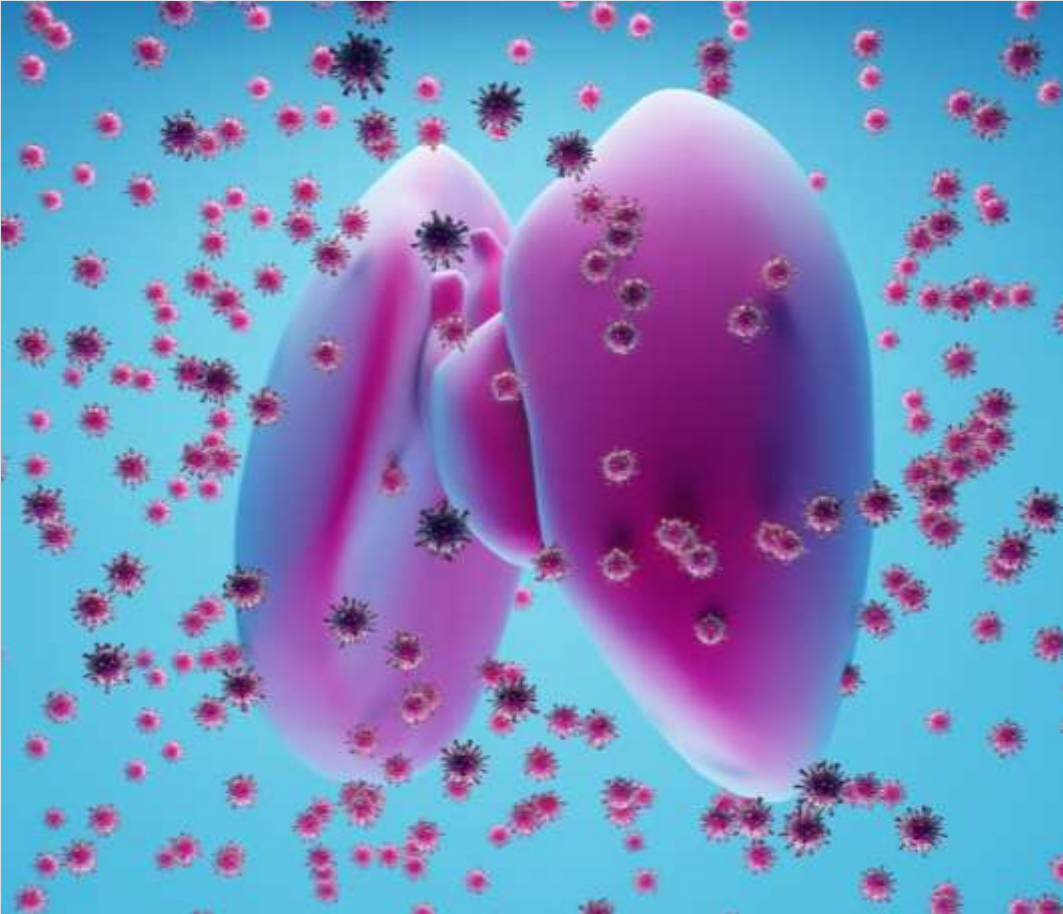
## **Physiological Impact**

The Bohr effect enhances oxygen delivery to metabolically active tissues and increases oxygen loading in the lungs.

THE HALDANE  
EFFECT:  
OPTIMIZING  
CARBON DIOXIDE  
REMOVAL



# MECHANISM AND PHYSIOLOGICAL SIGNIFICANCE OF THE HALDANE EFFECT



## **Oxygenation Reduces CO<sub>2</sub> Binding**

In lungs, oxygen binding to hemoglobin lowers its affinity for carbon dioxide and hydrogen ions, promoting CO<sub>2</sub> release.

## **Deoxygenated Hemoglobin Carries CO<sub>2</sub>**

In tissues, hemoglobin releases oxygen and binds carbon dioxide and hydrogen ions, enhancing CO<sub>2</sub> transport to lungs.

## **Synergy with Bohr Effect**

The Haldane effect complements the Bohr effect, maximizing gas exchange efficiency during oxygen loading and CO<sub>2</sub> unloading.