

MECHANISMS OF GASEOUS EXCHANGE

There are basically three mechanisms involve in gas exchange in mammals:

- Ventilation
- Diffusion of gases in the alveoli
- Transport of gases in blood

1. Ventilation

The mammalian lung is an elastic organ located in the pleural cavity whose wall form the thoracic cage. The elasticity create a low pressure in the fluid filled pleural space. The fluid is incompressible so when thoracic cage changes it volume, the gas filled lung follows. When lung is filled alveoli pressure increases than ambient pressure.

If lung volume is large the glottis in the mouth opens, ribs reduce pulmonary volume and air flows out.

This is best explained by the process of breathing in and out.

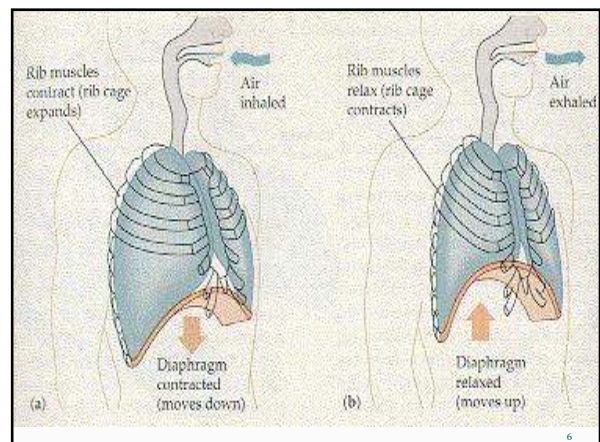
Higher concentration of CO₂ and H⁺ ions are the stimuli that increases breathing rate.

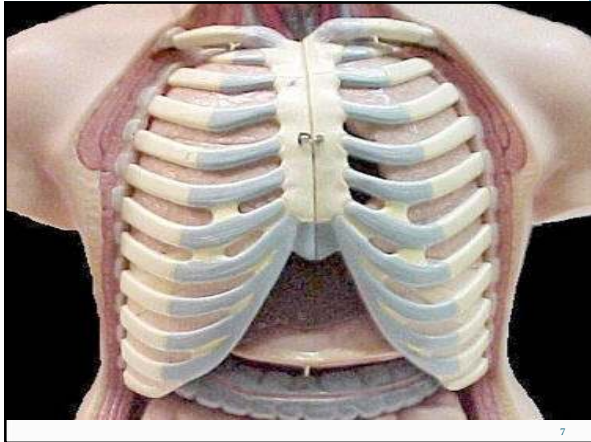
These are detected by chemoreceptors in the body and impulses sent to inspiratory centre.

The centre then fires impulses through the phrenic and thoracic nerves to the diaphragm and intercostal muscles causing inspiration (involuntary).

When lung is fully stretched receptors in the bronchial tree fire impulses to the inspiratory centre to cut off inspiration and expiration then follows.

Breathing can also be voluntarily controlled. Oxygen concentration in blood also affects breathing.





2. Diffusion of gases

Diffusion is the movement of substances from one area to another without the use of energy. Usually movement is from areas of higher to lower concentrations