

Nitric Oxide (NO) Uncovered

The gas, Nitric Oxide (NO), also known as Nitric Monoxide, was first identified as a gas by Joseph Priestly in 1772; however, its true value and importance wasn't discovered until 1986. Prior to that, it was simply thought of as an atmospheric pollutant. Through painstaking research, Ferid Murad, Louis Ignarro and Robert Furchgoot, were able to establish that NO played an important role in regulating biological functions in humans. The original discovery of these three men focused on investigating how blood vessels dilate, or relax, knowing that this, in turn, would controlled blood pressure. Their findings concluded with the fact that nitric oxide was the agent at work that did promote vasodilation in blood vessels; hence, the successful use of nitroglycerin by people with angina. They also found that NO is not only a widespread signaling molecule in all organs of the body, but that the main site for its production is the paranasal sinuses. For their collaborative efforts, they were awarded the Noble Prize of Medicine or Physiology in 1998. (1)

Healthy paranasal sinus epithelium expresses an inducible NO synthase that continuously generates large amounts of NO. (2) Nitric oxide synthases are a family of enzymes catalyzing the production of NO from the amino acid, L-arginine. NO is an important cellular signaling molecule. Since NO is found in all epithelial tissues it can also be increased by eating foods high in Nitric Oxide, such as kale, beets, meat, dark chocolate, etc.

What are the roles of Nitric Oxide in the body? Some of the known functions are listed below.

Cardiovascular system	<ul style="list-style-type: none">• Controls vascular tone.• Relaxes vascular smooth muscles and reduces blood pressure.• Dilates vessels and relieves the pain of angina.• Inhibits the aggregation of platelets within the vessels and prevents thrombotic events.
Nervous system	<ul style="list-style-type: none">• Acts as a neurotransmitter, including in the autonomic nervous system.• Increases cerebral blood flow and oxygenation to the brain.• One of the important mediators in penile erection during sexual arousal.
Lungs	<ul style="list-style-type: none">• Dilates pulmonary vessels.• Beneficial in Adult Respiratory Distress Syndrome, Pulmonary hypertension and Chronic Obstructive Airway Disease.• Produced in abnormal amounts in inflammatory lung conditions.• Concentration of NO in exhaled air can be taken as a marker of airway inflammation.
Gastrointestinal tract	<ul style="list-style-type: none">• Regulates the relaxation of smooth muscles.• Controls peristalsis and the function of sphincters.
Renal system	<ul style="list-style-type: none">• Due to its vasodilatory effect, increases blood flow to the kidney.• Increases the glomerular filtration rate and the production of urine.
Immune system	<ul style="list-style-type: none">• Modulates T cell-mediated immune response.
Reproduction	<p>Possible role in early embryo implantation in the uterus Regulating maternal blood pressure</p>

There is also a link or possible link between low NO levels and many physical problems. Here are a few associated with low Nitric Oxide:

High blood pressure
Heart disease
Heart attack
Stroke
Digestive tract issues; e.g. irritable bowel syndrome
Alzheimer's disease
Dementia
Erectile dysfunction
Bladder issues
Preeclampsia (3) (4)

One very interesting study was conducted concerning nasal NO levels and humming.

The hypothesis was: Would the oscillating airflow produced by humming increase nasal NO levels? Although a small group of subjects was used in this study, the results they found were telling. The noted findings? Humming caused a 15-fold increase in nasal NO compared with quiet exhalation. (5) Why is this of importance? Some of the health benefits noted are the result of NO being produced in others area of the body, rather than the paranasal sinuses. That being said, it appears that the paranasal sinuses are one of the main sites for its production which is another talking point for those of us who encourage nasal breathing instead of mouth breathing. When armed with facts to support our stance, it makes an impact on those to whom we speak about the overall benefits of proper breathing. In my opinion, NO production is certainly one of the major reasons behind the necessity of nasal breathing! Let's all keep humming 😊

This paper is but a small overview of the very complicated but incredibly important gas, molecule, hormone know as Nitric Oxide. There are many articles and studies dealing with this relatively newly found gas as it relates to our bodies health, or lack of. I encourage you all to seek out more information for yourselves and look for further research concerning this amazing gas as the scientific community reveals more findings concerning Nitric Oxide.....

REFERENCES

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