

Chemoreceptors in the carotid arteries
Receive a high level of blood flow.
Hypoxia is the primary stimulus.
 V_E increases exponentially when PO_2 is low.

The carotid receptor cell is called a glomus.
Its mechanism of stimulation unknown.
The aortic bodies help in response;
Carotid bodies do not act alone.

These “ganglion minutuum” are innervated
By a branch of the 9th cranial.
The innervation of the aortic bodies,
In contrast, is known to be vagal.

At a PaO_2 of 60 (mm Hg) or lower,
Activity increases in the nerve.
This dramatic response to hypoxia
Is what causes the hyperbolic curve.

As one expects from what we know,
In low O_2 , V_E increases.
Frequency and V_t go up and up,
Until the stimulus ceases.

And so it goes the body's response;
To being hypercapnic
And dealing with hypoxia too,
In striving to be homeostatic.

By Lineke

We all agree that when we breathe
We hardly even know it.
Even without conscious input,
Our chest walls stop and go it.

Our brains and muscles work hard at this,
As controllers and effectors.
But the missing link in this feedback loop
Are the body's chemoreceptors.

Centrally located in our medulla oblongata
Are sensors that respond to PCO_2 .
Located peripherally in systemic arteries
Are more; these sense oxygen and pH too.

Bilateral pairs of chemosensitive zones,
But not their exact location,
Researchers agree much more
Upon the means of their stimulation.

These zones respond to acidification
But H^+ cannot pass the barrier.
The membrane between the blood and brain,
So CO_2 must be the carrier,

Response to hypercapnia is somewhat delayed,
 CO_2 diffuses slowly through.
 H^+ arrives at the chemosensitive zones
Via the CSF and brain tissue.

To keep arterial blood gases constant,
Respiration rate and depth are regulated.
Keeping PCO_2 at 45 mm Hg
Is achieved by the alveoli ventilated.

The individual response to CO_2 changes
Is somewhat determined by arousal state.
When we are anaesthetised or fast asleep
Increase in V_E can be rather late.

80% of our ventilatory response to hypercapnia
Is due to these central sensors.
Help, in acute situations or in hypoxia,
Is provided by peripheral receptors.